THE SELF AND AUTISM: AN EXPERIMENTAL INVESTIGATION

by

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Abstract

The development of the self is primarily dependent on a child's experience of her/himself in relation to others. A cardinal feature of early childhood autism is the child's deficient capacity for, and probably experience of, affectively patterned interpersonal relations. These considerations led to the hypothesis that young people with autism would experience and conceptualise themselves in ways that are qualitatively different from non-autistic people of the same chronological and mental age. This hypothesis was explored by a combination of clinical and experimental methodologies comparing matched autistic and non-autistic subjects: The evaluation of participants' self-descriptions through semi-structured interviews; the assessment of participants' self-depiction through drawings; and the investigation of linguistic self-reference through formal experimental studies of participants' personal pronoun comprehension and use.

Broadly speaking, the results were in accord with the predictions derived from the above hypothesis. Young people with autism, although describing themselves with as wide a range of statements as their matched control subjects, were significantly less likely to define themselves in relation to others and significantly less likely to use social reasoning to explicate their statements about themselves. They did use a comparable number of physical, active and psychological based self-constructs as their matched counterparts. In the drawing tasks, the young people with autism produced drawings and copied geometric figures as competently as their matched controls, but showed significantly less differentiation among their human figure drawings (including those of the self) vis-à-vis non-human figure drawings in terms of their use of features to depict them. In the final set of tasks, designed to explore personal pronoun understanding and use, there was no group difference in the participants' comprehension. The autistic group, however, showed a relative propensity to use the pronoun 'I' rather than 'me' in certain visuo-spatial tasks, and those of lower ability tended to use proper names instead of 'me' and 'you' for themselves and the experimenter. These findings are discussed within the framework of a theory of the development of self-reflective awareness in normal and autistic children, with special reference to lack of engagement with other people by young people with autism.
Table of contents

ABSTRACT .................................................................................................................................................2
TABLE OF CONTENTS ..................................................................................................................................3
LIST OF TABLES .........................................................................................................................................7
LIST OF FIGURES .......................................................................................................................................9
ACKNOWLEDGEMENTS ............................................................................................................................10

CHAPTER ONE: THE SELF: DEFINITION, ORIGINS AND EARLY DEVELOPMENT .............................. 11
1.1 INTRODUCTION ........................................................................................................................................12
Plan of Thesis and Predictions ..................................................................................................................14
1.2 THE DEFINITION OF SELF .......................................................................................................................16
1.3 THE ORIGINS AND EARLY DEVELOPMENT OF THE SELF .............................................................. 17
The ecological self .................................................................................................................................18
The interpersonal self ............................................................................................................................19
1.4 SELF-RECOGNITION AND EARLY SELF-UNDERSTANDING ......................................................... 33
Mirror self-recognition ..........................................................................................................................33
Videotaped self-recognition .................................................................................................................38
Picture self-recognition .........................................................................................................................40
Early self-understanding .........................................................................................................................41
Self-conscious behaviour .....................................................................................................................45
Early understanding of the other ........................................................................................................48
1.5 OVERVIEW ..............................................................................................................................................49

CHAPTER TWO: THE SYNDROME OF AUTISM ...................................................................................... 52
2.1 INTRODUCTION ........................................................................................................................................53
2.2 THE CLINICAL FEATURES OF AUTISM ..............................................................................................54
Case material ............................................................................................................................................54
Current diagnostic criteria ....................................................................................................................59
The prevalence of young people with autism ..................................................................................60
An overview of the social impairment in young people with autism ................................................61
2.3 FACETS OF THE SOCIAL IMPAIRMENT ..............................................................................................62
Joint attention ...........................................................................................................................................63
Social referencing .................................................................................................................................72
Imitation ..................................................................................................................................................75
Social role-taking .....................................................................................................................................80
Summary of the research findings .........................................................................................................85
2.4 SELF-RECOGNITION AND SELF-UNDERSTANDING IN YOUNG PEOPLE WITH AUTISM ........ 86
Self-recognition in young people with autism ..................................................................................87
Self-conscious behaviour in young people with autism ..................................................................91
Self-description in young people with autism ..................................................................................93
Summary of research findings ............................................................................................................95
2.5 THEORETICAL APPROACHES TO SELF-OTHER AWARENESS IN AUTISM ......................... 95
The Interpersonal model ....................................................................................................................96
The Theory of Mind model .................................................................................................................101
The Executive Functioning model ......................................................................................................104
2.6 CONCLUSION .........................................................................................................................................109
CHAPTER THREE: SELF-UNDERSTANDING .......................................................... 111

3.1 INTRODUCTION................................................................................................. 112
3.2 SELF-UNDERSTANDING FROM EARLY CHILDHOOD TO LATE ADOLESCENCE .... 113
   Early childhood.................................................................................................. 113
   Late childhood.................................................................................................. 118
   Early adolescence.............................................................................................. 119
   Late adolescence............................................................................................... 120
   Summary of research findings......................................................................... 121
3.3 SELF-UNDERSTANDING IN YOUNG PEOPLE WITH MENTAL RETARDATION ....... 122
   Summary of research findings......................................................................... 126
3.4 SELF-UNDERSTANDING IN YOUNG PEOPLE WITH AUTISM............................. 127
   Summary of research findings......................................................................... 136
3.3 A DEVELOPMENTAL MODEL OF SELF-UNDERSTANDING .................................. 137
   Self-as-subject.................................................................................................. 140
   The self-as-object.............................................................................................. 143
3.5 METHODOLOGICAL ISSUES................................................................................ 146
   Language comprehension.................................................................................. 146
   Language expression......................................................................................... 149
   Memory............................................................................................................. 150
   Motivation.......................................................................................................... 151
3.6 A STUDY TO EXAMINE SELF-UNDERSTANDING IN YOUNG PEOPLE WITH AUTISM . 152
   Participants...................................................................................................... 152
   Method.............................................................................................................. 153
   Scoring of the self-understanding interview..................................................... 154
   Results: Self-as-subject...................................................................................... 156
   Examples of self-as-subject statements.............................................................. 157
   Summary of results: Self-as-subject.................................................................... 166
   Results: Self-as-object......................................................................................... 167
   Examples of self-as-object statements............................................................... 171
   Summary of results: Self-as-object..................................................................... 185
3.7 SUMMARY OF FINDINGS AND DISCUSSION........................................................ 187

CHAPTER FOUR: SELF-DEPICTION IN HUMAN FIGURE DRAWING.......................... 192

4.1 INTRODUCTION................................................................................................. 193
4.2 THE EMERGENCE OF REPRESENTATION IN CHILDREN'S DRAWINGS: THE NORMAL CASE ...... 194
   The pre-schematic stage.................................................................................... 195
   The schematic stage.......................................................................................... 196
   The naturalistic stage......................................................................................... 198
4.3 THE HUMAN FIGURE DRAWING AS AN INDEX OF COGNITIVE DEVELOPMENT........ 200
4.4 THE DRAWING DEVELOPMENT OF YOUNG PEOPLE WITH MENTAL RETARDATION .... 203
4.5 THE DRAWING DEVELOPMENT OF YOUNG PEOPLE WITH AUTISM...................... 205
   Summary of research findings......................................................................... 214
   Methodological issues....................................................................................... 214
4.6 STUDY I: SELF-DEPICTION IN THE DRAWINGS OF YOUNG PEOPLE WITH AUTISM ...... 215
   Participants...................................................................................................... 216
   Method.............................................................................................................. 217
   Coding of drawings.......................................................................................... 219
   Analysis of data and results............................................................................. 220
   Summary of findings from Study I.................................................................... 224
4.8 STUDY II: SELF-DEPICTION IN THE DRAWINGS OF YOUNG PEOPLE WITH AUTISM ..... 226
   Participants...................................................................................................... 226
   Method.............................................................................................................. 227
   Coding of drawings.......................................................................................... 227
List of Tables

**Table 3.1** Distribution of the percentage of self-statements: adapted from Mavropoulou (1995) .......................................................... 134

**Table 3.2** Self-understanding study: Participant characteristics .......................................................... 153

**Table 3.3** Self-as-subject: Distribution of coded chunks .................................................................. 156

**Table 3.4** Self-as-subject: Spearman Rank Correlation Coefficients for performance with verbal mental age and verbal IQ ................................................. 166

**Table 3.5** Self-as-object: Distribution of coded chunks .................................................................. 167

**Table 3.5** Self-as-object: Spearman Rank Correlation Coefficients for performance with verbal mental age and verbal IQ ................................................. 185

**Table 4.1** Drawing study I: Participant characteristics .......................................................... 216

**Table 4.2** Study I: Total scores on the drawing tasks by the autistic group ........................................ 220

**Table 4.3** Study I: Total scores on the drawing tasks by the non-autistic group .............................. 221

**Table 4.4** Study I: Between-group comparison of mean total scores .................................................. 222

**Table 4.5** Differentiation in terms of form: Self versus same-sex human figure drawings ....... 223

**Table 4.6** Differentiation in terms of style: Self versus same-sex human figure drawings ............... 223

**Table 4.7** Differentiation in terms of form: Female versus male human figure drawings ..... 224

**Table 4.8** Differentiation in terms of style: Female versus male human figure drawings ..... 224

**Table 4.10** Study II: Total scores on the drawing tasks by the autistic group ................................. 229

**Table 4.11** Study II: Total scores on all drawing tasks by the non-autistic group ............................ 229

**Table 4.12** Study II: Between-group comparison of mean total scores ........................................ 230

**Table 4.13** Differentiation in terms of form: Self versus same-sex human figure drawings ............. 231

**Table 4.14** Differentiation in terms of style: Self versus same-sex human figure drawings ............. 231

**Table 4.15** Differentiation in terms of form: Female versus male human figure drawings ..... 231

**Table 4.16** Differentiation in terms of style: Female versus male human figure drawings ............. 232

**Table 4.17** Differentiation in terms of form: House versus school figure drawings .................... 233

**Table 4.18** Differentiation in terms of style: House versus school figure drawings .................... 233

**Table 4.19** Differentiation in terms of form: School versus church figure drawings ............ 233
TABLE 4.20 Differentiation in terms of style: School versus church figure drawings .......... 234

TABLE 4.21 Differentiation in terms of form: First non-human contrast - first human contrast .............................................................................................................................................. 235

TABLE 4.23 Differentiation in terms of style: First non-human contrast - first human contrast .............................................................................................................................................. 235

TABLE 4.24 Differentiation in terms of style: Second non-human contrast - second human contrast .............................................................................................................................................. 236

TABLE 4.25 Details of scores achieved on drawing tasks by the autistic participant .......... 242

TABLE 4.26 Details of scores achieved on drawing tasks by the non-autistic participant ...... 242

TABLE 4.27 Pearson correlation coefficients for verbal mental ability and task performance .............................................................................................................................................. 243

