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# PILOT STUDY FOR AN "EMOTION" TRAINING PACKAGE FOR ADULTS WITH ASPERGER SYNDROME

SOLVEIG HOBRO, NADINE

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University of Plymouth

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PILOT STUDY FOR AN "EMOTION" TRAINING PACKAGE  
FOR ADULTS WITH ASPERGER SYNDROME

by

**NADINE SOLVEIG HOBRO**

A thesis submitted to the University of Plymouth  
in partial fulfilment for the degree of

**DOCTOR OF CLINICAL PSYCHOLOGY**

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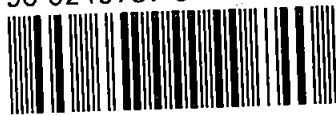
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# **PILOT STUDY FOR AN "EMOTION" TRAINING PACKAGE FOR ADULTS WITH ASPERGER SYNDROME**

**Nadine Solveig Hobro**

## ***ABSTRACT***

Asperger Syndrome (AS) is considered to belong to the spectrum of autistic disorders. Although people with AS are more cognitively able than many others with autism, they share a number of traits including the social impairments identified by Wing and Gould (1979). Problems with processing emotional information may underlie some of these social impairments. Reported difficulties in this area include perceptual deficits which interfere with processing visual cues offered by others, difficulties in matching emotional signals across modalities (e.g. visual, auditory, and contextual), and lack of comprehension about affective information.

The present study aimed to investigate the above emotional impairments, and to determine whether an intervention which developed the cognitive skills of adults with AS could compensate for some of these difficulties. Four participants, diagnosed as having AS by a psychiatrist, took part in the study. Each was assessed on emotion-processing tasks before and after finishing a six session intervention focusing on the use of cognitive and behavioural strategies to decipher affective information.

Prior to the intervention, the difficulties reported by other studies on matching visual and cross-modal signals of emotional information were generally found, but results for comprehension of verbal terms and recounting emotional experiences were not clearly replicated. Following the intervention, all participants improved on or performed at ceiling level for the visual and cross-modal tasks. Predicted improvement on the comprehension tasks was not always found. It is suggested that although linguistic ability is obviously important in such tasks, exposure to social situations is required if connections are to be made between verbal labels, affective behaviours, and social contexts.

Strengths and weaknesses of the overall design are discussed. It is argued that the single-case study approach was useful for revealing operational problems in an efficient manner. However, the small number of participants make it difficult to generalise the findings, and the materials used can be criticised in terms of their reliability and validity. Questions are raised about the potential to generalise improvement found in a controlled environment to more natural settings.

It is concluded that although the design can be criticised on a number of counts, the results suggest it is possible to train adults with AS to systematically decipher visual and cross-modal emotional cues using their cognitive abilities. Recommendations for improving the intervention include concentrating on one aspect of emotional processing at a time. In view of the clearer findings for visual and cross-modal processing tasks it is proposed that these areas should be the starting point of an intervention. Further research could determine whether people with AS who have been taught to categorise visual cues in a systematic way can then be taught to link other forms of affective information to these physical images.

# **CONTENTS**

	<b>Page</b>
<b><i>Copyright Declaration</i></b>	<b>1</b>
<b><i>Title Page</i></b>	<b>2</b>
<b><i>Abstract</i></b>	<b>3</b>
<b><i>List of Contents</i></b>	<b>4-6</b>
<b><i>List of Tables</i></b>	<b>7</b>
<b><i>List of Illustrations</i></b>	<b>8</b>
<b><i>Acknowledgements</i></b>	<b>9</b>
<b><i>Author's Declaration</i></b>	<b>10</b>
<b><u>Chapter 1: Introduction</u></b>	<b>11-44</b>
1.1 Characteristics of Asperger Syndrome (AS)	12-20
1.1a Comparisons between AS and Autism	12-17
1.1b Comparisons between AS and other Syndromes and Disorders	17-19
1.1c Summary - Characteristics of AS	20
1.2 Implications of AS	20-25
1.2a Family Life	20-21
1.2b Education	21-22
1.2c Work	22-23
1.2d Social Life	23-24
1.2e Intimate Relationships	24-25
1.2f Summary - Implications of AS	25
1.3 Models of Intervention	25-29
1.3a Pharmacological Treatment	26
1.3b Psychogenic Model of Treatment	26-27
1.3c Behaviour Therapy	27
1.3d Social Skills Training	28
1.3e TEACCH	28-29
1.3f Summary - Models of Intervention	29
1.4 Emotional Deficits Underlying Social Difficulties	29-36
1.4a Theories Encompassing Emotional Deficits in AS	29-31
1.4b Evidence for Unusual Emotional Processing in People with AS	31-35
1.4c Summary - Evidence for Unusual Emotional Processing	35-36
1.5 Rationale for the Present Study's Intervention	36-40
1.5a The Use of a Structured Training Intervention	37
1.5b Components of an Emotional Processing Teaching Intervention	37-38
1.5c Summary - Rationale for the Present Study	38-40
1.6 Aims of the Study	41
1.7 Hypotheses	41-44
1.7a Comparisons between Studies	41-42
1.7b Comparisons between Pre-intervention and Post-intervention Scores	42-44

# **CONTENTS** (cont. / 2)

	<b>Page</b>
<b><u>Chapter 2: Method</u></b>	<b>45-57</b>
2.1 Design	45-46
2.1a The "Replication" Studies	45
2.1b The "Intervention"	46
2.1c Sequence for Order of Presentation of Materials	46
2.1d Comparisons	46
2.2 Participants	47-48
2.3 Materials	48-51
2.3a Replications Studies	
<i>Advanced Test of Theory of Mind</i>	48-49
<i>Emotion and Identity Sorting Tasks</i>	49
<i>Comprehension of Verbal Terms for Emotions</i>	49
<i>Cross-Modal Processing Task</i>	49-50
<i>Understanding of Simple and Complex Emotions</i>	51
2.3b Intervention	51
2.4 Procedure	52-57
2.4a Replication Studies	
<i>Advanced Test of Theory of Mind</i>	53
<i>Emotion and Identity Sorting Tasks</i>	53-54
<i>Comprehension of Verbal Terms for Emotions</i>	54
<i>Cross-Modal Processing Task</i>	55
<i>Understanding of Simple and Complex Emotions</i>	55-56
2.4b Intervention	56-57
<b><u>Chapter 3: Results</u></b>	<b>58-83</b>
3.1 Advanced Test of Theory of Mind	58-62
3.1a Comparison between Replication Study and Pre-Int Scores	59-60
3.1b Comparison between Pre-Int and Post-Int Scores	60-62
3.2 Emotion and Identity Sorting Tasks	62-64
3.2a Comparison between Replication Study and Pre-Int Scores	62-63
3.1b Comparison between Pre-Int and Post-Int Scores	63-64
3.3 Comprehension of Verbal Terms for Emotions	65-72
3.3a Comparison between Replication Study and Pre-Int Scores	65-66
3.3b Comparison between Pre-Int and Post-Int Scores	66-72
3.4 Cross-Modal Processing Task	72-74
3.4a Comparison between Replication Study and Pre-Int Scores	72-73
3.4b Comparison between Pre-Int and Post-Int Scores	73-74
3.5 Understanding of Simple and Complex Emotions	75-83
3.5a Comparison between Replication Study and Pre-Int Scores	75-77
3.5b Comparison between Pre-Int and Post-Int Scores	77-83
<b><u>Chapter 4: Discussion</u></b>	<b>84-104</b>
4.1 Comparisons between Studies	84-94
4.1a Advanced Test of Theory of Mind (TOM)	84
4.1b Emotion and Identity Sorting Tasks	85-86
4.1c Comprehension of Verbal Terms for Emotions	86-88
4.1d Cross-Modal Processing Task	88-89
4.1e Understanding of Simple and Complex Emotions	89-92
4.1f General Comments about the Replication Studies	92-93

# **CONTENTS** (cont. / 3)

**Page**

## ***Chapter 4: Discussion*** (cont.)

**84-104**

### **4.2 The Intervention**

**94-95**

### **4.3 Recruitment of Participants**

**95-96**

#### **4.3a Factors involved in the use of Control Variables**

**95-96**

#### **4.3b Difficulties in Recruitment**

**96**

### **4.4 Materials used in the Study**

**97-101**

#### **4.4a Validity and Reliability**

**97-98**

#### **4.4b Technical Proficiency**

**98-99**

#### **4.4c The "Acting" of Emotions**

**99-100**

#### **4.4d Issues Surrounding Generalisation**

**100-101**

### **4.5 Recommendations**

**101-103**

### **4.6 Conclusions**

**104**

## ***Appendices***

**94 pages**

### **I Advanced Theory of Mind Stories**

**11 pages**

### **II Emotion and Identity Sort: Photocopies of faces used**

**6 pages**

### **III Comprehension of Verbal Terms: Instructions, words used, and drawing locations in PPVT**

**1 page**

### **IV Cross-Modal Processing: Photocopies of faces used**

**3 pages**

### **V Cross-Modal Processing: Instructions and example of part of rating form for judges**

**1 page**

### **VI Cross-Modal Processing: Photocopies of "thing" used**

**3 pages**

### **VII Understanding Emotions: Instructions and standardised stories**

**2 pages**

### **VIII Intervention: Example of instructions and part of rating form for photographs, video- and audio-taped materials**

**1 page**

### **IX Intervention: Inter-rater agreement for materials**

**1 page**

### **X Intervention: Session 1 handout - understanding emotions**

**12 pages**

### **XI Intervention: Session 2 handout - facial cues**

**9 pages**

### **XII Intervention: Session 3 handout - bodily gestures**

**9 pages**

### **XIII Intervention: Session 4 handout - face and body combined**

**4 pages**

### **XIV Intervention: Session 2 - facial expressions, photocopies of photographs**

**7 pages**

### **XV Intervention: Session 3 - body gestures, photocopies of photographs**

**7 pages**

### **XVI Intervention: Session 4 - faces and bodies combined, photocopies of photographs**

**7 pages**

### **XVII Information sheet for participants**

**1 page**

### **XVIII Consent form**

**1 page**

### **XIX Emotion and Identity Sort: Example of rating form for trials**

**1 page**

### **XX Comprehension of Verbal Terms: Example of rating form for trials**

**1 page**

### **XXI Comprehension of Verbal Terms: Instructions and example of rating form for raters**

**2 pages**

### **XXII Cross-Modal Processing: Example of rating form for trials**

**2 pages**

### **XXIII Understanding Emotions: Instructions and example of rating form for raters**

**2 pages**

## ***References***

**8 pages**

# LIST OF TABLES

Page

## **Chapter 1: Introduction**

Table 1.1. Wing & Gould's Triad of Social Impairment: Comparisons between normal development, Autism and AS	13
---	----

## **Chapter 2: Method**

Table 2.1. Order of Presentation of Materials	46
Table 2.2. Diagnostic Criteria for Asperger's Syndrome (from DSM-IV 1994 - 299.80 page 77)	47
Table 2.3. Information regarding Participants	48
Table 2.4. Inter-Rater Agreement for Materials used in Cross-Modal Processing Task	50
Table 2.5. Summary of Intervention Sessions	57

## **Chapter 3: Results**

Table 3.1. Time sequence for trials on the Replication Studies	58
Table 3.2. TOM Stories: Comparison of mean correct responses for "Why ...?" questions (Happe 1994 cf present study)	60
Table 3.3. TOM Stories: Categorisation of Ps' responses to "Why ...?" questions into mental and physical explanations	62
Table 3.4. Comprehension of verbal terms: Mean percentage "usual" explanations pre-int and post-int	67
Table 3.5. Understanding Emotions: Comparison of mean scores for task difficulty (Capps et al 1992 cf present study)	76
Table 3.6. Understanding Emotions: Mean percentage locus of control pre-int and post-int for "simple" and "complex" emotions	78
Table 3.7. Understanding Emotions: Emotions for which audience presence or absence remained constant across all trials	79
Table 3.8. Understanding Emotions: Mean percentage audience presence or absence across "simple" and "complex" emotion categories pre-int and post-int	79
Table 3.9. Understanding Emotions: Mean average time latency (in seconds) pre-int and post-int	80
Table 3.10. Understanding Emotions: Mean percentage cognitive strategy pre-int and post-int for "simple" and "complex" emotion categories	81
Table 3.11. Understanding Emotions: Mean percentage type of response pre-int and post-int for "simple" and "complex" emotion categories	82



# LIST OF ILLUSTRATIONS

	<i>Page</i>
<b><u>Chapter 1: Introduction</u></b>	
Figure 1.1. Flow-chart of proposed method for people with AS to process emotional cues in simple social situations	40
<b><u>Chapter 3: Results</u></b>	
Figure 3.1. TOM Stories: Pre-int and post-int correct responses for "Is it true ..?" questions	61
Figure 3.2. TOM Stories: Pre-int and post-int correct responses for "Why ...?" questions	61
Figure 3.3. Sorting Tasks: Comparison of mean correct scores (Hobson et al 1988 cf present study)	63
Figures 3.4 to 3.7. Sorting Tasks: Comparison of Ps' pre-int and post-int performance	64
Figures 3.8 to 3.11. Comprehension of Verbal Terms: Categories of explanations for nouns pre-int and post-int	69
Figures 3.12 to 3.15. Comprehension of Verbal Terms: Categories of explanations for neutral adjectives pre-int and post-int	70
Figures 3.16 to 3.19. Comprehension of Verbal Terms: Categories of explanations for emotional adjectives pre-int and post-int	71
Figure 3.20. Cross-Modal Processing Tasks: Comparison of mean correct scores on the Emotions Test (Hobson 1986a cf present study)	72
Figures 3.21 to 3.24. Cross-Modal Processing Tasks: Comparison of pre-int and post-int scores	74
<b><u>Chapter 4: Discussion</u></b>	
Figure 4.1. Proposed preliminary stage of an intervention for teaching people with AS to use cognitive-behavioural strategies to decipher emotional information	102

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## ***AUTHOR'S DECLARATION***

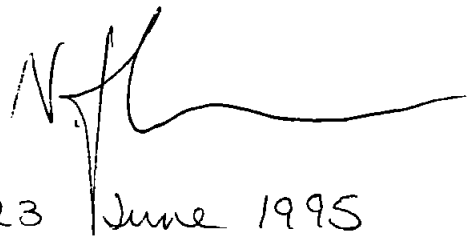
At no time during the registration for the degree of Doctor of Clinical Psychology has the author been registered for any other University award.

The contents of this bound volume are identical to the volume submitted for examination in temporary binding except for the amendments requested at the examination.

All original photographs, videotapes and audiotapes used in this research are held by the author.

This study was conducted while the author was a Trainee Clinical Psychologist in the South West Region based in Southmead Health Services NHS Trust and the research was conducted in collaboration with Southmead Health Services NHS Trust, Bristol and Phoenix NHS Trust, Bristol.

Signed

A handwritten signature in black ink, appearing to be 'N. H.', followed by a long horizontal flourish.

Date

23 June 1995

# ***CHAPTER 1 - INTRODUCTION***

People with Asperger Syndrome (AS) have been reported to display a number of emotional processing deficits. These include impairments in deciphering facial expressions (e.g. Hobson, Ouston & Lee 1988), matching information across visual and auditory modalities (e.g. Hobson 1986a), and comprehension of verbal material which contains emotional information (e.g. Van Lancker, Cornelius & Needleman 1991). The purpose of this research is to investigate whether adults with AS can be taught to use cognitive and behavioural strategies to decipher cues used to signify emotional information.

To understand why this might be a worthwhile clinical task it seems useful to first describe the characteristics of AS and how they impact on the life of people with AS and their carers. The strengths and weaknesses of past and current treatment models used to counteract some of the identified difficulties are also discussed, and a case is made for the importance of facilitating people with AS to use their cognitive abilities to decipher emotional information in social situations.

An important point to stress is that although AS is considered a rare syndrome it is linked to a vast amount of research through its connection with autism (see below for prevalence rates). Despite the belief that autism is even less common than AS it has generated much clinical, experimental and philosophical attention. However, apart from summarising similarities in symptoms between autism and AS, this project will focus on AS. Nevertheless, the presence of autism will remain apparent throughout because at present the argument as to whether or not AS and autism are part of the same continuum (Wing 1988) or spectrum (Fraser 1991) is unresolved. The terms AS and highly functioning autism (HFA) are considered synonymous by a number of researchers (e.g. Howlin

1989; Fraser 1991; Szatmari et al 1989), but others contend that there may be a case for viewing AS and autism as separate syndromes (e.g. Cull et al 1984; Ozonoff et al 1991b; Bowler 1992).

### 1.1. ***CHARACTERISTICS OF ASPERGER SYNDROME***

In 1944 Hans Asperger, an Austrian psychiatrist wrote a series of cases describing "autistic psychopathies" in childhood (cited by Wing 1981), but now commonly known as AS. In the previous year Kanner published an account of the syndrome he called Early Infantile Autism (see Frith 1990), and which shall be referred to as autism in this research. The description of children offered by the two accounts shared a number of features including a profound difficulty in making contact with other people (Fraser 1991). The work conducted by Kanner reached an international audience, but Asperger's research was not widely disseminated outside the German literature until the 1980s (Frith 1991).

Explanations for the cause of AS are speculative, and include genetic components (e.g. Gillberg 1989, in Gillberg & Coleman 1992) and neurological explanations focusing on, for example, unilateral dysfunction of the temporal or prefrontal areas of the brain (Goodman 1989, cited by Gillberg & Coleman 1992; Ozonoff et al 1991a).

For the purposes of this research, emphasis is placed on the clinical characteristics of AS rather than on investigating causation, and below is an attempt to summarise current thinking on how AS manifests itself.

#### 1.1a ***Comparisons between AS and Autism***

##### ***Wing and Gould's Triad of Social Impairment***

Wing (1988) believes the central problem of autism is an impairment in the development of the ability to engage in reciprocal social interaction, which can be divided into three areas: impairment of social recognition;

impairment of social communication; and impairment of social imagination and understanding (see Table 1.1 below). This group of impairments is commonly known as Wing and Gould's Triad (1979).

The term AS has generally been used to describe those people who show evidence of Wing and Gould's Triad, but who are assessed as being of normal or near normal intelligence (e.g. Schopler 1985). From a clinical perspective, people with AS may initially present as merely eccentric, but their difficulties in engaging in reciprocal social interactions become more apparent over time.

<p><b>(A) Impairment of Social Recognition</b></p> <p><i>Normal Development:</i> Newson &amp; Newson (cited by Wing 1988) observed social recognition in "normal" infants during the early weeks of life.</p> <p><i>Autism:</i> At it's most severe, impairment of social recognition can take the form of active avoidance of social and physical contact.</p> <p><i>AS:</i> Social recognition can be detected in people with AS but it seems stilted and this may be because it has been developed by learning rules through intellectual rather than intuitive processes (Wing 1988).</p>
<p><b>(B) Impairment of Social Communication</b></p> <p><i>Normal Development:</i> Social communication includes the ability to give and receive non-verbal, pre-verbal and verbal social signals, together with a desire to enter into such communication. This has been observed in children in the first two to three months of life (e.g. Salter Ainsworth et al 1974).</p> <p><i>Autism:</i> There is a tendency not to use gestures to initiate social interaction or express feelings (Attwood 1984, cited by Wing 1988).</p> <p><i>AS:</i> There may be attempts to enter into conversation, but they are often limited to factual comments and can be irrelevant to the social context (Wing 1988). Contrary to the more severe forms of autism, some people with AS express a wish to form friendships (Tantam, 1991), and their growing awareness of their difficulties in this area may partially account for their presence within psychiatry during adolescence and adulthood (Green 1990).</p>
<p><b>(C) Impairment of Social Imagination and Understanding</b></p> <p><i>Normal Development:</i> Social abilities which involve the imagination are acquired from the second or third year of life (Bulowa 1979, in Wing 1988).</p> <p><i>Autism:</i> Pretend play in which the imaginative use of putting oneself in the position of another person to experience their thoughts and feelings can be lacking.</p> <p><i>AS:</i> Any conception of what is required during play seems to arise from cognitive abilities to decipher and mimic social rules, rather than through intuitive understanding (Wing 1988).</p> <p>This form of impairment is thought to adversely affect the capacity of the individual to estimate the knowledge held by others (Baron-Cohen, Leslie, &amp; Frith 1985). In adults with AS there can be a recognition of the fact that other people have minds and feelings, but this tends to be on an intellectual rather than empathic level (Wing 1988).</p>

**Table 1.1. Wing & Gould's Triad of Social Impairment:  
Comparisons between normal development, Autism, and AS**

### *Other Areas of Comparison*

Although Wing and Gould's Triad are considered to be fundamental to both of the syndromes, other symptoms should also be present when making a diagnosis of autism or AS. These are described below.

#### Language and Communication

*Autism:* If spoken language is present, the "mechanics of language" (Wing 1988) such as vocabulary and syntax are often delayed in development.

*AS:* There does not tend to be a delay in the acquisition of the "mechanics" of language, but vocabulary and grammar may be marked by unusual patterns such as repetitive, long-winded speech.

*Shared peculiarities of speech:* There can be problems in pragmatic aspects such as comprehension and use of language within a social context (e.g. Tager-Flusberg 1981). Echolalia and idiosyncratic use of words and phrases may also be present (e.g. Ricks & Wing 1975). The delivery of speech tends to be staccato or monotonous (Howlin 1989).

*Non-verbal accompaniments to speech:* Facial expressions, eye contact, and gestures are often unusual in autism and AS, and there can be a lack of understanding of other peoples' non-verbal cues (Wing 1988).

#### Cognitive Skills

*Autism:* 67% to 88% of people with autism are thought to have learning disabilities (Gillberg & Coleman 1992). Abilities that do not require social perception or language, for example mathematical and visuo-spatial skills, are usually less impaired than other functions (Lockyer & Rutter 1969).

*AS:* Near-average to average scores tend to be found on intelligence quotient (IQ) scales. In a minority of cases there can be above average ability in one or more areas, such as absolute pitch in music (Wing 1988).

Unusually good rote memory is thought to underlie these skills (Baron-Cohen & Bolton 1993). Recall of information outside areas of special interest often seem impaired (Boucher 1981, cited by Wing 1988), but it is not clear if this is due to a failure to understand the meaning of questions asked or to a failure of memory (Wing 1988).

*Possible cognitive differences between AS and HFA:* Ozonoff et al (1991b) found that their group of AS participants (Ps) performed better on verbal intelligence items and theory of mind tasks compared to an HFA group who gained higher scores on performance tasks.

### Behaviour

Although some researchers have referred to the presence of obsessions and compulsions in people with autism and AS, this study adopts Baron-Cohen's (1989a) suggestion that "repetitive activities" is a more accurate description as it is not always possible to gain subjective data about mental processes underlying the behaviour. Rigid and repetitive patterns of behaviour can be evident in both autism and AS.

*Autism:* There is a tendency to collect objects and/or insistently line up collectable items (Howlin 1989).

*AS:* The collection of facts is more pronounced (Wing 1988), usually manifested in a strong interest in amassing facts about one subject (Howlin 1989), and adhered to in a repetitive way which seems to rely heavily on rote memory (Gillberg & Gillberg 1989).

*Behaviour problems found in autism and AS:* These can include eating difficulties, sleeping problems, aggression (Howlin 1989).



### Responses to Sensory Stimuli

*Autism:* Coleman & Gillberg (1985) noted a tendency for unusual responses (e.g. indifference, distress, fascination) to input in any of the five senses.

*AS:* Although Wing (1988) suggests the above form of response is less observable in people with AS, Bartak & Rutter (1976) report that sensitivity to noise is more pronounced.

### Motor Co-ordination

*Autism:* Problems with motor co-ordination are not noted.

*AS:* There appear to be problems with aspects of motor co-ordination, for example, some children with AS are late in walking while others can be clumsy and awkward (Wing 1988). There may also be difficulties with operations requiring combinations of movement, such as turning a door handle and opening a door at the same time (Wing 1988).

### Prevalence

*Autism:* Gillberg & Gillberg (1989) suggest a prevalence rate of 2 to 4.5 per 10,000 population.

*AS:* The prevalence of AS is approximately 10 to 30 per 10,000 (Gillberg & Gillberg 1989).

*Similarities in Autism and AS:* There is thought to be a preponderance of males in both conditions (Howlin 1989). However, AS may be more common in females than originally thought. For example, Gillberg & Rastam (1992, cited by Gillberg & Coleman 1992) found an increased frequency of AS in the premorbid history of some girls who developed anorexia nervosa in adolescence.

### Age of Onset

**Autism:** Onset of autism should be apparent before 30 months (see Baron-Cohen & Bolton 1993).

**AS:** Diagnosis of AS seems to be less easily identifiable in early childhood compared to autism. Indeed, AS may not be recognised until adolescence or adulthood when family crisis or personal distress, precipitated by the condition, brings the person with AS to psychiatric attention (Green 1990).

#### 1.1b. **Comparisons between AS and other Syndromes and Disorders**

Gillberg & Coleman (1992) have proposed that the umbrella term "autism syndromes" or "autism and autistic-like conditions" could cover the group of severe disorders in the autism spectrum. All categories covered by this term would share the following characteristics: severe abnormality of reciprocal social relatedness; severe abnormality of development of communication; rigid and restricted behavioural repertoire and imaginative skills; and that all of these symptoms are out of phase with the overall intellectual level of the child.

Although this proposed method of categorisation seems a sensible one, and most researchers believe there is a link between AS and autism, it should be recognised that AS has been associated with a number of other conditions including Semantic-Pragmatic Disorder (Bishop 1989), DAMP (deficits in attention, motor control and perception: see Gillberg 1993), Tourette's Syndrome, and Epilepsy (Tantam 1993). It has also been reported that "depression", "paranoia" "obsessive-compulsive personality disorder" (Gillberg & Coleman 1992), and "anxiety states" (Tantam 1991) are common diagnostic labels given to adolescents and adults with AS by adult psychiatrists. Other conditions, which have been controversially linked with AS, are briefly discussed below.

### *Learning Disabilities (LD)*

The term LD is commonly employed to describe people with IQ scores of 70 or under. As mentioned above, the majority of people with autism will fit into this category, but those with AS may not.

Clearly some means of deciding a cut-off point for access to available services needs to exist. However, it can be argued that the present criteria, with its emphasis on cognitive performance, is too limited. Greenspan & Granfield (1992) propose that intelligence should also include aspects of social competence, and Stokes (1987; in Sinason 1992) makes the distinction between emotional and cognitive intelligence. If these two criteria are accepted then it can be argued that people with AS do come under the umbrella of LD.

A reason for making this point is that, at present, carers of many people with AS find it difficult to access professional services and rely on agencies such as the National Autistic Society for information and guidance (personal communication with the parents of one participant in this study). The alternative for many in adulthood is the psychiatric services where their condition could be misunderstood (see below under "Schizophrenia").

### *Schizoid Personality (SP)*

Wolff and her colleagues have argued that SP, autistic psychopathy and AS are equivalent terms, and that children diagnosed as SP differ on a number of psychological tests from both autistic and normal children (Wolff & Barlow 1979).

Although the core attributes of SP in childhood, such as social isolation, the single-minded pursuit of special interests, and abnormalities of verbal communication, seem remarkably similar to those found in the

autistic spectrum, Cull, Chick & Wolff (1984) suggest that SP in childhood should be differentiated from autism on two counts. Firstly, that while the above characteristics remain stable over time in SP, emotional withdrawal improves with age in autism. Secondly, in the case of boys, the syndrome of SP in childhood corresponds to the diagnosis of SP in adult life. Howlin (1989), however, argues that one reason for rejecting a term including the word "schizoid" is that it suggests links with Schizophrenia.

### *Schizophrenia*

Although it can be argued that both SP and Schizophrenia share certain characteristics in common with AS such as inappropriate affect, unusual forms of social interactions and communication, and difficulties in understanding facial information (e.g. Gessler et al 1989 with regard to Schizophrenia; Hobson 1986a with regard to AS), they are qualitatively different (Howlin 1989).

One distinguishing feature is that while people with AS have never shown normal development in the above areas, people with Schizophrenia are thought to show a deterioration in these abilities, usually during adolescence or early adulthood. Nevertheless, some people with AS have been misdiagnosed as having Schizophrenia in early adult life, and Gillberg & Coleman (1992) suggest this may be because psychiatrists who specialise in work with adults are unfamiliar with the condition of AS. Tantam (1991) argues that one reason for avoiding such a misdiagnosis is that it can lead to inappropriate treatment for AS, such as the prescription of neuroleptic drugs which, ironically, can worsen the lack of emotional expression (Tantam 1988).

### 1.1(c) **Summary - Characteristics of AS**

Although AS has been linked to a number of other disorders, this study adopts the position that AS belongs within the autistic spectrum and the labels AS and HFA are interchangeable (e.g. Szatmari, Bartolucci & Bremner 1989). The stance is taken for pragmatic reasons as Ps in previous research are likely to have been clinically diagnosed by people who adhere to the idea that AS and HFA are synonymous, and much of the research of interest to the present study has focused on autism in general rather than AS in particular.

### 1.2 ***IMPLICATIONS OF AS***

The above offers a description of the characteristics found in AS. They can have negative consequences for the lives of people with AS and their carers. Outlined below are some areas on which the symptoms of AS can impinge in a detrimental fashion.

#### 1.2a ***Family Life***

In the early years parents may be faced with a child who seems indifferent to them. Parents in a study by Newson et al (1984c) considered lack of responsiveness or communication to be amongst the most "trying behaviours" of their children. Parents are also likely to remain responsible for their child much longer than is the case with "normal" children. One reason why the AS individual may wish to remain with their parents is because the relative safety of the known family is preferable to unknown interpersonal situations (Bemporad 1979).

The family may have to cope with behaviour problems such as poor hygiene (Newson et al 1984c), wakefulness at night, food fads, and aggressiveness (Tantam 1993). There can also be a tendency for the person with AS to repeat the same questions continually about things that

interest them, day after day for years (Newson 1987). The individual with AS may demand adherence to rigid routines in an attempt to "get order into an unbearably chaotic life" (Jolliffe et al 1992), but this can impose intolerable demands on other family members.

Due to the comparatively unobtrusive disabilities of AS compared to other forms of learning disability there can be a delay in diagnosis. However, the above problems can be compounded by this delay (Tantam 1991), for example by leaving parents feeling isolated and labelled as "neurotic" (personal communication with parent of a P in this study).

### 1.2b ***Education***

The education of children with AS will depend on a number of factors including whether the syndrome has been recognised and diagnosed, and if particular educational provisions such as special units within mainstream schools, or schools which specialise in teaching children with autism, are available in their local district. Some children with AS do not receive any kind of special educational provision because the syndrome is not recognised. Indeed, their orderliness, punctuality and lack of rebellion (Tantam 1991) may result in teachers perceiving them as model pupils, and their good linguistic skills can mask their social and emotional impairments (Jordan 1992).

Children with AS tend to perform better at subjects which rely on good memory, for example maths and music, than they do with subjects involving social or communicative skills such as English literature which requires the interpretation of characters' meanings and intentions (Baron-Cohen & Bolton 1993). A few children with AS can be successful in examinations, and may go on to higher education (Tantam 1991).

Newson et al (1984b) found that the main problem behaviours of children with AS in primary school were social integration and general

unmanageability and disruptiveness, while two problems emerged when the child moved into secondary school. These were difficulties in adjusting to larger class sizes and also the greater need for self-organisation.

Case studies suggest that some children with AS are frightened by other children, although they desire more human contact by adolescence (e.g. Bemporad 1979; Jolliffe et al 1992). Newson et al (1984b) found that the children may fail to make friends and be subjected to teasing and bullying in secondary school, and that they rarely participate in school activities. Other children may take advantage of the lack of social understanding in a child with AS and encourage them to display unacceptable behaviour (Howlin 1993).

### 1.2c **Work**

Bartak & Rutter (1976) reported that approximately half of their Ps with IQ scores of 70 or above among their sample found employment on the open market. This suggests that, at least in a buoyant economic climate, job prospects are possible for some people with AS.

The social and communicative impairments of an individual with AS may not be noticed until they begin work. Tantam (1991) identifies a common pattern in the work history of a person with AS who has been academically successful: the first job is consistent with scholarly achievements but will only last a few months; this is followed by another job of lesser responsibility which lasts for an even shorter time; this is then followed by a succession of less skilled jobs; and ultimately the person with AS may become unemployed.

Problems at work can arise for a number of reasons including the difficulty experienced by a person with AS to understand the implicit social rules taken for granted by others, and because of problems in coping with changes in routine (Howlin 1993). Lack of empathy on the part of the

person with AS can lead to offensive behaviour towards co-workers, while anxiety may result in the need for constant reassurance from supervisors (Arendt 1991).

Nevertheless, some people with AS have been successful in retaining work and employers rate them as reliable and hardworking (Newson et al 1984b). Bemporard (1979) suggests that if instructions are made explicit then individuals with AS are capable of doing an adequate job, but "common sense" cannot be relied upon because they lack the ability to distinguish between trivial and crucial aspects of a job.

#### 1.2d ***Social Life***

The inability of a person with AS to modify speech for different listeners, the tendency to talk too long on subjects that do not interest others, the lack of understanding about conversational turn-taking, and the terseness of tone can all alienate other people. Impairments in pragmatic and non-verbal forms of communication can mean that jokes, metaphors, exaggerations, and ironical statements are taken literally (Tantam 1991).

People with AS may wish to initiate and maintain social contact but they lack the skills to carry it through successfully (Jordan 1992). They may be unusually demanding of attention and their approaches perceived as odd (Volkmar et al 1989, cited by Lord 1993). There can be a realistic fear of rejection on their part because of past experiences (Bemporad 1979). They may fail to recognise cues from others suggesting boredom or irritability (Dewey & Everard 1974), and their lack of guile may result in behaving in ways considered impolite by others, for example by being too honest in their opinions or not understanding the implicit rules governing personal space or eye contact (Howlin 1993).

Most people have the ability to deceive, charm, and manipulate others for their own needs, and can also assess their impact on their



audience. They can also use this knowledge when deciphering the behaviour of others so as to make judgements about who to trust and what motives underlie the other person's behaviour (Tantam 1991). People with AS, however, lack these abilities because of their social and emotional impairments. Their inability to empathise with others means they cannot predict what others will do (Bemporad 1979). Life to a person with AS may appear as "bewildering, a confusing, interacting mass of people, events, places and things with no boundaries" (Jolliffe et al 1992).

A core element of AS is difficulty in understanding and using rules governing social behaviour (Wing 1981) and a consequence of this can be that a person with AS will not be restrained by a show of fear in another person (Tantam 1991). It is not known whether this is likely to result in people with AS committing more misdemeanours than people in the general population, but catalogued transgressions include grievous bodily harm and sexual offences (Murphy 1991).

#### 1.2e ***Intimate Relationships***

Although individuals with AS can become attached to other people (Dewey & Everard 1974), few are able to engage in long-term intimate relationships (Tantam 1993). Bemporad (1979) recounts how one client with AS rationalised his difficulties with the opposite sex by complaining that they preferred "weirdos and hippies" to dating "nice guys". Although there was recognition on the part of the client that he was different from other people, Bemporad believes he needed to deny this difference and so looked for external factors to blame for his difficulties.

Despite problems in forming intimate relationships, many people with AS have sexual feelings, and may use masturbation to relieve sexual tension. However, their lack of understanding of social etiquette means they may do so in unacceptable places. This can cause embarrassment for

carers who may wish for the behaviour to stop. However, it seems unfair to stop an activity which many people enjoy. Newson (1987) suggests effort would be more profitably employed in teaching the person with AS about where and when it is permissible.

#### 1.2f **Summary - Implications of AS**

Although the above paints a bleak picture for the prospects of people with AS, Gillberg & Coleman (1992) consider the prognosis for AS to be variable, ranging from "excellent to poor". Tantam (1988) identifies adolescence as the most turbulent time because of its association with the development of sexual partnerships and the transition from school to the less structured world of work.

Some people with AS probably never come to the attention of any professional service, and it may be that they are perceived as eccentric by acquaintances. However, Newson et al (1984c) caution that the more intellectually able a person is, the more vulnerable they may be to the anxieties aroused about being "so close to 'normality' and yet not able to enter into normal society in their own eyes."

#### 1.3 **MODELS OF INTERVENTION**

It is hoped that the above conveys some of the potentially detrimental effects that AS can have on a person's life. A number of interventions are available for those people with AS who do receive professional attention. However, it is difficult to distinguish the effectiveness of such treatments on people with AS, because much the research in this area focuses on autism, and this is reflected below.

Schreibman (1988) divides treatment approaches for autistic people into three categories: drug therapy; models based on a psychogenic explanation, and behavioural approaches. Each are outlined below.

Although it could be argued that social skills training and the TEACCH (Treatment and Education of Autistic and related Communication-handicapped CHildren) program employ behavioural techniques, they are discussed separately because both have generated much research and clinical work, and also have relevance to the present study.

### 1.3a ***Pharmacological Treatment***

This form of treatment focuses on the use of drugs to alleviate some of the disruptive behaviours found in autism (Schreibman 1988).

The efficacy of a number of drugs have been explored, including fenfluramine which is used to reduce the blood level of serotonin, a natural chemical found to be high in about one third of autistic children. However, the benefits of this drug are not clear (Baron-Cohen & Bolton 1993). Major tranquillisers (including chlorpromazine and thioridazine) have been used to provide temporary relief from aggression and other behaviour problems, but because of their powerful effects they are used only in the short-term (Baron-Cohen & Bolton 1993). There is contradictory evidence about the usefulness of amphetamines to improve attention span and lower activity levels in autistic children (e.g. Mesibov & Dawson 1986, c.f. Campbell et al 1972, cited by Schreibman 1988).

Problems with using pharmacological interventions include the possibility of negative side effects. There are also difficulties involved in attempting generalised use of this treatment in a population which is not yet clearly defined.

### 1.3b ***Psychogenic Model of Treatment***

This approach considers autism to be the result of an extremely unsatisfactory relationship between child and parent (usually the mother). Essentially, it is hypothesised that the parent directs very negative feelings

towards their infant. As a consequence, the child learns to perceive the world as a dangerous place and so withdraws from social contact (see Cantwell, Baker & Rutter 1979).

Treatment can consist of removing the child from the parental home into a residential setting where therapists undertake the role of surrogate parent in an attempt to encourage the re-emergence of the child's natural trust in other humans and the environment (Schreibman 1988).

Few clinicians hold this position today (Cantwell, Baker & Rutter 1979), and there is no empirically validated evidence to support the underlying hypothesis that parents are responsible for the development of autism in the child (e.g. Rutter 1971, cited by Schreibman 1988).

### 1.3c ***Behaviour Therapy***

Behaviour therapy using operant procedures is thought to have been useful in modifying a number of behaviours perceived as problematic in people with AS or autism. These include aggressive behaviour, rituals and disturbances of eating and sleeping (see Howlin et al 1973).

A disadvantage of earlier behavioural programmes was the type of reward and punishment regime imposed, for example food as a reward for desired behaviour, and physical punishment for unacceptable behaviours. However, recent programmes have employed more natural social rewards such as praise and attention (Hemsley et al 1979).

One advantage of this approach is that parents can be trained to carry out behaviour therapy in the home (e.g. Hemsley et al 1979). Lovaas (1979) reported that children whose parents took on this role continued to improve after his team withdrew from working with them.

### 1.3d **Social Skills Training**

Social skills training encompasses a broad range of techniques used to help teach individuals with autism how to interact with other people (Baron-Cohen & Bolton 1993), and a number of therapeutic programmes have been developed (e.g. Hemsley et al 1979).

Interventions have included the teaching of rules about who to talk to, and how different topics of conversation are more acceptable in some situations than others. Drama groups and role play have also proved useful in offering feedback about social performance (Howlin 1988).

A number of difficulties have been highlighted by researchers. One poignant problem is that following social skills training there may be an expectation on the part of someone with AS to form friendships using the acquired skills, and subsequent depression if this fails to occur (Howlin 1988). Unsurprisingly, social behaviour can seem stilted because it relies on applying taught rules rather than "naturally" learned behaviour (Baron-Cohen & Bolton 1993).

### 1.3e **TEACCH**

The TEACCH program was developed in North Carolina by Schopler and his colleagues (e.g. Lansing & Schopler 1979) in recognition of the fact that it is unlikely that any one technique can accommodate the wide range of behavioural and intellectual impairments found under the label of autism (Lansing & Schopler 1979).

The program uses parents as co-therapists in the TEACCH centre and also in the home where a curriculum for home teaching is developed on an individual basis. It takes into account each child's developmental level and the parents' priorities and resources (Lansing & Schopler 1979).

Similar work, utilising the home environment, has been conducted in England in the "Home-based Treatment Programme" developed by Howlin and colleagues (e.g. Hemsley et al 1979; Howlin et al 1973).

### 1.3f **Summary - Models of Intervention**

The above outlines a number of treatments employed to help people within the autistic spectrum, although it does not claim to be a comprehensive list. Those that have been mentioned are drug treatments to alleviate particular difficulties manifested in autism, psychogenic models of understanding the condition, and behavioural programmes to extinguish or modify "deviant" behaviours and encourage socially acceptable conduct.

Although behavioural approaches in particular have proved useful in increasing self-help skills, Baron-Cohen & Bolton (1993) suggest they have been less successful with social and communicative skills because these abilities do not depend on any one single behaviour that can be increased or decreased. It has also proved difficult for social skills training to teach people with autism to understand concepts such as empathy or to be sensitive to other people's feelings (Baron-Cohen & Bolton 1993).

## 1.4 ***EMOTIONAL DEFICITS UNDERLYING SOCIAL DIFFICULTIES***

### 1.4a **Theories Encompassing Emotional Deficits in AS**

Theories explaining the deficits found in the autistic spectrum fall into two categories (Loveland & Tunali 1993). The first adopts a cognitive stance, arguing that the child fails to develop a theory of other people's minds. The second proposes that there is a gross affective deficit whereby a human's innate capacity to engage in reciprocal interactions is somehow disturbed. Both offer explanations for the emotional deficits found in AS.

### *The Role of Theory of Mind (TOM) in Explaining Emotional Impairments*

TOM has generated vast amounts of theoretical and experimental attention. However, this study will limit itself to a very brief outline of the theory and how it is thought to impinge on emotional understanding in people with AS.

Essentially, it is thought that autistic individuals are impaired in their ability to conceive of other people's mental states, including beliefs and knowledge and are, therefore, limited in their appreciation of another person's point of view (e.g. Frith 1990). Proponents of the theory suggest that a consequence of this cognitive fault is that their understanding of the emotional life of themselves and others is limited (see Mundy & Sigman 1989).

Baron-Cohen (1989b) found that some autistic children were able to make simple mental state attributions, and it has been proposed that there are three different levels of belief attributions. A person unable to make any mental state attributions is classified as having no TOM; someone with first-order TOM can attribute mental states to another person; second-order TOM ability requires the person to predict one person's thoughts about another person's thoughts (Ozonoff et al 1991a).

### *The Role of Affective Theory of Autism in Explaining Emotional Impairments*

Fein et al (1986) propose that the social and cognitive impairments found in people with autism are a consequence of deficits in affective functioning, and that part of this impairment is an inability to decode the emotions of others.

Hobson (1989) argues that most infants are innately equipped with the ability to see other people as human beings, but this is missing or damaged in individuals with autistic symptoms. The fundamental deficit

found in autism is believed to be a lack of direct affective recognition and responsiveness, and a resultant lack of shared intentionality with others. The child with autism is, therefore, considered to be restricted in their understanding of "persons with minds" (Hobson 1993), and this lack of shared information is thought to lead to the language problems reported in the autism literature.

### *Integration or Rejection of the Two Theories?*

Mundy & Sigman (1989) suggest the above two theories could be integrated into a model which proposes that deficits in both cognitive and affective processes influence a child's development and lead to gestural joint-attention deficits. One consequence of this could be that the child with autistic features does not learn to use or build upon the predictor behavioural clues offered by other people with regard to what can happen in the world around them.

Ozonoff et al (1991a), on the other hand, propose that a neurological model of explanation should be adopted. This model would focus on the search for an underlying impairment in prefrontal function because the prefrontal cortex is thought to be associated with executive function deficits such as perseveration and planning difficulties, and plays a role in regulating emotional behaviour. People with AS show impairments in both of these capacities. Ozonoff et al, therefore, suggest that investigating neurological explanations could lead to a move away from "the sometimes misleading cognitive vs affective dichotomy ..."

#### **1.4b Evidence for Unusual Emotional Processing in People with AS**

Arguments for and against the cognitive and affective theories of fundamental emotional deficits in people with AS have not yet been resolved. Nevertheless, it seems to be agreed that autistic and AS



individuals have problems in processing information with an emotional content, and these have implications for their interactions with others.

It should also be remembered that emotions can be linked to cultural codes beyond infancy, and as with social conventions, they have to be learned (Frith 1990). When people interact they often have unexpressed reasons for how they behave. These motivations can be distinguished by a number of factors including context, emotional expression, and the relationship between the interacting individuals (Happe 1994). People within the autistic spectrum, however, seem not to use social or environmental cues and either display little or no differential emotional reactions or show erratic affective behaviour (Schreibman 1988).

Tantam (1993) suggests that the lack of empathy in people with AS may result in inappropriate behavioural responses to other people's emotional cues. For example, they may laugh when another person expresses pain. It has been proposed that the essential drive necessary for learning social conventions is missing in people with autistic attributes, and that they can be described as "behaviourists" (Frith 1990). By this it is meant that they understand behaviour in terms of how it is presented rather than try to infer meaning behind it such as deception or persuasion.

Documented areas of particular problems in emotional processing found in people within the autistic spectrum are described below.

### *Faces*

Faces are probably the most important biological and social object within our environment (Ellis 1990), yet a child with AS may appear insensitive to the facial expressions of their parents and, less commonly, be unable to identify faces of people that they can recognise in photographs (Tantam 1993). People with AS have also been found to

perform more poorly than controls on production of facial expressions of emotions (e.g. Scott 1985, cited in Davies et al 1994).

Weeks & Hobson (1987) reported that on a sorting task, autistic children gave priority to sorting by type of hat whereas non-autistic children sorted by facial expression. They concluded that the results reflected autistic children's insensitivity to other people's facial expressions of emotion. Davies et al (1994), however, put forward an alternative hypothesis. They reported that compared to a matched group of "normal" children, their HFA group performed more poorly on matching both facial and non-facial stimuli, and argue from these results that there is no support for an emotion-specific deficit in face perception. They propose, instead, that HFA people have a fundamental perceptual problem in recognising configural patterns.

Support for the notion of perceptual deficits are found in a number of other studies. Langdell (1978) found that "normal" Ps tended to use the upper regions of the face to help with facial identification tasks, whereas younger autistic children focused more on the lower features. Interestingly, older autistic children do not seem to rely on any specific area of the face for recognition, and, unlike most people, appear to be unimpinged in their ability to recognise inverted faces (Langdell 1978; Tantam et al 1989).

Boucher & Lewis (1992) suggest that autistic children use abnormal strategies for face recognition tasks, perhaps looking at component parts rather than the face as a whole. This hypothesis is supported by the personal account of Jolliffe about living with autism (Jolliffe et al 1992), in which she describes her inability to look at the whole when gazing at pictures or people, and instead looks only at outlines or small sections at a time.

### *Comprehension of Emotional Cues*

It has been found that people with AS perform more poorly than control populations on tests of emotion-related comprehension and spoken expression of emotion (Scott 1985, in Davies et al 1994). Baron-Cohen (1991, in Baron-Cohen et al 1993) noted that Ps with autism were able to predict a story character's emotion when it was caused by a situation, but impaired in their ability to predict the emotion if it was a consequence of the character's belief. Van Lancker et al (1991) reported that autistic individuals, compared to Ps with Schizophrenia or a control group matched for chronological age, were less able to recognise the meanings of emotional adjectives than nouns or neutral adjectives. They also found that judges could distinguish between the definition responses of autistic and normal children for emotional adjectives.

It has been suggested that people with autism may be able to understand 'simple' emotions, but those which are cognitively or belief-based will pose difficulties (Wellman 1990, in Baron-Cohen et al 1993). The findings of Capps, Yirmiya & Sigman (1992) offer some support for this proposal. They noted that although "non-retarded" children with autism were able to talk about and differentiate between "simple" emotion-laden experiences involving happiness and sadness, they had difficulty in recounting experiences containing the complex emotions of pride and embarrassment. They also took longer and required more prompts than a control group when describing these complex emotions.

### *Cross-Modal Processing*

Hobson (e.g. 1986a, 1986b) has conducted a number of experiments in which autistic individuals were required to match facial expressions of emotion to emotional gestures, vocalisations and contexts, and objects to movement, sound and context. He found that although the

autistic Ps were able to match objects across modalities, their performance on matching different forms of emotional information was poor relative to their age, ability and education. Frith (1990) suggests this may be evidence of specific difficulties in emotion recognition, independent of general cognitive ability.

Interestingly, Szatmari (1986, cited by Braverman et al 1989) found that a group of Ps with AS had little difficulty in comprehending emotional content found in vocal, gestural or verbal information, and Prior, Dahlstrom & Squires (1990, see Davies et al 1994) suggest performance on these tasks is related to chronological and verbal mental age.

#### 1.4c ***Summary - Emotional Deficits Underlying Social Difficulties***

Kasari et al (1993) suggest that the above impairments in emotional processing share a common underlying theme which affects social interaction. They argue that observed social deficits are the result of an inability of autistic people to share or regulate affective meaning with others. An important implication is that social interaction deficits are not the result of social disinterest but rather arise from a lack of social understanding.

Although differences between autistic and control Ps have been found in performance on face perception tasks, it may be that these are not due to impairments in understanding the emotional significance of facial expressions but rather to a fundamental deficit in perceptual processing (e.g. Davies et al 1994 cf Ozonoff et al 1990). Nevertheless, a puzzling aspect of this area of study is why, if there are general perceptual processing difficulties, autistic individuals can perform well on control tasks using objects as evidenced in Hobson's cross-modal studies (e.g. 1986a).

One can question whether it is the movement of the face that interferes with the processing of informational cues or whether there is

something about human faces which cause the problem, for example a "refusal" to acknowledge emotions in others for some reason, or fear of other human beings because of their unpredictability? Whatever underlies the impairment, however, the deficit has repercussions for individuals with AS in terms of understanding emotional cues in social interactions.

With regard to emotion comprehension, it has been found that autistic individuals find it time-consuming and effortful to comprehend and process emotional information (Capps, Yirmiya & Sigman 1992).

If, unlike the majority of us, individuals with AS are not able to combine salient features of a face for both emotional and identity recognition, and require longer to process emotional information, then this will lead to difficulties in the context of social exchange because they will experience problems in integrating perceptual and verbal cues while at the same time attempting to follow the ebb and flow of social interactions.

### 1.5 ***RATIONALE FOR THE PRESENT STUDY'S INTERVENTION***

There is little published work on the usefulness of systematic training of emotional expressiveness for people with AS (Tantam 1991). In view of this the present research project adopts a single case study approach so that descriptions of outcome can be reported in detail, and idiosyncratic information is not lost in group means.

The purpose of this study is to investigate whether adults with AS can benefit from an intervention which draws on their cognitive strengths to decipher emotional cues, and is assessed by measuring pre-intervention and post-intervention performance on tests purporting to measure specific emotional deficits. The decision to focus on adults is a response to the lack of practical interventions offered to adults compared to children with autism or AS (see Arendt 1991). Although more interest is emerging as AS reaches a wider audience (e.g. Tantam 1991; Howlin 1993), at present

the dearth of written information gives the erroneous impression that as children grow into adulthood the characteristics of AS disappear.

It is suggested that prior to social skills training there needs to be a teaching component in which people with AS learn to use their cognitive abilities to, at least partly, compensate for their impairments in emotional processing. There may be a need to learn about basic emotional cues in a structured, albeit artificial, way before attempting to process additional information about social situations.

#### 1.5a ***The Use of a Structured Training Intervention***

The use of structured programmes for people with autism or AS have been suggested for a number of reasons. One important reason is that unless the "teacher" actively initiates and plans interactions an individual with autistic characteristics may redirect their attention towards repetitive behaviour which could exclude others (e.g. Baron-Cohen & Bolton 1993) and result in a withdrawal of attention from social interactions (Howlin & Rutter 1991).

#### 1.5b ***Components of an Emotional Processing Teaching Intervention***

Although social skills training can include some material focusing on understanding emotional cues (e.g. Howlin 1988), it may be more useful to employ the cognitive strengths shown by people with AS to help them decipher emotional cues in isolation before attempting to integrate this information into social situations.

#### ***Deciphering Visual Information***

Research, outlined above, seem to converge on the opinion that people with AS use unusual perceptual strategies for processing visual stimuli, including facial expression. It is thought that an individual with AS

looks at component properties rather than viewing the face as a whole, and, therefore, mentally process faces in terms of isolated features (see Davies et al 1994).

This will have repercussions for integrating facial information, but it may be possible to use the impairment in a useful way. For example, it could prove beneficial to encourage a person with AS to use their cognitive abilities to focus on specific salient facial cues rather than, possibly, just scanning the face in an ad hoc manner. A similar strategy could also be used to analyse body gestures and vocal tones.

### *Comprehension of Emotions*

The systematic teaching of basic rules about facial, body and vocal expressions could build on strategies that people with AS may already have learned through personal experience. Comprehension of contexts for emotions could then utilise these rules. For example, it may be possible to use the learned knowledge about facial configurations as a foundation for matching basic emotional responses to social contexts (e.g. Ozonoff et al 1990). An example of this might be noticing that people in traffic jams often shake their heads from side to side, bare their teeth, glare through their car windows and grip the steering wheel tightly. It may be possible to link together this pattern of behavioural cues and register it to mean that the car-drivers get angry when their journeys are delayed.

### **1.5c Summary - Rationale for the Present Study**

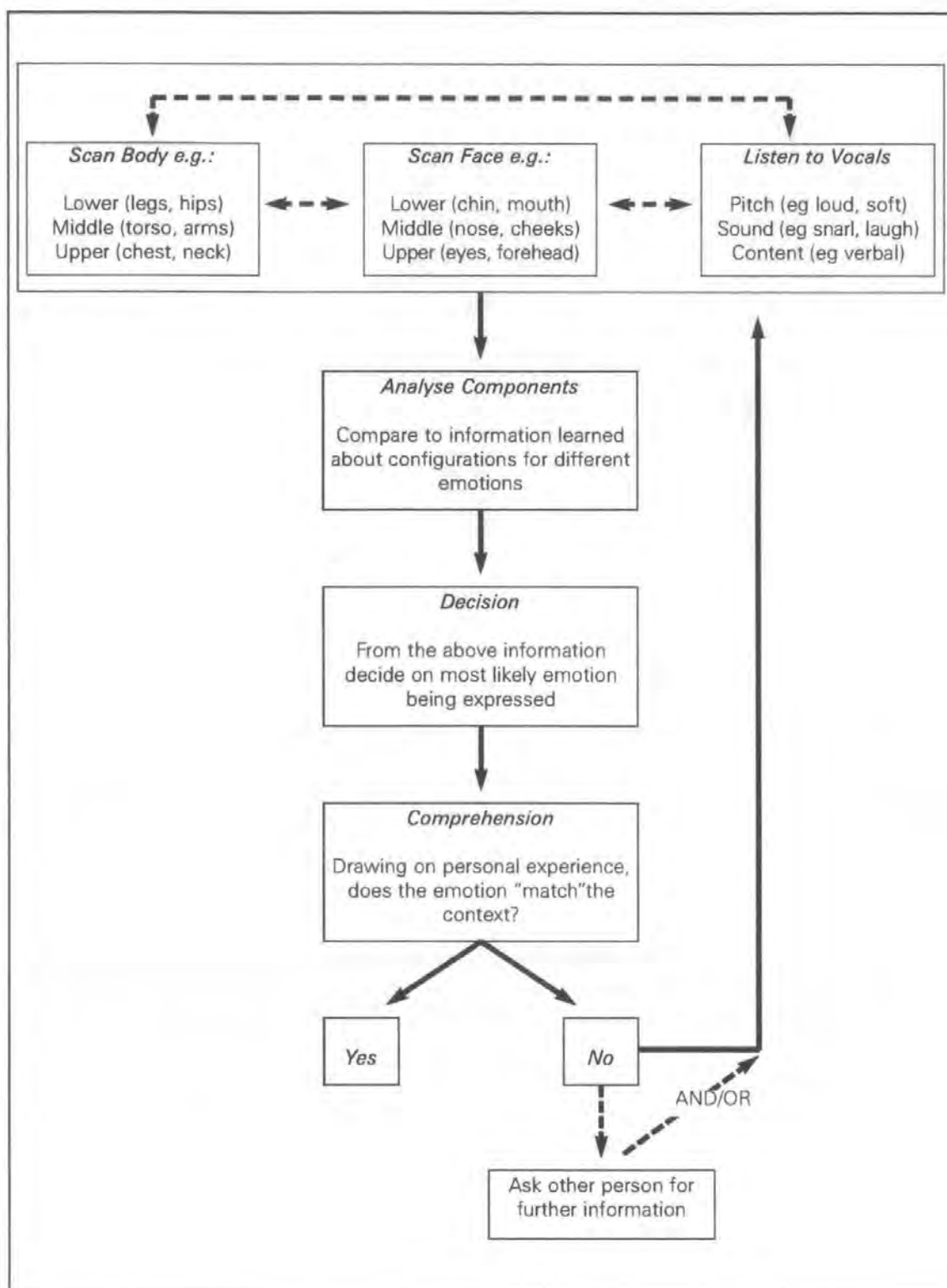
People with AS often give the impression in social situations that they are using cognitive processes, for example looking for cause and effect reasons, rather than intuitively responding to social demands. The present study aims to draw on their cognitive abilities to learn some basic rules about emotional cues. It is hypothesised that if cognitive skills are

channelled into learning specific rules about facial configurations and how to match particular expressions to situations then people with AS may "learn" to understand the ebb and flow of simple social interactions more clearly. Figure 1.1 below outlines how the overall strategy might usefully help someone with AS to interact with others.

The diagram does not claim to offer a perfect or exclusive representation of how adults with AS can be taught to respond to emotional information. Similarly, the intervention is not proposed as an antidote to the stilted social interactions for which people with AS are noted. It is unlikely that the subtle nuances of emotional interactions can be taught, as so much of this understanding seems to be implicit (e.g. recognising that although someone smiles their intentions are hostile).

It is hoped, however, that offering a logical and systematic process for deciphering emotional information will help the person with AS to identify gross emotional cues and apply this information to help them in their daily lives.





Key: - - - - = use additional information if necessary

*Fig 1.1: Flowchart of proposed method for people with AS to process emotional cues in simple social situations*

## 1.6 ***AIMS OF THE STUDY***

- 1 To replicate previous findings of particular types of deficits in emotional processing and understanding within the autistic spectrum, in particular the AS population.
- 2 To investigate whether the performance of the present study's Ps will show an improvement on emotional processing tasks following an intervention using behavioural and cognitive strategies.

## 1.7 ***HYPOTHESES***

### 1.7a ***Comparisons between Studies***

Ps' pre-intervention scores will be similar to those of autistic or AS people on tests investigated by other researchers. More specifically:

#### **TOM Task**

- a Pre-intervention performance of Ps in the present study on the "physical stories" of the TOM test will match those of the second-order TOM Ps in Happe's (1994) study.
- b The responses of Ps in the present study to "Is it true ...?" questions will indicate similar linguistic comprehension abilities to those of the second-order TOM group in Happe's (1994) research.
- c The justifications used by Ps in the present study for responses to "Why ...?" questions will match those of the second-order TOM group in Happe's (1994) study.

#### ***Emotion and Identity Sorting Tasks***

Pre-intervention performance of Ps in the present study on emotion and identity sorting tasks will match those of the autistic group in Hobson, Ouston & Lee's (1988) study.

### ***Comprehension of Verbal Terms for Emotions***

Prior to the intervention, the performance of Ps in the present study on matching pictures to words will be similar to those of the autistic group in Van Lancker, Cornelius & Needleman's (1991) research.

### ***Cross-Modal Processing Task***

Pre-intervention scores of Ps in the present study on a cross-modal processing test will correspond to those of a group of "intellectually able" autistic children in Hobson's (1986a) study.

### ***Understanding of Simple and Complex Emotions***

- a The pre-intervention perception for type and locus of control of simple (happiness and sadness) and complex (embarrassment and pride) emotions for Ps in the present study will match those of the HFA group in Capps, Yirmiya & Sigman's (1992) research.
- b The pre-intervention accounts of emotional experiences by Ps in the present study will match the pattern for audience presence found for Capps et al's HFA group for each of the emotions.
- c Prior to the intervention, Ps will require the same number of prompts and show similar response latency as the HFA group for recounting incidents involving each of the emotions.
- d Prior to the intervention, patterns for using general or specific incidents and "thinking" phrases for particular emotions will match those of the HFA Ps.

### ***1.7b Comparisons between Pre-intervention and Post-intervention Scores***

On completion of the intervention, each P will perform similarly on the TOM task as this is a control variable, but show an improvement on performance of emotion-related tasks. More specifically:

## **TOM Task**

The post-intervention scores for Ps in the present study on "Is it true ...?" and "Why ...?" questions will be the same as their pre-intervention scores.

## ***Emotion and Identity Sorting Tasks***

Following the intervention, each P in the present study will show an improvement on pre-intervention performance for sorting photographs of facial expressions into emotion and identity categories.

## ***Comprehension of Verbal Terms for Emotions***

- a After completion of the intervention, each P will show an improvement in matching emotional adjectives to pictures, but performance on matching nouns and neutral adjectives will remain similar to pre-intervention scores.
- b Judges' ratings for Ps' reasons for making choices about each of the three word types, both pre-int and post-int, will indicate that Ps have unusual mental representations for emotional adjectives. This will be apparent from the number of "unusual" explanations offered for emotional words compared to more "usual" responses for nouns and neutral adjectives.
- c Judges' ratings for Ps' post-intervention reasons for making choices about emotional adjectives will indicate an increase in "usual" explanations compared to pre-intervention responses. There will be no change in raters' decisions about Ps' performance on nouns or neutral adjectives following the intervention.
- d Following the intervention, the Ps in the present study will all show a similar pattern for types of explanation used for emotional adjectives, regardless of idiosyncratic responses prior to the intervention.

Categories of explanation for nouns and neutral adjectives will remain unchanged from pre-intervention responses.

### ***Cross-Modal Processing Task***

On completion of the intervention, the scores of Ps in the present study will show an improvement in cross-modal processing of emotional materials compared to pre-intervention performance.

### ***Understanding of Simple and Complex Emotions***

- a There will be no difference between pre-intervention and post-intervention perceptions of locus of control for sadness, happiness, pride and embarrassment. Locus of control for other emotions will be similar to that found for the above four emotions.
- b On completion of the intervention, Ps in the present study will show an increase in audience presence for each of the emotions compared to pre-intervention scores.
- c Following the intervention, Ps in the present study will need less time and fewer prompts to recount emotional experiences than they had prior to the intervention.
- d Ps in the present study will use more specific incidents post-intervention than pre-intervention for emotions discussed in the intervention.
- e Ps in the present study will recount more "usual" stories post-intervention compared to pre-intervention.

## **CHAPTER 2 - METHOD**

### **2.1 DESIGN**

A variation of a mixed-participants (Ps) A-B-A design using multiple dependent variables, plus a control variable was used. Each P was treated independently and administered a series of tests prior to and following an intervention, as described below.

#### **2.1a The "Replication" Studies**

A battery of tests including a Theory of Mind (TOM) task and four tests purporting to measure emotional abilities, were adapted from research with children and adults who had been diagnosed as having either autism or AS. These tests will be referred to under the umbrella term of "Replication Studies" throughout.

The tests were administered prior to and following an intervention. The pre-intervention scores were used as a baseline for performance on the tasks.

#### ***The Control Variable***

One set of stories from a TOM test (Happe 1994) was administered at the same time as the first presentation of the emotion tests, and a second set at the final administration of emotion tests.

#### ***Multiple Dependent Variables***

A number of tests designed to assess emotional processing and understanding were administered twice before each P took part in a six week intervention. The second pre-intervention attempt at these tests was done to check for reliability of scores.

The same tests were then re-administered following the intervention to look for changes in performance for each P.

2.1b The “Intervention”

The intervention acted as the independent variable (IV). It consisted of a six-week programme comprising of one hourly sessions held weekly

Each P separately completed the same intervention, which focussed on how people use their faces, bodies and voices to convey emotional information.

2.1c Sequence for Order of Presentation of Materials

Ps were each required to repeat the emotional tests after P1 and P2 had completed the intervention, and again after P3 and P4 had finished. Finally all four Ps repeated the emotion tests approximately three months later.

P1 & P2	B1+W+T	B2	I	E	N	E	N	E+T
P3 & P4	N	B1+W+T	N	B2	I	E	N	E+T

**Key:**  
B1 = Emotion tests, baseline I presentation      B2 = Emotion tests, baseline II presentation  
W = WAIS-r.assessment      T = Theory of Mind assessment  
E = Emotion tests (post-intervention)      I = six week Intervention  
N = no contact with P

**TABLE 2.1: Order of Presentation of Materials**

Table 2.1 above outlines the proposed order of presentation of materials to each P.

2.1d Comparisons

Two types of performance comparisons were made:

- 1 The pre-intervention performance of Ps in the present study were compared to selected Ps in the respective replication studies.
- 2 The pre-intervention scores for the replication studies were compared to post-intervention performance on the same tests.

2.2 **PARTICIPANTS**

Four adults, aged over 18 years, and diagnosed as having AS by a psychiatrist interested in the condition, agreed to take part in the project. The two females were approached through Phoenix Learning Disability NHS Trust in Bristol, and the two males through the Bristol branch of the National Autistic Society (NAS).

**CRITERIA FOR INCLUSION**

**Formal Diagnosis**

Ps were diagnosed by a psychiatrist using the DSM-IV diagnostic criteria for AS (1994). See Table 2.2 below.

A.	Qualitative Impairment in social interaction, as manifested by at least two of the following: (1) marked impairment in the use of multiple nonverbal behaviours such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction (2) failure to develop peer relationships appropriate to developmental level (3) a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (eg by a lack of showing, bringing, or pointing out objects of interest to other people) (4) lack of social or emotional reciprocity
B.	Restricted repetitive and stereotyped patterns of behaviour, interests, and activities, as manifested by at least one of the following: (1) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus (2) apparently inflexible adherence to specific, nonfunctional routines or rituals (3) stereotyped and repetitive motor mannerisms (e.g. hand or finger flapping or twisting, or complex whole-body movements) (4) persistent preoccupation with parts of objects
C.	The disturbance causes clinically significant impairment in social, occupational, or other important areas of functioning.
D.	There is no clinically significant general delay in language (e.g. single words used by age two years, communicative phrases used by age 3 years).
E.	There is no clinically significant delay in cognitive development or in the development of age-appropriate self-help skills, adaptive behaviour (other than in social interaction), and curiosity about the environment in childhood.
F.	Criteria are not met for another specific Pervasive Developmental Disorder or Schizophrenia.

*Table 2.2: Diagnostic Criteria for Asperger’s Disorder  
(from DSM-IV 1994 - 299.80 page 77)*



### "Cognitive Intelligence"

Ps scored above 70 on the Verbal, Performance, and Full Intelligence Quotient Scales of the Wechsler Adult Intelligence Scale, revised (WAIS-r).

The WAIS-r was completed by Ps 1, 3 and 4 as there was no record of past administration for any of them.

P2, however, had previously completed an earlier version of the WAIS. Wechsler (1981) has suggested that scores on the WAIS can be adjusted to fit with scores on the WAIS-r, and he estimates that the mean IQs for verbal, performance and full scale IQs are 7, 8, and 8 points higher respectively than corresponding IQ scales on the WAIS-r. This suggests P2's scores of 82 on both the verbal and performance intelligence quotient scales (VIQ and PIQ respectively), and 81 for full scale intelligence quotient (FSIQ) would translate to 75, 74, and 73 respectively on the WAIS-r. In either case, she fulfilled criteria for inclusion. The adjusted scores are shown in Table 2.3 below, together with brief details about each P.

P	Age	Sex	Accommodation	Interests	WAIS Scores		
					VIQ	PIQ	FSIQ
1	26	Male	Parental home	Physics, computer games, instantaneous space travel	116	101	109
2	28	Female	Institution unit	Calendar dates	75*	74*	73*
3	24	Male	Parental home	Computers, collecting TV and music shows on tape	95	98	94
4	34	Female	Community residential home	Compiling music charts and tapes of pop music	71	71	70

\* estimated scores

*Table 2.3: Information regarding Participants*

## 2.3 **MATERIALS**

### 2.3a REPLICATION STUDIES

#### *Advanced Test of Theory of Mind (Happe, 1994):*

Twenty four short stories were provided, two for each of twelve categories: Lie, White Lie, Joke, Pretend, Misunderstanding, Persuade,

Appearance / Reality, Figure of Speech, Sarcasm, Forget, Double Bluff, and Contrary Emotions. Two questions (three for Double Bluff stories) were attached to each story. A set of six control "physical" stories, (three for each presentation) which do not involve mental states, were also provided.

The complete set of stories are shown in Appendix I.