TABLE 4.28 Spearman rank correlation coefficients for cognitive verbal ability and differentiation depicted between human figure drawings .............................................................................................................................................. 244

TABLE 4.29 Spearman rank correlation coefficients for cognitive verbal ability and differentiation depicted between non-human figure drawings .............................................................................................................................................. 245

TABLE 5.1 Pronoun experiment one: Participant characteristics ........................................ 267

TABLE 5.2 Comprehension task 1(a): Performance of those subjects who made at least one error overall ................................................................. 274

TABLE 5.3 Production task 1(b): Number of individuals in each 'predominant response' category .............................................................................................................................................. 276

TABLE 5.4 Production task 1(b): Number of individuals in each 'predominant response' category .............................................................................................................................................. 278

TABLE 5.5 Production task 1(b): Performance of those participants using correct pronouns to refer to themselves .............................................................................................................................................. 279

TABLE 6.1 Pronoun experiments two and three: Participant characteristics .................... 285

TABLE 6.3 Production task 2.1(b): Number of individuals in each response category .......... 289

TABLE 6.4 Production task 2.2(b): Number of individuals in each response category .......... 292

TABLE 6.5 Production across tasks 2.1(b) and 2.2(b): Individual s' patterns of performance .............................................................................................................................................. 293

TABLE 6.6 Production task 3: Number of individuals in each response category ............ 295
List of Figures

**Figure 3.1** The developmental model of self-understanding (adapted from Damon and Hart, 1988) ................................................................. 139

**Figure 3.2** Items comprising the Self-understanding Interview ......................................................................................................................... 155

**Figure 3.3** Self-as-subject scheme: Distribution of the mean number of chunks (group x category) ................................................................. 157

**Figure 3.4** Self-as-object scheme: Distribution of the mean number of chunks (group x category) ................................................................. 169

**Figure 3.5** Self-as-object scheme: Distribution of the mean number of chunks (group x level) .............................................................................. 170

**Figure 3.6** Self-as-object scheme: Distribution of the mean group difference in number of chunks ........................................................................... 170

**Figure 4.1** Example of a 'tadpole' figure: Self-figure drawn by Tom at 3 years 9 months of age ................................................................................. 196

**Figure 4.2** An example of a self-figure drawn by Sinéad at 4 years 7 months of age .......................................................... 197

**Figure 4.3** An example of a 'parachuting' human-figure drawn by Sinéad at 5 years 8 months of age .................................................. 198

**Figure 4.4** An example of a self-figure drawn by Tom at 7 years 9 months of age .............................................................. 199

**Figure 4.5** The Rey-Osterrieth complex figure .......................................................................................................................... 218

**Figure 4.6a** Human figure drawings of a young person with autism .............................................................................................. 238

**Figure 4.6b** Non-human figure drawings of a young person with autism .............................................................................................. 239

**Figure 4.7a** Human figure drawings of a young person with mental retardation ............................................................................................. 240

**Figure 4.7b** Non-human figure drawings of a young person with mental retardation ............................................................................................. 241

**Figure 6.1** Experiment Two: Orders of presentation of pairs of photographs ............................................................................................. 287
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CHAPTER ONE: The self: Definition, origins and early development
1.1 Introduction

In this thesis the self is understood as an organising entity; a psychological interface that operates between the organism and its environment. The innate capacity to organise invariant patterns enables the new-born child to apprehend salient aspects of her/his physical and social world. The primary representations that connect the child with the physical environment determine the ecological self, while the capacity to spontaneously engage with other people is the basis for the interpersonal self. These are, it is assumed, the foundations of the self-as-subject.

The interpersonal self continues to develop as a result of the child's own emerging social capacities and the internalisation of the attitudes of others towards the individual. Insight into the form of the child's self may be obtained through observation of the child in relation to others and through forms of symbolic expression as evidenced, for example, in self-drawings or self-description once the requisite capacities and skills have emerged. Those aspects of the self upon which the child may reflect upon come to define the self-as-object.

Children with autism lack the ability to effect intersubjective co-ordination with other people, and are thus less able than non-autistic children to respond to, understand and integrate others into their representation of the world. The implications of this are that the awareness and understanding of self, which is defined principally in relation to others, will be correspondingly limited in people with autism.

Clinical descriptions of young people with autism show that some of these children may be observed to avoid or be indifferent to the company of others; that they may demonstrate a strong and pervasive preference to be alone; they may seem to be more content with familiar inanimate objects than with familiar people; they appear unable to relate to or engage with other people; and they seem not to appreciate social rules and mores. These and other observations appear to reflect the deficient or poor interest paid by children with autism to other people, and raise the possibility of a lack of self-awareness
in relation to others. This lack of self-awareness in young people with autism has also been suggested by the self-reports and autobiographies of exceptionally articulate autistic adults (e.g., Bemporad, 1979; Grandin, 1984).

Experimental studies designed specifically to understand the nature of the self in autism have shown that young people with autism who demonstrate physical self-recognition tend not to show coy or self-conscious behaviour (Dawson and McKissik, 1984; Neuman and Hill, 1978; Spiker and Ricks, 1984); they tend not to share their achievements with others, nor to react to the praise given to them for such achievements by others (Kasari, Sigman, Baumgartner, and Stipek, 1993); they tend to demonstrate difficulties in spontaneously producing the first- and second-person pronouns (Jordan, 1989); and they tend to perceive themselves as less physically and socially competent and hold lower estimates of overall self-worth than non-autistic matched control individuals (Capps, Sigman and Yirmiya, 1995). In addition several experimental studies, not designed to directly examine the self in autism, have shown that these people have difficulties in understanding the mental or psychological states of other people. For example, young people with autism have been shown to have difficulties with recognising emotions (Hobson, Ouston and Lee, 1988a, b; Snow, Hertzig and Shapiro, 1987), and in understanding that other people behave in ways that reflect their beliefs and desires (Baron-Cohen, Leslie and Frith, 1985; 1986). The difficulties of young people with autism to understand the mental states of others may be expected to affect their awareness of self in relation to others.

To date there has been little systematic research designed to examine the spontaneous expressions of the self in young people with autism. The purpose of the research to be presented in this thesis is to explore the self in young people with autism from three different perspectives: a standard, semi-structured clinical interview to examine their self-descriptions; a study of their human figure drawings (self-depiction); and an investigation of first- and second-person pronoun comprehension and use to examine their self-reference.
Plan of Thesis and Predictions

In this chapter the definition of the self as outlined above will be expanded upon. The origins and early development of the self-as-subject in normally developing children will be traced. The distinction and evidence for the ecological self, that defines the child in relation to a physical world, and the interpersonal self, that defines her/him in relation to other people, will be considered. With the child's developing capacity to hold secondary representations, the self-as-object emerges. At this time too, children demonstrate a different quality of relating to other people (secondary intersubjectivity). Experimental studies will be reviewed to trace the social capacities and different stages of self-development in normally developing children, and to present the techniques employed to tap into the self at each of these stages.

In Chapter Two, the clinical features associated with the syndrome of autism, and the criteria necessary for formal diagnosis will be outlined. Drawing on clinical and empirical findings, a detailed description of the nature of the social impairment in children and young people with autism will be provided. In particular, the child's impaired capacity for secondary intersubjectivity will be examined. This will be followed by a review of the research literature on the self in autism. Chapter Two will conclude with a section on the current theoretical approaches to understanding the social impairment in young people with autism.

Three sets of studies, each using different methodological designs ranging from clinical to experimental, have been used to explore the principal thesis. The first study was designed to examine the self-description of young people with autism using a standardised semi-structured clinical interview. The participants of the study group were matched with non-autistic children for both chronological age and verbal mental ability, and therefore for verbal IQ. It was predicted that, relative to the non-autistic control group, children and young people with autism would be less likely to explicitly or implicitly integrate other people into their accounts of self. A review of the literature, this study and its findings will be reported in Chapter Three.
The second set of studies were designed to examine the self-depiction of young people with autism through their drawings of the human figure. The study group were compared with a non-autistic control group who were individually matched for chronological age, verbal and non-verbal mental ability. It was predicted that the differentiation between the female and male human figure drawings, and the self and same-sex human figure drawings would be less marked for autistic than non-autistic participants. A review of the literature, the two studies and their findings will be reported in Chapter Four.

The third and final set of studies were designed to examine linguistic self- and other-reference in young people with autism. First- and second-person pronoun comprehension and use were formally tested in the course of three experimental studies. The study group were compared with a non-autistic control group individually matched for chronological age and verbal mental ability. The prediction was that in comparison with the control group, the autistic group would be less likely to comprehend or employ the personal pronouns 'I / me' and 'you', preferring instead to use their own and the other's first names. The first study employed visuo-spatial role-taking tasks, and the second and third studies used photographs of the self and familiar others to examine pronoun comprehension and use in young people with autism. A review of the literature, the first pronoun study and its findings will be reported in Chapter Five, while the other two pronoun studies and their findings will be reported in Chapter Six.

The final chapter will be devoted to a review of the above studies, a discussion of their significance in relation to previous clinical and experimental investigations, and a consideration of methodological issues. Prospects for future studies will also be considered.

In what follows, space will be devoted to conceptual clarification concerning the notion of self. This will provide the basis for the thinking that underlies the present set of studies. To understand 'self-development' in children and young people with autism, it will be necessary to be as clear as possible about the meaning of self in non-autistic individuals. Moreover, the studies to be described include conditions in which young people with autism were tested for their ability to describe themselves, depict themselves in drawings, to employ personal pronouns, and to recognise themselves in photographs, and
so it is pertinent to review how related abilities emerge in the course of the early development of non-autistic children.

1.2 The definition of self

William James (1961/1892) defined the whole or global self, in terms of two simultaneously operating parts: the subjective 'I' and the objective 'me'. The subjective 'I' (self-as-subject) is the knower, the experiencer; it is that aspect of the self that initiates, organises and interprets experience in a subjective manner. James reasoned that the self-as-subject is not cognisant and therefore not discernible. Damon and Hart (1982) write:

The 'I' enters into all of a person's experience since it determines the unique nature of all the person's interpretations of events, people, and things. It determines the very meaning of life events, providing itself even with a perspective on itself (p. 845).

The individual may, however, become aware of the 'I' through four types of experience: the awareness of her/his agency over life events provides the individual with a sense of autonomy; the awareness of her/his personal continuity provides the individual with a sense of the stability over time; the awareness of her/his distinctness or uniqueness of life experiences provides the individual with a sense of one's individuality; and the awareness of her/his own awareness or self-reflectivity provides the individual with a sense of self-consciousness.

The objective 'me' (self-as-object) defines what is known: The sum total of all a person can call his (James, 1961/1892: p. 44). For James the 'me' comprises three constituents: the material characteristics of the self, which include one's body and possessions; the social characteristics of the self, which include one's relations, roles and personality; and the spiritual characteristics of the self, which include one's thoughts and psychological mechanisms. James believed these three constituents to be hierarchically organised with the material self at the bottom and the spiritual self at the top, and that they combine in unique ways to create each person's view of her/himself. Damon and Hart (1982) proposed a fourth
constituent, the active qualities of the self, which include one's typical behaviour. Furthermore, they dispute the hierarchically organised structure proposed by James, suggesting that each constituent develops in its own right and alongside the others. The various categories comprising the self-as-subject and self-as-object will be returned to in Chapter Three.

The partitioning of the self into the self-as-subject and self-as-object will be adopted throughout this thesis. The possible origins and early development of the self will now be considered.

1.3 The origins and early development of the self

The self-as-subject represents all psychological functioning, and emerges from a broad range of early experiences that provide a sense of order through consistency and regularity for the child. It is assumed that the new-born is predisposed to perceive and register such order. The self-as-object arises later with the emerging capacity for self-reflective awareness. In the following section more detail as to the possible origins of the self-as-subject will be considered.

The self-as-subject may be considered as having its origins in two fundamental aspects of the world. The physical world presents a degree or regularity to which, it is assumed, the new-born child is predisposed to register. This physical source of information provides the basis of the ecological self. In addition, the social world presents a degree of regularity through the child's experience with other people. This social source of information is the basis for the interpersonal self. The physical and social patterns are apprehended by the infant through primary representations. In this section these two aspects of the self will be considered.
The ecological self

The ecological self, proposed by Neisser (1993), specifies the young child’s direct and therefore immediate perception of her/himself in terms of her/his ongoing relation to the physical environment. Direct information is that which does not require reflection. It is assumed that the child is predisposed to register certain patterns of stimuli through primary representations. These serve to provide the new-born with immediate survival responses, and provide the foundations for a more sophisticated construction of her/his physical world.

There are a number of studies which have provided support for the notion of an ecological self. The most well-cited example is the demonstration that babies will flinch from an expanding optical array: so called looming (e.g., Ball and Tronick, 1971). Further evidence is cited from the effects of parallel flow in the optic array, which specifies movement. Lee and Aronson (1974), for example, stood young children who had only recently learned to stand onto a rigid floor. When the walls were slightly moved the children compensated for the non-existent loss of balance signalled by the optic flow pattern, and fell in the direction appropriate to the plane of instability specified. Similarly, Butterworth and Hicks (1977) found that children too young to stand also compensated for visually specified instability when seated in moving room. Finally, Pope (1984) sat babies too young to crawl in a moving room and demonstrated that they made compensatory head movements.

The ideas and evidence supporting the ecological self will be taken no further in this thesis. Before ending, however, it is worth noting that this aspect of the self in young people with autism appears to be intact relative to their interpersonal self. Clinical descriptions of young people with autism, for example, contest to their adeptness in negotiating their physical environment, and highlight their good relations to the physical environment in contrast to their poor relations to other people (Bosch, 1970; Creak, 1961; Kanner, 1943). The juxtaposition of the ecological self with the interpersonal self may prove a fruitful way forward in teasing out underlying processes in representation ability in young people with autism in future studies.
The interpersonal self

The interpersonal self is based upon the young child's capacity to spontaneously engage with her/his caregiver. The most startling demonstration of this is to be found in the new-born baby's ability to imitate another person. Meltzoff and Moore (1977) reported two studies in which they examined the capacity of infants under three weeks of age to imitate. Each child was shown four gestures in a repeated-measures design (lip protrusion; mouth opening; tongue protrusion; sequential finger movement). The investigators found that the children differentially imitated all four responses. They argued, however, that the findings could have been explained in terms of 'motor resonance' or co-action. To control for this possibility, they conducted a second study in which a short delay was imposed between the modelling and response. The children were shown two gestures in a repeated-measures design (mouth opening; tongue protrusion). The presentation of the visual stimulus and the child's response was spilt temporally by providing the children with a pacifier to suck on during the visual display. After the experimenter demonstrated the gesture, a passive face pose was assumed. At this point the pacifier was removed. After 150 seconds the pacifier was re-presented to the infants and the second gesture was modelled. The infants actively sucked on the pacifier during the presentation of the gestures. The sucking reflex took precedence over any imitative tendency. The findings supported the hypothesis of imitation: the investigators found that infants as young as three-weeks old were able to differentially imitate the two gestures presented, and that the pacifier manipulation excluded the possibility that the findings were due to motor resonance.

Meltzoff and Moore (1983) argued that the children may have learned to copy these displays during the early mother-infant interaction that occurred in the very first postnatal weeks surrounding feeding. They reasoned that if early childhood imitation depended upon prior social learning, then new-born children should fail at these tasks. They therefore examined 40 new-born babies, who had a mean age of just 32 hours. Each child was shown two gestures in repeated-measures design (mouth opening; tongue protrusion). Results showed that there were significantly more mouth openings in the mouth opening condition than for the tongue protrusion condition and vice-versa.

We can conclude that extended postnatal learning from interactions with caretakers is not a necessary condition for imitation in humans. Some primitive capacity to copy the actions of the adult appears to be present from birth ... infants can, at some level of processing, apprehend the equivalencies between body transformations they see and body...
transformations of their own that they proprioceptively "feel" themselves make. Infants see the adult's display and incorporate it as a kind of target against which they can compare their ongoing movement patterns and bodily postures (Meltzoff, 1990: p 157).

Other examples of spontaneous engagement include the demonstration that new-born babies show a strong preference for the human face (Johnson, Dziurawiec, Ellis, and Morton, 1991), and that by six to eight weeks of age, babies return embraces, maintain eye-contact, and exhibit the beginnings of reciprocal vocalisation with their mothers (Bateson, 1975). These and other predisposed integrative social capacities enable the young child to 'resonate' and interact with other people on a primitive level. Furthermore, parents demonstrate a capacity to spontaneously and consistently attune to their baby's early physical and social needs, suggesting that they too are biologically endowed to respond in a meaningful manner to their babies' early relational capacities (Papousek and Papousek, 1983).

This latter point is clearly evidenced in the distress shown by infants when parents' responses are discordant with that of their infants. Murray and Trevarthen (1985), for example, sat individual two- and three-month-old children before a television monitor that showed their mother's face, looking towards the infant. The mother herself was situated in another room, but she too could relate to a television monitor showing her baby facing her, close-up. During this arrangement the mother and her baby were shown to engage with each other in a surprisingly natural and fluent way. A 'perturbation' was achieved by employing a videotape feedback system to introduce a delay of 30 seconds in the time when the mother's responses were relayed to the baby over the television link. This meant that from each participant's point of view, what should have been a co-ordinated to-and-fro sequence of interaction became totally desynchronised. The effect was considerable child distress, with every child observed turning her/his head away from their mother, and each making darting, brief looks back towards the television image. This represented a qualitatively different set of reactions than occurred when the mother merely looked away or even displayed a 'blank-faced' posture in earlier contrived conditions.

These early face-to-face, non-reflective, spontaneous, and co-ordinated communications between the young child and her/his caregiver are examples of primary intersubjectivity (Murray and Trevarthen,
The observation of this early communication, mediated through primary representations, supports the notion of an innate readiness for an emotional relationship with others.

Stern (1985) proposes four different senses of self in infancy, each of which are based upon the infant's social capacities at the time. As new social capacities emerge the self develops to provide increasingly mature subjective perspectives on the self and other. He argues that between birth and two months, the infant's social capacities operate with vigorous goal directedness to assure social interactions. With the capacity to integrate 'diverse happenings' connectedness forms rapidly, and infants experience the emergence of organisation: a sense of an emergent self. These integrative experiences are not yet embraced by a single organising subjective perspective. This occurs at the next developmental stage.

Between the second and sixth month of life infants have the capacity to sense that they and mother are physically separate, are different agents, and have distinct affective experiences. This allows for the formation of the physical self. It is experienced as a coherent, wilful, physical entity. This self generally operates outside of awareness: an experiential sense Stern refers to as the sense of core self. It rests upon the working of many interpersonal capacities. Its formation causes the subjective social world to alter allowing interpersonal experience.

Between the seventh and ninth months infants develop the capacity for sharing a focus of attention; for attributing intentions and motives to others; and for attributing states of feeling in others. The child 'discovers' that there are other minds as well as their own. Self and other are now registered (but not fully represented) as distinct in terms of feelings, motives and intentions. These mental states now become the subject matter of relating and provides the infant with a sense of subjective self. Again this is not a sense that the young child is aware of.

At around 15 to 18 months the sense of a verbal self arises from the emerging capacities to objectify oneself, to be self-reflective, and to comprehend and produce language. It represents a store of knowledge and experience that can be objectified and rendered as symbols that convey meanings to be
communicated and shared: the self-as-object. Stern asserts that all four domains of relatedness remain active during development. Each becomes more elaborate.

The self-as-subject, then, has its origins in the predisposed capacity to sense order, consistency and regularity in the information registered by the young child. Such information may be classed in terms of that which is physically immediately available to the her/him (specifying the ecological self) and that which is available through other people (specifying the interpersonal self). The interpersonal self may be seen to develop through a series of stages as the infant's other capacities emerge and develop. In their early stage of formation, the ecological and interpersonal selves are not cognitive or inferential. It is assumed that the reactions of babies to their physical and social environments are based upon a predisposed capacity to hold primary representations.

How the infant, with her/his predisposition to apprehend order, then comes to be self-conscious is a fundamental question. Vygotsky (1979) argued that social meaningful activity may serve as a generator of consciousness. He suggested that individual consciousness is built from outside through relations with others.

_The mechanism of social behavior and the mechanism of consciousness are the same ... We are aware of ourselves, for we are aware of others, and in the same way as we know others; and this is as it is because in relation to ourselves we are in the same as others are to us (Vygotsky, 1979: p. 29-30)._ 

Human higher mental functioning must be viewed as products of mediated activity. The role of mediator is played by psychological tools and means of interpersonal communication. There is a striking similarity between Vygotsky's thesis and that of Mead's ideas on symbolic development. Mead (1934) argued that a person's self-awareness arises from interacting with others in the course of her/his ontogenetic and social development. The self could only be understood in relation to that which was 'non-self'. The most important class of 'non-self' was that of 'others'. For Mead the gesture served as the basis of social interaction, and was defined as a part action which others complete. Mead's distinctive approach was to define the meaning of a gesture as being the response which it evokes in others.
The events that inform the interpersonal self, therefore, are defined in the expressive gestures directed toward the young child from the other person. As Hamlyn (1974) writes:

... certain emotional attitudes and reactions are part of our genetic inheritance, thus forming the basis of... the natural reactions of person to person... such... that a personal relation is a natural thing for a person whether it is recognised or not (p. 24 - 25).