### **Tests of Emotional Expression**

***Emotion and Identity Sorting Tasks*** (adapted from Hobson, Ouston, & Lee 1988):

Photocopies were used of the full-face photographs employed by Hobson et al (1988). These were copies of faces which appear in Ekman & Friesen (1975), but with the hair and ears removed.

The faces of the same two females and two males were used throughout, in which they each expressed neutrality, sadness, anger, happiness and fear. Additionally, for the emotion sort task, there were four photocopies of a target female in which she looked sad, angry, happy and frightened respectively. (See Appendix II.)

***Comprehension of Verbal Terms for Emotions*** (adapted from Van Lancker, Cornelius, & Needleman 1991):

Three sets of eight words each were selected from Van Lancker et al's (1991) lists. The first set comprised of nouns, the second of neutral adjectives, and the third set of emotional adjectives (see Appendix III). Four line drawings from the Peabody Picture Vocabulary Test (Dunn 1959) were selected for each target word.

***Cross-Modal Processing Task*** (adapted from Hobson 1986a):

- (a) ***Emotions Task***: Colour photographs of an actor showing facial expressions for anger, sadness, fear, happiness, and neutrality were used (see Appendix IV for photocopies), together with video-taped

segments of a masked actor using body gestures (Gestures trial), and then shown in contexts which would elicit emotional responses (Context trial).

The video-segments, which were approximately 10 seconds long were rated by 10 judges using a free-response format described by Izard (1971). Additionally, judges were asked to rate each segment as "easy", "ok", or "difficult" to recognise. (See Appendix V for an example.)

The segments with highest agreement rates for ease of recognition for gestures of sadness, anger, happiness, and fear were used in the replication study. A similar format was used for judging 10-second segments of emotional sounds (Sounds trial), and photographs of actors' facial expressions. Table 2.4 below shows levels of rater agreement for the materials chosen.

Materials	Recognition	Anger-%	Sadness-%	Happiness-%	Fear-%
PHOTOS	Easy or Ok	100	100	100	100
GESTURES	Easy or Ok	90	70	90	80
CONTEXTS	Easy or Ok	100	70	80	80
SOUND	Easy or Ok	90	100	100	60

**TABLE 2.4: Inter-Rater Agreement for Materials used in Cross-modal Processing Task**

- (b) *Things Task*: Photographs of a bird, car, train, dog and aeroplane were used (Appendix VI). Video-taped segments of approximately 10-seconds were made of a car, bird, train, and dog in motion (Movements trial), and of a group of garages, a bird's nest, a railway station, and a dog basket (Contexts trial). Sounds, each lasting about 10-seconds, of a car moving then braking to a halt, some birds singing, a train drawing into a station, and a dog barking were audio-recorded (Sounds trial). These were used to correspond with the Gestures, Contexts, and Sounds sections of the emotion tasks respectively.

*Understanding of Simple and Complex Emotions* (Capps, Yirmiya, & Sigman 1992):

A list of four emotion nouns (happiness, sadness, pride and embarrassment) were presented to Ps on the first occasion. From trial two onwards a further five emotion nouns, which were to be studied during the intervention, were added. These were anger, contempt, disgust, fear, and surprise. Standardised stories for each of the emotions were also available, and are shown in Appendix VII.

### **2.3b INTERVENTION**

Five judges rated drawings, and 10 judges each rated photographs plus video-taped segments (lasting approximately 10 seconds each) of volunteer actors expressing the seven emotions described by Ekman and Friesen (1975). These are anger, contempt, disgust, fear, happiness, sadness, and surprise. Actors were shown in three guises: facially only; masked but full-length and gesticulating; and using face and gesture combined.

A rating form adapted from Izard (1971) was used in which judges were asked to circle one of nine emotions which they felt best matched the actors' actions. In addition, they were asked to rate the material as "easy", "OK", or "difficult" to recognise. Appendix VIII shows an example of the form layout. One drawing for each emotion, and two each of photographs, videos and audio segments, which scored highest for each of the seven emotions, were used in the intervention. Appendix IX gives levels of rater agreement for the materials chosen. No drawings or sounds scored less than 70% agreement as either "easy" or "OK" to recognise. Judges found photographs and video-taped materials "easy" or "OK" to recognise on 83% and 98% of occasions respectively.

Ps were given handouts summarising topics for sessions one to four (see Appendices X to XIII). Photocopies of drawings and photographs used in sessions two to four are shown in Appendices XIV to XVI.

## 2.4 **PROCEDURE**

Each P was initially seen with a carer, except for P2 who was seen on her own, but gave permission for her key-worker to be approached separately to discuss the project. All Ps and carers were informed that the Experimenter (E) wished to look at how Ps used their faces and bodies to show their feelings to other people, and also how they worked out what other people are feeling. Ps 1 and 3 were aware that they had been diagnosed as having AS, and the condition had been explained to them and their families by a psychiatrist. It was unclear whether Ps 2 and 4 had an understanding of AS, but both seemed aware of difficulties in relating socially to other people.

Ps were told they would be required to repeat some tests before and after a six-week intervention programme, and that they would be asked to answer some questions about a number of short stories (the TOM tests), identify how people looked in some photographs, match words to pictures, match videotaped movements and sounds to photographs, and give brief examples of times when they had experienced particular emotions.

The intervention procedure was then discussed. It was explained that discussion as well as photographs, video-tapes, and audio-tapes of actors would focus on how people use face, body and vocal cues to inform others of how they are feeling.

A hand-out was provided for the P to keep (see Appendix XVII), and both the P and carer were given the opportunity to ask for clarification of details and voice concerns. If Ps were still willing to take part they were required to sign a consent form (Appendix XVIII).

Ps were seen on their own for the replication studies and intervention. Ps 1 and 3 were seen in their homes, P2 in the Psychology Department of the institution where she lived, and P3 at an Adult Training Centre.

Following completion of the project each P was offered the opportunity to be seen, either on their own or with a carer, and debriefed.

## 2.4a REPLICATION STUDIES

Since detailed descriptions have already been published for the following tests, only a brief resume is given below.

### *Advanced Test of Theory of Mind* (Happe 1994)

At the initial session the first set of 12 TOM stories, and three “physical stories” were read out to the P. At the end of each story the P was asked whether a statement made by one of the story’s protagonists, (or in the “physical” stories a statement about the story) was true, and then to explain why the statement had been made. Replies were noted down on the story sheets and/or video-taped if the P gave permission. At the final session, the second story set was used, and the P’s task was the same as in the initial session.

The stories were read out in the same order to each P. No feedback was given about the veracity of replies, but positive comments were made throughout to encourage participation.

### Tests of Emotional Expression

Presentation of the four types of task were always in the same order as follows below.

### *Emotion and Identity Sorting Tasks* (adapted from Hobson, Ouston, & Lee 1988)

- (a) *Emotion Sort Test*: At the initial two sessions the E named each of four emotions depicted by a target female (happy, angry, sad, frightened), as the photocopies were placed in front of the P. Subsequently Ps named the emotions, and were corrected if necessary. There were four trials, one for each actor. The P’s task was to match actors’ emotional expressions to those of the target faces, by placing a happy face under the target happy face, a sad face under the target sad face, and so on.

- (b) *Identity Sort Test* : Images of the same four actors were used for the identity sort test, using the same four emotional expressions described above. Target photocopies of the actors showing neutral expressions were laid out in front of the P. The task required the P to match faces according to identity. For example, in the first trial all four actors might look happy, and the P was asked to match the happy face with the neutral face of the same person.

The order of presentation for all materials for the above tasks was randomly selected by the E prior to each session.

During the administration of both tasks no feedback was given to Ps about their choices. Responses were noted down on a rating sheet (see Appendix XIX).

***Comprehension of Verbal Terms for Emotions*** (Van Lancker, Cornelius, & Needleman 1991):

Three eight-word lists, one each for nouns, neutral adjectives and emotional adjectives, were presented to the P. The task of the P was to match each word to one of four pictures on a page, and explain their choice. They were then asked to define the word. The presentation of stimuli remained the same at each session for all Ps.

Ps responses were noted on a separate sheet (see Appendix XX) and were then rated by the E and four other people (Appendix XXI) according to the following criteria: (1) correct or incorrect choice of picture; (2) whether the rationale for the choice was usual or unusual; and (3) category of definition of the word. There were seven categories: self-referential; generalised or situational; synonym; concrete or physiological; local detail in the drawing; perseveration; and incorrect.

***Cross-Modal Processing Task*** (adapted from Hobson 1986a):

- (a) *Emotions*: The photographs of an actor's face showing angry, sad, fearful, happy and neutral expressions were laid out in front of the P, and remained there until all three of the "Emotions" tasks were finished. In the first two sessions the E named the emotions, but subsequently the P was asked to do this, and corrected if necessary. The P's task was to match video-taped gestures and contexts (with the sound turned off), and audio-taped sounds to the appropriate facial expression.
- (b) *Things*: Photographs of a dog, train, car, bird, and aeroplane were laid out in front of the P and remained there until all three of the "Things" task were completed. The P was asked to match the video-taped movements and contexts (with the sound turned off), and the audio-taped sounds to the appropriate thing.

The order of presentation for the two tasks was counterbalanced across each testing. In both tasks the P could either point to a photograph or verbally match the emotion or object, and responses were noted down on a form (see Appendix XXII). Ps were offered encouraging comments, but no feedback was given about the correctness of replies.

***Understanding of Simple and Complex Emotions*** (Capps, Yirmiya, & Sigman 1992)

Ps were asked to recall a time when they had felt each of four emotions in the first trial, and nine emotions in subsequent trials. Standardised stories for the emotions were provided by the E if the P was unable to provide an example. In these instances, after the E had finished the standardised story the P proceeded with the other emotions before returning to the source of difficulty.



Every response was rated by the E and four other people according to the following criteria: (1) locus of control; (2) audience presence; (3) cognitive strategy; (4) thinking phrases; (5) type of response (see Appendix XXIII). Time latency and number of prompts required between saying the word and recounting an experience were also recorded.

#### **2.4b INTERVENTION**

Ps were seen individually for approximately one hour per week over six weeks. Ps 1 and 2 were initially seen concurrently, then Ps 3 and 4 were seen in tandem over another six week period.

The basic idea behind the programme was to deconstruct face and/or body cues, as well as sounds, to identify salient aspects for different emotions, and thus to develop a body of knowledge about how people can use visual and auditory signals to convey how they feel. The intervention included instructions on deciphering cues, modelling and rehearsal of emotional signals, feedback on performance, and handouts to study as homework, as these components are thought to be useful teaching tools (Trower 1986). From session two onwards there was a brief recap on material covered in prior sessions to ensure continuity of information.

From session two onwards, where Ps made errors in matching emotional materials, the following procedure was always undertaken. A P's reasons for reaching their decision was validated before the E suggested other cues which could link the material to another emotion. The P was then asked to make another match. This procedure was repeated until the correct choice was made. Where audio or videotapes were used, the segment in question was replayed. Video-taped segments were always played with the sound turned off.

Some tasks required the P to model an emotional cue, either physically or vocally, and verbal praise was given for all attempts, no matter how brief.

The emphasis for each session is described in Table 2.5 below:

***Session 1: How emotions can be experienced***

**Purpose:**

To discover Ps' levels of understanding of the seven emotions identified by Ekman & Friesen (1975).

**Tasks:**

- a P encouraged to name the emotion being modelled facially by the E.
- b P to identify alternative words they use for the different emotions from a list of definitions (New Collins Dictionary and Thesaurus 1987).

***Session 2: Facial cues for emotions***

***Session 3: Body cues for emotions***

***Session 4: Face and body cues combined for emotions***

**Purpose:**

To look at how different parts of the body can offer information about how people are feeling.

**Information:**

Handouts using written and graphic information are discussed in detail, and queries are answered.

**Tasks:**

- a P to match photographs to drawings for each of the above emphasised cues.
- b P encouraged to explain the decision, and identify the cues which helped in making the decision.
- c P to then match video-taped segments to the drawings and photographs.
- d P asked to mimic corresponding cues to those shown in the video-taped segments.
- e P asked to describe a situation in which they might use similar cues.

***Session 5: Auditory cues for emotions***

**Purpose:**

To investigate how different vocal sounds offer information about how people are feeling.

**Information:**

Audio-taped sounds and their links to visual emotional cues are discussed in detail, and queries are answered.

**Tasks:**

- a P to match photographs of face and body combined to drawings.
- b P asked to match sounds to the appropriate visual material.
- c P asked to identify the emotion shown in video-taped segment of actor depicting face and body cues.
- d P asked to either vocalise an appropriate sound or verbally describe how a person might sound for the emotion identified in (c).
- e P encouraged to describe a time when they might use a similar sound.

***Session 6: Review information covered in past five weeks***

**Tasks:**

- a Using visual material depicting actors' faces and bodies combined, P asked to match photographs to drawings, and then video-taped segments to photographs.
- b P asked to match sounds to the visual materials.
- c P encouraged to describe a situation where they might use similar cues, and where they might expect to see someone else displaying the emotion.

***TABLE 2.5: Summary of Intervention Sessions***

## CHAPTER 3 - RESULTS

Unless otherwise stated two types of comparison for each of the Ps' performance on the five tests were made: pre-intervention (pre-int) scores with that of Ps in the replication studies; pre-int with post-intervention (post-int) scores within the present study. The time lapse between retests on the replication studies are shown in Table 3.1 below.

	Time lapse between trials		
	Pre-Int 1 and Pre-Int 2	Pre-Int 2 and Post-Int 1	Post-Int 1 and Post-Int 2
P1	2 weeks	8 weeks	8 weeks*
P2	2 weeks	8 weeks	20 weeks*
P3	8 weeks	8 weeks	12 weeks
P4	8 weeks	8 weeks	12 weeks

\* It had been anticipated that Ps 1 and 2 would repeat the emotion tests three time post-int. However, P1 was not available for the final retest, and P2 refused to take part in the middle retests. Therefore, two sets of pre-int and two of post-int scores were available for each P in the present study.

*Table 3.1. Time sequence for trials on the Replication Studies*

Due to the number and variety of tests used, hypotheses about expected outcome are given in small type italics above relevant sections to aid the reader.

### 3.1 **ADVANCED TEST OF THEORY OF MIND (TOM)**

(adapted from Happe 1994)

The following factors were analysed: how Ps performed on the physical stories; how they responded to the "Is it true ...?" question; whether their response to the "Why ...?" question was correct or incorrect; and whether they used mental or physical explanations for the "Why ...?" question. The time lapse between the presentation of Story Set 1 and Story Set 2 was approximately six months. There were 12 TOM stories and three physical stories in each set.

P1 completed the first set of stories, but was unavailable at the time of the second administration. However, in view of the consistency of his scores in the other tests it has been assumed that his performance in the second story set would be similar to that in the first story set, and figures have been adjusted accordingly for mean comparison scores in the following analyses.

### 3.1a Comparison between Replication Study and Pre-Int Scores

The scores of Ps in the present study were compared to six HFA Ps (mean age 17:7 years, range 11:5 - 25:5) referred to as the second-order TOM group in Happe's study.

#### **Physical Stories**

*Pre-intervention performance of Ps in the present study on the "physical stories" of the TOM test will match those of the second-order TOM Ps in Happe's study.*

Similarly to Happe's findings, the scores of Ps in the present study were at or near ceiling level (Ps 1, 3, and 4 all scored 100% on both story sets). P2 made one error on the first set of stories only.

#### **TOM Stories**

##### a Is it true ...?

*The responses of Ps in the present study to "Is it true ...?" questions will indicate similar linguistic comprehension abilities to those of the second-order TOM group.*

The "Is it true ...?" question attached to each story is regarded as a test of linguistic comprehension (Happe 1994).

Happe collapsed her Ps' scores for the two story sets into one score, and this was also done in the present study to aid comparisons. Although no figures are given by Happe about the 6 second-order TOM Ps specifically, all of her Ps, including autistic individuals, scored between 22 and 24 out of 24 correct. In the present study, the mean score for linguistic comprehension was 20.5 (S.D. = 1.29), suggesting that the linguistic comprehension of Ps in the present study was slightly lower than for those in Happe's sample.

b     Why ...?

*The justifications used by Ps in the present study for responses to “Why ...?” questions will match those of the second-order TOM group.*

Similarly to Happe’s study, the justifications given by Ps in the present study in response to the “why...?” question were scored as correct or incorrect and categorised as either mental or physical explanations.

Table 3.2 below compares scores between Ps in the present study and the second-order autistic Ps in Happe’s study. In general, Ps in the present study made fewer correct responses and used less mental explanations than did Happe’s second-order TOM group. However, the range of scores for Ps in the present study was wider than for Happe’s group with regard to correct mental explanations. In the present study the mean for correct explanations masks the high score for P1, low score for P2, and P3’s comparatively preponderant use of physical explanations (see Figure 3.2 and Table 3.3 below which include each P’s pre-int scores).

Happe 1994 (n = 6) (max score = 24)				Present Study (n = 4) (max score = 24)			
Mental Explanations		Physical Explanations		Mental Explanations		Physical Explanations	
Mean	Range	Mean	Range	Mean	Range	Mean	Range
15.3	11-19	4.7	1-7	11.75	4-20	5.5	2-11

*Table 3.2. TOM Stories: Comparison of mean correct responses for “Why ...?” questions (Happe 1994 cf present study)*

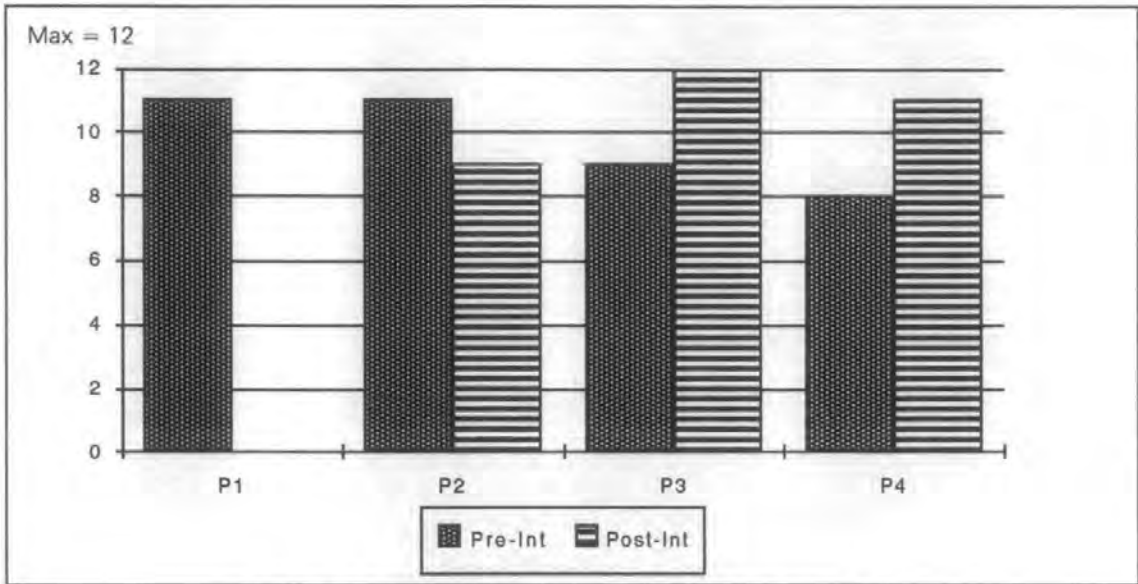
3.1b   Comparison between Pre-Int and Post-Int Scores

As the TOM test acted as a control variable it was anticipated that pre-int and post-int scores on all dimensions would be similar.

a     “Is it true ...?”

*The post-int scores for Ps in the present study on “Is it true ...?” questions will be the same as their pre-int scores.*

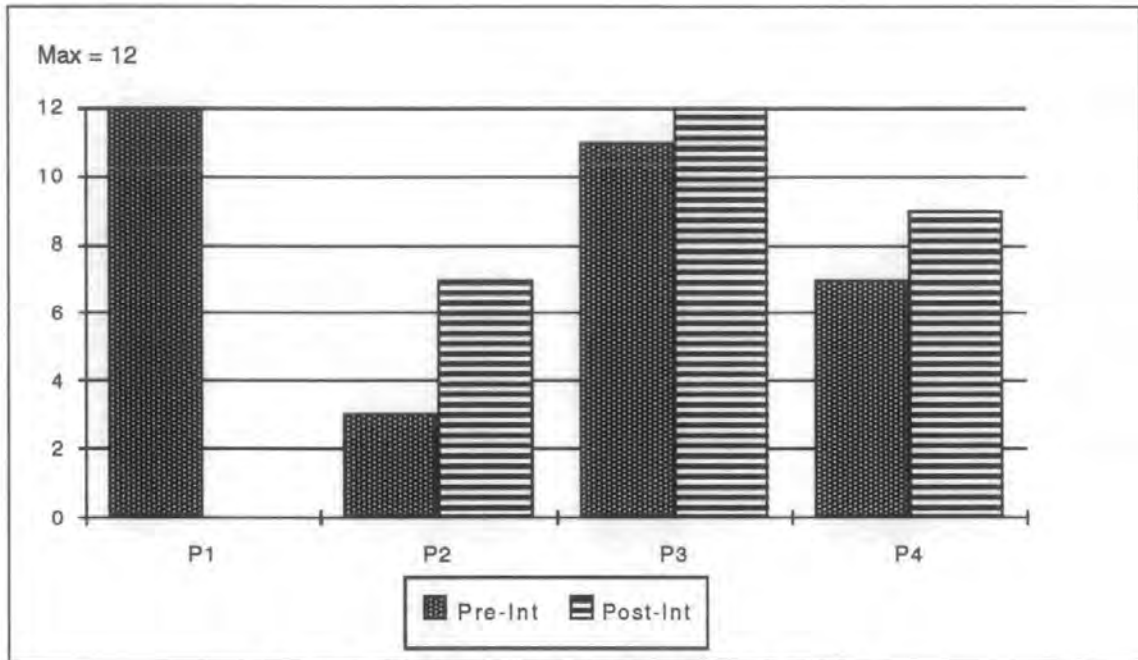
Figure 3.1 below compares Ps' scores pre- and post-intervention. The disparity in pre-int and post-int performance was unexpected.



*FIG. 3.1. "TOM Stories: Pre-int and post-int correct responses for "Is it True ...?" questions*

b Why ...?

*The post-int scores for Ps in the present study on "Why ...?" questions will be the same as their pre-int scores.*



*FIG. 3.2. "TOM Stories: Pre-int and post-int correct responses for "Why ...?" questions*

Figure 3.2 above graphically indicates that Ps 2, 3 and 4 showed an improvement on performance following the intervention. This had not been anticipated.

Table 3.3 below sets out correct and incorrect scores for Ps, categorised into mental and physical explanations for pre-int and post-int story sets. The increase in number of correct explanations and decrease in incorrect explanations for Ps 2 and 4 post-int was not expected.

	Pre-Int: Story Set 1				Post-Int: Story Set 2			
	Mental		Physical		Mental		Physical	
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
<b>P1</b>	10	0	2	0	-	-	-	-
<b>P2</b>	1	7	2	2	3	2	4	3
<b>P3</b>	6	0	5	1	6	0	6	0
<b>P4</b>	5	4	2	1	6	2	3	1

*Table 3.3. TOM Stories: Categorisation of Ps' responses to "Why ...?" questions into mental and physical explanations*

## **TESTS OF EMOTIONAL EXPRESSION**

### **3.2 EMOTION AND IDENTITY SORTING TASKS**

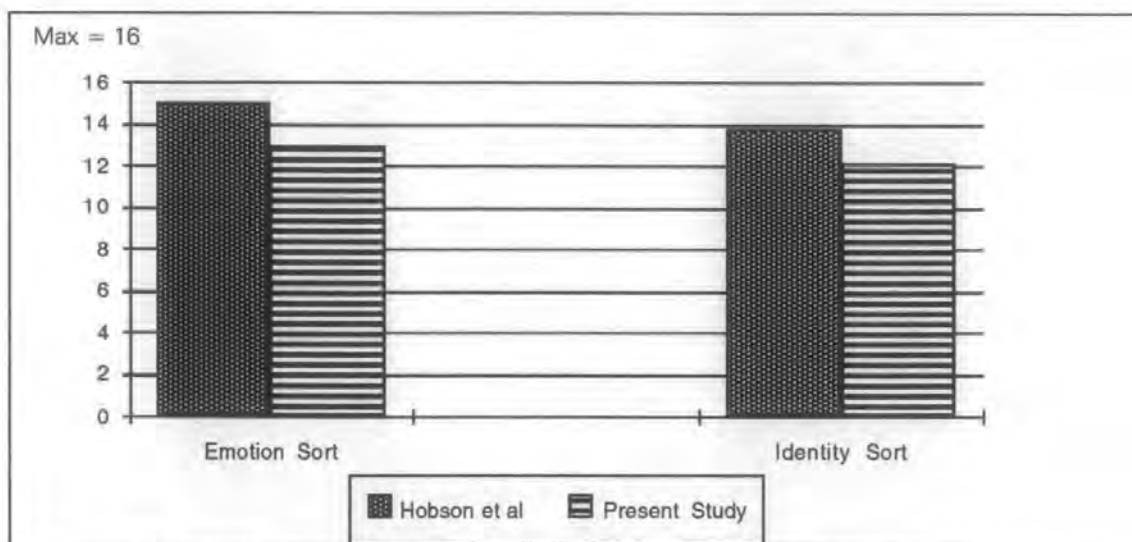
(Adapted from Hobson, Ouston & Lee 1988)

#### **3.2a Comparison between Replication Study and Pre-Int Scores**

Ps in the present study were compared to 17 autistic Ps in Hobson et al's study (mean age 19:4, range 13:4 - 25:10) on emotion and identity sorting tasks.

*Pre-int performance of Ps in the present study on emotion-sorting and identity-sorting tasks will match those of the autistic group in Hobson et al's study.*

Figure 3.3 below suggests that, overall, Ps in the present study were less accurate at both emotion and identity sorting tasks compared to Hobson et al's group. However, Figures 3.4 to 3.7 below reveal that the low pre-int scores of P2 on "emotion sorting" and P4 on "identity sorting" weighted down the overall mean scores.



**FIG. 3.3. Sorting Tasks: Comparison of mean correct scores (Hobson et al 1988 cf present study)**

### 3.2b Comparison of Pre-Int and Post-Int Scores

*Following the intervention, each P in the present study will show an improvement on pre-int performance for sorting photographs of facial expressions into emotion and identity categories.*

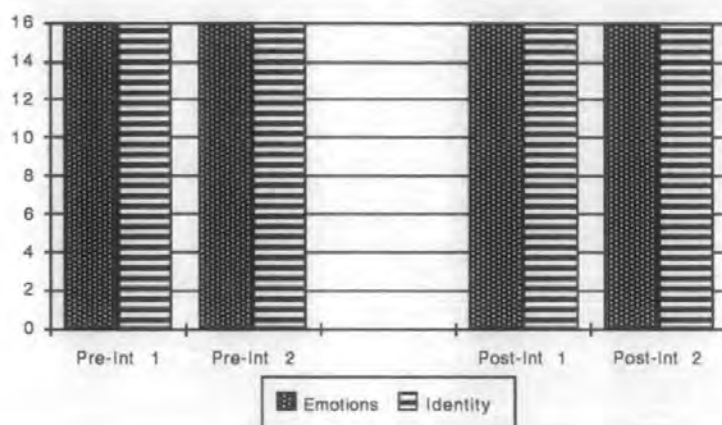
Within-P T-tests were used to compare conditions (identity and emotion) by stage (pre-int, post-int) and revealed non-significant effects for emotion by stage ( $t = -1.73$ ,  $df = 3$ ,  $p < 0.182$ ), and identity by stage ( $t = -2.82$ ,  $df = 3$ ,  $p < 0.067$ ). Identity by stage almost reached significance and it is possible that the non-significant finding is due to the small number of Ps in the study.

Figures 3.4 to 3.7 below graphically illustrate the following points. P1 performed at ceiling level throughout, and the other three Ps showed an improvement following the intervention. All were 100% accurate on both post-int trials for the two tasks. It is not clear why P2 showed a greater increase in emotion sorting while scores for Ps 3 and 4 indicated greater improvement on identity sorting.



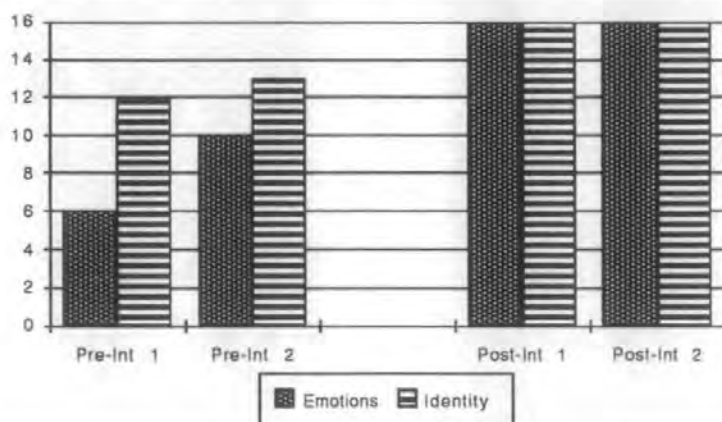
Max = 16

Fig. 3.4:  
P1



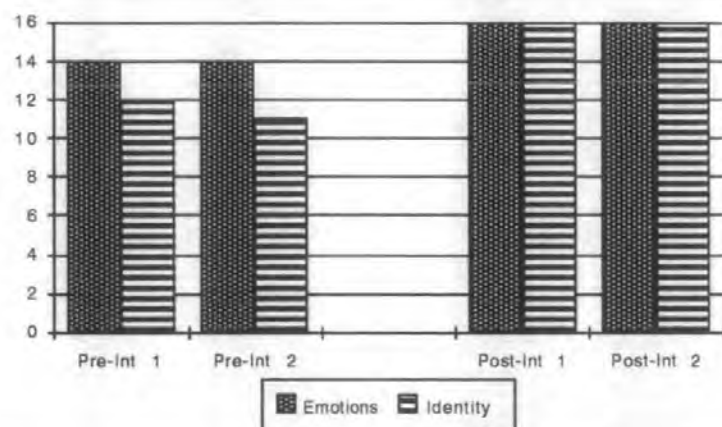
Max = 16

Fig. 3.5:  
P2



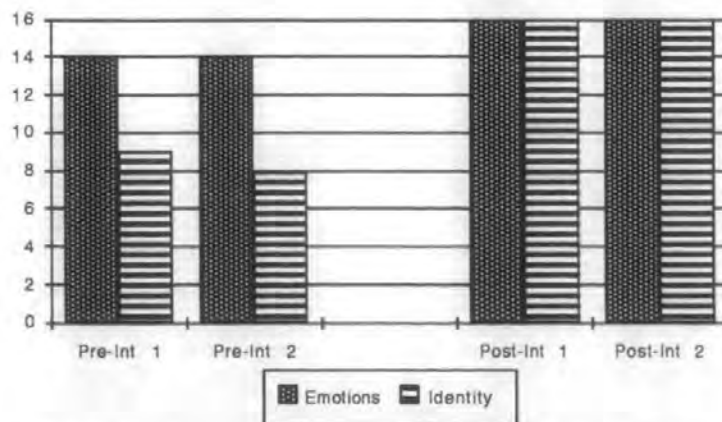
Max = 16

Fig. 3.6:  
P3



Max = 16

Fig. 3.7:  
P4



*FIGS. 3.4 to 3.7. Sorting Tasks: Comparison of Ps' pre-int and post-int performance*

### 3.3 **COMPREHENSION OF VERBAL TERMS FOR EMOTIONS**

(Adapted from Van Lancker, Cornelius & Needleman 1991)

The ability of Ps to match pictures to nouns, neutral adjectives, and emotional adjectives was analysed. Their answers were also rated by judges according to whether responses were "usual" or "unusual, and for type of word definition. There were seven category types for word definitions: perseveration on the target word; description of local detail from a drawing; concrete response; self-referential (i.e. the emotion was related to a specific personal experience of the P); generalised situational or experiential; true synonym; wrong definition.

#### 3.3a **Comparison between Replication Study and Pre-Int Scores**

Ps in the present study were compared to 20 autistic children (17 males, 3 females; mean age 8:8 years, range 7:0 - 12:10 years) in Van Lancker et al's research.

#### ***Matching Pictures to Words***

*Prior to the intervention, the performance of Ps in the present study on matching pictures to words will be similar to those of the autistic group in Van Lancker et al's study.*

Although Van Lancker et al's study used 15 words in each of three lists (nouns; neutral adjectives; emotional adjectives) the present study used only 8 words per list because of time restraints.

All Ps in the present study performed similarly to those in Van Lancker et al on nouns (100% compared to 94% for Van Lancker et al's Ps). The scores of P2 were similar to Van Lancker et al's autistic group on neutral adjectives (81.3% compared to 77.6%), but better on emotional adjectives (87.5% compared to 63.7%). The scores of Ps 1, 3, and 4 (100% accurate) suggest superior matching abilities to those of Van Lancker et al's group for the neutral and emotional words.

If autism and AS are developmental disorders, then it seems feasible that adults with AS would perform better than autistic children on a task matching pictures to words. However, it is also possible that the scores of Ps in the present study would have been more similar to those in Van Lancker et al's research if they had been subjected to 15 words per list.

### ***Descriptive Study***

Similarly to part of the descriptive section of Van Lancker et al's study, the Ps in the present project were asked to give reasons for their choices, and how they would define each word. This was done to investigate Van Lancker et al's hypothesis that autistic people may have unusual mental representations of meanings for emotional adjectives, even when they produce correct recognition responses to a matching task. Unfortunately raw data was not available in Van Lancker et al's paper, so comparisons between the two studies was not possible.

In addition to looking at meanings for emotional adjectives, this study also looked at Ps' responses for the other two word types to determine if there was a distinctive pattern for autistic people's responses to emotional adjectives only as Van Lancker et al suggest. Pre-int and post-int results for the present study are given below.

### **3.3b Comparison of Pre-Int and Post-Int Scores**

#### ***Matching Pictures to Words***

*After completion of the intervention, each P will show an improvement in matching emotional adjectives to pictures, but performance on matching nouns and neutral adjectives will remain similar to pre-int scores.*

The maximum number that could be scored for each word category at each trial was eight. Ps 1, 3, and 4 were 100% accurate in matching pictures to words pre-int and post-int for the three word-type categories.

P2 was 100% accurate pre-int and post-int for nouns, 81.3% pre-int and 88% post-int for neutral adjectives, and 87.5% pre-int, 100% post-int for emotional adjectives. As the intervention concentrated on emotional cues the higher accuracy rate for emotional than neutral adjectives was expected.