Through being in relation with others, the young child continually experiences the attitudes, conveyed through gestures, of those key people in her/his life. Attitudes themselves are characterised by a regular mental stance in relation to an object or person, with an associated affect. These social attitudes become internalised (Mead, 1934), and shape the self-as-subject, providing the young child with a growing sense of agency, continuity, and distinctness. These aspects of the self-as-subject will be discussed further in Chapter Three.

Primary representations are assumed to be more or less accurate reflections of a perceived reality. Secondary representations, on the other hand, are detached or separated from one's immediate perceptual reality. Thus an awareness of the self requires the capacity for secondary representation, because the self-as-object is not a direct perception of the self but rather a constructed mental model. The point at which the self-as-object emerges will now be considered.

The self-as-object represents the conscious aspects of self. As children develop, they become able to reflect on aspects of the emerging order centred around the self-as-subject. Neisser (1993) writes:

Younger infants have active ecological and interpersonal selves, but they do not take themselves as objects of thought. The ability to think explicitly about oneself probably begins with the realization that someone else is doing so already - that is, on becoming aware that one is the object of another person's attention (p. 5).

The individual is an object in the social world of other people. Through interacting with others she/he becomes an object to her/himself. The growing awareness of oneself in relation to others may be evidenced in the different quality of social initiations and reactions to other people. Young children, towards the end of their first year, begin to look to where their caregiver is looking (joint attention); to integrate their caregiver's emotional attitude towards another person or novel object (social referencing); to make attempts to deliberately do what their caregiver does with objects (imitation); and to view the
world from other people's perspectives (social role-taking). These co-ordinated communications between
the child and her/his caregiver are examples of secondary intersubjectivity (Trevarthen and Hubley,
1978). Furthermore, children at this age begin to direct intentional communicative gestures to adults,
thus showing that they hold expectations that their caregivers are causal agents who make things
happen. Each participant not only interacts with the other but is also aware of the other's intentional
participation. Tomasello (1993) argues that secondary intersubjectivity enables children to reflect upon
and categorise the attitudes of others towards them. At this time children may begin to use their
developing abilities of categorisation to begin forming true self-concepts. The classes of self-as-object
categories, including the physical, active, social and psychological aspects, will be discussed in detail in
Chapter Three. The remainder of this section will examine more closely the nature of the interactions
between the young child and her/his caregiver in terms of the child's capacity for joint attention, social
referencing, imitation, and social role-taking, and their implications for the development of the self-as-
object. The prime reason for considering these social activities is that they have each been shown to be
impaired to a greater or lesser degree in young people with autism. The empirical evidence for the
impairments in young people with autism will be taken up in Chapter Two.

Joint attention

At around eight months of age the child demonstrates a capacity not only to respond appropriately to the
simple gestures of another person, but to deliberately use such gestures with eye contact to co-ordinate
attention with another person in order to share the experience of an interesting object or event. Making
eye contact with another person while pointing to a toy in order to direct the attention of the other is an
example of joint attention.

The capacity of young children to understand such gestures was demonstrated by Butterworth and
Cochran (1980). These investigators conducted a series of studies with mothers and their children (aged
6, 12 and 18 months of age) to explore joint visual attention. The mother-child pairs were sat facing
each other in the middle of a room. Targets were presented either two or four at a time at various
locations around the room. Once the mother had the attention of her child she was instructed to turn and
inspect one of the targets for six seconds before turning back to her/him. From the analysis of the video-
taped material, the investigators observed that the children did not follow their mother's gaze while she was turning, but they fixated on her then turned to fixate on the target itself after she had located it. This was observed despite other targets in the children's direct line of sight. It appears that children respond to their mother's orientation and not simply the presence of any object along their own line of regard.

Joint attention interactions that focus the attention of both the young child and her/his caretaker on the same object or event, is an important expression of the child's psychological linking to and differentiation from other people. It represents an early manifestation of the kind of interaction that is essential to self- and other-awareness, for the reason that such 'linkage' is essential for the development of awareness that 'self' and 'other' are in many respects comparable (especially, as centres of consciousness), and such differentiation is essential to awareness that 'self' is separate and distinguishable from others.

Adopting a neuro-cognitive stance, Baron-Cohen (1995) has proposed two evolutionary mechanisms to account for the capacity of young children for joint attention. The first is the Eye Detection Detector (EDD). This allows for the rapid detection of eyes, and functions to inform the organism that it is the focus of another's attention. This device allows the organism to construct dyadic representations (i.e., a relationship between two entities). For example, if the organism (Self) is looked at by another organism (Agent) the representation may be 'She sees me' or 'I see her'. What if the Agent is not looking at the Self, but at some other aspect of the shared environment? To deal with this, Baron-Cohen proposes the Shared Attention Mechanism (SAM). This functions to verify if the Agent and Self are attending to the same aspect of a shared world. This allows for the construction of triadic representations (i.e., a representation that includes an embedded element which specifies that Agent and Self are attending to the same object). SAM builds triadic representations using dyadic representations obtained from EDD. Baron-Cohen proposes that the capacity to construct triadic representations is necessary for joint attention. It is not clear, however, whether Baron-Cohen's 'mechanisms' explain how development takes place, or whether they merely describe it.
Social referencing

Social referencing refers to the capacity of the young child to register and respond to another person's affective orientation toward objects, other people or events within a shared environment. Sorce, Emde, Campos and Klinnert (1985) examined the responses of one-year-old children, in relation to their mothers, when faced with an uncertain situation. Each child was held by a person familiar to them on the shallow side of a visual cliff. Their mother was positioned opposite them on the other side of the perspex covered cliff, holding an attractive toy. All of the mothers had been trained earlier to pose each of four standard facial expressions (i.e., depicting happiness, fearfulness, interest and anger). The mother was then instructed to encourage her child to crawl towards her using the attractive toy. When the child reached the apparent drop off, looked down, then looked up at their mother's face, the mother was instructed via an ear-piece to pull one of the four standard expressions.

The first experimental condition compared the reaction of the children to the positive and negative emotional signals given to them by their mothers. Fourteen of the 19 children who were met with a happy face crossed over the cliff, whereas not one of the 17 children who were met with a fearful face did so. Indeed, 11 of the children who were met with a fearful face retreated from the edge. This latter group were also judged to express more distress than the former group. The second condition compared the reaction of the children to the interested and angry emotional signals given to them by their mothers. Eleven of the 15 children whose mothers posed an interested face crossed the cliff, compared with only two of the 18 children who were met with an angry face. Fourteen infants in the latter group actively retreated from the edge.

The children appeared to recognise that another person's expression has meaning with reference to an environment common to themselves and that person. The phenomenon of social referencing is not simply a reflection of how a child's general mood state may be altered by an adult's affective expressions. There is an impact on the child's appraisal of the specific object or event to which the adult's expressed state 'refers'.

26
Hobson (1994) defines the infant-person-environment configuration highlighted in social referencing and joint attention as a 'relatedness triangle'. The triangle reflects the nature of the relations that exist between the infant, the other person and the referent. It shows how the infant may perceive the quality and directedness of the other person's attitude towards a referent that is also the focus of the infant's own attitude. The triangulation importantly highlights that the infant has the opportunity to register that the same object in the visually-specified world has one 'meaning-for-self' and a different 'meaning-for-other'. Hobson points out that the infant can apprehend that 'meanings' are person-dependent.

... one thing may have more than one 'meaning', and a single person can have more than one 'meaning-conferring-attitude'. Insight into all this constitutes a major advance in the distancing of Thought from Thing, and of Self from Other. Not merely the separateness, but also the connectedness, of self, other, thought, and thing is being apprehended (p. 142).

Affective and conative meanings are central to the infant's concerns. These are perceived directly by the infant, who from birth is capable of relating to people and experiencing their emotional expressions. The awareness of the self is facilitated through the infant's affective engagement with her/his caregiver. This approach emphasises the social-developmental paths for the acquisition of a theory of mind. According to Hobson (1990), self-knowledge is a critical accompaniment to understanding of the mental states of others. Hobson cites his empirical work with children and young people with autism to support this account. He argues that autism results from the child's lack or slow development of the innate ability to relate and experience persons as persons, and predicts that the child with autism's knowledge of self and other will be seriously impaired. Hobson's theory and supporting evidence will be considered in more detail in Chapter Two.

Like joint attention, social referencing interactions are important expressions of the young child's psychological linking to and differentiation from other people, and therefore essential to the development of the self. Another social capacity important in the child's engagement with others is her/his capacity to imitate. This will be considered in the next section.
Imitation

The capacity to deliberately imitate the actions of another must be distinguished from those spontaneous imitative acts of neonates discussed above. The imitation to be considered here is more elaborate, in that the young children recognise and identify with other people. Meltzoff (1990) identified three types of increasingly cognitively demanding imitative tasks. Social modelling tasks require the young person to imitate the actions of another person either while or immediately after they have been performed. As reported above, social modelling has been demonstrated in new-born babies and represents the simplest form of imitation. Deferred-imitation tasks require the young child to produce the actions of another person after an extended delay, and require the child to hold a mental representation of the event to be later recalled. Social mirroring tasks require the young child to recognise when her/his own actions are being imitated by another person, and represents for Meltzoff the most demanding form of imitation. Below studies that have examined deferred imitation and social mirroring in young children will be described.

In order for a child to imitate another person after a delay in time, she/he must be able to hold a mental representation of the observed act which can be accessed at a later time. Meltzoff (1988a) examined deferred imitation in thirty-six 14-month-old children. The children were randomly assigned to one of three testing conditions: (a) in the control baseline condition the experimenter sat opposite the child, but spoke with the child's caregiver. No toys were presented to this group; (b) in the second control condition, termed 'Adult Manipulation', the child watched the experimenter pick up and simply manipulate each of six toys for 20 seconds. Each manipulation was performed three times in this period; and (c) in the imitation condition the child watched the experimenter pick up and perform a target act with each of the six toys. One week later the same children were returned to the same testing room, and presented with the same six toys. Each child was given a score from 0 to 6 according to the number of target behaviours produced.

Meltzoff found that the young children who were assigned to the imitation condition produced more target behaviours (mean = 3.42) than those in the baseline condition (mean = 1.25) or the adult manipulation condition (mean = 1.67). The difference between the two control conditions was not
statistically significant. These findings have been replicated in children as young as nine months of age (Meltzoff, 1988b). The results demonstrate not only that a robust capacity for deferred imitation is present late in the first year, but that the young child can readily 'link' in with another person to appreciate how they themselves are similar to, but different from others.

Meltzoff (1990) also conducted three experiments to examine social mirroring. In the first, twenty-eight 14-month-old children were each positioned across a table facing two experimenters. The participant and two experimenters were each given an identical toy. The first experimenter immediately mirrored all the actions performed by the child with the toy, while the second experimenter sat passively holding the toy loosely on table top. There were seven 45 second trials, each with a different toy. The response measures included the child's preferential looking, smiling, and testing behaviour. Meltzoff found that the children looked significantly longer, smiled significantly more, and directed significantly more testing behaviour at the experimenter who acted as a social mirror than at the experimenter who remained passive.

It could have been, however, that the young children in the first study were simply attracted to the active person rather than the passive one, and not identifying their actions in the person who was mirroring them. To control for this possibility, Meltzoff had the second experimenter imitate the 'real time' actions of a different young child through a television monitor, while the first experimenter imitated the 'real time' actions of the index child through a different television monitor. The two monitors were positioned behind the index child and the procedure of the first study was repeated. Fifty-six 14-month-old children were tested. The results from the first study were replicated.

In the second study the results could been explained in terms of the attractiveness of the temporal contingency information, and not that the children recognised that their actions were structurally equivalent to that of the experimenter. The third experiment was designed to control for this possibility. Meltzoff examined social mirroring in fifty-six 14-month-old children. The temporal aspects were controlled for by having the two experimenters acting at precisely the same time. There were three predetermined pairs of target actions. The two experimenters sat passively until the young child
performed one of the target actions. Then the first experimenter imitated the child, while the second experimenter performed an action that was paired with it from a predetermined target list. As soon as the child stopped, both experimenters stopped. Again, the findings from the first two studies were replicated.

These results show that ... infants can recognise the structural equivalence between the acts they see others perform and the acts they do themselves. In that sense, they have already begun to elaborate a notion of self which, if not based strictly on a visual self-image, consists of a kind of extended 'body scheme' - a system of body movements, postures, acts, and their relationship to like behaviors of others (Meltzoff, 1990: p. 146).

These two cognitively advanced forms of imitation highlight the young child's capacity to psychologically 'link' in with another person. The child identifies with another person, and shows that she/he can appreciate both the similarity and difference between the self and other. The final capacity evidenced in the young child which enables her/him to engage with another person is social role-taking. This will be considered in the following section.

Social role-taking

Social role-taking involves the ability to emotionally attune to another person. It is an explicit demonstration of one person's awareness of her/himself as similar, but at the same time differentiated from other people's psychological stances that she/he may adopt in relation to the world. Hoffman (1982) proposed four levels of empathic response that emerge from the coalescence of empathic affect and the developing awareness of the other people. The first level defined global empathy. This may be observed in children under the age of 12 months, and arises in response to those cues that reflect another person's affective experience:

Because infants cannot yet differentiate themselves from others, they must often be unclear as to who is experiencing the affect, and they may at times act as if what is happening to the other were happening to them. An example is an 11-month-old girl who saw another child fall and cry. She first stared at the victim, looking as though she were about to cry herself, and then put her thumb in her mouth and buried her head in her mother's lap, just as she does when she is hurt (p. 284).

The second level defines 'egocentric' empathy, and may be observed in one- to two-year-olds, who are more aware of the difference between themselves and other people than younger children. These older children may become empathically aroused, but remain aware that the other person is having the direct
emotional experience and not themselves. At this stage, however, children cannot yet distinguish between their own inner states and those of others, and is apt to confuse them. Hoffman gives the example of a 13-month-old child, who responded with a distressed look to an adult who looked sad and then offered the adult his own favourite doll. Thus children tend to assume that that which suits their needs or wishes will suit the other's needs or wishes.

Experimental support for this comes from a study by Cummings, Zahn-Waxler, and Radke-Yarrow (1981). These investigators examined the reactions to 24 children between the ages of 10 and 20 months over a nine month period as bystanders to naturally occurring and simulated incidents of affection and anger. The mothers of the children were trained to observe and produce detailed verbal reports on tape-recorders of discrete sequences of behaviour. Apart from recording the responses to spontaneous incidents of affection and anger, the mothers also observed their children witness both the experimenter (during each home visit) simulate anger, pain or minor physical discomfort, and at various intervals themselves simulate affection (by hugging and kissing the father in front of the child) and anger (by pretending to be angry with another person over the telephone in front of the child).

The investigators found that in response to naturally occurring and simulated affection incidents, affection (61 percent) was the most common response. In response to naturally occurring anger, distress (46 percent) and anger (24 percent) were the most common reactions, while to simulated anger the most common response was no affective response (55 percent). Distress responses were more likely to occur during incidents in which one person hit another.

Hoffman's third level defines empathy for another person's feelings. This may be observed in children as young as 3 years of age who have developed the capacity to be aware that other people's feelings are not only independent of their own, but may be based on the other person's understanding and interpretation of events. This defines social role-taking proper.

*What empathy requires is the ability to know what another person thinks or feels despite the fact that this is different from one's own mental state at the time. In empathy one shares emotional reactions to the other person's different state of mind. In cases where two people have the same feeling or thought at the same time we speak of sympathy rather than empathy. Empathy presupposes amongst other things a recognition of different mental states. It also presupposes that one goes beyond that recognition of difference to*
adopt the other person's frame of mind with all the consequences of emotional reactions. (Frith, 1989; p. 154-155).

The fourth and final level defines empathy for another person's general life condition, and may be observed in late childhood. The capacity in these young people to feel another person's well-being or distress, despite contradictory situational or expressive cues, may be observed. This level goes beyond the remit of this thesis, and will not be considered further.

To reiterate, social role-taking involves the ability to emotionally attune to another person. It is an explicit demonstration of one person's awareness of her/himself as similar, but at the same time differentiated from other people's psychological stances that maybe adopted in relation to the world.

In summary, the ability to explicitly think about oneself and others may be evidenced in the quality of interactions between the young child and another person. The developing capacity for secondary intersubjectivity in young children, particularly in the form of joint attention and social referencing interactions, and in imitation and social role-taking, reflect an implicit awareness of the self as similar to but separate from the other. With the emergent capacity for symbolic functioning, a new level of awareness marks the ability of the child to objectify and categorise her/himself: the self-as-object. It is reasonable to assume that the early 'content' of the self-as-object will reflect aspects of the experience of the self-as-subject. Indeed, it is conceivable that the awareness of self is sharpened through those experiences which do not fit in with the order defined by the self-as-subject, where the young child attempts to resolve or integrate differences between what is experienced and what is expected.

The domain of self-understanding includes a person's knowledge and reflection on the self-as-subject as well as the self-as-object. It cannot include the actual 'I' in the Jamesian sense, because this extends beyond self-understanding to the entire domain of psychological functioning. Having said this, the observation of regular and consistent patterning of responses in young children and adults may betray aspects of the self-as-subject that they themselves are unaware of. This paradigm has been adopted in a few studies which have attempted to examine the self-as-subject in young children. There now follows a selective review of the research literature to explore the evidence for the emergence and development of
self-understanding in infants. This will cover studies to elucidate and measure the awareness of the self-as-subject and the boundaries of the self-as-object. The observations are relevant for considering self-understanding in young people with autism, insofar as these individuals may be impaired in 'infant-level' interpersonal processes and understanding. Moreover, some of the techniques employed in studying self-development in infancy and early childhood (picture self-recognition, the use of personal names and pronouns, the early forms of self-description) are closely aligned to those employed in the present experiments with older autistic subjects.

1.4 Self-recognition and early self-understanding

The study of self-recognition in the pre-language non-autistic child has been dominated by a single experimental paradigm. This has typically involved the demonstration of self-recognition by the child from her/his reflection in a mirror, image on a television monitor or picture in a photograph. The results from a selection of these studies will be considered in this section.

Mirror self-recognition

Most researchers in this field have used the mirror to assess self-recognition ability in pre-verbal children. Mirror images contain two sources of information that specify self-recognition: contingency cues and feature cues. Contingency cues arise from the fact that one's image in a mirror moves synchronously with one's sensations of movement. The young child may be drawn to the coincidence of the movement and sensation, rather than recognising her/his own features. If the child recognises her/himself from feature cues alone, this implies that the she/he holds an internal representation of aspects of her/his physical self. Contingency cues are not usually considered a true index of self-recognition. An ingenious technique, referred to as the rouge test, was devised which conferred mirror self-recognition from feature cues alone (Gallup, 1970; Amsterdam, 1971). Amsterdam's (1971) procedure involved the caregiver surreptitiously placing a spot of rouge on her child's nose or cheek. The
child then faced a mirror. Self-recognition was judged to be present if the child either touched the actual spot or used the mirror to examine the spot on her/his face; so-called *mark-directed behaviour*. The rationale underlying the rouge test is that for a child to correctly appreciate the source of the individual depicted in the mirror, there must be a mental representation of self onto which this perception of the reflection is mapped.

Amsterdam (1971) studied the responses of 88 children between the ages of 3 and 24 months of age using the mirror self-recognition task. After the rouge was applied to the child's face, her/his mother was asked to point to her child's face reflected in the mirror and say, 'See... See... See...' and then 'Who's that?'. Amsterdam identified three distinct phases in the child's reaction to her/his mirror image. Between 6 and 12 months of age, 85 percent of the children reacted to their mirror image as they would have done to a sociable 'playmate': they smiled and vocalised delight in a playful manner. Between 13 and 24 months of age, 90 percent of the children became wary and withdrew from their image. This response was associated with self-consciousness and/or recognition of the image by the children. Finally, between 20 and 24 months of age, 65 percent of the children met criteria for self-recognition. Interestingly, after 20 months 75 percent of the sample also displayed signs of embarrassment and self-admiration.

Amsterdam's findings were supported in a study by Lewis and Brooks-Gunn (1979). These investigators examined the 'mirror reactions' of 96 children between 9 and 24 months of age to their own reflected images in two conditions. In the non-marked condition, each child was simply observed in front of a mirror. In the subsequent marked condition, the child's mother surreptitiously placed rouge on her/his nose, and they were again observed in front of the mirror. Only two percent of children in the non-marked condition touched their noses, while 33 percent of children did so in the marked condition. Mark-directed behaviour was only evidenced in 19 percent of the fifteen-month-olds; 25 percent of the eighteen-month-olds; 63 percent of the twenty-one-month-olds; and 66 percent of the twenty-four-month-olds. The investigators also observed little or no silly or coy behaviour in children younger than 15 months of age. This becomes a relatively established part of the response for children 18 months of age and older.
There is now broad agreement that self-recognition as defined by the child's actions towards the rouge mark through the use of the mirror emerges between 15 and 20 months of age. Why is it that not all young children of this age show self-recognition? Butterworth (1990) pointed out that while mirrors offer self-perception, mirror self-recognition is not a straightforward case of perception. In particular, a certain level of cognitive development is required.