**Descriptive Study**

**a    Reason for Choice**

*Judges’ ratings for Ps’ reasons for making choices about each of the three word types, both pre-int and post-int will indicate that Ps have unusual mental representations for emotional adjectives. This will be apparent from the number of “unusual” explanations offered for emotional words compared to more “usual” responses for nouns and neutral adjectives.*

The findings do not support Van Lancker et al’s hypothesis that autistic people have unusual mental representations for emotional adjectives in particular, as all 4 Ps were judged to offer usual responses most of the time. Ps 2 and 4 were each judged to offer some unusual explanations for their choices prior to the intervention, and each were judged to make more usual explanations following the intervention for all three word categories (see table 3.4 below). However, the comparison may not be fair as it should be remembered that Ps in the present study may be considered more “intellectually able”, and also that they only had to respond to 8 items per word list compared to 15 in Van Lancker et al’s research.

	Nouns		Neutral Adjectives		Emotional Adjectives	
	Pre-Int	Post-Int	Pre-Int	Post-Int	Pre-Int	Post-Int
<b>P1</b>	100.0	100.0	100.0	100.0	100.0	100.0
<b>P2</b>	81.3	93.8	75.0	87.5	81.3	93.8
<b>P3</b>	100.0	100.0	100.0	100.0	100.0	100.0
<b>P4</b>	73.3	86.7	87.5	100.0	93.8	100.0

**TABLE 3.4. Comprehension of Verbal Terms:  
Mean percentage “usual” explanations pre-int and post-int**

*Judges' ratings for Ps' post-int reasons for making choices about emotional adjectives will indicate an increase in "usual" explanations compared to pre-int responses. There will be no change in raters' decisions about Ps' performance on nouns or neutral adjectives following the intervention.*

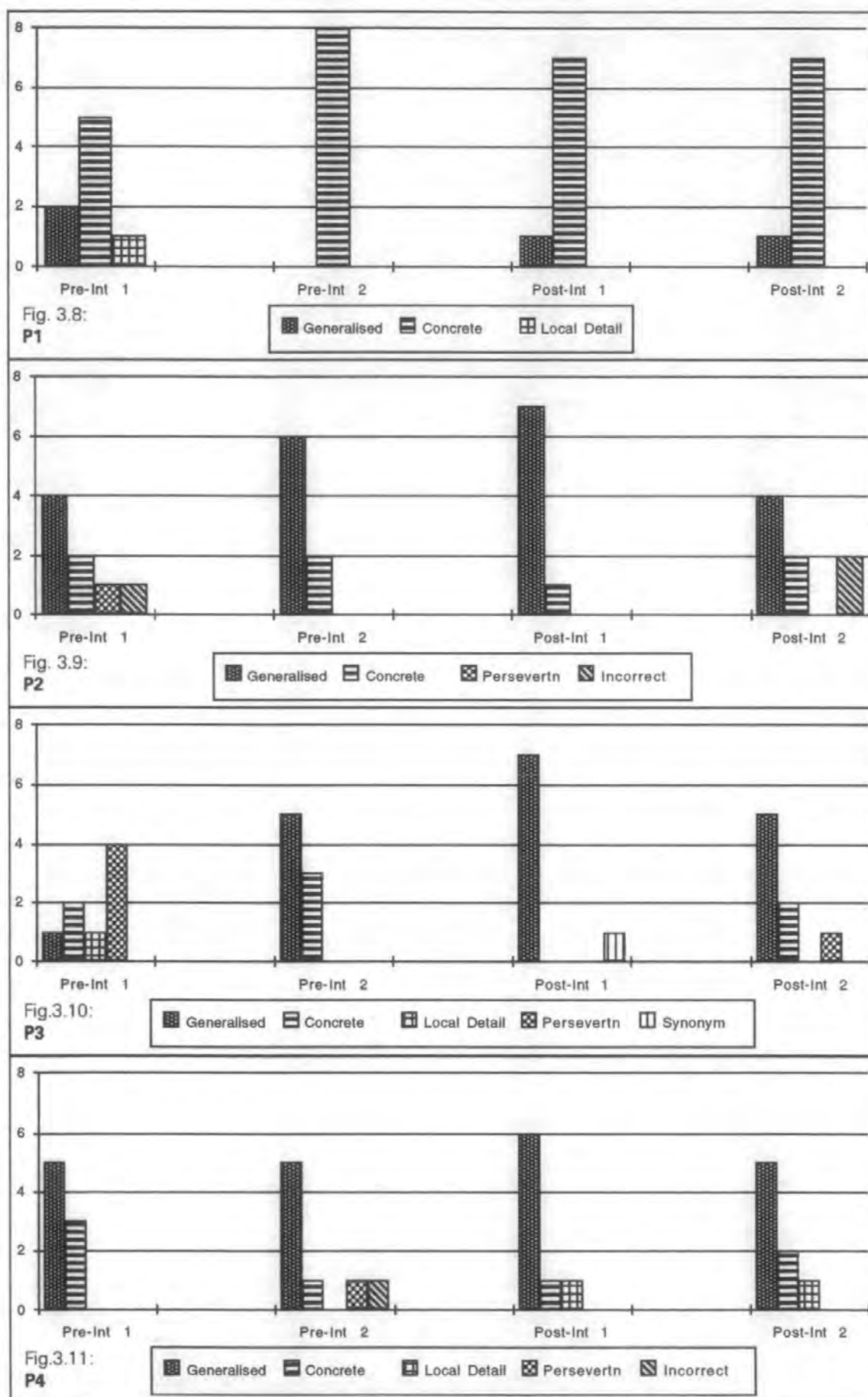
Table 3.4 above compares the mean percentage "usual" reasons, pre-int and post-int, given by each P for the three word lists. The findings show that Ps 1 and 3 were judged to always offer "usual" reasons for all three word lists, both prior to and following the intervention.

Ps 2 and 4 were judged to offer more usual reasons for making choices on emotional adjectives (12.5% and 6.2% respectively) following the intervention. However, they were also judged to offer more usual reasons for their responses for the other two types of words. P2 showed an 12.5% increase for both nouns and neutral adjectives, while P4 improved by 13.4% for nouns and 12.5% for neutral adjectives. Their post-int improvement on nouns and neutral adjectives is puzzling as the intervention concentrated on emotional information.

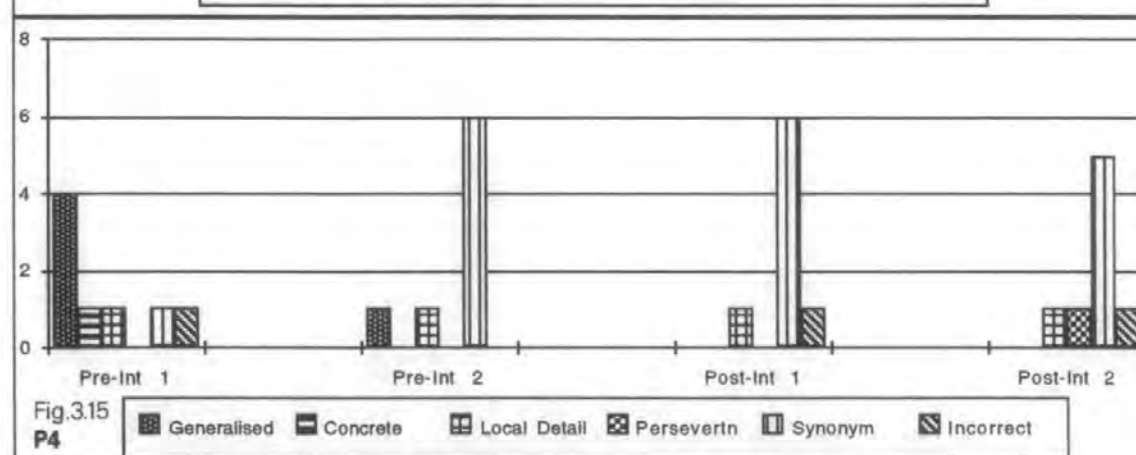
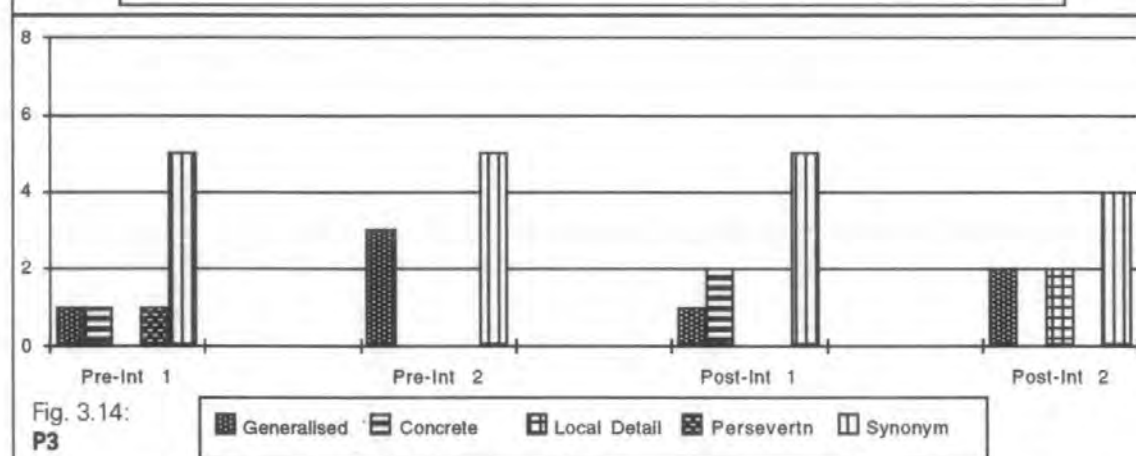
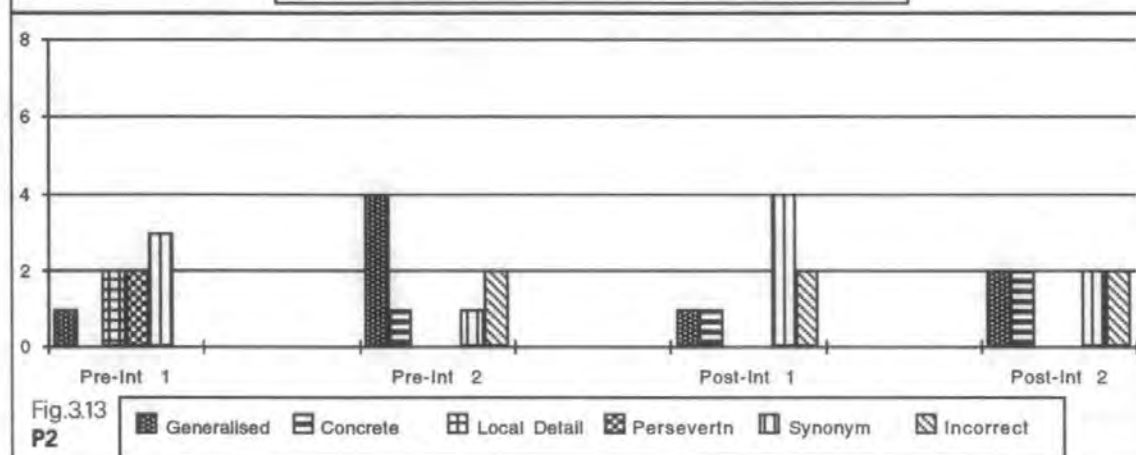
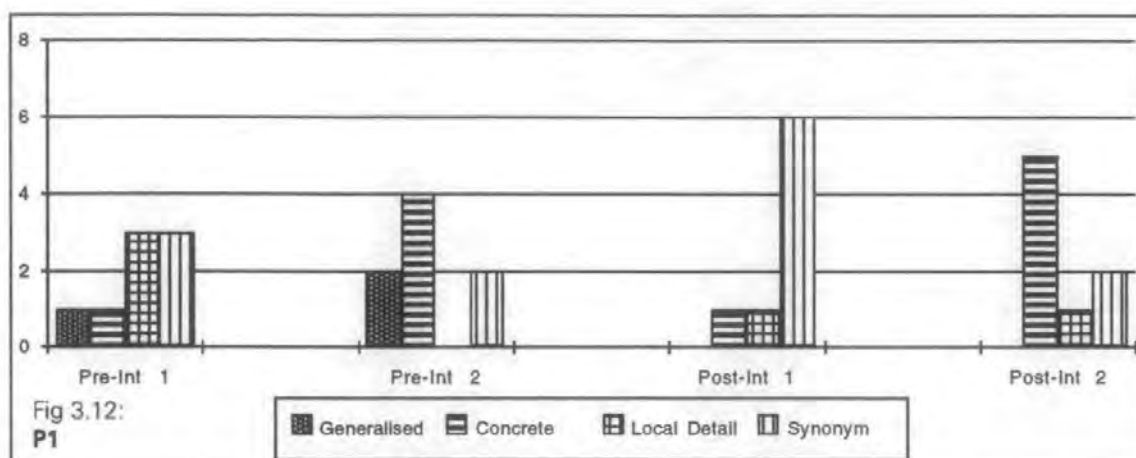
#### **b    Response Categories**

*Following the intervention, the Ps in the present study will all show a similar pattern for types of explanation used for emotional adjectives, regardless of idiosyncratic responses prior to the intervention. Categories of explanation for nouns and neutral adjectives will remain unchanged from pre-intervention responses.*

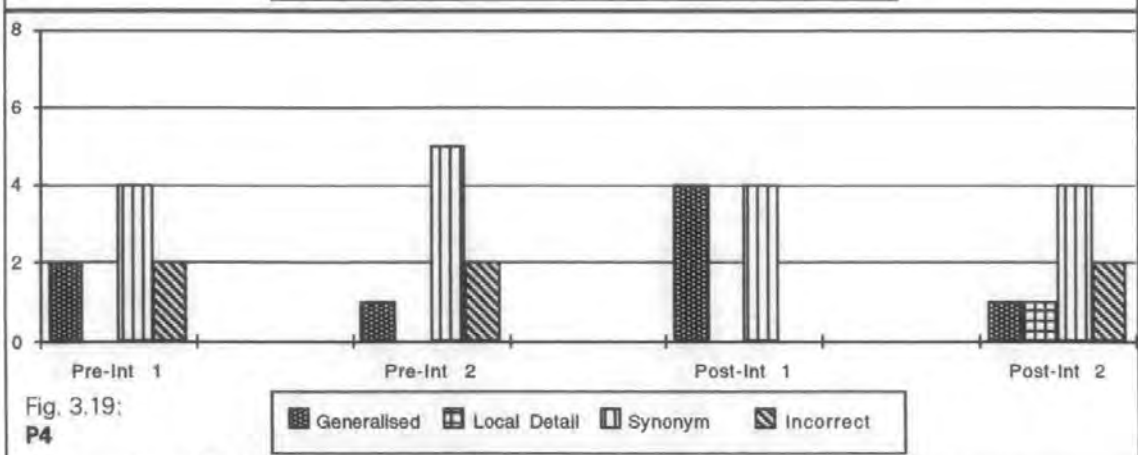
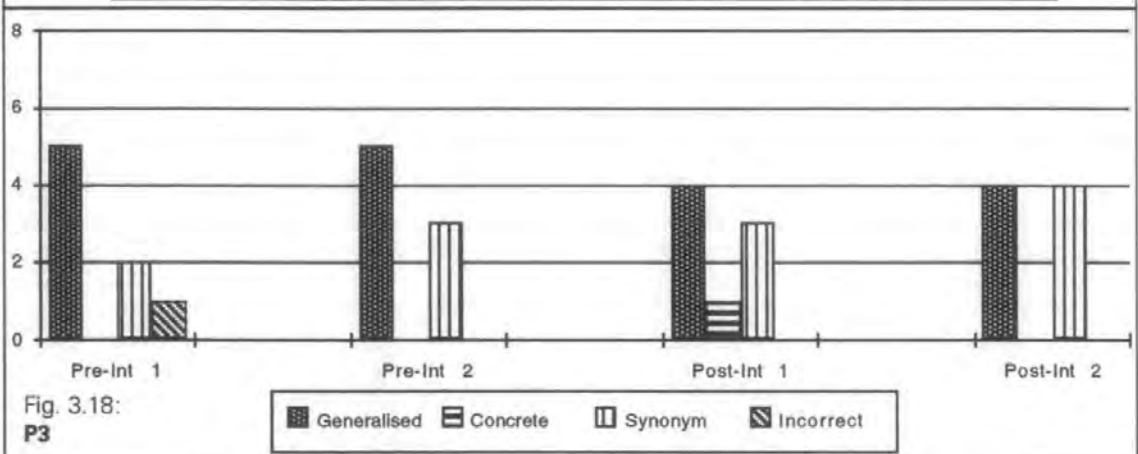
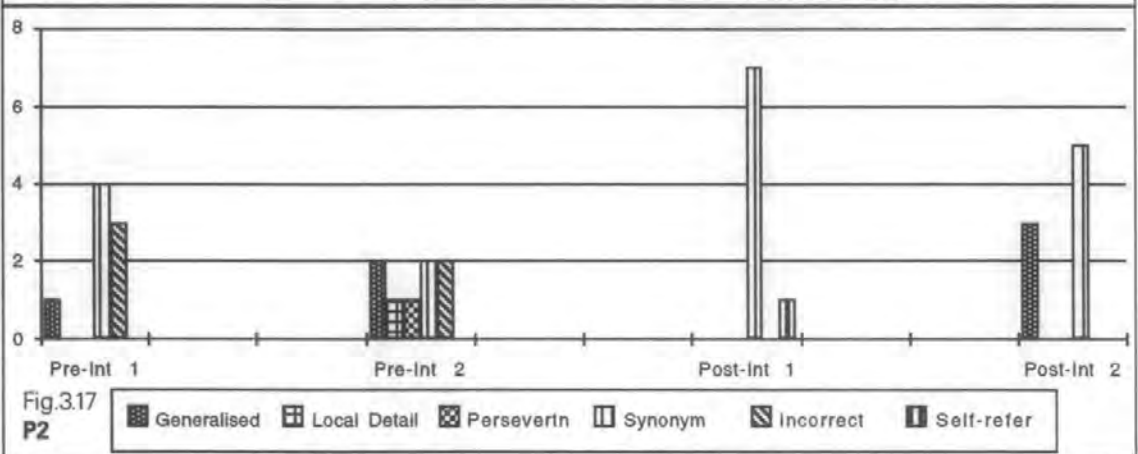
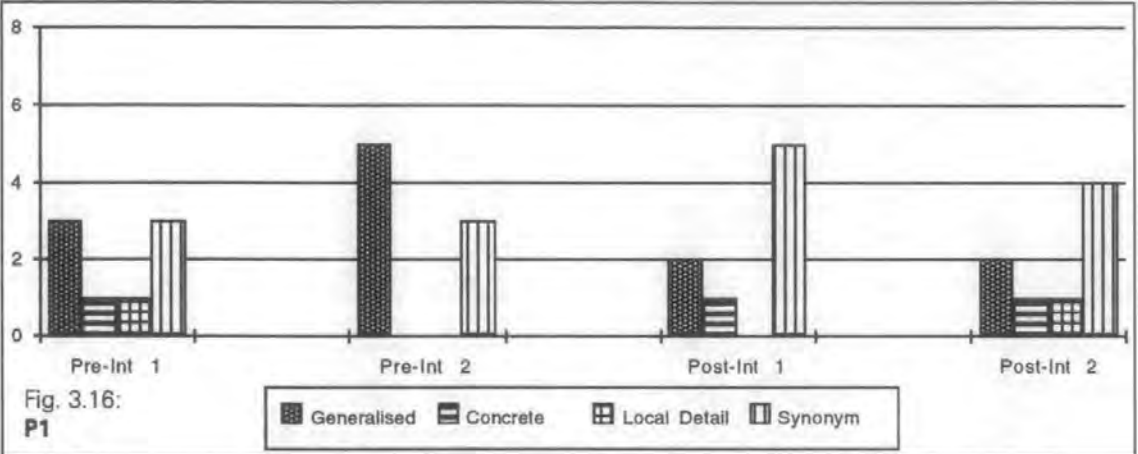
Figures 3.8 to 3.11 below graphically illustrate response categories for each P on nouns, figures 3.12 to 3.15 for neutral adjectives, and figures 3.16 to 3.19 for emotional adjectives. Overall, they suggest there was a tendency for each of the Ps in the present study to use generalised and concrete examples for nouns pre-int and post-int. Generalised and synonym explanations were generally used for emotional adjectives, with Ps 1 and 2 showing a decrease in generalised responses and increase in synonyms post-int. Types of explanation for neutral adjectives tended to vary more for all Ps across trials.



*FIGS.3.8 to 3.11. Comprehension of Verbal Terms: Categories of explanation for nouns pre-int and post-int*



FIGS. 3.12 to 3.15. Comprehension of Verbal Terms: Categories of explanation for neutral adjectives pre-int and post-int



**FIGS.3.16 to 3.19. Comprehension of Verbal Terms:**  
*Categories of explanation for emotional adjectives pre-int and post-int*



The results failed to find an anticipated clear pattern of response categories for the emotional adjectives post-int despite all Ps receiving the same information during the intervention. It is unclear why there was so much fluctuation in pre-int and post-int category types for neutral adjectives.

### 3.4 **CROSS-MODAL PROCESSING TASK**

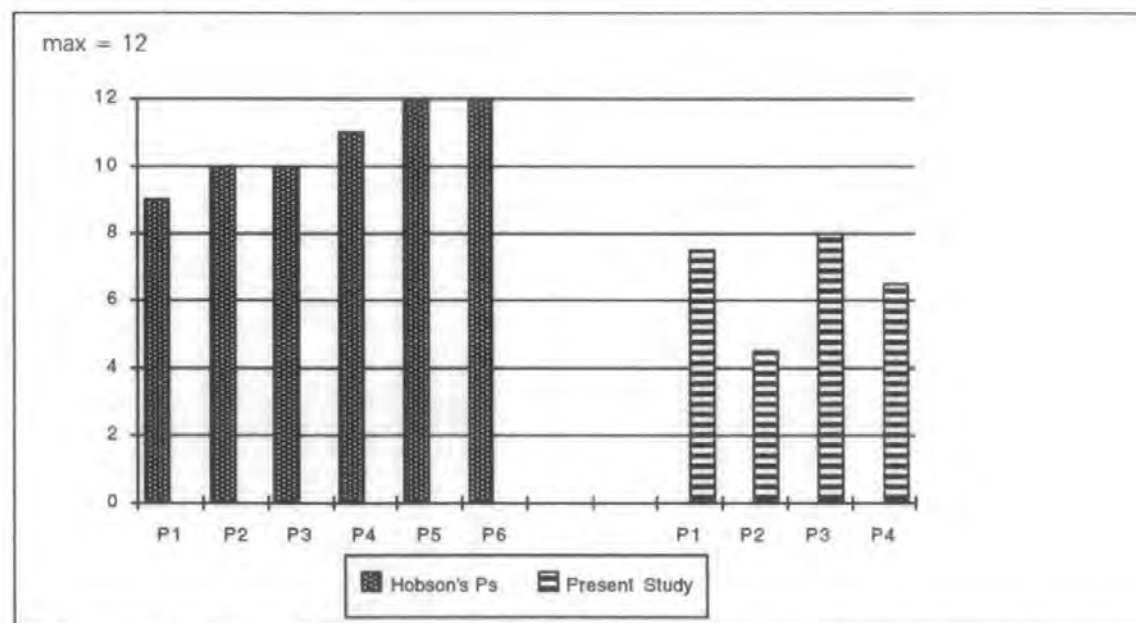
(Adapted from Hobson 1986a)

Following Hobson's procedure, Ps in the present study were asked to make four judgments in each condition for the "Emotions Test" (Gestures, Vocalizations, Contexts) and the "Things Test" (Movements, Sounds, Contexts). These were scored as correct (score 1) or incorrect (score 0).

#### 3.4a Comparison between Replication Study and Pre-Int Scores

*Pre-int scores of Ps in the present study on a cross-modal processing test will correspond to those of a group of "intellectually able" autistic children in Hobson's (1986a) study.*

Ps in the present study were compared to 6 of 23 autistic children in Hobson's study (18 males, 5 females; mean age 14:7 years, range 9:11 - 19:6 years). The 6 were judged to be more intellectually able than the others.



**FIG. 3.20. Cross-Modal Processing Tasks: Comparison of mean correct scores on the Emotions Test (Hobson 1986a cf present study)**

Similarly to Hobson's findings, Ps in the present study tended to perform at ceiling level on the "Thing" Test. Exceptions were P2 for Sound (75% pre-int, 50% post-int), and P4 for Gestures (87.5% pre-int, 100% post-int).

Figure 3.20 above graphically illustrates that Ps in the present study performed less well than the HFA group on cross-modal processing of emotional materials. This seemed a surprising result, particularly with regard to Ps 1 and 3 whose WAIS-r scores suggest they are within the normal range for VIQ, PIQ, and FSIQ (see Table 2.3 in the Methods section).

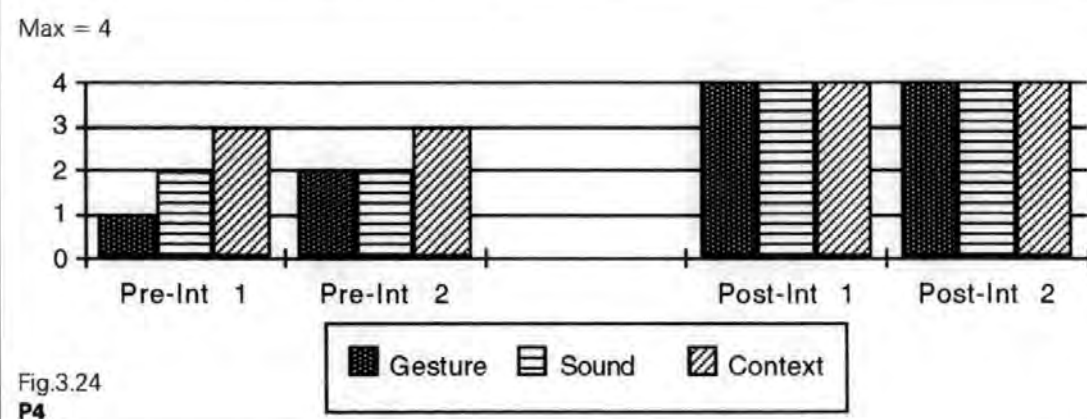
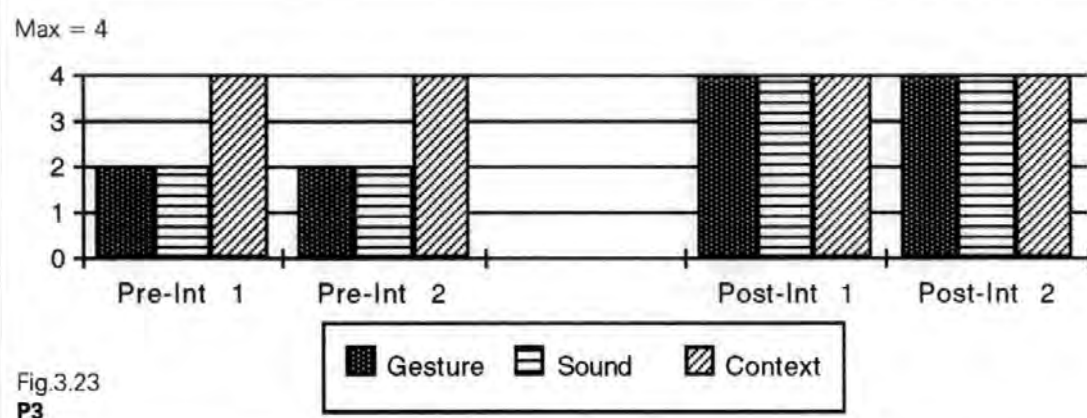
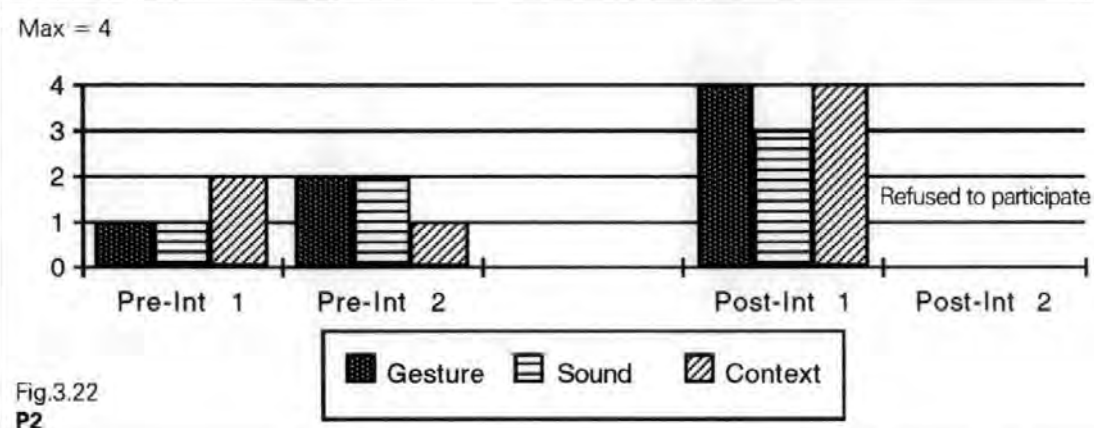
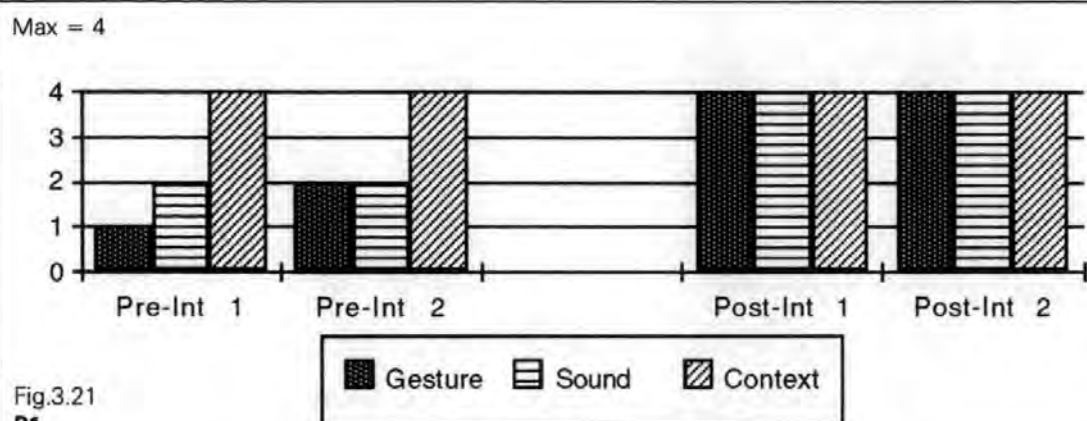
It would have been interesting to compare the raw scores of Hobson's 6 high-scoring Ps with those of Ps in the present study on the Raven's Progressive Matrices (RPM, 1960) to determine if the RPM is a better performance discriminator than the WAIS on this type of task. Unfortunately only a mean average score was given for the group of 23 autistic children (29.9, range 6 - 62). Ps in the present study scored 55, 36, 53 and 23 respectively on the RPM. With regard to the present Ps, P4's scores on the RPM and cross-modal processing task seem disproportionately balanced.

### 3.4b Comparison of Pre-Int and Post-Int Scores

*On completion of the intervention, the scores of Ps in the present study will show an improvement in cross-modal processing of emotional materials compared to pre-int performance.*

Figures 3.21 to 3.24 below illustrate each P's scores pre-int and post-int. Two points are apparent. Firstly, that prior to the intervention Ps 1, 3 and 4 performed better on the Context condition than on the Gesture or Sound trials. Secondly, where pre-int scores were not at ceiling level, the post-int scores were, with the exception of P2 for the Sound condition.

Ps' scores for the three conditions (gesture, sound and context) were collapsed into mean overall scores for performances. A Within-P T-test was used to compare pre-int and post-int scores, and revealed a significant difference ( $t = -1.73$ ,  $df = 3$ ,  $p < 0.003$ ).



**FIGS. 3.21 to 3.24. Cross-Modal Processing Task: Comparison of Pre-Int and Post-Int Scores**

### 3.5 ***UNDERSTANDING OF SIMPLE AND COMPLEX EMOTIONS***

(Adapted from Capps, Yirmiya & Sigman 1992)

Ps were required to recount times when they had felt the emotions of happiness and sadness (categorised by Capps et al as simple emotions), and embarrassment and pride (complex emotions). Responses were analysed for the following elements: locus of control; audience presence; task difficulty; and cognitive strategy.

#### ***3.5a Comparison between Replication Study and Pre-Int Scores***

Ps in the present study were compared with 18 HFA children in Capps et al's research (mean age approximately 12:6 years, SD 2:2 years; WISC-r mean VIQ = 98.6, PIQ = 105.3, and FSIQ = 101.9). Qualitative comparisons are made where raw data is unavailable in Capps et al's paper.

##### **a Locus of Control**

*The pre-int perception for type and locus of control of simple and complex emotions for Ps in the present study will match those of the HFA group in Capps et al's research.*

The pre-int performance of Ps in the present study were similar to those of the HFA group with regard to generally perceiving happiness, sadness and embarrassment as emotions outside of their control, but did not replicate the findings of Capps et al for pride. Their Ps perceived pride as a controllable emotion while Ps in the present study considered it to be uncontrollable.

There were mixed findings for locus of control. Ps in the present study perceived sadness as internally-located (100%), which contrasted with Capps et al's HFA children, who tended to view it as externally-located (73%). For the complex emotion of pride, Ps in the present study showed more variability in locus of control (62.5% internally, 37.5% externally) than did Capps et al's Ps who showed a tendency to locate it internally (71%).

Predicted similarities between the Ps in the two studies for locus of control for happiness and embarrassment were found. Locus of control for

happiness was generally perceived as external for both Capps et al’s Ps (82%) and Ps in the present study (87.5%). Ps in both studies showed a similar pattern of fluctuation for locus of control for embarrassment (Capps et al - 60% internal, 40% external; present study - 62.5% internal, 37.5% external).

**b    Audience Presence**

*The pre-int accounts of emotional experiences by Ps in the present study will match the pattern for audience presence found for Capps et al’s HFA group for each of the emotions .*

Audience presence was categorised as either present or absent. Some of the HFA group in Capps et al’s study did not refer to an audience when describing an embarrassing situation. This finding was not replicated in the present study where all Ps described at least one situation where an audience would be likely. Raw data for audience presence for other emotions is not given by Capps et al so further comparison between studies is not possible.

**c    Task Difficulty**

*Prior to the intervention, Ps will require the same number of prompts and show similar response latency as the HFA group for recounting incidents involving each of the emotions.*

Task difficulty was measured by looking at response latency (measured in seconds) and number of prompts required before recounting a situation. Capps et al found that their autistic Ps required more time and a greater number of prompts than a non-autistic group before offering a “codeable response” for the complex emotions.