Bertenthal and Fischer (1978) examined the relationship between the stages of self-recognition and the level of cognitive development. These investigators were interested to examine a predicted sequence of self-recognition stages in a sample of 48 children aged between 6 and 24 months. After the mother had surreptitiously placed rouge on her child's nose, she and her child were led into the experimental room for a five minute 'familiarisation' period. The experimenter then brought in a mirror. The mother pointed to her child's mirror image and said three times, 'Who's that?' This phase was used to establish the stage of self-recognition: from tactile exploration of the mirror image, to touching the rouge on the child's own nose, to the use of her/his name or a personal pronoun. In the following trial, the child was fitted with a special vest with an attached wooden rod which extended over the child's head. On top of the rod was a hat, which rested six inches above the child's head, out of immediate vision. The child was positioned in front of the mirror and the mother asked her child to find the hat. The criterion for this task was met if the child looked around to see and/or grab the hat after seeing it in the mirror. The investigators reasoned that because the hat was connected to the child, its movements could be considered as an extension of the body movements of the child, and thus be less cognitively demanding than if it were independent of her/his body. In the final condition a toy, independent of the child's body movements, was lowered from the ceiling behind the child until its image was viewed by her/him in the mirror. The mother asked her child to bring her the toy. In addition to these tasks, all of the children were examined for their level of object permanence skill.

Considering the pattern of performance across the age groups, a predicted sequence of self-recognition was demonstrated in 46 out of 48 children: from tactile exploration of the mirror image, to looking/reaching for the hat, to looking/reaching for the toy, to passing the rouge task, to finally
referring to the child's own reflection by name or pronoun. The investigators also found a significant positive correlation between the children's achieved level of self-recognition and performance on the object permanence scales. Bertenthal and Fischer concluded that self-recognition does not emerge suddenly at a single point in development, but gradually through a series of stages. The stages appear to be related to cognitive ability, though self-recognition does not necessarily develop in synchrony with these skills. The investigators proposed that these diverse skills are only integrated into a true concept of self at around two years of age.

Further evidence for a cognitive component in mirror self-recognition tasks comes from studies of young children with mental retardation. Mans, Cicchetti and Sroufe (1978) examined mirror self-recognition using the rouge task in 55 children with Down syndrome who ranged from 15 to 48 months of age. The task was conducted by the child's mother in the family home. The mother, blind to the purpose of the experiment, placed her child in front of a mirror for 20 to 30 seconds and scored the presence or absence of gaze, affective expression, vocalisation and motor behaviour. She then pretended to wipe her child's nose while in fact smearing rouge on it, and repeated the mirror test.

The results of this investigation revealed that 22 percent of the 15- to 22-month-olds, 56 percent of the 23- to 33-month-olds, and 89 percent of the 34- to 48-month-olds met the criterion for self-recognition. Changes in affect also discriminated between the age groups: 50 percent of the younger group as opposed to 5 percent of the older group appeared sober and puzzled, whereas 28 percent of the younger group as opposed to 58 percent of the older group showed surprise or positive affect. Delays in mirror self-recognition paralleled delays in cognitive development.

This study shows that the emergence of self-awareness is intimately tied with other developmental indicators, specifically, level of cognitive functioning (Mans, Cicchetti and Sroufe 1978; p. 1249).

In a recent set of studies, Asendorpf and Baudonnière (1993, 1996) also considered the cognitive capacities underlying self-awareness and other-awareness. In their first study (Asendorpf and Baudonnière, 1993), the investigators paired 112 unfamiliar 19-month-old children (SD 0.2 months) in terms of their mirror self-recognition status. There were 18 pairs comprising children who demonstrated
mirror self-recognition, 12 pairs of children who did not demonstrate mirror self-recognition, and 26 pairs in which a 'recogniser' was matched with a 'non-recogniser'. The children in each pair had access to a set of identical objects, and the investigators examined the extent to which the children engaged in 'synchronic imitation' (i.e., when the two partners use the same object while displaying visual regard).

Only the data from those pairs that played for more than 7½ minutes were included (i.e., 12 recognisers, 9 non-recognisers, and 20 mixed). The investigators found that those children who demonstrated mirror self-recognition became engaged in long phases of synchronic imitation if their partner was also a recogniser (i.e., average of 13½ percent of their time spent in synchronic imitation), compared with those whose partners were non-recognisers (i.e., average of 8½ percent of time), and compared with pairs of non-recognisers (i.e., average of 4 percent of time).

We interpret these findings as support for the hypothesis that the capacities for mirror self-recognition and for synchronic imitation of the object usage of an unfamiliar peer emerge synchronically ... and supports the more general hypothesis of a synchrony between self- and other-awareness (p. 93).

In a further study, Asendorpf and Baudonnière (1996) examined children with a mean age of 18½ months (SD 0.2 months) who were divided according to their mirror self-recognition ability. In this study, the investigators used more stringent operational definitions of both mirror self-recognition and synchronic imitation than in their 1993 study. This resulted in 42 children who demonstrated mirror self-recognition; nine who were 'delayed recognisers' (i.e., demonstrated mirror self-recognition after a standard prompt); and 27 who were classed as non-recognisers. In the first experimental condition, the children and the experimenter had access to a set of identical objects. The experimenter performed a standard enactment with each of the five objects, and examined the extent to which the children engaged in synchronic imitation. In the second condition, three additional identical pairs of objects were introduced. Whenever the children handled an object, the experimenter took the same object and closely imitated their actions, posture, and vocalisations. The investigators examined the degree to which the children 'tested' the contingency with the experimenter.

The investigators found that the majority of both the non-recognisers (52 percent) and recognisers (69 percent) imitated the actions of the experimenter at least once. The difference between the two groups
did not reach statistical significance. Self-recognisers, however, imitated the experimenter for more than twice the time than did the non-recognisers (i.e., they engaged in significantly longer phases of synchronic imitation). When children were imitated by the adult, the majority of both the non-recognisers (56 percent) and the recognisers (57 percent) showed at least one testing sequence, though the latter group varied their activity more than did the former. The investigators cautiously conclude that these results support the view that children are aware of social contingency before they can recognise themselves in a mirror.

In summary, the above studies have provided reliable evidence that the ability of children to recognise their own facial features in a mirror occurs between 15 and 20 months of age. This is also accompanied by self-conscious emotions, such as embarrassment and self admiration, in response to their image. The development of mirror self-recognition appears to be dependent upon the child's cognitive maturity, and parallels, if not slightly follows the capacity for other-recognition. To explore the specificity of this developmental sequence researchers have also examined young children's responses to their image on a television monitor, and to pictures of themselves and others. In the following two sections the findings from studies that have used these two different methodologies will be briefly considered.

Videotaped self-recognition

The mirror self-recognition technique successfully distinguishes between 'self-reactions' based on contingency cues from those based on feature cues. Response to contingency cues, however, may also be an index of self-recognition. The use of videotaped images of the child has been used to examine this possibility.

In a pilot study, Papousek and Papousek (1974) examined the preferential 'looking activity' of eleven 5-month-old infants to their self image. They reasoned that infants may respond to several factors in their mirror image, including eye-to-eye contact, contingency cues, and a smiling face. These and other factors were systematically isolated. For example, the investigators presented the live image of the infant on both monitors transmitted from a camera placed above the right monitor. Thus when the infants
looked directly at the right monitor they were able to make eye-to-eye contact with themselves; but when they viewed the left monitor they were unable to make such eye-to-eye contact, as they viewed a slightly off-square image of themselves. As the contingency cues from both monitors were controlled for, the distinctive variable was the eye-to-eye contact. Similarly, the investigators matched a pre-taped and therefore non-contingent self-image on one monitor and matched this with a live, contingent image taken from the same camera. In this way the contingency of the self-image was the distinctive variable.

Each two minute data period was divided into four 30 second blocks to consider trends. Papousek and Papousek found that to begin with the infants attended more to the eye-to-eye contact in the non-contingent self-image as opposed to contingent self-image, suggesting that eye-to-eye contact might be a more important determinant of the infant's preference than contingency. Towards the end of the period, however, attention to the contingent image increased, suggesting the possibility of a developing salience of this component. The investigators proposed that the effectiveness of contingency as a cue to mirror responses requires a period of learning from incidental observations of the relation between the infant's own movements and the movement in the mirror image. They found no clear evidence that smiling was a sign of self-recognition at 5 months of age.

Similarly, Lewis and Brooks-Gunn (1979) conducted two videotaped studies to examine young children's response to contingent and to non-contingent self-images. On the basis of their results, they proposed the following developmental sequence in the use and salience of contingency and specific perceptual features. Contingency movements of the self-image are the cues to which the child first attends. Contingency cues continue to be important throughout the first two years of life. In contrast, responding to specific perceptual features of the self appear at 15 to 18 months of age and are established by 21 to 24 months of age. Consistent differential responses between the self and another person are not apparent until 30 to 36 months of age.
**Picture self-recognition**

Pictures of children can be used to present feature cues alone. Lewis and Brooks-Gunn (1979) presented 70 young children, who ranged from 9 to 24 months of age, with two different sets of ten coloured slides of the head and upper torso of: (a) a current picture of the child's mother; (b) a current picture of the child's father; (c) a current picture of self; (d) a picture of an 8-month-old stranger; (e) a picture of a same aged female stranger; (f) a picture of a same aged male stranger; (g) a picture of a 5-year-old female stranger; (h) a picture of a 5-year-old male stranger; (i) a picture of an adult female stranger; and finally (j) a picture of an adult male stranger. The slides were presented so that the head length of each person was approximately six inches when projected onto a screen. Hair length, hair colour and eye colour were not held constant. Each slide was presented for 15 seconds with a 15 second interval between presentations. The child's mother, who was present during testing, was asked, if necessary, to direct her child's attention but once to each image by pointing and saying, 'Look'. The investigators coded three classes of response made by the children to each slide: visual fixation was determined by the position of the infant's eyes and was recorded continuously; positive and negative affect were coded in terms of facial expression (smile/frown), and vocalisation (laughing, cooing, babbling/cry, fret, whimper); and thirdly, all spontaneous utterances were recorded. The absence or presence of the affect measures was recorded every five seconds, and the scores on each affect measure ranged from 0 to 3.

The investigators found that all of the infants differentiated between different-aged strangers, between self and same-aged peers, and to a lesser extent, between same- and opposite-sexed peers. These findings were heavily influenced by the age of the infant. The age trends indicated that the 9- to 12-month-olds demonstrated some differential responses between the pictures of themselves and those of others, while the 15- to 18-month-olds differentiated maximally among conditions. Lewis and Brooks-Gunn also found that for this older sub-group of infants, the pictures of the self elicited the lowest amount of smiling to any baby picture. The investigators reasoned that as self-recognition emerges at this time, this group's response may have been related to self-consciousness.
In summary, it would appear from the evidence reviewed here on the development of the self-recognition, that from around five months of age the child shows the ability to recognise self-contingency cues. Between the ages of 15 to 18 months of age the child can construe her/himself as a permanent object with enduring qualities, and demonstrate the ability to associate stable categorical features (sex and age) with the self. Finally, in the second year of life the child can define her/himself through specific categorical features alone and demonstrate self-recognition. The recognition of other people's features appears to occur at this time, though consistent differentiation between the self's features and those of another person is not evidenced until the third year. Finally, self- and presumably other-recognition is dependent upon the child's level of cognitive development.

Self-recognition is but an aspect of the entire self, yet such studies seem to outweigh other empirical studies designed to examine the self in normally developing children. This may in part be due to the fact that self-recognition has been clearly operationalised. The following sections will examine other methods used to examine aspects of the self in young children.

**Early self-understanding**

With the emergence of language in the second and third years of life, children begin to use their name or personal pronoun to refer to themselves (Brown, 1973); to refer to themselves as the agents of action in everyday speech (Huttenlocher, Smiley, and Charney, 1983); to identify internal states (Bretherton and Beeghly, 1982); and to identify objects as belonging to themselves (Levine, 1983). This suggests that the child comes to have a more differentiated representation of the self than a perceptual image alone (Bullock and Lütkenhaus, 1990). Self-understanding in the language competent child will be reviewed in Chapter Three. At this point the expression of self-understanding in those children whose language is just emerging will be considered. Specific consideration of early comprehension and use of personal pronouns will be postponed until Chapter Five.

In a cross-sectional study, Stipek, Gralinski and Kopp (1990) administered a questionnaire covering a broad range of behaviours assumed to reflect aspects of the self to 123 mothers of children from 14 to 40
months of age. They identified four factors: (a) items that comprised self descriptions and evaluations (e.g., Does your child ever resist your help by saying 'Do it myself!' or the equivalent? and Does your child ever insist on wearing certain clothing?); (b) items related to the recognition of self as an identifiable, physical entity (e.g., Does your child ever communicate her/his dislikes verbally? and Does your child recognise her/himself in pictures?); (c) items related to emotions associated with wrong doings and self regulation (e.g., Does your child ever seem upset when calling your attention to something she/he has done wrong? and Has your child ever inhibited her/himself from doing something she/he obviously wanted to do because you were watching?); and (d) items related to resistance to adult intervention, which the investigators termed autonomy (e.g., Does your child ever assert her/his own will contrary to yours, just for the sake of being contrary? and Does your child ever resist your help by pushing your hand away or saying 'no'?). Further analysis of the data led the investigators to suggest that the ontogeny of selfhood during the second and third year can be defined in terms of three constituents: physical self-recognition; self-description (both neutral and evaluative); and emotional responses associated with self evaluation. These constituents emerge in a systematic order.

The sequence in which this group of behaviors emerged is therefore consistent with the proposal that self-description and self-evaluation follow the development of a categorical self-concept. Thus, the self-concept evolves from a recognition of the self as physically distinct and recognisable to a representation of the self as an entity with distinguishing, verbally representable characteristics (e.g., little boy, or curly hair) (p. 975).

Data collected from questionnaires may be useful in examining areas not easily accessible to standard observation. They may, all the same, be subject to response bias. Bullock and Lütkenhouse (1990) observed young children and examined their self-involvement-in-actions in tasks designed to assess self-as-subject along with a battery of standard self-as-object measures. They tested eighty-nine children who ranged from 15 to 35 months of age. There were four self-as-subject measures. In the first, termed Outcome Reaction, the child was engaged in the building of a tower with building blocks. The criterion was met if the child showed a clear affective response specific to completing the tower, demonstrating that the child recognised a particular outcome as being the product of her/his own activity. In the second self-as-subject task, termed Remembering Outcomes, the child's mother made reference to a picture drawn earlier by her child ('Oh, what a nice picture! Who did that? ... Did you do that?'). The criterion was met if the child responded with her/his name or personal pronoun to the first question and/or an
affirmative nod to the second, demonstrating that the child remembered a particular action-outcome she/he had produced. In the third, Wanting-to-do-it-oneself task, the experimenter interrupted the infant, taking over the her/his activity. The criterion was met if the child protested (grabbing materials back from the experimenter, saying 'I', 'Me' or 'No', or showing some negative emotional reaction), demonstrating that the child perceived that involvement from another changed the responsibility for her/his action. In the final self-as-subject task, termed Protest-at-destruction-of-outcome, the experimenter washed off the infant's chalk drawing from a black-board and said 'Now it is ruined!' The criterion was met if the child showed clear protest, demonstrating that the child could see the product of her/his own activity as belonging to her/himself. These tasks were sequenced to account for the increasing cognitive demand placed on the infant, and matched on these grounds with four self-as-object tasks: In the Blanket task, the child was seated on a blanket, and asked to give it to the experimenter. The criterion was met if the child stepped off the blanket before attempting to give it to the experimenter, demonstrating that the child took into account her/his body as a hindrance to obtaining an object. Mirror self-recognition, photograph self-recognition and the use of the child's name or personal pronoun comprised the other three self-as-object tasks.

Bullock and Lütkenhause found, as expected, that the percentage of the self-as-object tasks passed increased with age. Thus by 18 months of age, most children demonstrated knowledge of possessing a separate self through sensori-motor means (blanket task), by 24 months, this knowledge was extended to visual characteristics of the self (mirror task), and by 30 months to self-recognition from static visual cues (photograph task). This was followed by the use of the infant's own name from about 30 months of age and above. Broadly, the percentage of self-as-subject tasks passed also increased with age, though the effect was primarily accounted for by performance on two of the tasks (i.e., outcome reaction and remembering outcome). Outcome reactions developed gradually over the age range studied, reaching ceiling in the 30-month-old group. Remembering outcomes was first detected in at 23 months of age and was close to ceiling at 30 months of age.

This active involvement, characterized by selective responses to self-produced outcomes, suggests an increased focus on what the self produces. It is not known, however, how knowledge about the results of actions (e.g., success or failure) affects this aspect of the self; that is, when more general ideas about competence and control become part of the self-system (Bullock and Lütkenhause, 1990: p. 233).
The number of children who passed the other two self-as-subject tasks, both indexed by protest reactions, was relatively consistent across the ages tested (15 to 35 months). Protest was common in the case of wanting-to-do-it-oneself and fairly uncommon in the case of destruction-of-an-outcome.

Subsequent analysis of the data examined the relations between the self-as-subject and the self-as-object tasks. Outcome reactions were significantly related to mirror self-recognition. The investigators argued that affective reactions to self-produced outcomes and mirror self-recognition may both rely on the ability to recognise a discrepant outcome. Mirror self-recognition is shown when the child reacts to a discrepancy in the face; outcome reactions (in response to better or more efficient outcomes) may be expressions of unexpected success. The investigators also found that remembering outcomes was significantly related to mirror and photographic self-recognition tasks and name tasks. They made the speculative interpretation that although outcomes are potentially enduring events, the agent who produces them is not visible per se in the product. Processing and remembering the enduring and non-visible features of the self may require more abstract and representational skills. Finally, wanting-to-do-it-oneself was related to the name task. The investigators argue that protest, a non-visible aspect of self, indicates the infant's anticipation that the interference will take away responsibility for the action and its outcome. Under this assumption, wanting-to-do-it-oneself should be related to other tasks involving the processing of non-visible features of the self.

The complementary changes in the two aspects of the self system suggests that self-recognition skills may index a wider range of self-understanding than simple knowledge of external features of the self alone. Furthermore, the relations among the tasks supports the assumption that the early development of the self involves changes from processing immediate and visible features to processing more enduring and non-visible features of the self.
Self-conscious behaviour

Lewis, Sullivan, Stranger and Weiss (1989) distinguish between primary and secondary emotions. Primary emotions include happiness, sadness, anger and fear. With the emergence of cognitive capacities (including self-other differentiation and object permanence, which are typically evident between 18 to 24 months of age) the child develops the first class of secondary emotions, which include self-conscious emotions such as embarrassment, empathy and possibly envy. At this time children also learn rules of conduct that allow them to evaluate their own and others actions. This leads to a second class of self-conscious emotions that include the self-evaluative emotions of guilt, shame and pride.

Amsterdam and Greenberg (1977) observed four 10-month-olds, four 15-month-olds, and four 20-month-olds in each of four conditions: while watching their own live image; while watching their own previously recorded image; while watching the image of a control child; and while watching the image of an adult female stranger. The presence of four self-conscious reactions were judged by two blind raters. The four reactions included: appearing coy, where the child glanced at the image while smiling slightly, or looked 'cute'; admiring the image, where the child stood quietly before the image glancing up and down showing an expression of delight; clowning, where the child appeared to be 'showing off' while moving about and observing the image with approval; and appearing embarrassed and uncomfortable, where the child turned away from the image abruptly or quickly, or glanced furtively at it.

In the analysis of their data the investigators collapsed the self-conscious reactions into one category, and, unfortunately, did not present nor discuss the specific self-conscious reactions. None of the 10-month-old children exhibited self-conscious behaviour. At 15 months of age, one child showed self-conscious behaviour when watching his own live image, two children did so to their own pre-recorded self image and two to the control child image. At 20 months of age, all of the children showed a self-conscious reaction to their own live image, two to their own pre-recorded self image, and three to the control child image. The investigators concluded that:

... self-consciousness appears some time after 10 months of age, is a rare response to a female stranger, is more likely to occur with another child and occurs with the greatest
frequency to a simultaneous self-image. By 20 months of age the child responds to the simultaneous image of his own body with significantly greater self-consciousness than do younger subjects of 10 and 15 months. Apparently, self-consciousness may first occur as a diffuse response in the 2nd year of life and become differentiated and limited to situations where one is most acutely aware of being the focus of attention, e.g., when observing oneself (p. 5).

Lewis, Sullivan, Stranger and Weiss (1989) observed the development of the primary and secondary emotions and examined their relation to self-referential behaviour in twenty-seven 9- to 24-month-olds. Specifically they predicted that the primary emotion of wariness would appear early and not require self-referential behaviour, while embarrassment would emerge with self-referential behaviour.

There were three experimental conditions. In the first, each child was approached by a female stranger who touched the child's hand then walked back out of the door she came through. Wariness was defined as an 'attentive look characterised by a neutral or sober facial expression accompanied by a sudden inhibition of ongoing vocal or other behavior ... followed by gaze aversion' (p. 148). In the second condition the child's reaction to her/his own reflection in a mirror was observed. Specifically the investigators were interested to observe embarrassment. Embarrassment was defined as a smiling facial expression followed by a gaze aversion and movement of the hands to touch hair, clothing, face, or other body parts. The hand gestures reflect the nervous movements characteristic of embarrassment. In the third condition the mirror self-recognition task using the rouge technique was conducted using standard criteria.

Twenty-three of the 27 children showed wariness to the approach of the stranger. There were no significant age differences, although the 9- to 12-month-olds were significantly more likely to cry in response to the approach of the stranger than were the 15- to 18-month or 21- to 24-month-olds. In general, the children were significantly more likely to show wariness than embarrassment in this condition. In fact only one child from each of the two youngest age groups were judged to show embarrassment.