	Simple Emotions				Complex Emotions			
	Happiness		Sadness		Pride		Embarrassment	
	Time	Prompts	Time	Prompts	Time	Prompts	Time	Prompts
<b>Capps et al (n = 18)</b>	0.88	0.47	1.10	1.69	1.14	1.35	1.40	1.43
<b>Present Study (n = 4)</b>	0.00	0.00	0.63	0.25	1.75	0.25	3.13	0.63

*Table 3.5. Understanding Emotions: Comparison of mean scores for task difficulty (Capps et al 1992 cf present study)*

As can be seen in Table 3.5 above, Ps in the present study tended to require less time to recount experiences involving simple emotions, but longer for complex emotions. Overall, they required fewer prompts for all four emotions than did the HFA Ps in Capps et al's study.

#### d Cognitive Strategy

*Prior to the intervention, patterns for using general or specific incidents and "thinking" phrases for particular emotions will match those of the HFA Ps.*

Cognitive strategy was measured by Capps et al in terms of whether Ps used general or specific incidents and "thinking" phrases (e.g. phrases which suggested cognitive effort rather than idiomatic use such as "you know").

Capps et al found that the HFA group were likely to offer specific incidents for sadness (mean average 75%), but for happiness, pride and embarrassment there was a tendency to use generalised examples (mean average 59%, 81%, and 67% respectively). In the present study Ps seemed to fluctuate between recounting general and specific incidents for sadness and pride (mean = 50% general, 50% specific), but, similarly to Capps et al's HFA group, used more generalised incidents for happiness and embarrassment (88% and 75% respectively).

No raw data was available in Capps et al's paper for thinking phrases so comparisons between studies are not possible.

#### **3.5b Comparison of Pre-Int and Post-Int Scores**

From pre-int trial 2, Ps in the present study were required to recount experiences which included the emotions studied during the intervention. These additional emotions were anger, fear, surprise (categorised by the E as "simple" emotions), and contempt and disgust ("complex" emotions). This means only one set of raw data for these emotions was available pre-int but two sets were available post-int.

a Locus of Control

*There will be no difference between pre-int and post-int perceptions of locus of control for sadness, happiness, pride and embarrassment. Locus of control for other emotions will be similar to that found for the above four emotions.*

		P1		P2		P3		P4	
		Pre-Int	Post-Int	Pre-Int	Post-Int	Pre-Int	Post-Int	Pre-Int	Post-Int
Simple Emotions	EU	29	40	29	40	57	30	29	10
	IU	29	50	57	40	43	40	57	80
	IC	42	10	14	20	0	30	14	10
Complex Emotions	EU	67	50	17	63	50	37	50	50
	IU	33	37	83	37	50	38	33	25
	IC	0	13	0	0	0	25	17	25

*Key: EU = external, uncontrollable; IU = internal, uncontrollable; IC = internal, controllable*

**Table 3.6. Understanding Emotions: Mean percentage locus of control pre-int and post-int for “simple” and “complex” emotions**

Table 3.6 above shows each P’s locus of control for the simple and complex emotions both prior to and following the intervention. As locus of control was not discussed during the intervention it was predicted that there would be little change in locus of control for emotions pre-int and post-int.

The results suggest Ps tended to view most emotions as uncontrollable both pre-int and post-int, although locus of control seemed to fluctuate between internal and external sources with no clear pattern emerging.

Exceptions were for Ps 1 and 4 who showed a 32% and 4% drop respectively in viewing simple emotions as internal and controllable, while mean scores for Ps 2 and 3 increased by 6% and 30% respectively on this dimension. With regard to locus of control for complex emotions, P1’s responses indicated a 13% increase in perceiving them as internal and controllable, but P4’s scores showed a 41% decline in this perception.

When specific emotions were analysed clear differences emerged for P1 for disgust (internal pre-int to external post-int), P2 for contempt (internal to external), and P3 for anger and contempt (both external to internal). These were all emotions that were discussed during the intervention. However, why

one P should move from perceiving contempt as internally to externally located and another from external to internal is intriguing as attempts were made to ensure each P received a similar intervention package to the others, and discussion about locus of control was not included.

b     Audience Presence

*On completion of the-intervention, Ps in the present study will show an increase in audience presence for each of the emotions compared to pre-int scores.*

It was anticipated that Ps would include an audience more often following the intervention because the sessions included discussion about the role of other people during emotional situations.

	Audience Present Pre-int and Post-int	Audience Absent Pre-int and Post-int
P1	Embarrassment	Pride
P2	Anger, Contempt	-
P3	Embarrassment, Contempt	Fear, Disgust
P4	Embarrassment, Anger, Contempt, Surprise	Disgust

*Table 3.7. Understanding Emotions: Emotions for which audience presence or absence remained constant across all trials*

Table 3.7 above shows the emotions for which audience presence or absence remained constant across both pre-int and post-int trials for each P. Only P2 did not always include an audience for embarrassment.

Table 3.8 below shows mean percentage audience presence and absence for the categories of simple and complex emotions.

		P1		P2		P3		P4	
		Pre-Int	Post-Int	Pre-Int	Post-Int	Pre-Int	Post-Int	Pre-Int	Post-Int
Simple Emotion	Audience	57	30	71	80	57	60	86	70
	Absent	43	70	29	20	43	40	14	30
Complex Emotion	Audience	50	37	50	37	67	63	67	63
	Absent	50	63	50	63	33	37	33	37

*Table 3.8. Understanding Emotions: Mean percentage audience presence or absence across “simple” and “complex” emotion categories pre-int and post-int*



As can be seen, Ps 2 and 3 showed a slight increase in audience presence for simple emotions following the intervention, but Ps 1 and 4 tended to include them less often. With regard to complex emotions, all four Ps showed an unexpected decline in the presence of an audience.

No clear reason for these unanticipated findings is available. Even when scores for individual emotions were analysed it was found that only P1 showed a clear change in pre-int and post-int strategy for audience inclusion, although not always in the predicted fashion. For example, he included an audience for happiness and contempt prior to the intervention, but excluded them following the intervention. For surprise, however, he did not include an audience pre-int, but did post-int.

c    Task Difficulty

*Following the intervention, Ps in the present study will need less time and fewer prompts to recount emotional experience than they had prior to the intervention.*

		Simple Emotions					Complex Emotions			
		H	S	A	F	Su	E	P	C	D
<b>P1</b>	<b>Pre-Int</b>	0.0	0.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0
	<b>Post-Int</b>	6.5	0.5	0.0	0.0	1.0	2.0	1.0	1.5	1.0
<b>P2</b>	<b>Pre-Int</b>	0.0	0.0	0.0	2.0	0.0	3.0	0.5	3.0	0.0
	<b>Post-Int</b>	1.0	0.5	0.5	5.0	1.5	2.5	0.0	5.0	1.5
<b>P3</b>	<b>Pre-Int</b>	0.0	1.0	1.0	0.0	0.0	1.5	5.5	3.0	6.0
	<b>Post-Int</b>	1.5	2.5	5.5	4.0	0.0	1.0	1.5	3.5	1.5
<b>P4</b>	<b>Pre-Int</b>	0.0	1.5	4.0	0.0	1.5	0.0	1.0	3.0	0.0
	<b>Post-Int</b>	0.0	1.0	3.0	0.0	0.0	4.0	4.0	0.0	1.0

**Key:** (Simple Emotions) H - Happiness; S - Sadness; A - Anger; F - Fear; Su - Surprise  
 (Complex Emotions) E - Embarrassment; P - Pride; C - Contempt; D - Disgust

***Table 3.9. Understanding Emotions:  
 Mean average time latency (in seconds) pre-int and post-int***

Table 3.9 above gives mean average time latency for each P pre-int and post-int. Means for each emotion are shown because the wide variability of scores would have been masked by collapsing them into simple and complex categories.

Interestingly, there was a tendency for Ps 1, 2, and 3 to require the same or more time post-int to respond to requests for experiences concerning simple emotions, and Ps 1 and 2 for the complex emotions discussed during the intervention. It is not clear why this should occur. A possible explanation is that Ps were using time to recall information made available during the intervention. However, this does not explain why time latency did not remain the same pre-int and post-int for the emotions not discussed during the intervention (i.e. embarrassment and pride).

Ps required fewer prompts post-int compared to pre-int. Prior to the intervention P1 needed two prompts for embarrassment and P2 required one prompt each for sadness, embarrassment and pride. Neither required prompts post-int. P3 had one prompt each pre-int for sadness and embarrassment and one prompt post-int for surprise. P4 needed one prompt each for embarrassment (pre-int) and one pre-int plus one post-int for pride.

d Cognitive Strategy

*Ps in the present study will use more specific incidents post-int than pre-int for emotions discussed in the intervention.*

		P1		P2		P3		P4	
		Pre-Int	Post-Int	Pre-Int	Post-Int	Pre-Int	Post-Int	Pre-Int	Post-Int
Simple Emotions	Generalised	57	50	43	60	86	70	57	70
	Specific	43	50	57	40	14	30	43	30
Complex Emotions	Generalised	33	50	67	63	83	75	83	50
	Specific	67	50	33	37	17	25	17	50

*Table 3.10. Understanding Emotions: Mean percentage cognitive strategy pre-int and post-int for "simple" and "complex" emotion categories*

Table 3.10 above compares the strategies used by the Ps pre-int and post-int for recounting emotional incidents. Although Ps 1 and 3 used more specific incidents for simple emotions post-int (7% and 16% respectively), they still tended to recount more generalised incidents overall. There was a post-int increase in the use of specific incidents for Ps 2, 3 and 4 on complex emotions (4%, 8%, and 33% respectively), but P1 showed a decline (17%).

Analysis of pre-int and post-int strategies for specific emotions indicated that following the intervention P2 shifted from generalised to specific incidents for happiness and P4 showed the same directional shift for anger, fear, and contempt. However, P2 showed a post-int increase in the use of generalised incidents for surprise, and P4 did the same for embarrassment. P3 recounted specific experiences for happiness, embarrassment, and disgust across all trials, and moved from specific to generalised incidents for anger and contempt,

With regard to thinking phrases, P4 never used them and P2 only used them for simple emotions. The only clear difference in use of thinking phrases pre-int and post-int for P2 was her use of them for happiness on both post-int trials. P1 shifted from no use of such phrases pre-int to their use post-int for anger and contempt, but stopped using them post-int for fear. P3 stopped using thinking phrases post-int for anger, fear, and contempt.

#### e Type of Response

*Ps in the present study will recount more "usual" stories post-int compared to pre-int.*

		P1		P2		P3		P4	
		Pre-Int	Post-Int	Pre-Int	Post-Int	Pre-Int	Post-Int	Pre-Int	Post-Int
<b>Simple Emotions</b>	Usual	71	50	57	80	86	100	86	100
	Unusual	29	50	43	20	14	0	14	0
<b>Complex Emotions</b>	Usual	50	75	50	50	83	88	50	75
	Unusual	50	25	50	50	17	12	50	25

**Table 3.11. Understanding Emotions: Mean percentage type of response pre-int and post-int for "simple" and "complex" emotion categories**

The stories recounted by the Ps were rated as either "usual" or "unusual" by five judges. The results have been collapsed into simple and complex emotional categories and are shown in Table 3.11 above.

Predicted post-int increase in number of usual incidents for simple emotions were found for Ps 2, 3, and 4, and for Ps 1, 3, and 4 for complex emotions. However, it was disappointing that although Ps 3 and 4 were judged to offer usual stories 100% of the time for simple emotions, no P performed at ceiling level across all emotions following the intervention.

When specific emotions were analysed it was found that P2 was judged to never give a "usual" response for contempt, and at the final post-int trial was judged to offer "unusual" responses for fear and disgust. P1 offered "unusual" responses for anger at both post-int trials, for sadness at the first post-int trial and for surprise and disgust at the final post-int trial. P4 offered "unusual" responses for the final post-int trial for contempt.

Where "usual" responses were offered for the first post-int trial and "unusual" responses for the final post-int trial, it is tempting to suggest that these occurred because of poor memory over time. However, as there was little consistency between Ps' "unusual" responses for different emotions this explanation seems inadequate.

## **CHAPTER 4 - DISCUSSION**

### **4.1 COMPARISONS BETWEEN STUDIES**

#### **4.1a Advanced Test of Theory of Mind (TOM)**

The hypothesis that Ps in the present study would match the second-order TOM group in Happe's (1994) research in performing at almost ceiling level for the "physical stories" was confirmed. Their performance on "Is it true ...?" questions indicated a slightly lower level of linguistic comprehension compared to the second-order TOM group.

Comparison of mean overall scores for "Why ...?" questions suggested that the present study's group were less able than Happe's second-order TOM group to justify why story protagonists made true or false statements. However, analysis of individual scores suggested there were individual differences for types of strategy used and TOM abilities across Ps in the present study.

As the TOM test was used as a control variable no difference between pre- and post-intervention performance was expected. However, improvements in making judgements about story protagonists' declarations were found for Ps 2, 3, and 4.

There may be a number of reasons for this unexpected result. Part of the intervention strategy focused on Ps thinking about situations when they or other people feel certain emotions. Although the TOM stories were not necessarily linked to emotional incidents, it may be possible that a by-product of the intervention was for Ps to think more carefully about characters' motivations, and then apply this strategy to the TOM stories. Alternatively, extraneous factors such as increased familiarity with the E over time may have resulted in a more relaxed approach to the test situation and concurrent improvement in performance (e.g. Wright & Fowler 1986).

#### 4.1b ***Emotion and Identity Sorting Tasks***

It was hypothesised that prior to the intervention Ps in the present study would perform similarly to Hobson et al's (1988) autistic group on emotion and identity sorting tasks, and this was found for Ps 1, 3 and 4 for emotion sorting and Ps 1, 2 and 3 for identity sorting.

It was also predicted that following the intervention, all Ps in the present study would show an improvement on pre-intervention performance. Despite failing to reach significance, graphical data clearly indicated that where Ps did not perform at ceiling level pre-intervention, following the intervention they were all 100% accurate on both post-intervention trials despite differences in time lapse between the two trials (see Table 3.1 in the Results section). The lack of statistical significance may, therefore, have been due to factors such as the small number of Ps, narrow range of scores possible, and particularly with regard to emotion-sorting, the cluster of scores at or near ceiling level for Ps 1, 3 and 4.

Different abilities are thought to underlie identifying faces and recognising emotions in faces (Hobson et al 1988). This distinction seemed to be borne out in the present study where it was found that emotion sorting was easier for two of the three Ps not performing at ceiling level prior to the intervention. A possible explanation for the better emotion sorting scores is that people with AS may not sort by emotional content (Hobson et al 1988) but instead deconstruct facial features into segments before making comparisons, for example matching an upturned mouth with another upturned mouth before labelling the facial expressions as "happy". Further investigation is required to clarify strategies used by people with AS in emotion sorting tasks. Only P1 (who performed at ceiling level throughout this test) verbalised his thought processes. His comments suggested that sorting by perceptual cues was, in fact, his chosen strategy.

The identity sorting task, by contrast, seems to involve matching the same person's face in a more holistic way. It can be argued that clues such as 'upturned mouths equal happiness' are redundant in this sort of task. For example, the individual has to assess facial components in at least three ways: process two sets of facial cues (i.e. the two different emotional expressions); reconstruct the features to make whole faces; then attempt to match each feature for feature even though they will be contorted (e.g. smiling will make the nose widen as the mouth elongates itself and turns upwards at the ends, while crying may pull the mouth downwards even though the nose may still widen).

The comparison between pre- and post-intervention results in the present study suggest that whatever strategies Ps were using prior to the intervention, they could be taught to perform better on both tasks in terms of matching more materials correctly. It is not implied, however, that better performance means they have been taught to understand the emotional significance of facial expressions. Rather, it is suggested that they may use their cognitive abilities to process cues according to rules and then make associations between visual information and verbal labels.

#### 4.1c **Comprehension of Verbal Terms for Emotions**

It was hypothesised that Ps in the present study would perform similarly to a group of autistic children in Van Lancker, Cornelius & Needleman's (1991) study with regard to matching pictures to nouns, neutral adjectives, and emotional adjectives. The results suggested that Ps in both studies performed similarly for nouns (i.e. at or near ceiling level), but Ps 1, 3 and 4 in the present study showed superior matching abilities for neutral and emotional adjectives.

In view of the research supporting the notion that autism is a developmental disorder (e.g. Frith 1990) it is not surprising to find better

performance amongst adults compared to children. It may be that as individuals with AS grow older they are subjected to more experiences and an associated wider vocabulary. However, it is not clear why P2's pre-intervention scores were lower than those of other Ps in the present study.

It was also hypothesised that Ps would offer more usual responses for their choices on emotional adjectives post-intervention compared to pre-intervention. Ps 1 and 3, however, were judged to always offer usual explanations for why they matched the three word categories with pictures across all trials. This could suggest that individuals with AS who have higher levels of VIQ have already learned to draw on this ability to make associations between verbal and visual information in these sorts of tasks. Ps 2 and 4, who had lower VIQ scores, were judged to offer more usual responses for their choices on emotional adjectives following the intervention. Contrary to expectations, the two Ps also offered more usual explanations post-intervention for nouns and neutral adjectives, despite the intervention concentrating only on emotional information. Perhaps, then, rather than improvement being due to the actual information offered during the intervention per se, the increase in usual explanations for all three word types was another unexpected by-product of an intervention which encouraged Ps to consciously generate verbal information about visual imagery.

As the intervention offered the same information to each P about emotions but none about concrete nouns or neutral adjectives, it had been hypothesised that post-intervention statements given by the four Ps about emotional adjectives would fall into the same category, but each P's explanations for nouns and neutral adjectives would show similar patterns to those found prior to the intervention. As predicted, response categories remained relatively stable for nouns, and patterns of fluctuation between categories for neutral adjectives continued across all trials.



The anticipated uniformity in types of response categories used for emotional adjectives was not clearly established. Although Ps 1 and 2 both showed an increase in use of synonyms post-intervention, Ps 3 and 4 tended to continue with the same categories they had used prior to the intervention. This suggests that the intervention had little influence in the types of categories Ps use for explaining words.

#### 4.1d ***Cross-Modal Processing Task***

The prediction that Ps in the present study would perform at a similar level to the HFA group in Hobson's (1986a) research was not confirmed. A possible explanation for this unexpected finding is that extraneous factors such as boredom or fatigue led to the poor performance of Ps in the present study, as they always completed this task after the sorting and comprehension tests. However, the second hypothesis that Ps would show an improvement on pre-intervention scores after completion of the intervention was confirmed. As order of completion of tasks remained the same post-intervention, this throws doubt on the above fatigue or boredom explanation for poorer pre-intervention performance.

Generalisation of the study's results is limited because of the small number of Ps, but in view of the improved performance across Ps for post-intervention scores, it does at least suggest that a methodical approach to processing cues can aid adults with AS in labelling gestures, sounds and contexts for particular emotions. As with the sorting task described above, this does not imply that people with AS will learn to process information for emotional content in the way that others might, but rather that they may learn to decipher and make associations between what may be, for them, abstract perceptual cues.

The response of P2 to this task deserves particular mention on two counts. Firstly, her performance on matching sounds to photographs on

both the "emotion" and "things" tasks may have been marred by minor hearing difficulties due to excess wax in her ears rather than because of a specific problem in matching sounds to images. Secondly, the cause of her refusal to participate in this particular task on two out of three occasions post-intervention is not known as she chose not to offer an explanation. P2 had also sporadically refused to look at video-taped materials during the intervention which meant that drawings and photographs were used more extensively for her than for the other Ps. It is not known whether this was an idiosyncratic response to video-taped materials, or if there is a sub-group of the AS population who share an aversion to this form of moving images. Investigation into this area could have implications for intervention strategies.

#### 4.1e **Understanding of Simple and Complex Emotions**

There were mixed findings for comparisons between the Ps in the present study and those of the HFA children in Capps, Yirmiya & Sigman's (1992) research into the simple emotions of happiness and sadness, and the complex emotions of embarrassment and pride. For example, while the anticipated concordance for locus of control and cognitive strategy was found for happiness and embarrassment, there were differences between the two groups with regard to sadness and pride. Contrary to expectations, Ps in the present study were also more likely than Capps et al's group to include the presence of an audience when describing embarrassing incidents, and they needed less time or prompts for recounting all four emotional incidents.

It is possible that some of the discrepancies in findings were due to factors such as less possibility of variation in scores for the present study (n = 4) compared to Capps et al's group (n = 18), and developmental differences due to age.

From the second pre-intervention trial, Ps in the present study were also asked offer accounts of incidents involving the emotions used in the intervention. These were categorised as follows: anger, fear and surprise were classified as simple emotions; contempt and disgust were grouped under complex emotions. The decision to place "disgust" in the complex group of emotions for this task is explained because of it's ambiguous status. Disgust can arguably be categorised as a simple emotion when it manifests itself in a physiological reaction, for example feeling distaste at the sight of someone vomiting. However, belief-based or culturally-dictated factors can also underlie situations in which disgust is expressed (for example people's response to socially unacceptable behaviour such as picking one's nose while talking with another person). It has been suggested (e.g. Wellman 1990, in Baron-Cohen et al 1993, page 67) that emotions which involve cognitive or belief-based factors can pose problems for people within the autistic spectrum, and it is these that are classified as complex emotions.

There were few clear differences between pre-intervention and post-intervention performances on this task. It was predicted that there would be no pre- and post-intervention changes in locus of control because this was not discussed during the intervention, and this was generally found to be the case.

It had also been hypothesised that there would be a post-intervention increase on pre-intervention audience presence within recounted stories because the role of others in emotional situations was discussed during the intervention. Although there was a slight post-intervention increase on this measure for Ps 2 and 3 on simple emotions, there was a decrease for Ps 1 and 4. An unexpected decline in the presence of an audience was found for all Ps for complex emotions.

Task difficulty was measured by time latency and number of prompts for responses, and it was hypothesised that following the intervention Ps would need less time and prompts than they had prior to the intervention. Overall, it was found that Ps tended to need the same or more time to recount incidents, but required fewer prompts.

With regard to cognitive strategies used, it was predicted that Ps would relate more specific incidents following the intervention because they had been encouraged to make connections between personal events and named emotions during the intervention. Ps 1 and 3 showed an increased use of specific incidents for simple emotions. P3 was more akin to Ps 2 and 4 with regard to using more specific incidents for complex emotions as well. The stories recounted by Ps were also judged as usual or unusual by five independent raters. Analysis of this data failed to find an anticipated increase in "usual" stories offered post-intervention for the emotions covered during the intervention.

The findings for comparisons between pre- and post-intervention performances are intriguing because the intervention included discussion about the role of other people in emotion-laden events, but the Ps do not seem to have systematically applied this information during the post-intervention trials. In view of their improved performances on the visual and auditory matching tasks, one can speculate whether Ps found it easier to use specifically-defined rules (as were available for visual and cross-modal information) than more generalised information (as was the case for discussing emotional events).

Perhaps of all the emotion tasks used, this one is the most sensitive for identifying underlying impairments in understanding emotional information, and the results suggest that this ability is less amenable to change using the types of concrete strategies offered by the present intervention.

Although linguistic ability is necessary to relay the information about a situation, there is also a need to understand why the incident possesses emotional resonance. One way of gaining this knowledge if it is not available in an innate sense (as is arguably the case for people with AS) is to be exposed to situations where other people can name the connections between events, behaviours and feelings. In other words, the ability to comprehend complex emotions, in particular, may require greater understanding of social situations (Kasari et al 1993), and this may only be possible through actual exposure to shared experiences with others.

#### 4.1f **General Comments about the Replication Studies**

Interestingly, in addition to patterns of performance on tests, Ps 1 and 3 shared a number of characteristics, as did Ps 2 and 4. For example, Ps 1 and 3 were both males, living in their parents' homes, and with IQ scores within the "normal" range. Ps 2 and 3 were both females, living in NHS LD-based accommodation (one in an institution, the other in a community-based home), and with IQ scores nearer the cut-off point for LD. Ps 1 and 3 seemed to have less problems with some of the TOM tasks than did Ps 2 and 4, and their pre-intervention scores on a number of the emotion tasks also suggested superior performance.

One interpretation of this pattern of factors is that cognitive intelligence can play some part in performance on emotional processing tasks. Perhaps, as people with AS grow older they learn to rely more on their cognitive abilities to make sense of other people's behaviour (e.g. Capps et al 1992; Wing 1988).

There were also differences between P1 and the other three Ps. His verbal IQ and performance on the TOM test seemed closer to those of a group of AS Ps in a study by Ozonoff et al (1991b), and his performance on emotion tests prior to the intervention suggested that he was already

drawing on useful cognitive strategies to perform at ceiling level on a number of the tasks. These differences raise the question of whether there is validity in the argument for making a distinction between AS and HFA. Ozonoff et al (1991b) suggest that an important advantage of distinguishing between the two conditions is that more homogeneity in autistic subtypes could lead to the establishment of clearer assessment of particular types of abilities, and a corollary of this could be more suitably designed interventions for particular impairment levels and patterns.

Perhaps present research methods are not sensitive enough to isolate the factors that make people with AS appear so odd in social interactions. For example, P1's superior IQ scores and good pre-intervention performance on emotional tasks in test conditions cannot mask his impairments of emotional and social understanding. He has less contact with the outside world than the other three Ps, despite a verbally expressed wish for friends. His attempts at mixing with others have been largely unsuccessful unless the situation revolved around his circumscribed interests. His distress about his social isolation was painfully clear in informal discussions at the end of sessions, and his lifestyle contrasts with P3 who has recently found a girlfriend and is on a computer-programming training scheme, and Ps 2 and 4 who are provided with a ready network of social contacts through their lives within a professional LD service.

All of the above points raise questions about the ecological validity of the tests used to investigate emotional processing, and how skills shown in test situations can be generalised to more natural situations. These issues are addressed below in point 4.4 with regard to the materials used in the study.

## 4.2 ***THE INTERVENTION***

One advantage of conducting a pilot study is that it can reveal operational problems in an intervention in a comparatively quick and efficient manner, and highlight factors for future consideration. During the course of the study a number of issues became apparent.

In the present study, although only four Ps were used they related to the E in different ways. P1 was verbose, P2's verbal interaction could vary from moment to moment, and Ps 3 and 4 would sometimes only offer cursory answers to questions. This meant that although the procedure for the intervention was adhered to in a systematic way, the actual process would vary according to individuals' needs and methods of interaction. For example, if a P deviated from the immediate subject at hand this was tolerated but gentle prompting would be used to refocus the P's attention onto the intervention materials.

It is also suggested that the intervention programme was too ambitious for a six week pilot scheme. On reflection, it would have been better to concentrate on one aspect of emotional processing such as, for example, deciphering visual cues for emotional information. Nevertheless, the overall results suggest that a methodical approach to unravelling emotional information could be useful for adults with AS.

The intervention used a hierarchical approach drawn from the systematic desensitisation model in which behaviour is broken down into a series of smaller stages to be understood and acted upon before moving on to the next stage. It has been noted above that people with AS seem to use rules learned through intellectual processes (e.g. Wing 1988), and Ps' responses to the present intervention suggest that offering a structured approach to utilising their cognitive skills seems a sensible way to facilitate the deciphering and mimicking of emotional expressions. It seems unlikely,

however, that the approach could fully compensate for the intuitive understanding of affective states.

More specific issues about the design of the intervention are addressed below.

#### 4.3 ***RECRUITMENT OF PARTICIPANTS***

##### 4.3a ***Factors involved in the use of Control Variables***

The present study used each of the Ps as their own controls in an A-B-A design mainly because of time and resource restraints. The nature of the study meant that it was time-consuming, involving repeating five tests before and after an intervention which took up at least one hour per week over six-weeks for each P. Conducting the research at locations convenient for Ps was also taxing on time.

It could be argued that the use of groups would have been more efficient. However, the single case study approach was decided upon for a variety of reasons. The project was a pilot study not only attempting to investigate whether a structured teaching approach to learning about emotions would be beneficial for adults with AS, but also if the materials used were effective tools. As the E was working on her own it would have been difficult to assess the intervention as well as cater to individual needs within a group.

It should also be stressed that Ps seemed to function well in a one-to-one situation. The Ps were not known to each other, and given the social interaction problems inherent in AS, it may have been difficult to develop a trusting group relationship in the time available, or maintain the level of motivation and concentration found when working on a one-to-one basis. It has also been reported that people with AS find it easier to interact with one person at a time (Braverman et al 1989).



The use of other populations as control groups might have strengthened the overall design of this study. For example, it would have been interesting to determine reliability of control group performances found in the replication studies, and thus more fully assess their findings and conclusions. However, Hobson (1991) highlights a number of problems in selecting suitable control groups for the autistic population. For example, it may be possible to match autistic and control populations on some performances indicating "mental age" but then find discrepancies in other matching tests. Problems also exist in trying to equate cognitive tests with emotional tests for task difficulty because of the inherent conceptual differences between the two.

#### 4.3b ***Recruitment Difficulties***

The Ps in the present study were, essentially, a self-selecting group of individuals. Although it was decided to use only four Ps in this pilot study, 12 were approached before the four were found who fitted all the criteria for inclusion in the project. Of the other eight, four people were unable or unwilling to complete all the cognitive or emotional tests, and four individuals, or their carers, refused to take part in the study.

This suggests that recruitment of adults with AS for research can be difficult. It may be that by the time they reach adulthood some people with AS have decided not to engage in social interactions with people outside of their familiar circle of contacts, and those who will take part in research are those who are interested in interacting with a wider range of people. Alternatively, if the E had been more closely associated with the National Autistic Society or actively working within Phoenix NHS Trust at the time of the research, her professional status may have been enhanced and this might have led to a lower refusal rate.

#### 4.4 ***MATERIALS USED IN THE STUDY***

Most of the materials used in the study were compiled by the E (the exception being photocopies of photographs used by Hobson et al 1988). They sufficed for the present research but can be criticised on a number of grounds.

##### 4.4a ***Validity and Reliability***

The overall findings of the study suggests that adults with AS can be taught to deconstruct visual and auditory emotional information into constituent parts. However, one can question if the types of material used are actually a valid way of teaching people about the components that can make up emotions.

Potential weaknesses in studies looking at the processing of emotional information include: only the four basic emotions of anger, sadness, happiness and fear are often used (Braverman et al 1989); they are generally presented in a static fashion for unnaturally long periods of time (Braverman et al 1989); and are often presented singly and out of context (Hobson 1986a). They can be said, therefore, to lack ecological validity. In normal day-to-day social situations, for example, a much wider range of emotional expressions and states are utilised in a dynamic way.

With regard to reliability of the materials used in the research, on 70% or more occasions judges agreed on the emotional meaning of all drawings, most photographs, video-taped segments and sounds, and confirmed that they were judged as easy or OK to recognise. The materials could, therefore be said to at least possess inter-rater reliability. Exceptions included the sound of fear for the cross-modal task, and intervention photographs for facial expressions of fear, plus one of the sounds and one "gesture" photograph for contempt. None of the materials scored less than 60% agreement.

Working in settings familiar to the Ps was decided upon in an attempt to reduce possible anxieties about contact with a stranger on unfamiliar tasks. The advantages of this approach included the likelihood that Ps would be present for all sessions, and that the surroundings and noises outside were predictable and thus less distracting than a new environment. However, the E had less control over the environment, and had to find ways of attempting to work similarly with each P despite differences in room arrangements and unfamiliar types of video-recorders. An unexpected benefit of this was that Ps seemed to enjoy being able to teach the E about their equipment and this helped in forming a more relaxed relationship. Nevertheless, working within different settings does have implications for developing assessment techniques to measure reliability and validity (Howlin et al 1973), and this is an area which should be investigated further.

#### 4.4b ***Technical Proficiency***

Although the materials used in the study were judged to be reasonably reliable representations of the emotions required, the video-taped materials can be criticised for their unstable nature. The quality of the clips of material seemed to suffer each time they were copied onto different tapes for particular functions, such as preparing them to be judged by raters, and then placing them in sequence for the replication studies and intervention. They deteriorated further as they were replayed over a number of occasions. Fortunately, they remained in reasonable condition until the last showing to P4, during which the following segments were comprehensible but fluctuated in colour and vertical hold: contexts for fear and anger in the cross-modal task; and for the intervention, facial expression for sadness and disgust, body gesture for sadness, and face and body combined for happiness.

In view of the above problems it is advised that, if the study were repeated, a professional technician is used to replicate and edit the materials.

#### 4.4c *The "Acting" of Emotions*

Actors, who were all non-professional volunteers, were asked to hold emotional expressions for approximately 10 seconds for video-taped materials. An obvious problem in complying with this request lies with the transitory nature of some emotions. For example, an expression of surprise usually lasts less than 10 seconds, while disgust may quickly be masked by a neutral expression because of social rules (e.g. a nasty cooking smell may elicit disgust and apprehension in a guest diner, but social rules dictate a pleasant expression so as not to upset the cook).

The actors also tended to use posed and exaggerated gestures and sound. This was done for two reasons: firstly, so that information could be clearly gained during the intervention; and secondly, particularly with regard to the intervention materials, the actors found it difficult to perform in a less artificial manner because of the lack of a situational context.

A third major area of difficulty was that the emotions expressed were often "pure" in that they only displayed one type of affect at a time. In more natural situations people sometimes express mixed emotions. For example, a person may laugh while being pushed reluctantly onto a fast fairground ride, and may continue laughing but use language suggesting they feel both sick and scared during the duration of the ride.

Overall, then, some of the visual materials can be criticised for their unnatural appearance. However, a counter-argument to the above criticisms is that the materials were developed to be used as an initial part of a training package and, therefore, needed to be clear and remain on-screen long enough for information to be elicited from them. If time had

allowed, an extension of the package could have consisted of more natural poses and relevant contexts for the emotions.

#### 4.4d ***Issues Surrounding Generalisation***

A number of studies investigating generalisation of intervention packages suggest that although people with autistic features may make good progress within the programme setting, they do not carry these skills into daily life (e.g. Lovaas et al 1973, cited by Howlin et al 1973; Schreibman 1988).

One problem in the design of this research was finding tests which would be able to not only identify but also mirror the underlying impairments in emotional processing for people with AS in everyday situations. For example, although Happe (1994) used more naturalistic items to measure TOM abilities than do other tests, one can still question the process of gathering the information. For example, why were Ps in the present study able to make attributions about other people's behaviour in the test situation, but not use this ability in everyday life?

Perhaps part of the difficulty lies in the different requirements of experimental and clinical research (e.g. Schopler 1979, page 417). Obviously, in experimental work there is a need to control as many variables as possible so that the item under scrutiny is investigated as clearly as possible. This is an important part of research because it can hopefully lead to identification of cause and effect for variables under investigation. However, in clinical work there needs to be an acknowledgement that "things" influence and are influenced by systems.

With regard to the present study, the replication tests were conducted in an experimental manner and an attempt was made to keep extraneous factors to a minimum, therefore, the environment for investigating possible emotional impairments was artificial. For example,

Ps were given more time to offer a response than would be tolerated in more normal circumstances, and they were only obliged to concentrate on the task at hand. In social interactions the environment is less controlled and people need to concentrate on more than one factor at a time. Essentially, the point being made is that although Ps in the present study, especially P1, seemed to do well on the replications tasks this should not mask the fact that all have been identified as having problems in relating to other people in everyday life.

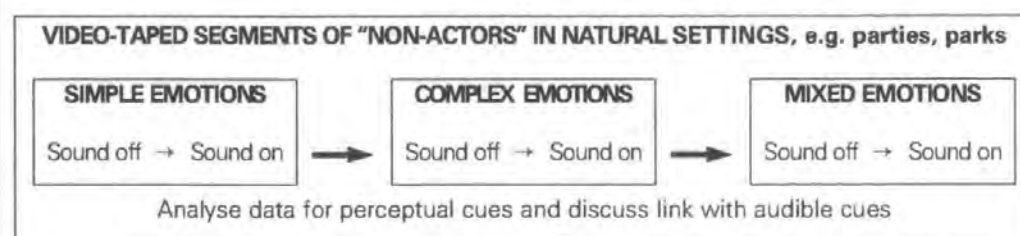
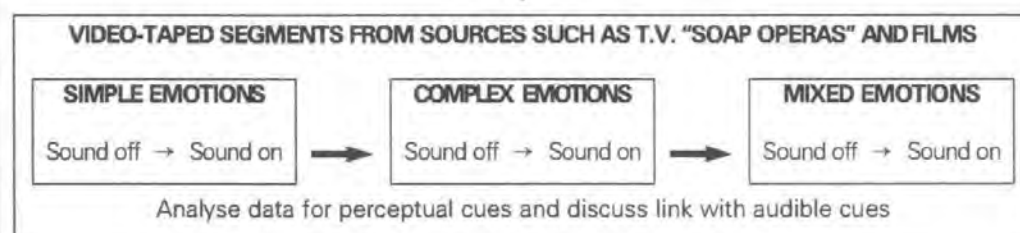
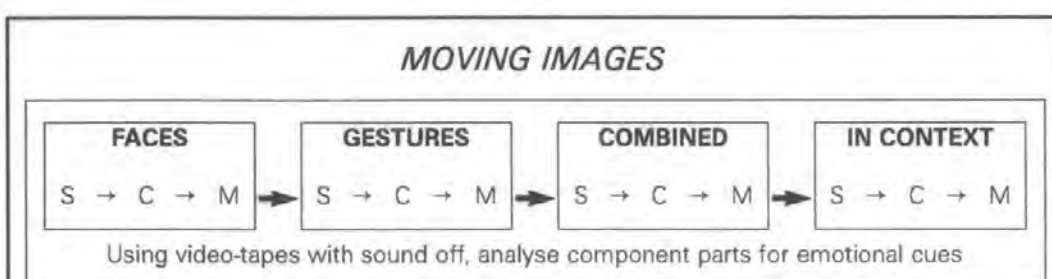
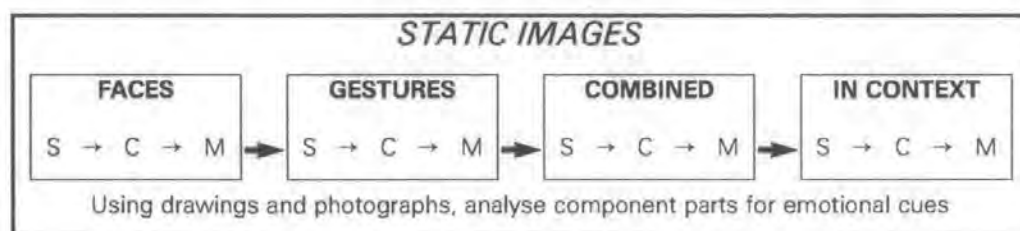
With regard to maintenance of performance levels, it can be said that for tasks involving visual and cross-modal processing of emotional information, improvement proved durable over time, at least within the experimental setting. Further investigation is needed to determine whether the improved performance shown in artificial settings can be extended to everyday life.

#### **4.5 *RECOMMENDATIONS***

Although a number of problems with the study have been highlighted above, the overall results do suggest that the basic approach has some merit, and a number of recommendations for strengthening the intervention are offered below.

If one adopts Davies et al's (1994) proposal that faulty perceptual processing underlies many of the difficulties found within the autistic spectrum, and accepts that the findings in this study are valid, this suggests an intervention focusing on a methodical approach to assessing emotional information would benefit from initially concentrating on visual data, and move from static materials through to more natural social situations (e.g. Fein et al 1992). A possible hierarchical approach is outlined in figure 4.1 below.

# LEARNING IN A CONTROLLED ENVIRONMENT



# Move to LEARNING IN A NATURAL ENVIRONMENT

**Key:** S = simple emotions; C = complex emotions; M = mixed emotions

*Fig. 4.1. Proposed preliminary stage of an intervention for teaching people with AS to use cognitive-behavioural strategies to decipher emotional information*

The proposal includes the use of components that are specifically designed for such an intervention, as well as other easily accessible materials such as excerpts from so-called "soap operas" and films as both offer a rich source of emotional material in a variety of modalities including visual "close-ups" of faces, auditory and verbal information and contexts with explicit emotional content.

Lansing & Schopler (1979) make the point that although pre-packaged programmes can be used with a number of people they tend not to fit the idiosyncratic needs of the individuals. It is hypothesised, therefore, that although the model shown in figure 4.1 above could be used in a standardised way in that individuals go through each stage of learning in the proposed format, the actual length of time needed for each stage will vary across individuals.

With regard to comprehension of emotional information, the results of this study are less clear than for tasks relying on visual or cross-modal processing. It may be that this component of emotional processing should be taught after the visual material rather than in conjunction with it. It would be worthwhile investigating whether people with AS could learn to attribute more meaning to linguistic information if they have clearer ideas about physical manifestations of emotions. Further research is also necessary to determine whether individuals with AS who have been offered ways of categorising visual information can then be taught to link other forms of emotional information, such as contextual attributes, to these concrete images.

It may also be useful to test the intervention on both children and adults with AS to determine whether it is of benefit to both groups, as well as assess the use of carers as co-teachers (e.g. Lansing & Schopler 1979; Loovas 1979).



#### 4.6 **CONCLUSION**

Since Wing's (1981) paper, AS seems to have become more widely recognised and generated some interesting theoretical and experimental work. Although the characteristic impairments of the syndrome are less obvious than in autism, it is hoped that this study makes apparent the difficulties faced by people with AS. Perhaps, as the syndrome becomes better known in different specialities (e.g. child, LD, and adult) more practical interventions will be made available earlier. This seems an important point as Howlin (1988) notes that it is easier to successfully intervene in the problems of a young child than in those of an adult.

It is considered unlikely that adults with AS can be taught to discern all the complexities of emotional processing and understanding in social situations. Nevertheless, the results of the study do suggest that deciphering visual and cross-modal cues for emotional information can be taught in a systematic way and applied in a controlled environment.

Further research is necessary to determine whether the approach can be successfully extended, and recommendations have been outlined above. Perhaps, as Howlin (1988) suggests, people with AS may always have to resort to dogmatic rules in social situations, particularly when interpreting the emotional meaning behind behaviours. But this may be preferable to having no rules at all.

**APPENDIX I: ADVANCED THEORY OF MIND STORIES (page 1 of 11)**

**FIRST SET OF STORIES**

**(Happe 1994)**

"Here are some stories, and some questions. I'm going to read out the stories and I'd like you to listen carefully, and help me with the questions at the end of each story."

**1      PRETEND**

Mark and Adam are having great fun! They have turned the kitchen table upside down and they are sitting in it, paddling along with rolled-up newspapers. When their mother comes in she laughs. "Whatever are you two doing?, she asks. "This table is a pirate ship", says Adam, "and you had better get in too before you sink - because you are standing in the sea!"

Is it true what Adam says? YES / NO / DON'T KNOW

Why does Adam say this?

**2      JOKE**

Today James is going to Claire's house for the first time. He is going over for tea, and he is looking forward to seeing Claire's dog, which she talks about all the time. James likes dogs very much. When James arrives at Claire's house, Claire runs to open the door, and her dog jumps up to greet James. Claire's dog is huge, it's almost as big as James! When James sees Claire's huge dog he says, "Claire, you haven't got a dog at all. You've got an elephant!"

Is it true what James says? YES / NO / DON'T KNOW

Why does James say this?

**APPENDIX I: ADVANCED THEORY OF MIND STORIES (page 2 of 11)**

***FIRST SET OF STORIES***

**(Happe 1994)**

**3 LIE**

One day, while she was playing in the house, Anna accidentally knocks over and breaks her mother's favourite crystal vase. Oh dear, when mother finds out she will be very cross! So when Anna's mother comes home and sees the broken vase and asks Anna what happened, Anna says, "The dog knocked it over, it wasn't my fault!"

Was it true what Anna told her mother? YES / NO / DON'T KNOW

Why did Anna say this?

**4 WHITE LIE**

Helen waited all year for Christmas, because she knew at Christmas she could ask her parents for a rabbit. Helen wanted a rabbit more than anything in the world. At last Christmas Day arrived, and Helen ran to unwrap the big box her parents had given her. She felt sure it would contain a little rabbit in a cage. But when she opened it, with all the family standing round, she found her present was just a boring old set of encyclopedias, which Helen did not want at all! Still, when Helen's parents asked her how she liked her Christmas present, she said, "It's lovely, thank you. It's just what I wanted."

Is it true what Helen said? YES / NO / DON'T KNOW

Why did she say that to her parents?

**5 FIGURE OF SPEECH**

Emma has a cough. All through lunch she coughs and coughs and coughs. Father says, "Poor Emma, you must have a frog in your throat!"

Is it true what Father says to Emma? YES / NO / DON'T KNOW

Why does Father say that?

**APPENDIX I: ADVANCED THEORY OF MIND STORIES** (page 3 of 11)

***FIRST SET OF STORIES***

**(Happe 1994)**

**6 MISUNDERSTANDING**

Late one night old Mrs Peabody is walking home. She doesn't like walking home alone in the dark because she is always afraid that someone will attack her and rob her. She is really a very nervous person! Suddenly out of the shadows comes a man. He wants to ask Mrs Peabody what time it is, so he walks towards her. When Mrs Peabody sees the man coming towards her, she starts to tremble and says, "Take my purse, just don't hurt me please!"

Was the man surprised at what Mrs Peabody said?

YES / NO / DON'T KNOW

Why did Mrs Peabody say that, when he only wanted to ask her the time?

**7 DOUBLE BLUFF**

During the war, the Red army capture a member of the Blue army. They want him to tell them where his army's tanks are; they know they are either by the sea or in the mountains. They know that the prisoner will not want to tell them, he will want to save his army, and so he will certainly lie to them. The prisoner is very brave and very clever, he will not let them find his tanks. The tanks are really in the mountains. Now when the other side ask him where his tanks are, he says, "They are in the mountains."

Is it true what the prisoner says? YES / NO / DON'T KNOW

Where will the other army look for his tanks?

BY THE SEA / IN THE MOUNTAINS

Why did the prisoner say what he said?

**APPENDIX I: ADVANCED THEORY OF MIND STORIES (page 4 of 11)**

***FIRST SET OF STORIES***

**(Happe 1994)**

**8      SARCASM**

Ann's mother has spent a long time cooking Ann's favourite meal; fish and chips. But when she brings it in to Ann, Ann is watching TV and she doesn't even look up, or say thank you. Ann's mother is cross and says, "Well that's very nice, isn't it! That's what I call politeness!"

Is it true what Ann's mother says? YES / NO / DON'T KNOW

Why does Ann's mother say this?

**9      PERSUASION**

Jill wanted to buy a kitten, so she went to see Mrs Smith, who had lots of kittens she didn't want. Now Mrs Smith loved the kittens, and she wouldn't do anything to harm them, though she couldn't keep them all herself. When Jane visited she wasn't sure she wanted one of Mrs Smith's kittens since they were all males and she had wanted a female. But Mrs Smith said, "If no-one buys the kittens I'll just have to drown them!"

Was it true what Mrs Smith said? YES / NO / DON'T KNOW

Why did Mrs Smith say this to Jane?

**10     CONTRARY EMOTIONS**

Jane and Sarah are best friends. They both entered the same painting competition. Now Jane wanted to win this competition very much indeed, but when the results were announced it was her best friend Sarah who won, not her. Jane was very sad she had not won, but she was happy for her friend, who got the prize. Jane said to Sarah, "Well done, I'm so happy you won!" Jane said to her mother, "I am sad I did not win that competition!"

Is it true what Jane said to Sarah? YES / NO /DON'T KNOW

Is it true what Jane said to her mother? YES / NO / DON'T KNOW

Why does Jane say she is happy and sad at the same time?

**APPENDIX I: ADVANCED THEORY OF MIND STORIES** (page 5 of 11)  
***FIRST SET OF STORIES***  
**(Happe 1994)**

**11 APPEARANCE/REALITY**

On Christmas Eve Alice's mother takes her to the big Department Store in town. They go to look in the toy department. In the toy department Mr Brown, Alice's next-door-neighbour, is dressed up as Santa Claus giving out sweets to all the children. Alice thinks she recognises Mr Brown, so she runs up to him and asks, "Who are you?" Mr Brown answers, "I'm Santa Claus!"

Is it true what Mr Brown says? YES / NO / DON'T KNOW

Why does Mr Brown say this?

**12 FORGETTING**

Yvonne is playing in the garden with her doll. She leaves her doll in the garden when her mother calls her to come in for lunch. While they are having lunch, it starts to rain. Yvonne's mother asks Yvonne, "Did you leave your doll in the garden?" Yvonne answers, "No, I brought her in with me, mummy."

Is it true what Yvonne says? YES / NO / DON'T KNOW

Why does Yvonne say this?

**APPENDIX I: ADVANCED THEORY OF MIND STORIES** (page 6 of 11)  
***FIRST SET OF STORIES***  
**(Happe 1994)**

**CONTROL PHYSICAL STORIES**

**1 SNOWMAN**

It was snowing and Bill went out into the garden to build a snowman. He made a fine snowman, with the snow in the garden. But after Bill had gone to bed that night, the weather got a lot warmer - and by the morning the snowman had melted away. There was nothing left but a puddle of water in the garden, where the snowman had stood.

Is it true that Bill made a snowman? YES / NO / DON'T KNOW

Why was the snowman not there the next morning?

**2 RABBIT**

Paul has a pet rabbit. He is always very careful to shut the door of the rabbit's cage after feeding him or playing with him. Today, as usual, he shuts the cage door after feeding his rabbit. But, oh dear! After Paul has gone the wind blows the door of the cage open, and the rabbit gets out.

Is it true that Paul fed his rabbit today? YES / NO / DON'T KNOW

Why did the cage door open?

**3 CAKE**

Mother has just made a cake for Oliver's birthday. It is a lovely cake, with icing on it, saying "Happy Birthday Oliver". It has ten candles on it, because Oliver is ten years old this birthday. But as mother carries the cake through to the dining room, to give it to Oliver, she trips and drops the cake. It falls on the floor and is ruined - no one can eat it now!

Is it true that Oliver's cake had 15 candles on it?  
YES / NO / DON'T KNOW

Why is the cake now ruined?

**APPENDIX I: ADVANCED THEORY OF MIND STORIES** (page 7 of 11)  
**SECOND SET OF STORIES**  
(Happe 1994)

"Here are some stories, and some questions. I'm going to read out the stories and I'd like you to listen carefully, and help me with the questions at the end of each story."

**1      PRETEND**

Katie and Emma are playing in the house. Emma picks up a banana from the fruit bowl and holds it up to her ear. She says to Katie, "Look! This banana is a telephone!"

Is it true what Emma says? YES / NO / DON'T KNOW

Why does Emma say this?

**2      JOKE**

Daniel and Ian see Mrs Thompson coming out of the hairdresser's one day. She looks a bit funny because the hairdresser has cut her hair much too short. Daniel says to Ian, "She must have been in a fight with a lawn-mower!"

Is it true what Daniel says? YES / NO / DON'T KNOW

Why does Daniel say this?

**3      LIE**

John hates going to the dentist, because every time he goes to the dentist he needs a filling, and that hurts a lot. But John knows that when he has toothache, his mother always takes him to the dentist. Now John has bad toothache at the moment, but when his mother notices he is looking ill and asks him, "Do you have toothache, John?" John says, "No, mummy".

Is it true what John says? YES / NO / DON'T KNOW

Why does John say this?



**APPENDIX I: ADVANCED THEORY OF MIND STORIES** (page 8 of 11)  
**SECOND SET OF STORIES**  
(Happe 1994)

**4 WHITE LIE**

One day Aunt Jane comes to visit Peter. Now Peter loves his aunt very much, but today she is wearing a new hat; a new hat which Peter thinks is very ugly indeed. Peter thinks his aunt looks silly in it, and much nicer in her old hat. But when Aunt Jane asks Peter, "How do you like my new hat?", Peter says, "Oh, it's very nice."

Was it true what Peter said? YES / NO / DON'T KNOW

Why did Peter say it?

**5 FIGURE OF SPEECH**

William is a very untidy boy. One day his mother comes into his bedroom, and it is even more messy than usual! There are clothes, toys, and comics, everywhere. William's mother says to William, "This room is a pig sty!"

Is it true that William keeps pigs in his room? YES / NO / DON'T KNOW

Why does William's mother say this?

**6 MISUNDERSTANDING**

A burglar who has just robbed a shop is making his getaway. As he is running home, a policeman on his beat sees him drop his glove. The policeman does not know the man is a burglar, he just wants to tell him he dropped his glove. But when the policeman shouts out to the burglar, "Hey you! Stop!", the burglar turns round, sees the policeman and gives himself up. He puts his hands up and admits that he did the break-in at the local shop.

Was the policeman surprised by what the burglar did?  
YES / NO / DON'T KNOW

Why did the burglar do this, when the policeman just wanted to give him back his glove?

**APPENDIX I: ADVANCED THEORY OF MIND STORIES (page 9 of 11)**  
**SECOND SET OF STORIES**  
**(Happe 1994)**

**7 DOUBLE BLUFF**

Simon is a big liar. Simon's brother Jim knows this, he knows that Simon never tells the truth! Now yesterday Simon stole Jim's ping-pong bat, and Jim knows Simon has hidden it somewhere though he can't find it. He's very cross. So he finds Simon and he says, "Where is my ping-pong bat? You must have hidden it, either in the cupboard or under your bed, because I've looked everywhere else. Where is it, in the cupboard or under your bed?" Simon tells him the bat is under his bed.

Is it true what Simon told Jim? YES / NO / DON'T KNOW

Where will Jim look for his ping-pong bat?  
IN CUPBOARD / UNDER BED

Why will Jim look there for his bat?

**8 SARCASM**

Sarah and Tom are going on a picnic. It is Tom's idea, he says it is going to be a lovely sunny day for a picnic. But just as they are unpacking the food, it starts to rain, and soon they are both soaked to the skin. Sarah is cross. She says, "Oh yes, a lovely day for a picnic alright!"

Is it true what Sarah says? YES / NO / DON'T KNOW

Why does Sarah say this?

**9 PERSUASION**

Brian is always hungry. Today at school it is his favourite meal - sausages and beans. He is a very greedy boy, and he would like to have more sausages than anyone else, even though his mother will have made him a lovely tea when he gets home! But everyone is allowed two sausages and no more. When it is Brian's turn to be served, he says, "Oh, please can I have four sausages, because I won't be having any tea when I get home!"

Is it true what Brian says? YES / NO / DON'T KNOW

Why does Brian say this?

**APPENDIX I: ADVANCED THEORY OF MIND STORIES (page 10 of 11)**  
**SECOND SET OF STORIES**  
**(Happe 1994)**

**10 CONTRARY EMOTIONS**

Today, Katy wants to go on the swings in the playground. But to get to the playground she knows she has to pass old Mr Jones; house. Mr Jones has a nasty fierce dog, and every time Katy walks past the house the dog jumps up at the gate and barks. It scares Katy awfully and she hates walking past the house because of the nasty dog. But Katy does so want to play on the swings. Katy's mother asks her, "Do you want to go out to the playground?" Katy says, "No."

Is it true what Katy says? YES / NO / DON'T KNOW

Why does Katy say she doesn't want to go to the playground, when she so wants to go on the swings that are there?

**11 APPEARANCE/REALITY**

It is Halloween, and Chris is going to a fancy-dress party. He is going as a ghost. He wears a big white sheet with eyes cut out to see through. As he walks to the party in his ghost costume, he bumps into Mr Brown. It is dark, and Mr Brown says, "Oh! Who is it?" Chris answers, "I'm a ghost, Mr Brown!"

Is it true what Chris says? YES / NO / DON'T KNOW

Why does Chris say this?

**12 FORGETTING**

At school today, John was not present. He was away ill. All the rest of Ben's class were at school though. When Ben got home after school his mother asked him, "Was everyone in your class at school today?" Ben answers, "Yes mummy."

Is it true what Ben said? YES / NO / DON'T KNOW

Why did Ben say that?

**APPENDIX I: ADVANCED THEORY OF MIND STORIES (page 11 of 11 )**

**SECOND SET OF STORIES**

**(Happe 1994)**

**CONTROL PHYSICAL STORIES**

**SEEDS**

Sally is in the garden. She is sowing seeds, so that next year she will have lots of vegetables in her garden. She sows seeds for carrots, lettuces, and peas. She sows the seeds well, but when she goes inside after sowing them, the birds fly down and eat up all Sally's seeds! Poor Sally, not one of her seeds is left!

Is it true that Sally sowed seeds for turnips and swedes?

YES / NO / DON'T KNOW

Why will Sally not have any vegetables in her garden?

**CAR**

John parked his car on a steep hill in town while he went shopping. Unfortunately, the brakes on John's car are not very good. The handbrake is not strong enough to hold the car on the steep slope, and the car soon starts to roll down the hill. At the bottom of the hill John's car crashes into a lorry that is parked there. Luckily, there was no one in the lorry, so no one was hurt.

Is it true that there was someone in the lorry?

YES / NO / DON'T KNOW

Why did the car roll down the hill?

**CASSEROLE**

Kate was making supper. She made a casserole and put it in the oven. she turned the oven on high, so the casserole would be cooked by the time she got back from visiting her friend. But while Kate was out, there was a power-cut. All the electricity in Kate's house went off, and her cooker did not work. Oh dear! The casserole won't be cooked now"

Is it true that Kate was making lunch?

YES / NO / DON'T KNOW

Why won't the casserole be cooked when Kate gets home?

**APPENDIX II: EMOTION AND IDENTITY SORT (page 1 or 6)**  
**PHOTOCOPIES OF FACES USED - *Target Face for Emotion Sort Task***  
(adapted from Hobson, Ouston & Lee 1988)

Sequence:

Sad  
Scared

Happy  
Angry



**APPENDIX II: EMOTION AND IDENTITY SORT** (page 2 of 6)  
**PHOTOCOPIES OF FACES USED - *Neutral Faces for Identity Sort Task***  
(adapted from Hobson, Ouston & Lee 1988)

Sequence:

Male Actor I

Male Actor II

Female Actor I

Female Actor II



**APPENDIX II: EMOTION AND IDENTITY SORT (page 3 of 6)**  
**PHOTOCOPIES OF FACES USED - *Female Actor 1***  
(adapted from Hobson, Ouston & Lee 1988)

Sequence:

Sad  
Scared

Happy  
Angry



**APPENDIX II: EMOTION AND IDENTITY SORT (page 4 of 6)**  
**PHOTOCOPIES OF FACES USED - *Female Actor II***  
(adapted from Hobson, Ouston & Lee 1988)

Sequence:

Sad  
Scared

Happy  
Angry





**APPENDIX II: EMOTION AND IDENTITY SORT** (page 5 of 6)  
**PHOTOCOPIES OF FACES USED - *Male Actor I***  
(adapted from Hobson, Ouston & Lee 1988)

Sequence:

Sad  
Scared

Happy  
Angry



**APPENDIX II: EMOTION AND IDENTITY SORT (page 6 of 6)**

**PHOTOCOPIES OF FACES USED - *Male Actor II***

(adapted from Hobson, Ouston & Lee 1988)

Sequence:

Sad

Happy

Scared

Angry



### **APPENDIX III: COMPREHENSION OF VERBAL TERMS FOR EMOTIONS**

(page 1 of 1)

#### **INSTRUCTIONS, WORDS USED, AND DRAWING LOCATIONS IN PPVT**

(adapted from Van Lancker, Cornelius, & Needleman 1991)

#### **INSTRUCTIONS**

"I am going to say some words and show you some pictures on a page. There are four pictures to a page, and I want you to point to the picture that goes with the word and tell me in a few words why you chose that picture. I would also like you to tell me what the word means. Do you understand?"

If participant does not understand, give more verbal instructions.

#### **WORDS USED AND LOCATION OF DRAWING IN PPVT**

##### **NOUNS**

	<u>page</u>	<u>number of drawing</u>
BICYCLE	4	4
PICTURE	47	1
CARROT	42	4
BED	3	3
EYE	131	2
DRUM	11	3
BUS	1	4
CAMERA	54	1

##### **NEUTRAL ADJECTIVES**

	<u>page</u>	<u>number of drawing</u>
ROUND	2	3
BIG	36	3
OLD	164	1
FURRY	41	4
THIRSTY	122	2
SQUARE	27	4
BROKEN	120	1
FAT	124	4

##### **EMOTIONAL ADJECTIVES**

	<u>page</u>	<u>number of drawing</u>
HURT	109	3
DISAPPOINTED	59	4
SCARED	109	2
HAPPY	109	4
FURIOUS	141	3
SURPRISED	55	4
ANGRY	86	4
SLEEPY	28	1

**APPENDIX IV: CROSS-MODAL PROCESSING** (page 1 of 3)  
**PHOTOCOPIES OF FACES USED**  
(adapted from Hobson 1986)

Sequence (top of page to bottom): Neutral

Scared



**APPENDIX IV: CROSS-MODAL PROCESSING** (page 2 of 3)  
**PHOTOCOPIES OF FACES USED**  
(adapted from Hobson 1986)

Sequence (top of page to bottom): Sad

Angry



**APPENDIX IV: CROSS-MODAL PROCESSING (page 3 of 3)**  
**PHOTOCOPIES OF FACES USED**  
(adapted from Hobson 1986)

Sequence:

Happy



**APPENDIX V: CROSS-MODAL PROCESSING** (page 1 of 1)  
**INSTRUCTIONS AND**  
**EXAMPLE OF PART OF RATING FORM FOR JUDGES**  
**(Adapted from Izard 1971)**

I am going to show you some photographs of different people trying to express a variety of emotions. The purpose of this exercise is to see if the people succeeded in expressing the various emotions clearly. I can estimate this by determining the extent to which people agree on the emotion expressed in each picture.

Please look at each picture carefully, then describe on the form how you think the person in the photo is feeling. It may be that in some photos you think more than one feeling is being expressed. In those cases, please note down the strongest emotion first, and then briefly describe any other emotions you feel are also present in the photo.

You are also requested to rate whether each scene is easy, OK, or difficult to recognise.

Remember, on the form describe the strongest emotion being depicted first, and then describe any other feelings that you think may also be present.

Actor n	Type of Emotional Expression (photos of face only)		
Photo 1			
	Easy	OK	Difficult
Photo 2			
	Easy	OK	Difficult
Photo 3			
	Easy	OK	Difficult

**APPENDIX VI: CROSS-MODAL PROCESSING (page 1 of 3)**  
**PHOTOCOPIES OF "THINGS" USED**  
(adapted from Hobson 1986)

Sequence (top of page to bottom): Plane

Car





**APPENDIX VI: CROSS-MODAL PROCESSING TASK** (page 2 of 3)  
**PHOTOCOPIES OF "THINGS" USED**  
(adapted from Hobson 1986)

Sequence (top of page to bottom): Train

Dog



**APPENDIX VI: CROSS-MODAL PROCESSING TASK** (page 3 of 3)  
**PHOTOCOPIES OF "THINGS" USED**  
(adapted from Hobson 1986)

Sequence:

Bird



**APPENDIX VII: EXPERIENCING EMOTIONS (page 1 of 2)**  
**INSTRUCTIONS AND STANDARDISED STORIES**  
(adapted from Capps, Yirmiya & Sigman 1992)

**Instructions**

Say:

"I am going to show you a list of words. I want you to read out one word at a time, and tell me about an occasion when you would have used that word about yourself."

If P reads out a word and then hesitates, say:

"Can you tell me a time when you felt (e.g.) pride?"

If P is unable to provide an example of a time when they felt one of the emotions:

- a Provide an example (standard story)
- b Proceed with other emotions
- c Return to the emotion that provided difficulty for the P. Prompt in the form of additional questions. For example, "What have you done that made you proud?"

**Standard Stories**

**Pride**

When I was a fashion student some years ago I entered a national fashion competition and won the prize for best knitwear design. I felt very proud of myself.

**Sadness**

I love cats, particularly mine. Last February my eldest cat died, and I felt very sad about this.

**APPENDIX VII: EXPERIENCING EMOTIONS (page 2 of 2)**  
**INSTRUCTIONS AND STANDARDISED STORIES**  
(adapted from Capps, Yirmiya & Sigman 1992)

**Happiness**

A friend recently gave me a photo album containing pictures of us 20 years ago. It brought back memories of long, summer days, and I felt very happy.

**Embarrassment**

I once went to a job interview. My chair had a plastic seat. As I sat down the chair made a rude noise. Even though it was not me that made the noise, I was very embarrassed.

**Anger**

I felt angry when someone pushed past me as I was walking along the road, and they did not say "sorry."

**Contempt**

When drivers do not indicate whether they want to turn left or right at a junction I feel contempt because I think "well, at least I let people know what I am going to do."

**Disgust**

I feel disgust when I see pigeon droppings.

**Fear**

When I am alone in my house at night and I hear a noise I can feel fear if there is no-one else around.

**Surprise**

Once I was walking down a street in London and I bumped into a school friend from Liverpool. I was very surprised to see her.

**APPENDIX VIII: INTERVENTION** (page 1 of 1)  
**EXAMPLE OF INSTRUCTIONS AND PART OF RATING FORM**  
**FOR PHOTOGRAPHS, VIDEO- AND AUDIO-TAPED MATERIALS**  
(adapted from Izard 1971)

I am going to show you some photographs of actors trying to use face and gestures to express a variety of emotions. The purpose of this exercise is to see if they succeeded in expressing the various emotions clearly. I can estimate this by determining the extent to which people agree on the emotion expressed in each picture.

Please look at each picture carefully, then circle the emotion you think is being depicted. It may be that in some photos you think more than one feeling is being expressed. In these cases, please circle the strongest emotion first, and then cross through any other emotions you feel are also present in the photo.

You are also requested to rate whether each scene is easy, OK, or difficult to recognise.

Remember, on the form circle the strongest emotion being depicted first, and then cross through any other feelings that you think may also be present.

Actor n	Type of Emotional Expression (photos of face only)		
Photo 1	ANGER	CONTEMPT	DISGUST
	FEAR	HAPPINESS	INTEREST
	SHAME	SURPRISE	SADNESS
	Easy	OK	Difficult
Photo 2	ANGER	CONTEMPT	DISGUST
	FEAR	HAPPINESS	INTEREST
	SHAME	SURPRISE	SADNESS
	Easy	OK	Difficult
Photo 3	ANGER	CONTEMPT	DISGUST
	FEAR	HAPPINESS	INTEREST
	SHAME	SURPRISE	SADNESS
	Easy	OK	Difficult

**APPENDIX IX: Inter-rater Agreement for Materials**

(page 1 of 1)

	Recognition	A - %	S - %	H - %	F - %	Su - %	C - %	D - %
<b>Drawings</b>	Easy or OK							
Face		100	100	100	100	100	100	100
Gesture		100	100	100	100	100	100	100
Combined		100	100	100	100	100	100	100
<b>Photos</b>	Easy or OK							
Face 1		100	100	100	60	100	190	100
Face 2		90	80	100	60	90	90	90
Gesture 1		100	70	100	70	100	70	80
Gesture 2		100	70	100	70	100	60	70
Combined 1		100	90	100	100	100	100	100
Combined 2		100	80	100	100	100	80	100
<b>Videos</b>	Easy or OK							
Face 1		100	100	100	80	90	100	100
Face 2		90	100	100	70	80	70	90
Gesture 1		100	90	100	100	80	100	100
Gesture 2		90	70	100	100	80	90	70
Combined 1		100	90	100	100	90	100	100
Combined 2		90	90	100	90	80	60	90
<b>Sound</b>	Easy or OK							
Sound 1		80	90	100	90	90	90	100
Sound 2		70	80	90	90	60	70	80

**Code:** A = Anger  
S = Sad  
H = Happy  
F = Fear  
Su = Surprise  
C = Contempt  
D = Disgust

APPENDIX X: INTERVENTION SESSION 1 HANDOUT (page 1 of 12)  
UNDERSTANDING EMOTIONS

SURPRISE

- 1 This emotion lasts for a shorter period than other emotions
- 2 People cannot be surprised for long - unless the surprising event keeps revealing new surprising elements
- 3 Surprise can be triggered by the **unexpected** and the **misexpected**:
  - a Example of an unexpected event  
If a person expects to see their friend at 4.00pm to go and play tennis, but their friend calls for them at 2.00pm dressed for a country walk. The person is likely to be surprised
  - b Example of a misexpected event:  
If a person is used to a friend visiting them at 2.00pm, but they answer the door and find it is a salesperson. As it is in contrast to what they expect, then the person is likely to be surprised
- 4 Almost anything can be surprising if it is unexpected or misexpected. Sight, smell, taste, noise, or touch can lead to surprise
  - a Example of a sight that might surprise a person:  
A person may expect to see a friend in their home town, but if they see them on a holiday abroad they may be surprised
  - b Example of a smell that might surprise a person:  
If a person thought their friend was cooking a cake for them, but then smelled stew they may be surprised
  - c Example of a taste that might surprise a person:  
If a person orders a cheese pastry and bites into and finds it is a cream pastry they may be surprised
  - d Example of a noise that might surprise a person:  
If a person expects a concert to start with the sound of a violin, but it starts with the sound of a drum they may be surprised
  - e Example of a touch that might surprise a person:  
If a person is blindfolded and told they will be given a towel, but is handed a plastic sheet they may be surprised
- 5 Once a person has considered the unexpected or misexpected event, they tend to move quickly from surprise to another emotion. Examples include:
  - a Surprise can turn to pleasure or happiness if the event is seen as positive by the person  
Example: walking into a room and finding it full of people greeting the person with shouts of "happy birthday"

**APPENDIX X: INTERVENTION SESSION 1 HANDOUT (page 2 of 12)**  
**UNDERSTANDING EMOTIONS**

**SURPRISE (cont /2)**

- b Surprise can turn to disgust if the event is seen as unpleasant  
Example: walking into the sea and finding it is near a sewerage plant
  - c Surprise can turn to anger if the event is seen as aggressive  
Example: walking into a club and being shouted at by a stranger
  - d Surprise can turn to fear if the event is seen as scary  
Example: walking round a corner and bumping into a mugger
- 6 As the experience of surprise is often short, and followed by another emotion, the face and body gestures often show a blend of surprise and the other emotion
- 7 Surprise can vary in intensity from mild to extreme, depending on the event. For example, it is likely that a person will be less surprised to see a dog in a pond than to see a kangaroo in a pond



APPENDIX X: INTERVENTION SESSION 1 HANDOUT (page 3 of 12)  
UNDERSTANDING EMOTIONS

FEAR

- 1 People are afraid of harm. Harm can be physical, psychological, or both
  - a **Physical Harm:**  
Can vary from minor to dangerous injuries. A minor harm may be an injection. A major harm could be injuries from a traffic accident
  - b **Psychological Harm:**  
Can also vary from minor disappointments to extreme harm. A minor disappointment may be not being chosen to sit next to at a dinner. A major harm could be the loss of a treasured possession
  - c **Physical and Psychological Harm combined:**  
Could arise when a person is beaten up by a bully (physical harm), in front of a group of friends (psychological harm)
- 2 People learn to think about danger before it happens
  - a Often a person can feel the emotion of fear before an event happens
  - b People can be afraid of almost anything, including events, people, animals, objects, or ideas
    - For example, if a person comes into a room shouting and pushing things out of the way, others may become afraid before the angry person even looks at them
- 3 Sometimes a person may not know they will be harmed. They can experience fear almost at the same time as they feel the harm  
For example, a sudden sharp pain can cause fear
  - If the pain continues, the person can feel even more fear as they think about what is happening
  - For example, if the pain occurs in the heart area, a person may fear they are having a heart attack
- 4 Fear is different from surprise in 3 ways:
  - a Fear is a horrible feeling. Surprise may not be. Even mild fear is not pleasant. Extreme fear, or terror, feels horrid. It is often accompanied by changes in the body:
    - the skin may turn pale
    - the person may sweat
    - the heart may start thumping faster than normal
    - the stomach may feel queasy, or churning
    - the hands may tremble
  - b A person can be afraid of familiar things. Surprise only occurs when something is unexpected or misexpected.  
Many people feel afraid about going to the dentist, even if they go every 6 months

**APPENDIX X: INTERVENTION SESSION 1 HANDOUT (page 4 of 12)**  
**UNDERSTANDING EMOTIONS**

**FEAR (cont /2)**

- c Fear can last longer than surprise does. Surprise only lasts a few moments. Fear can last much longer
  - Unexpected feelings of fear may occur at the same time as the harm occurs, and may only last a few seconds
  - Fear can also occur gradually. For example, a person may feel ok walking home at night, but become aware of footsteps behind them. They may feel a little worried by this, but gradually get more scared if the footsteps get closer
  
- 5 The emotion of fear can last even when the danger has passed
  
- 6 Fear can be associated with other emotions
  - a For example, if a person is physically attacked:
    - Fear may be followed by anger, and the person may then fight back against the feared object or event
    - Fear may be followed by self-disgust if the person feels they should have fought back
    - Fear may be followed by sadness if the attack was by someone they love
  - b There may be a blend of emotions. For example, if someone is attacked, the event may result in a person feeling both afraid of the attack and angry at how the other person was treating them
  - c Happiness can follow fear
    - For example, a person may become happy if the feared event does not happen, or the danger is over
    - Some people enjoy feeling fear sometimes. These people may be called brave or daring. They could be mountain climbers, or gamblers. Others enjoy the feeling of fear when they go on fairground rides

APPENDIX X: INTERVENTION SESSION 1 HANDOUT (page 5 of 12)  
UNDERSTANDING EMOTIONS

DISGUST

- 1 People generally want to avoid the person or object or situation which causes them to feel disgusted. It is a feeling of strong dislike
  - a A person can be disgusted by:
    - the sight of something }
    - the smell of something }
    - the taste of something }
    - the sound of something }
    - the feel of something }
  - b Something that might disgust one person may not disgust another, just as something that might disgust one culture may not arouse disgust in another culture. For example, some cultures view raw oysters as a delicacy
- 2 The feeling of disgust usually involves responses like getting rid of or getting away from the object, person or situation causing the disgust
- 3 Disgust can vary in intensity
  - At it's mildest, it can lead the person feeling like they want to turn away from the object, person, or situation
  - Sometimes people act on their feelings or wishing to turn away from, or get rid of the object, person, or situation
  - At it's most extreme it can lead to nausea, and sometimes even vomiting
- 4 Disgust is often experienced together with anger
  - a If someone is seen hitting and shouting at an animal, it can provoke feelings of both anger and disgust in the onlooker
  - b If a person, object or situation does not pose a threat, the onlooker is more likely to feel disgust than anger
- 5 Disgust can also be experienced together with other emotions such as surprise, fear, or sadness
  - a **An example of disgust experienced with surprise**  
A person may open a parcel expecting to find a book about fashion, but instead find a book about sewerage plants
  - b **An example of disgust experienced with fear**  
A person may walk down an alley and be confronted by rats
  - c **An example of disgust experienced with sadness**  
A person may find their pet lying dead in the road after being run over by a car

**APPENDIX X: INTERVENTION SESSION 1 HANDOUT (page 6 of 12)**  
**UNDERSTANDING EMOTIONS**

**CONTEMPT**

- 1      Contempt can be quite similar to disgust. What separates it from disgust is that contempt can only be experienced about people and the way people behave
  - A person may feel disgusted about the idea of eating raw oysters
  - A person may feel contempt for others who eat raw oysters
  
- 2      There is often an experience of superiority involved in contempt
  - a      For example, a person may feel contempt for other who behave in ways that they would not, but the person will not necessarily want to get away from the others
  - b      In disgust, a person wants to get away from the thing that is causing the unpleasant feeling
  
- 3      Contempt is similar to disgust in that they are often experienced together with anger:
  - A person can feel contempt for another person who tries to make them look silly by laughing at their views
  
- 4
  - a      People who express contempt for others can be respected and admired because they are seen as cleverer or as possessing strong moral principles
  - b      However, people who express contempt for others can also be seen as looking down on other people, or be disliked because they are seen as smug

APPENDIX X: INTERVENTION SESSION 1 HANDOUT (page 7 of 12)  
UNDERSTANDING EMOTIONS

ANGER

- 1 Anger is often viewed with fear by others. This is because when someone is angry they are most likely to deliberately hurt another
  - There is a risk of losing control when angry
  
- 2 Anger can be aroused in a number of ways:
  - a **Frustration**
    - Frustration is usually the result of feeling someone or something is interfering with the person's activity or pursuit of goals
    - If the person feels the agent of the interference is acting deliberately, unfairly, or spitefully, then the person's anger is likely to be more intense
  - b **Physical Threat**
    - If the attacker who is threatening physical harm seems less strong, then a person is more likely to feel contempt than anger
    - If the attacker seems stronger, then a person is more likely to feel fear than anger
    - If the attacker seems about equal in strength, then a person is most likely to feel angry, although they can also feel fear
    - When anger is aroused by the threat of physical harm, a person may choose one of a number of strategies:
      - to fight back
      - to verbally warn the attacker
      - to flee from the situation
  - c **Psychological Threat**
    - A person can feel angry if the attacker insults, rejects, or does something which shows a disregard for the person's feelings
    - A person must care about the attacker's opinions for anger to be felt when psychologically threatened
    - A person who is insulted by someone they do not care about, is more likely to feel contempt or surprise
  - d **The Breaking of Moral Values**
    - If a person sees someone or something behaving in a way in which they do not approve, this can lead to feelings of anger. For example, a person who loves the outdoor life is likely to experience anger if they see another throwing garbage in the countryside
  - e **Others Not Meeting Personal Expectations**
    - A person can feel anger if another does not meet their expected standards. For example, a parent may feel anger towards their child if the child does not do as well in exams as the parent thinks they should
  - f **Feeling Anger if Someone is Angry with the Person**
    - Some people seem to automatically get angry if another person expresses anger towards them

APPENDIX X: INTERVENTION SESSION 1 HANDOUT (page 8 of 12)  
UNDERSTANDING EMOTIONS

ANGER (cont /2)

- 3 Anger can lead to a number of bodily sensations. For example:
  - Blood pressure often increases
  - Sometimes the person's face will get darker (in white people this usually shows as a reddening of the face)
  - The veins on the forehead and neck may become more visible
  - The muscles of the body may tense
  - The body may lean towards the cause of the anger
  
- 4 Anger can vary in intensity
  - a There is a range of how anger can be expressed. For example:
    - A person can feel a little irritated by something, and may just say something nasty
    - A person can feel very angry, but not show it in their body gestures
    - A person may be unable to stay still, and will hit out and shout
  - b The length of time a person can feel angry can also vary For example:
    - Some people seem to get angry very quickly, over things that most people would not get angry about
    - Some people seem to stay angry a long time, while some seem to get angry quickly but soon get over it
  - c How people deal with anger can also differ. For example:
    - Some people seem to enjoy arguments, or even fighting
    - Some people think it is wrong to get angry, and so try to avoid the emotion - they may feel sad, ashamed, or disgusted if they do get angry

APPENDIX X: INTERVENTION SESSION 1 HANDOUT (page 9 of 12)  
UNDERSTANDING EMOTIONS

HAPPINESS

- 1 Most people want to feel happy because it feels good
  - Fear, anger, disgust, and sadness are usually considered negative emotions
  - Happiness is usually considered a positive emotion
- 2 People look for situations, people or objects they enjoy because this will lead to feeling happy
- 3 There are different types of happiness. For example:
  - a **Pleasurable Happiness:** A person can feel this while eating their favourite food.
  - b **Excited Happiness:** A person can feel this when their favourite team wins an important competition
  - c **Happy Relief:** A person can feel this when a pain stops, or when they have a drink after feeling very thirsty, or when unpleasant emotions end (for example, when a person stops feeling frightened, or sad)
  - d **Self-Concept Happiness:** A person can feel like this if they achieve something difficult, such as
    - Passing a tough exam
    - Gaining the respect of someone who they did not think liked them
    - Being praised for doing something well
- 4 Happiness can vary in intensity. For example:
  - A person can be mildly happily
  - A person can be pleasantly surprised
  - A person can be extremely happy, or ecstatic
- 5 Happiness can be expressed in a range of ways. For example:
  - a **It can be silently expressed:**
    - A small smile
    - A big grin
  - b **It can be heard:**
    - Chuckling quietly
    - Laughing quietly
    - Laughing loudly, with tears streaming down the face
- 6 Happiness can be experienced with the other emotions. For example:
  - a **Smiling may be a way of dealing with anxious or scary situations:**
    - A person may smile as they walk into an exam. This may be to let other people know that although they feel anxious about the exam they will not run away
    - A person may smile in an attempt to make an unpleasant situation seem more comfortable. For example, a doctor may smile at a patient to put them at their ease when telling them about an operation

**APPENDIX X: INTERVENTION SESSION 1 HANDOUT (page 10 of 12)**  
**UNDERSTANDING EMOTIONS**

**HAPPINESS (cont /2)**

- b    **A person may be happily surprised:**
  - If an old school-friend unexpectedly walks into a restaurant, a person may be pleased to see them. They may grin and call out to the old friend
- c    **A person may enjoy feeling smug (contempt mixed with happiness):**
  - If others have made a person feel stupid in the past, the person may enjoy making the others feel stupid now. For example, the person may correct the others about general knowledge question
- d    **A person may use signs of happiness to hide anger:**
  - A person may smile at someone who is telling them to do something they do not want to do



APPENDIX X: INTERVENTION SESSION 1 HANDOUT (page 11 of 12)  
UNDERSTANDING EMOTIONS

SADNESS

- 1      Sadness is often linked to loss. For example:
  - Loss through death
  - Loss through rejection
  - Loss of health
  - Loss of an opportunity
  - Loss of an object
  
- 2      Sadness is often a passive feeling, rather than an active one
  - a      A person can become withdrawn, and not talk much with others
  - b      However, loss can lead to feelings of distress which can lead to active expressions such as crying or shouting aloud
  
- 3      The feeling of sadness is often experienced as suffering
  - a      Suffering due to sadness is not necessarily the suffering of physical pain
  - b      Suffering due to sadness is felt as loss, disappointment, or hopelessness
  
- 4      Feelings of sadness can be triggered off by almost anything that reminds a person of something they have lost. For example:
  - The smell of a brand of perfume may remind a man of his dead wife
  - The sight of a certain breed of animal may remind a person of a lost pet
  - The taste of a certain food may remind a person of a happy childhood holiday with long-lost friends
  - The sound of certain music may remind a person of their lost ability to play an instrument
  - The touch of certain objects may remind a person of lost childhood toys
  
- 5      There are sex differences in how females and males are traditionally allowed to show sadness, although this is starting to change:
  - a      It seems to be acceptable for females to express sadness or distress by crying or talking about their losses. It seems less acceptable for females to express anger in an aggressive way
  - b      It does not seem so acceptable for males to express sadness or distress. It seems more acceptable to express negative feelings through anger

**APPENDIX X: INTERVENTION SESSION 1 HANDOUT (page 12 of 12)**  
**UNDERSTANDING EMOTIONS**

**SADNESS (cont /2)**

- 6 Sadness can be experienced with other emotions. For example:
- a The death of a loved parent can lead to feelings of anger as well as sadness and distress. Anger may be directed at the cause of the death, for example the driver of the car that killed the parent
  - b The loss of physical health can lead to feelings of fear as well as sadness and distress. Fear may be present if the person does not know whether their physical health will improve or not
  - c Seeing a sad film can lead to feelings of enjoyment as well as sadness. The person may enjoy a "good cry" once in a while

Adapted from: Ekman, P. and Friesen, W. V. (1975). Unmasking the face: a guide to recognizing emotions from facial cues, New Jersey Prentice-Hall Inc, Englewood Cliffs: Spectrum Books.

APPENDIX XI: INTERVENTION - SESSION TWO HANDOUT (page 1 of 9)  
FACIAL EXPRESSIONS

HOW FEAR CAN LOOK

**Eyebrows:**

- 1     The eyebrows can be raised and straight.
  - So, as in surprise, the eyebrows are raised, but rather than being curved they are straight.
  - They also may be drawn together at the inner corners of the brow.
- 2     Horizontal wrinkles appear across the forehead.

**Eyes:**

- 1     The eyes are opened and tense.
- 2     The upper eyelid is raised.
- 3     The whites of the eye, above the iris, can be seen.
- 4     The area below the eyes may be raised, covering the lower part of the iris.

**Mouth:**

- 1     The mouth often opens, but unlike in surprise, the lips are tense rather than relaxed, and may be drawn back tightly.
- 2     Sometimes the lips are stretched and tense with the corners of the lips pulled back.

APPENDIX XI: INTERVENTION - SESSION TWO HANDOUT (page 2 of 9)  
FACIAL EXPRESSIONS

HOW SURPRISE CAN LOOK

**Eyebrows:**

- 1 The eyebrows rise up and look curved and higher than usual.
- 2 - The lifting of the eyebrows can produce long horizontal wrinkles across the forehead.
- If a person has permanent wrinkles in this area, they become deeper and more obvious when the eyebrows are raised in surprise.

**Eyes:**

- 1 The eyes are opened wide.
- 2 The upper eyelids are raised.
- 3 The whites of the eyes can be seen above the iris (the coloured centre part of the eye).

**Lower face:**

- 1 The jaw drops, and this causes the lips and teeth to part.
- 2 The opened mouth looks relaxed, not tense.
- 3 The lips are not tight or stretched back.
- 4 The mouth can be: slightly open (mild surprise)  
moderately open (more surprised)  
wide open (very surprised)

APPENDIX XI: INTERVENTION - SESSION TWO HANDOUT (page 3 of 9)  
FACIAL EXPRESSIONS

HOW CONTEMPT CAN LOOK

Eyes:

- 1 The eyes might narrow and could produce lines and folds under the eye.

Lower face:

- 1 Upper and lower lips may be closed together, but with a slight raising of the corners on one side of the mouth.
- 2 Sometimes the teeth on one side of the mouth can be seen.
- 3 There may be wrinkling along the sides and bridge of the nose on the side of the mouth that is raised.
- 4 The cheek on the side of the of the mouth that is raised, will rise up.

APPENDIX XI: INTERVENTION - SESSION TWO HANDOUT (page 4 of 9)  
FACIAL EXPRESSIONS

HOW DISGUST CAN LOOK

**Eyes:**

- 1 The eyes might narrow and could produce lines and folds under the eye.

**Lower face:**

- 1 Upper lip is raised.
- 2 There may be wrinkling along the sides and bridge of the nose.
  - If the person is slightly disgusted there will not be much wrinkling around the nose.
  - If the person is very disgusted, the wrinkling will be more obvious.
  - If the person is very disgusted, the wrinkle running down from the nostrils to the outer lip corners become deeper.
- 3
  - The lower lip could be raised and pushed slightly forward.
  - The lower lip could be lowered and pushed slightly forward.
- 4 The cheeks will rise up.
- 5 If a person is very disgusted, the tongue may come out a little.

APPENDIX XI: INTERVENTION - SESSION TWO HANDOUT (page 5 of 9)  
FACIAL EXPRESSIONS

HOW HAPPINESS CAN LOOK

**Eyes:**

- 1 The skin below the lower eyelid can be pushed upwards, and lines will show below the eyelid.
- 2 Wrinkling can sometimes be seen at the outer corners of the eyes.

**Lower Face:**

- 1 Wrinkle lines can run from the nose and down towards the corners of the mouth.
- 2 The cheeks are often raised, especially when someone is smiling or grinning a lot.

**Mouth:**

- 1 The lips are often drawn back and slightly upwards at the ends.
- 2
  - a Sometimes the lips are kept closed together (smiling)
  - b Sometimes the lips are parted, and the teeth and jaw stay together (grinning)
  - c Sometimes the lips and teeth are parted (big grin)
    - Sometimes only the top teeth can be seen
    - Sometimes both the top and bottom teeth can be seen

**APPENDIX XI: INTERVENTION - SESSION TWO HANDOUT (page 6 of 9)**  
**FACIAL EXPRESSIONS**

**HOW ANGER CAN LOOK**

**Eyebrows**

- 1 The eyebrows can be drawn together and pulled downward towards the nose.
- 2 Vertical wrinkles can appear between the eyebrows.

**Eyes and Eyelids**

- 1 The eyelids are tensed.
- 2 The eyes stare.
- 3 Sometimes the eyes can be narrowed.
- 4 The upper eyelid usually is lowered.

**Mouth**

- 1 There are 2 basic types of mouth.
  - a In the first type, it can be closed, and the lips tightly pressed together.
    - This might happen when a person is physically attacking something or someone
    - It might also happen when a person is trying to stop themselves shouting out in anger.
  - b The second type of mouth is open and the bottom lip is quite straight. This can happen when a person is talking or shouting angrily at someone or something.

**Facial Areas of Anger compared to Surprise, Fear, or Disgust**

- 1 If the expressions of anger are not present in all three areas of the face (eyebrows, eyes, mouth) then it may be difficult to know if a person is angry.
- 2 Because anger is not clear unless the signs are present in the three areas, it is different from surprise or fear or disgust.
  - Surprise or fear can be recognised in how the eyebrows and eyes look, or in how the eyes and mouth look.
  - Disgust can be recognised by looking at the mouth and eyes.
- 3 However, even if the signs of anger are not present in all three areas of the face, it can be possible to know a person is angry by listening to their voice, or looking at their body signals.



**APPENDIX XI: INTERVENTION - SESSION TWO HANDOUT (page 7 of 9)**  
**FACIAL EXPRESSIONS**

**HOW SADNESS CAN LOOK**

**Eyebrows, Forehead, and Eyes:**

- 1 The inner corners of the eyebrows are raised and drawn together.
- 2 Horizontal wrinkles can sometimes be seen on the forehead.
- 3 Sometimes vertical wrinkles can be seen at the inner corners of the eyebrows and above the nose.
- 4 The upper eyelids are pulled upwards at the inner corners.

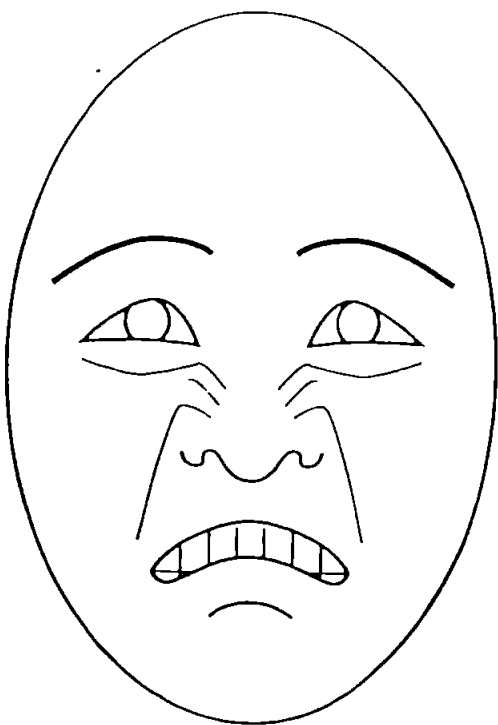
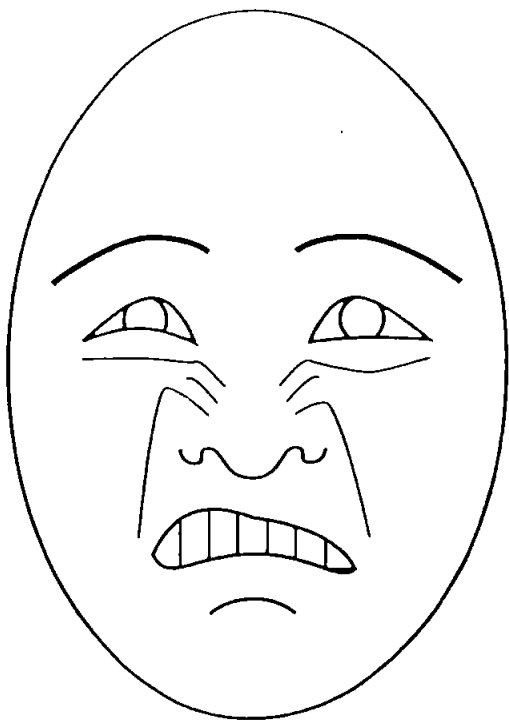
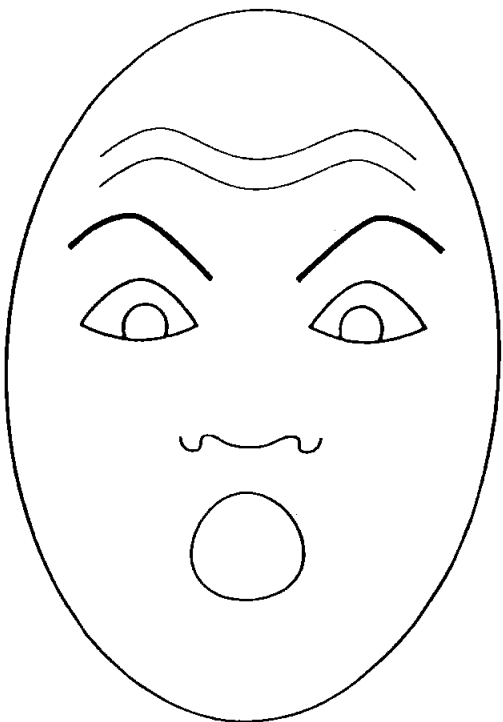
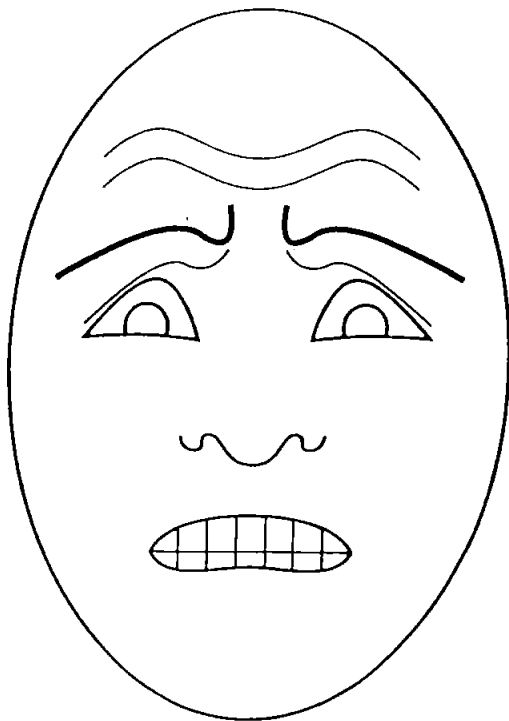
**Mouth:**

- 1 Sometimes the lips can look quite loose and tremble.
  - This can occur if a person is trying not to cry
  - It can also happen when a person is about to cry.
- 2 Sometimes the mouth is closed and tense. It is pulled down at the outer edges.
- 3 The chin can sometimes form lots of little lines, and it can sometimes tremble.

Adapted from: Ekman, P. and Friesen, W. V. (1975). Unmasking the face: a guide to recognizing emotions from facial cues. New Jersey Prentice-Hall Inc, Englewood Cliffs: Spectrum Books.

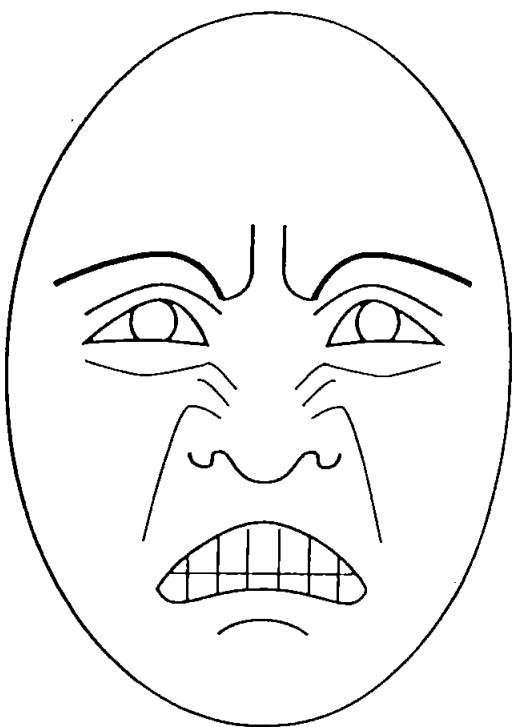
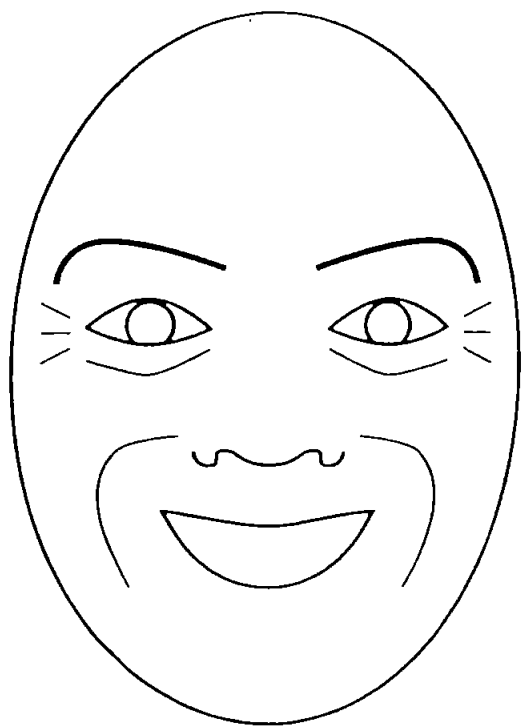
**APPENDIX XI: INTERVENTION - SESSION 2 HANDOUT** (page 8 of 9)  
**FACIAL EXPRESSIONS**

Sequence: Fear    Surprise    Contempt    Disgust  
(drawings are less than quarter of actual size used in intervention)



**APPENDIX XI: INTERVENTION - SESSION 2 HANDOUT** (page 9 of 9)  
**FACIAL EXPRESSIONS**

Sequence: Happiness      Anger      Sadness  
(drawings are less than quarter of quarter of actual size used in intervention)



**APPENDIX XII: INTERVENTION - SESSION THREE HANDOUT** (page 1 of 9)  
**BODY GESTURES**

**HOW ANGER CAN LOOK** (drawing shows an aggressive type of anger)

**Head and Neck**

- 1 The head may be pushed forwards
- 2 The neck can be tense, and the veins in the neck may be more noticeable than usual

**Shoulder and Arms**

- 1 The shoulders can come forward
- 2 The elbows may be bent and tense
- 3 The hands may form tightly clenched fists
- 4 - One arm may come forward as though ready to hit a person or object  
- The other arm may swing back, but also be ready to come forward to hit out

**Body area**

- 1 The body may lean forwards towards the person or object towards which the anger is directed
- 2 The chest can be pushed forwards

**Hips and Legs**

- 1 The hips may swing forwards
- 2 The legs may be bent to steady the person, and also to be ready to come forward towards the person or object that is causing the anger

**APPENDIX XII: INTERVENTION = SESSION THREE HANDOUT (page 2 of 9)**  
**BODY GESTURES**

**HOW HAPPINESS CAN LOOK** (drawing shows an excited type of happiness)

**Head and Neck**

- 1 The head may be slightly tilted upwards
- 2 The neck can be tense, and the veins in the neck may be more noticeable than usual

**Shoulder and Arms**

- 1 The shoulders can be raised
- 2 The arms may be pointed upwards and above the head
- 3 The elbows may be bent
- 4 The lower arms may be tense
- 5 The fingers on the hands may be splayed out, or they may be tightly clenched into a fist

**Body area**

- 1 The lower part of the body may be slightly tilted backwards
- 2 The upper part of the body can be slightly tilted forwards

**Hips and Legs**

- 1 The hips may swing forwards
- 2 The legs may be wide apart, with the knees bent to steady the person

HOW DISGUST CAN LOOK

**Head and Neck**

- 1 The head may be turned away from the object or person causing the disgust
- 2 The neck can be tense

**Shoulder and Arms**

- 1 The shoulders may twist away from the direction of the head
- 2 The arms can be twisted away from the direction of the head
- 3 The elbows may be bent
- 4 The hands may be raised upwards and outward, as though trying to push the object or person causing the disgust away

**Body area**

- 1 The body may be twisted to point in the same direction as the head
- 2 The back can be slightly bent

**Hips and Legs**

- 1 The hips may be twisted in the same direction as the head
- 2 The legs and feet can also be twisted in the same direction as the head

**APPENDIX XII: INTERVENTION - SESSION THREE HANDOUT (page 4 of 9)**  
**BODY GESTURES**

**HOW SURPRISE CAN LOOK**

**Head and Neck**

- 1 The head may be pushed backwards and into the neck
- 2 The neck can be pushed backwards

**Shoulder and Arms**

- 1 The shoulders can be slightly raised
- 2 The elbows may be bent
- 3 The fingers of the hands may be splayed out and frame the sides of the face

**Body area**

- 1 The lower part of the body may be pushed slightly forwards
- 2 The upper part of the body may be pushed backwards

**Hips and Legs**

- 1 The hips may swing forwards
- 2 The legs may be slightly bent to steady the person
- 3 The legs may be apart, with the knees slightly bent

APPENDIX XII: INTERVENTION - SESSION THREE HANDOUT (page 5 of 9)  
BODY GESTURES

HOW SADNESS CAN LOOK

**Head and Neck**

- 1 The head may be looking downward
- 2 The neck can be bent forwards

**Shoulder and Arms**

- 1 The shoulders may droop down
- 2 The elbows can be bent
- 3 The arms can be raised to either side of the head
- 4 The hands may be raised upwards and inward towards the face

**Body area**

- 1 The back may be bent forwards
- 2 The body may droop

**Hips and Legs**

- 1 The hips may be slightly pushed forwards
- 2 The legs and feet can be slightly apart, with the knees drooping downward



**APPENDIX XII: INTERVENTION - SESSION THREE HANDOUT (page 6 of 9)**  
**BODY GESTURES**

**HOW CONTEMPT CAN LOOK**

**Head and Neck**

- 1 The head may be turned towards the object or person causing contempt
- 2 The head may be slightly tilted downward

**Shoulder and Arms**

- 1 The shoulders may be raised
- 2 One arm may rest on the hip on the same side of the body, and the elbow may be bent
- 3 The other arm may be raised and bent, and crossing over the body
- 4 The hand on the arm crossing the body may be raised and pointing outward

**Body area**

- 1 The chest may be pointing away from the object or person causing the contempt
- 2 The lower part of the body may be slightly tilted in the same direction as the head

**Hips and Legs**

- 1 The hips may be at an angle, with one side higher than the other
- 2 One leg may cross over the other leg, and be bent at the knee
- 3 The leg that is being crossed over can be quite straight, to support the person

APPENDIX XII: INTERVENTION - SESSION THREE HANDOUT (page 7 of 9)  
BODY GESTURES

HOW FEAR CAN LOOK

**Head and Neck**

- 1 The head may be turned away from the feared object or person
- 2 The neck can be tense

**Shoulder and Arms**

- 1 The shoulders may twist away from the direction of the head
- 2 The arms can be twisted away from the direction of the head
- 3 The elbows may be bent
- 4 The hands may be raised upwards and outward, with one hand trying to shield the face, as though trying to keep the feared object or person away

**Body area**

- 1 The body may be twisted to point in the same direction as the head
- 2 The back can be bent

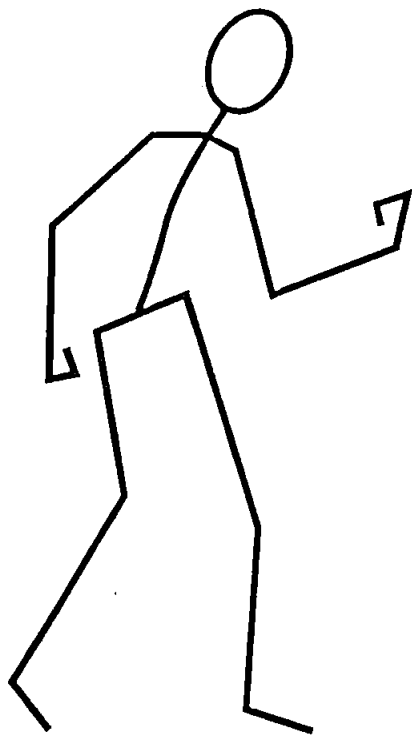
**Hips and Legs**

- 1 The hips may be twisted in the same direction as the head
- 2 The legs and feet can also be twisted in the same direction as the head
- 3 The legs may be apart, and the knees bent, to steady the person

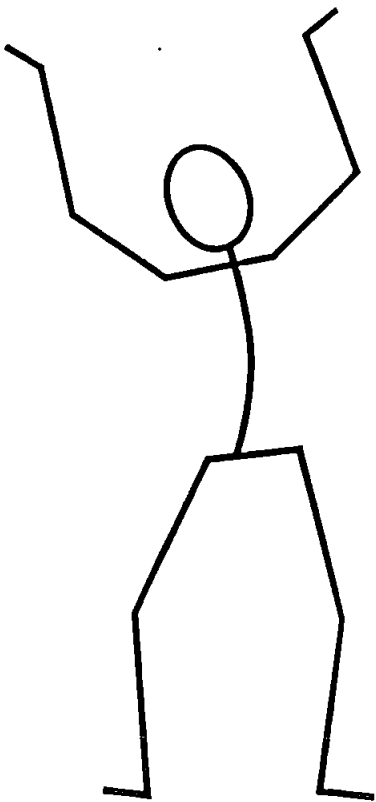
**APPENDIX XII: INTERVENTION - SESSION 3 HANDOUT** (page 8 of 9)  
**BODY GESTURES**

(Figures are less than quarter of actual size used in the intervention)

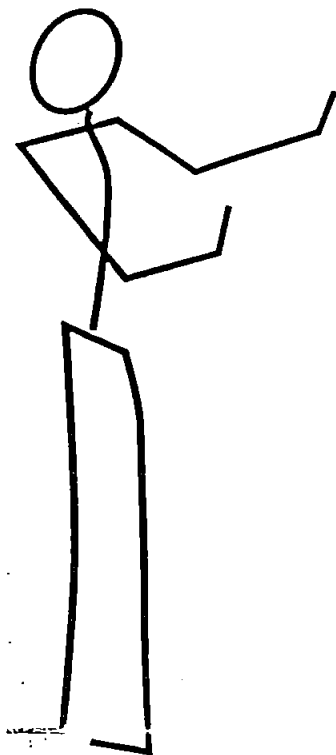
ANGER



HAPPY



DISGUST



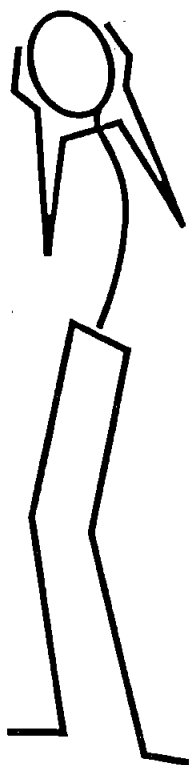
SURPRISE



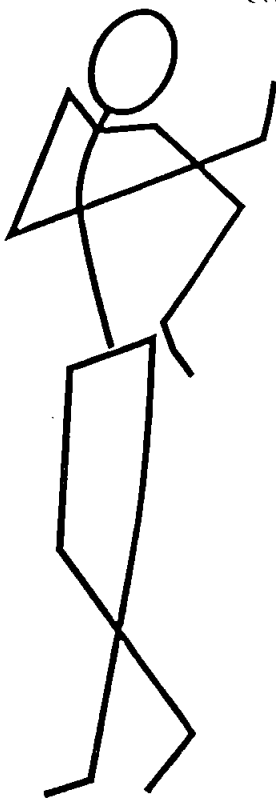
**APPENDIX XII: INTERVENTION - SESSION 3 HANDOUT** (page 9 of 9)  
**BODY GESTURES**

(Figures are less than quarter of actual size used in the intervention)

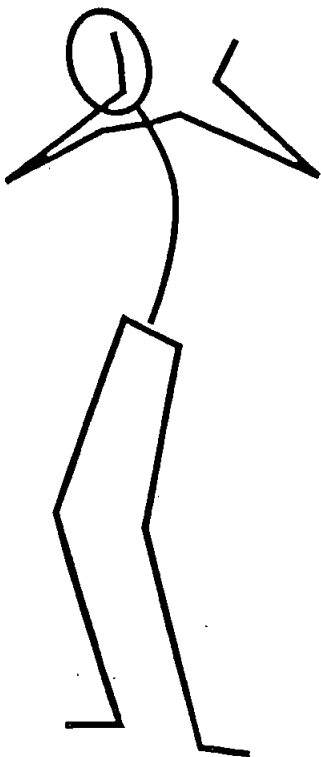
SAD



CONTEMPT



FEAR



FACIAL EXPRESSIONS	EMOTIONS						
Eyebrow Area							
Brows raised and curved				Surprise			
Brows raised and straight					Fear		
Brows drawn together at nose	Anger				Fear	Sadness	
Forehead horizontal wrinkles				Surprise	Fear	Sadness	
Eyebrow vertical wrinkles	Anger					Sadness	
Eye Area							
Eyes opened wide				Surprise	Fear		
Upper eyelids raised				Surprise	Fear	Sadness	
Upper eyelids lowered	Anger						
Lower eyelids raised		Happiness			Fear		
Whites of eyes seen				Surprise	Fear		
Eyes narrowed	Anger		Disgust				Contempt
Corners of eyes wrinkled		Happiness					
Lower Face Area							
Jaw drops				Surprise			
Relaxed open mouth				Surprise			
Tense open mouth	Anger				Fear	Sadness	
Tense closed mouth	Anger					Sadness	
Upper lip raised		Happiness	Disgust				
Lower lip dropped and straight	Anger						
One side of upper lip raised							Contempt
Cheeks raised		Happiness	Disgust				Contempt
Nose wrinkled			Disgust				Contempt

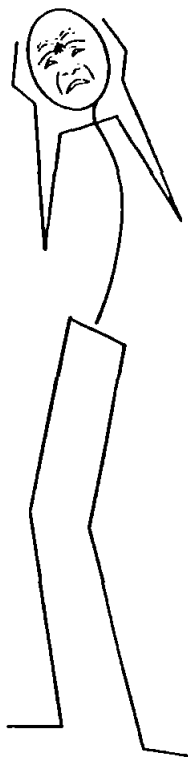
Appendix XIII: INTERVENTION SESSION FOUR HANDOUT - HOW BODY GESTURES LOOK IN THE DRAWINGS (page 2 of 4)

BODY POSTURES	EMOTIONS						
Head and Neck							
Pushed forwards	Anger						Contempt
Pushed backwards				Surprise			
Head turned away			Disgust		Fear		
Tense neck	Anger	Happiness	Disgust		Fear		
Head tilted upwards		Happiness					
Head tilted downward						Sadness	Contempt
Shoulders and Arms							
Shoulders coming forwards	Anger		Disgust		Fear		
Shoulders going back							
Shoulders raised		Happiness		Surprise			Contempt
Shoulders lowered						Sadness	
Arms raised upwards		Happiness		Surprise		Sadness	
Clenched fists	Anger						
Hands raised up and outward			Disgust	Surprise			
Hands raised up and inward						Sadness	
Open hands		Happiness					
Body Area							
Top of body leaning forwards	Anger	Happiness				Sadness	
Top of body leaning back			Disgust	Surprise	Fear		Contempt
Back bent			Disgust		Fear	Sadness	
Hips and Legs							
Hips swinging forwards	Anger	Happiness		Surprise		Sadness	
Hips swinging backwards			Disgust		Fear		
Hips at an angle							Contempt
Bent legs coming forwards	Anger						
Bent legs going backwards			Disgust		Fear		
Legs wide apart		Happiness		Surprise			

**APPENDIX XIII: INTERVENTION - SESSION 4 HANDOUT** (page 3 of 4)  
**FACES AND BODIES COMBINED**

(Figures are less than quarter of actual size used in the intervention)

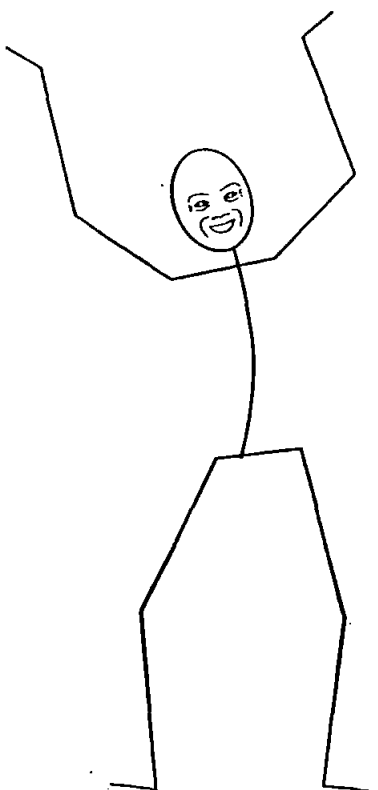
SAD



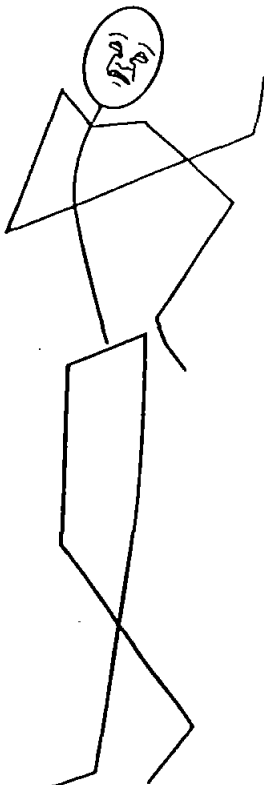
SURPRISE



HAPPY



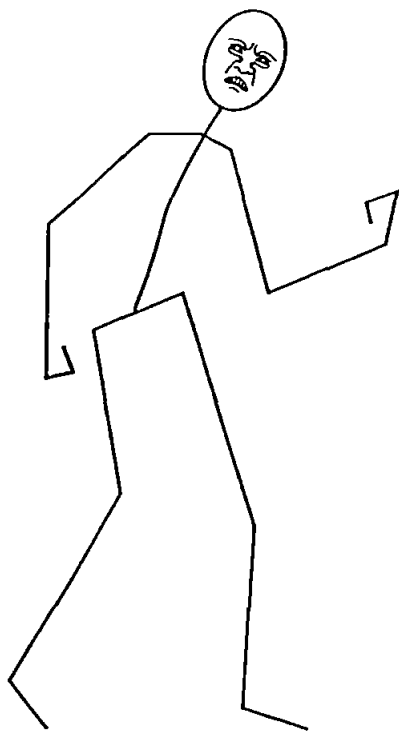
CONTEMPT



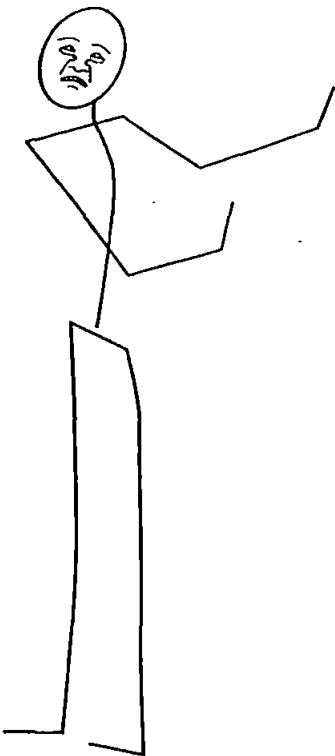
**APPENDIX XIII: INTERVENTION - SESSION 4 HANDOUT** (page 4 of 4)  
**FACES AND BODIES COMBINED**

(Figures are less than quarter of actual size used in the intervention)

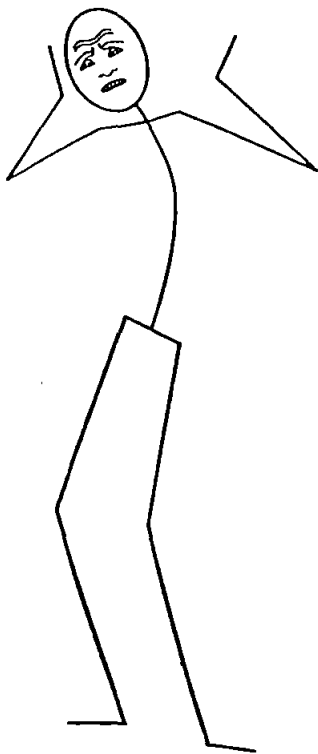
ANGER



DISGUST



FEAR





APPENDIX XIV: INTERVENTION - SESSION 2 (page 1 of 7)  
FACIAL EXPRESSIONS

Emotion: ANGER



APPENDIX XIV: INTERVENTION - SESSION 2 (page 2 of 7)  
FACIAL EXPRESSIONS

Emotion: CONTEMPT



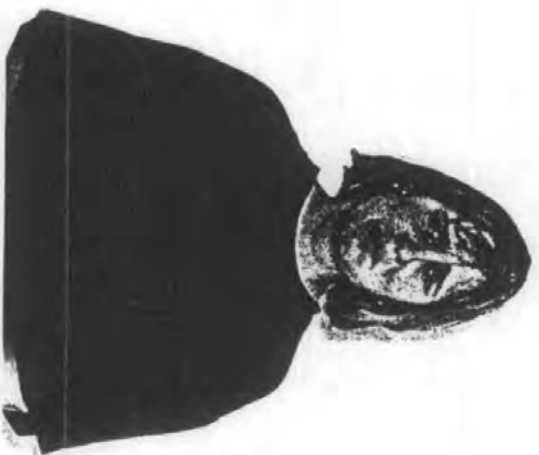
APPENDIX XIV: INTERVENTION - SESSION 2 (page 3 of 7)  
FACIAL EXPRESSIONS

Emotion: SURPRISE



APPENDIX XIV: INTERVENTION - SESSION 2 (page 4 of 7)  
FACIAL EXPRESSIONS

Emotion: SADNESS



APPENDIX XIV: INTERVENTION - SESSION 2 (page 5 of 7)  
FACIAL EXPRESSIONS

Emotion: HAPPINESS





APPENDIX XIV: INTERVENTION - SESSION 2 (page 6 of 7)  
FACIAL EXPRESSIONS

Emotion: FEAR



APPENDIX XIV: INTERVENTION - SESSION 2 (page 7 of 7)  
FACIAL EXPRESSIONS

Emotion: DISGUST



*APPENDIX XV: INTERVENTION - SESSION 3 (page 1 of 7)*  
**BODY GESTURES**

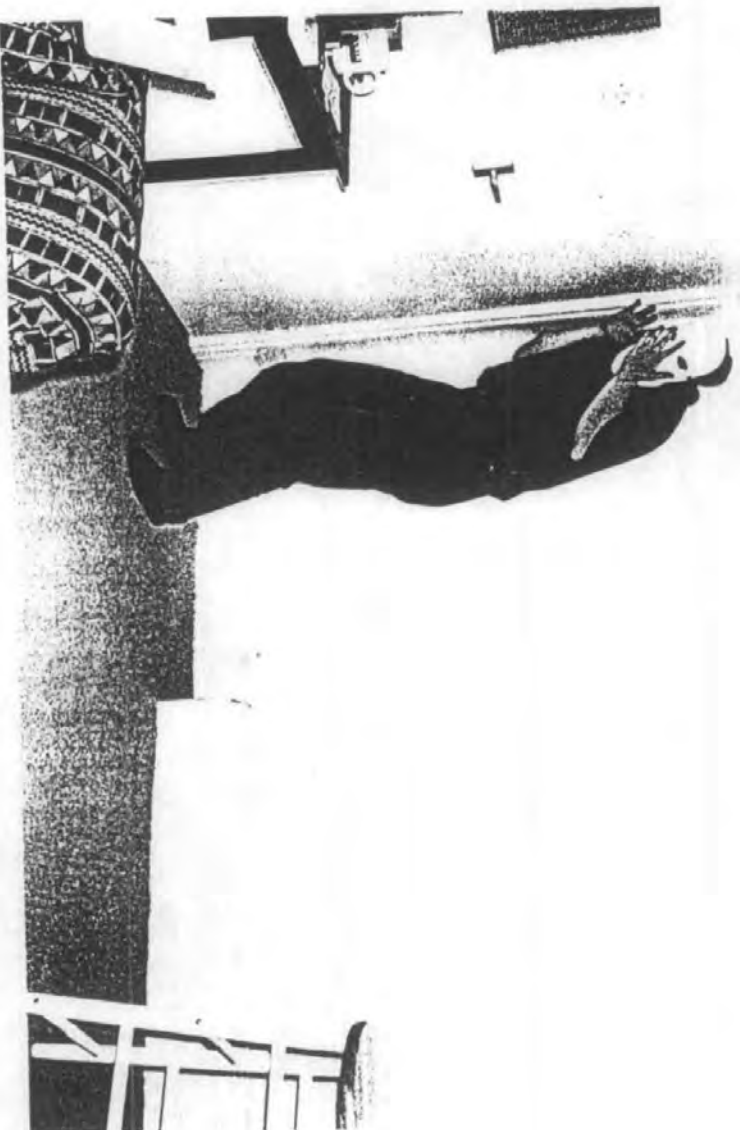
Emotion: DISGUST





*APPENDIX XV. INTERVENTION - SESSION 3 (page 2 of 7)*  
**BODY GESTURES**

Emotion: FEAR



*APPENDIX XV: INTERVENTION - SESSION 3 (page 3 of 7)*  
**BODY GESTURES**

Emotion: ANGER



*APPENDIX XV: INTERVENTION - SESSION 3 (page 4 of 7)*  
**BODY GESTURES**

Emotion: HAPPINESS



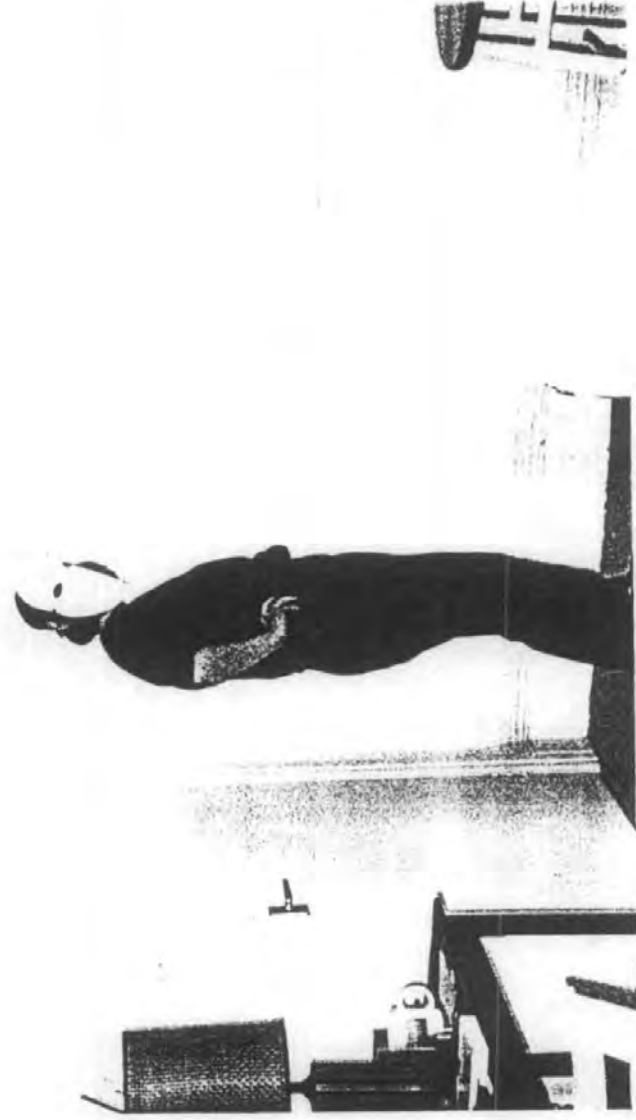
*APPENDIX XV: INTERVENTION - SESSION 3 (page 5 of 7)*  
**BODY GESTURES**

Emotion: SADNESS



*APPENDIX XV: INTERVENTION - SESSION 3 (page 6 of 7)*  
**BODY GESTURES**

Emotion: CONTEMPT



*APPENDIX XV: INTERVENTION - SESSION 3 (page 7 of 7)*  
**BODY GESTURES**

Emotion: SURPRISE





*APPENDIX XVI: INTERVENTION - SESSION 4 (page 1 of 7)*  
**FACES AND BODIES COMBINED**

Emotion: FEAR



*APPENDIX XVI: INTERVENTION - SESSION 4 (page 2 of 7)*  
**FACES AND BODIES COMBINED**

Emotion: SADNESS





*APPENDIX XVI: INTERVENTION - SESSION 4 (page 3 of 7)*  
**FACES AND BODIES COMBINED**

Emotion: DISGUST



*APPENDIX XVI: INTERVENTION - SESSION 4 (page 4 of 7)*  
**FACES AND BODIES COMBINED**

Emotion: HAPPINESS



*APPENDIX XVI: INTERVENTION - SESSION 4 (page 5 of 7)*  
**FACES AND BODIES COMBINED**

Emotion: ANGER



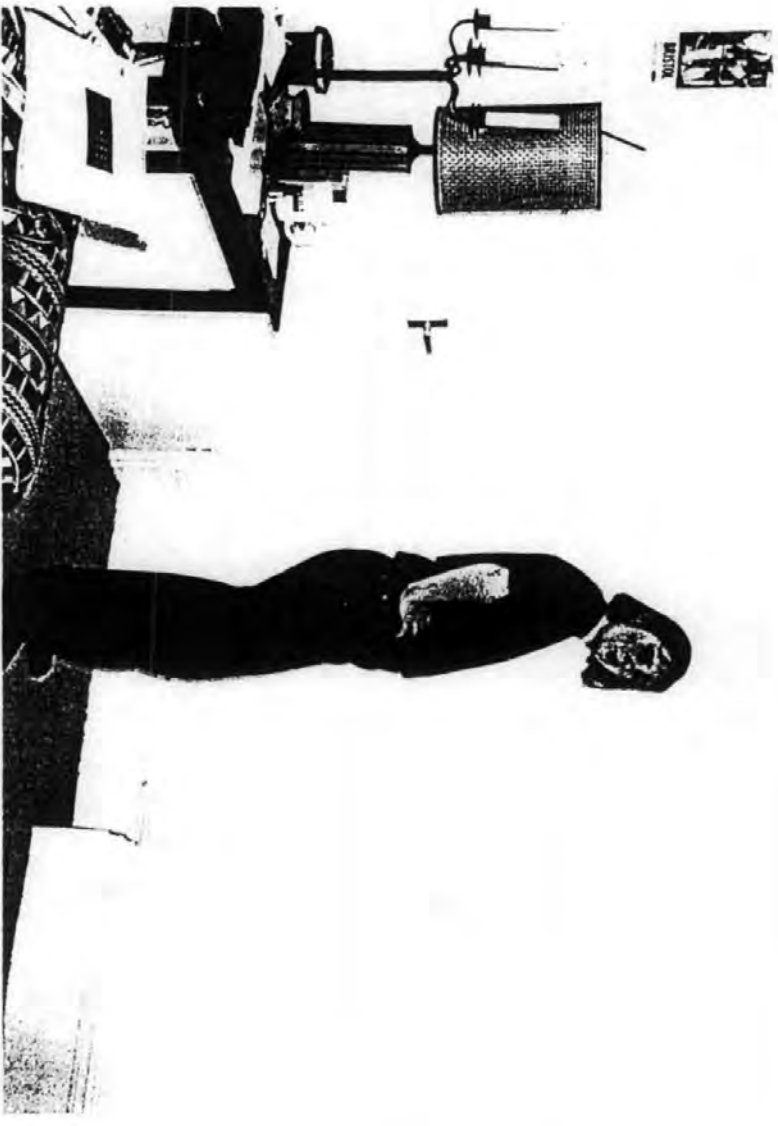
*APPENDIX XVI: INTERVENTION - SESSION 4 (page 6 of 7)*  
**FACES AND BODIES COMBINED**

Emotion: SURPRISE



*APPENDIX XVI: INTERVENTION - SESSION 4 (page 7 of 7)*  
**FACES AND BODIES COMBINED**

Emotion: CONTEMPT



**Nature of the Study**

The study is in two parts. Firstly, it will see how we understand what other people are feeling in social situations. Secondly, it will look at ways of improving these skills, so they can be better used in social situations.

A consent form will be given to you after you have read this sheet, and if you are willing to continue I would be grateful if you would sign it. Even if you do sign the form, you can withdraw at any time as your participation is voluntary.

Participants will be allocated to one of two groups. The only difference between the two groups is the point at which I will visit people individually for an hour a week over six weeks to do some work together.

**Stage I: Items participants will be asked to complete**

- 1      **Information processing:** the first set of items look at perception, learning and memory. There are three types of items, which are administered over one or two occasions.
- 2      **Stories:** participants will also be asked to listen to some stories, and answer questions about each story.
- 3      **Emotional processing:** the third set of items look at how people think about verbal and visual emotional information.

**Stage II: Weekly sessions looking at how emotions are expressed**

If you are still willing to take part at this stage, I will visit you once weekly on six occasions, and we will look at how emotions can be expressed and understood. Participants can choose whether or not the sessions are video-recorded.

**Stage III: Repeat of emotion information items**

Participants will be asked to repeat the emotional items, briefly described in Stage II above, to see if the work we did together during the six sessions was of use to participants in interpreting emotional information.

**General Notes**

Please remember that your participation is voluntary throughout, and if you do wish to withdraw this will not affect any current or future treatment offered by the National Health Service.

Please keep this sheet for your information. If you have any questions, please ask me.

**Address and telephone number where messages can be left for me**

Clinical Teaching Unit, Plymouth University, 4/5 Rowe Street, PLYMOUTH, PL4 8AA (Telephone: 0752 233163)

Nadine Hobro, Trainee Clinical Psychologist,  
Plymouth University / Southmead Health Care Services NHS Trust

**APPENDIX XVIII: CONSENT FORM** (page 1 of 1)

**Psychology research study investigating how emotional information is understood and processed**

**CONSENT FORM**

**PART A**

I \_\_\_\_\_  
(full name)

of (address)

\_\_\_\_\_  
\_\_\_\_\_

hereby fully and freely consent to participant in a psychology research project studying how emotional information is understood and processed.

I have been given an information sheet, which I have read and understood, and which I can keep for future reference.

I understand that I may withdraw my consent at any stage in the study.

Nadine Hobro and I have discussed how the study will proceed.

**Signed**

\_\_\_\_\_

**Name (in capitals)**

\_\_\_\_\_

-----  
**PART B**

I agree / do not agree\* to being video-taped / taped-recorded\* during sessions conducted with Nadine Hobro

**Signed**

\_\_\_\_\_

**Name (in capitals)**

\_\_\_\_\_

\* Please delete as appropriate

APPENDIX XIX: EMOTION & IDENTITY SORT (page 1 of 1)  
RATING FORM

EMOTION SORT - RATING FORM

Place tick in appropriate box for P's choice.

Match 1	A	F	H	S
P's choices				
M1				
F1				
M2				
F2				

IDENTITY SORT - RATING FORM

Circle emotion for set of photos being shown, then tick appropriate box for P's choice

Matching Faces	M1	F1	M2	F2
P's choice				
A, F, H, S				
A, F, H, S				
A, F, H, S				
A, F, H, S				

CIRCLE AS APPROPRIATE FOR EACH TRIAL PRESENTATION:

A = anger, F = fear, H = happy, S = sad

M1 = male 1, F1 = female 1, M2 = male 2, F2 = female 2



APPENDIX XX: COMPREHENSION OF VERBAL TERMS FOR EMOTIONS (page 1 of 1)  
RATING FORM

EMOTIONAL ADJECTIVES

PPVT NO.	LIST THREE	PARTICIPANT'S CHOICE		
		No.	Why that pic	What does word mean
109 No 3	Hurt			
59 No 4	Disappointed			
109 No 2	Scared			
152 No 2	Happy			
141 No 3	Furious			
55 No 4	Surprised			
86 No 4	Angry			
28 No 1	Sleepy			

APPENDIX XXI: COMPREHENSION OF VERBAL TERMS (page 1 of 2)  
INSTRUCTIONS AND EXAMPLE OF RATING FORM FOR RATERS

INSTRUCTIONS

You are asked to rate the following sets of statements according to the criteria set out below:

"Why that picture" statements:

Please rate whether each statement is either unusual or usual, and circle the appropriate number where:

Unusual = 1

(Odd or eccentric responses)

Usual = 2

(Eg normal, typical, or average responses)

"What does the word mean" statements:

Please circle one number for the above statement:

1

2

3

4

5

6

7

You are asked to circle one category number only. Categories are shown below:

Self-referential = 1

Eg the statement relates to a personal incident or circumstances.

Generalised or Situational = 2

Eg "Hurt" defined as "somebody got in an accident".

Synonym = 3

Eg "Furious" for "Angry".

Concrete = 4

Eg using a physiological reference.

Local Detail = 5

The statement refers to details in the picture.

Perseveration = 6

Eg the statement includes the target word.

Incorrect = 7

APPENDIX XXI: COMPREHENSION OF VERBAL TERMS (page 2 of 2)  
INSTRUCTIONS AND EXAMPLE OF RATING FORM FOR RATERS

EXAMPLE OF RATING FORM (NOUNS)

- 1 PPVT Picture / No. 4 / 4 Object: Bicycle P1 choice:  
Why that picture: (P's response given here)  
Please circle one number for the above statement

1 (unusual response)      2 (usual response)

What does the word mean: (P's response given here)

Please circle one number for the above statement

1            2            3            4            5            6            7

- 2 PPVT Picture / No. 47 / 1 Object: Picture P1 choice:  
Why that picture:  
Please circle one number for the above statement

1 (unusual response)      2 (usual response)

What does the word mean:

Please circle one number for the above statement

1            2            3            4            5            6            7

- 3 PPVT Picture / No. 42 / 4 Object: Carrot P1 choice:  
Why that picture:  
Please circle one number for the above statement

1 (unusual response)      2 (usual response)

What does the word mean:

Please circle one number for the above statement

1            2            3            4            5            6            7

What does the word mean: A vegetable.

- 4 PPVT Picture / No. 3 / 3 Object: Bed P1 choice: Why  
that picture:  
Please circle one number for the above statement

1 (unusual response)      2 (usual response)

What does the word mean:

Please circle one number for the above statement

1            2            3            4            5            6            7

APPENDIX XXII: CROSS-MODAL PROCESSING TASK (page 1 of 2)  
RATING FORM

EMOTIONS

Circle P's choice

E GESTURES	Participant's choice				
F	F	S	A	H	N
S	F	S	A	H	N
A	F	S	A	H	N
H	F	S	A	H	N
E SOUNDS	Participant's choice				
H	F	S	A	H	N
F	F	S	A	H	N
S	F	S	A	H	N
A	F	S	A	H	N
E CONTEXTS	Participant's choice				
F	F	S	A	H	N
H	F	S	A	H	N
S	F	S	A	H	N
A	F	S	A	H	N

CIRCLE AS APPROPRIATE FOR EACH TRIAL PRESENTATION  
 F=fear, S=sad, A=anger, H=happy, N=neutral

**APPENDIX XXII: CROSS-MODAL PROCESSING TASK (page 2 of 2)**  
**RATING FORM**

**THINGS**

Circle P's choice

MOVEMENTS	Participant's choice				
T	T	B	D	P	C
C	T	B	D	P	C
B	T	B	D	P	C
D	T	B	D	P	C
SOUNDS	Participant's choice				
C	T	B	D	P	C
T	T	B	D	P	C
D	T	B	D	P	C
B	T	B	D	P	C
CONTEXTS	Participant's choice				
T	T	B	D	P	C
C	T	B	D	P	C
D	T	B	D	P	C
B	T	B	D	P	C

**CIRCLE AS APPROPRIATE FOR EACH TRIAL PRESENTATION**  
 C=car, T=train, B=bird, D=dog, P=plane

APPENDIX XXIII: EXPERIENCING EMOTIONS (page 1 of 2)  
INSTRUCTIONS AND EXAMPLE OF RATING FORM FOR RATERS

You are asked to code the following extracts on the following dimensions:

- |   |   |           |
|---|---|-----------|
| 1 | <u>Locus of Control</u>   |           |
|   | <b>External and uncontrollable</b>  | Score = 1 |
|   | Statement does not directly centre on, or involve control by the P.                                       |           |
|   | Eg "My father retired."   |           |
|   | <b>Internal and uncontrollable</b>  | Score = 2 |
|   | Statement relates to and centres on the P, but is not in the P's control.                                 |           |
|   | Eg "I'm too big."   |           |
|   | <b>Internal and controllable by participant (P)</b>   | Score = 3 |
|   | Statement relates to and centres on the P, or P's efforts, and over which the P could exert some control. |           |
|   | Eg "I was good at exams."   |           |
| 2 | <u>Audience</u>   |           |
|   | <b>Absence of an audience</b>   | Score = 1 |
|   | No specific reference to an observer, and no contextual implications of an audience.                      |           |
|   | Eg "I was running and I tripped."   |           |
|   | <b>Implied audience</b>   | Score = 2 |
|   | Specific or implied presence of an audience   |           |
|   | Eg "I fell over and people laughed."  |           |
|   | "I fell over in the High Street."   |           |
| 3 | <u>Cognitive Strategy</u>   |           |
|   | <b>General</b>  | Score = 1 |
|   | P refers to a broad type of experience  |           |
|   | Eg "I was happy when I did something good."   |           |
|   | <b>Personal and/or specific</b>   | Score = 2 |
|   | Personal: P identifies a specific time and/or place.  |           |
|   | Eg "Yesterday I got angry when J hit me."   |           |
|   | Specific: P talks in the present tense.   |           |
|   | Eg "I'm angry when I get hit."  |           |
| 4 | <u>Cognitive Thinking Phrases</u>   |           |
|   | No use of such phrases, or the use of idiomatic phrases   | Score = 1 |
|   | Eg You know; I don't know   |           |
|   | Use of "thinking" phrases   | Score = 2 |
|   | Eg I think; I guess; I can't remember   |           |
| 5 | <u>Type of Response</u>   |           |
|   | Unusual type of response  | Score = 1 |
|   | Normal or usual type of response  | Score = 2 |

APPENDIX XXIII: EXPERIENCING EMOTIONS (page 2 of 2)  
INSTRUCTIONS AND EXAMPLE OF RATING FORM FOR RATERS

PRIDE

(P's response given here)

Please circle one score in each category according to the above coding criteria:

Locus			Audience		Strategy		Thinking		Response Type	
1	2	3	1	2	1	2	1	2	1	2

SADNESS

(P's response given here)

Please circle one score in each category according to the above coding criteria:

Locus			Audience		Strategy		Thinking		Response Type	
1	2	3	1	2	1	2	1	2	1	2

HAPPINESS (no pause)

(P's response given here)

Please circle one score in each category according to the above coding criteria:

Locus			Audience		Strategy		Thinking		Response Type	
1	2	3	1	2	1	2	1	2	1	2

EMBARRASSMENT (no pause)

(P's response given here)

Please circle one score in each category according to the above coding criteria:

Locus			Audience		Strategy		Thinking		Response Type	
1	2	3	1	2	1	2	1	2	1	2

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