In the mirror condition, no child showed wariness when exposed to her/his own reflection. The contrast between the two conditions allowed the investigators to conclude that wariness:
... theoretically need not involve a referential self, although it does require detection of the familiar versus the novel and possibly self-other discrimination (p. 150).

Embarrassment increased significantly with age in response to the infant's self-image: 22 percent of the 9- to 12-month-olds, 33 percent of the 15- to 18-month-olds, and 62 percent of the 21- to 24-month-olds showed embarrassment in this condition. As predicted, the majority of children who showed embarrassment also met the criterion for mirror self-recognition. There was no evidence of a relationship between self-recognition and wariness. The investigators also found no significant relationships between cognitive ability (as measured using the Bayley Scales of Child Development) and performance on any of the three tasks.

Lewis, Sullivan, Stranger and Weiss considered that the association between self-recognition and embarrassment may have been spuriously produced due to age changes. In the second study, therefore, they videotaped 44 children aged 22 months in the same experimental conditions as in the first study, and included a further two embarrassment eliciting conditions. In the 'over-compliment' condition, the experimenter engaged the child then 'lavishly complimented the child in an effusive manner'. In the 'request-to-dance' condition the child was coaxed by the experimenter and then the child's mother to dance. It was assumed here that conspicuousness would elicit embarrassment.

The stranger situation elicited wariness in 24 of the 44 children. This was significantly more than in any of the other conditions. Embarrassment was less likely to occur in the stranger situation (evidenced in only two of the 44 children) than in the mirror condition (11 of the 44 children), the over-compliment condition (13 of the 44 children), or the request-to-dance condition, whether with the experimenter (13 of the 44 children) or the child's mother (10 of the 44 children). In relation to self-recognition, of the 26 children who met criteria, 19 showed embarrassment in at least one condition; of the 18 children who did not meet criteria for self recognition, only five showed embarrassment. The investigators found no significant relationship between self-recognition ability and wariness. Interestingly, the investigators also found that the male children were more likely to show wariness than females (21 of the 25 males, and 6 of the 19 females) and females were more likely to show embarrassment than males (11 of the 25 males, and 13 of the 19 females).
Self-awareness is one of the later features of the self system to emerge, occurring in the last half of the second year of life.

The ability to consider one's self rather than the ability to differentiate or discriminate self from other is the cognitive capacity that allows for all self-conscious emotions such as embarrassment and empathy, although the development of standards is also needed for self-conscious evaluative emotions such as shame, guilt and pride (Lewis, Sullivan, Stranger and Weiss, 1989: p. 154).

The investigators claim that the results from both studies show that in general, embarrassment does not occur unless self-referential behaviour exists.

The principal focus in this review has been the recognition and understanding of the self, with incidental reference to the understanding of the other person. Young children differentially respond to familiar and strange adults at an early age, and before they demonstrate self-recognition based on their facial features. Those children who demonstrate self-recognition also demonstrate recognition of others based on feature cues. Early self-understanding follows on from self-recognition. In the following section, the early understanding of other will be briefly considered.

**Early understanding of the other**

In a longitudinal study Pipp, Fischer, and Jennings (1987) considered the development of both self- and mother-knowledge in 72 children who were 6 months of age, and then at every month for the following 35 months. The investigators devised six 'Agency Tasks', each of which had a child version and a mother version. The tasks were designed to place increasingly higher cognitive demands on the infant. For example, in the easiest agency task the experimenter modelled eating a piece of cereal then said to the infant, 'You do it!' The experimenter, using the same actions, then fed the infant's mother the piece of cereal and said to the infant, 'You do it!' In the most cognitively complex agency task, the child version was passed if the child could pretend that the mother doll was giving the baby doll a bottle, or rattle to play with, or a teddy bear to kiss, or the child called the mother doll a 'mother' or the baby doll a 'baby'. The mother version was passed if the child asks her/his mother to give the baby doll a bottle or rattle to play with, or a teddy bear to kiss, or the child called her/his mother a 'mother' or the baby doll a
'baby'. In a similar manner the investigators presented each child with a set of increasingly complex 'Feature Tasks', each with a child and mother version. For example, among the least demanding was the mirror self- and other-recognition task using the classic rouge technique. The more complex tasks involved the investigator asking the infant, 'Are you a girl / boy?' and 'Is mummy a boy / girl?'

The children followed the predicted developmental sequence for self- and mother-understanding in both the agency and featural domains. Furthermore, these sequences represented the same general ordering for both the self and the mother. For agency, the sequences moved from direct actions to complex types of pretend play involving social categories and social interaction. For features, the sequences moved from recognition of physical features to identification of socially defined features of self and mother, such as possessions and gender. The investigators found, however, consistent decalage in features between child and mother sequences up to 18 months of age: knowledge of mother preceded knowledge of infant. After 18 months this decalage virtually disappeared, with infant- and mother-knowledge subsequently developing in approximate synchrony. In the agency domain the authors found general consistency across the sequences: knowledge of self continues to precede knowledge of mother even late in the sequence. Pipp, Fischer, and Jennings conclude:

Early in development, knowledge is sensorimotor and grows directly out of what infants can perceive through their senses and what they can do with their bodies... Sensorimotor infants will know self and mother differently because they live in their own bodies and not in their mothers'. The situation changes with the emergence of representation late in the second year. When children become able to represent a person, thinking about him or her independently of their current sensorimotor activities, then the influence of the body becomes less strong and the influence of the content of the representations assumes more importance (p. 94).

1.5 Overview

In this chapter a sketch of the development of the self from birth up to the time when language emerges has been provided. The self is defined in terms of the self-as-subject and the self-as-object. The former emerges from the infant's predisposed capacity to perceive order, consistency and regularity in the
environment. Primary non-social representations specify the infant's direct and immediate awareness of itself in terms of its ongoing relation to the physical environment, and comes to define the ecological self. Primary social representations specify the infant's direct and immediate perception of itself in terms of its ongoing relation to other people, and come to define the interpersonal self. Innate predisposition for early relations with others include the infant's capacity for primary intersubjectivity. The interpersonal self, then, develops in the process of social experience and activity. As the child develops, she/he becomes able to reflect on aspects of the emerging order centred around the self-as-subject, and demonstrates a new quality of awareness of other people. Reflected, co-ordinated communications between the child and her/his caregiver with reference to a shared world are examples of secondary intersubjectivity. The child also demonstrates awareness of other people's intentional participation. At this time the child may begin to use her/his developing abilities of categorisation to begin forming a true self-concept. The self-as-object emerges with the capacity to hold secondary representations. Such representations are detached from the child's immediate perceptual reality. Self-understanding includes an individual’s knowledge and reflection on the self-as-subject as well as the self-as-object.

Mirror self-recognition studies have revealed that from as early as five months of age the normally developing young child demonstrates the ability to recognise contingency cues. Stable categorical features of the self, however, become evident between the ages of 15 to 18 months of age, when the young child shows that she/he can differentiate her/himself from others based on age and sex cues. Thus from this time onwards the child has the ability to construe her/himself as a permanent object with enduring qualities. In the second year of life the child can define the self through categorical features alone. The recognition of other people's features also occurs at this time, though it seems that the child is able to identify her/his mother's features before her/his own. Consistent differentiation between the self's features and those of a stranger is not evidenced until the third year. Self-recognition skills appear to index a wider range of self-understanding than simple knowledge of external features of the self alone. The early development of the self involves changes from processing immediate and visible features to processing more enduring and non-visible features of the self. In addition to demonstrating physical self-recognition and being able to provide simple self-descriptions, the child in the later half of her second year displays secondary emotional states, including self-conscious reactions.
The development of the interpersonal self is intricately tied in with the child's capacity to interact with other people. It is reasonable to assume that disorders in the development of the self may occur if the child's experiences with others are seriously disrupted, or if the child's capacity for interacting with others is deficient. Young people with autism are characterised in terms of their social impairment. It has been argued that the basis of this impairment lies in the inability to intuitively apprehend basic human forms and patterns of feeling in other people, thus preventing access to world of shared meaning (Hobson, 1993a). Given the fact that the interpersonal self develops through a child's experiences with other people, then it may be expected that this aspect of the self in children with autism will develop in an atypical way. In the next chapter, the clinical features of the syndrome of autism will be considered, and the nature of the social impairment as defined through both clinical and empirical findings will be highlighted.
CHAPTER TWO: The Syndrome of Autism
2.1 Introduction

Leo Kanner originally identified the syndrome of early infantile autism in 1943. Since this time there has been a vast amount of work attempting to understand the nature of this tragic disorder. The aim of this chapter is to firstly describe the syndrome of autism using Kanner's original case material, and to define the cardinal features that constitute early infantile autism. After reviewing the evidence for the existence of the syndrome of autism and stressing the centrality of the social impairment, more case material and empirical research will be cited to show how these children develop and change as they grow older. Facets of the social impairment in young people with autism, as highlighted through empirical studies, will then be considered. A select review considering the capacity for joint attention interactions, social referencing, imitation, and social role-taking in young people with autism will be conducted. As highlighted in Chapter One, these aspects of social functioning are important in the development of the self, and for self- and other-understanding. Empirical studies specifically designed to examine self-recognition and self-understanding in young people with autism will then be reviewed. This will be followed by a consideration of the possible psychological mechanisms that may underlie the syndrome of autism as proposed by three theories: the interpersonal theory, the theory of mind, and the executive functioning model. Each model will be briefly reviewed and a statement will be derived from each as to the likely nature of the self in autism.

The principal thesis that is being investigated in the present series of studies is that young people with autism lack the propensity to effect intersubjective co-ordination with others and are thus less able than non-autistic children to respond to, understand and integrate other people into their representation of the world. The implications of this are that the awareness and understanding of the self, which is defined principally in relation to others, is correspondingly limited in people with autism. In the course of this chapter this thesis will be expanded upon. The chapters that follow on from this chapter will report on the studies that have been designed to examine the thesis.
2.2 The clinical features of autism

Case material
Kanner (1943) described eleven children who presented with a pattern of clinical features that he termed *early infantile autism*. Before summarising Kanner's findings, material from his case histories will be cited to convey a sense of the condition of early infantile autism, and to highlight the quality of the impairment in interpersonal relations and in what seems to be the children's impoverished sense of self.

**Case 1: Donald T.** (First assessed at 5 years of age).

*It was observed at an early time that he was happiest when left alone, almost never cried to go with his mother, did not seem to notice his father's homecomings, and was indifferent to visiting relatives* (p. 218).

*He used the personal pronouns for the persons he was quoting, even imitating the intonation. When he wanted his mother to pull his shoe off, he said: "Pull off your shoes." When he wanted a bath, he said: "Do you want a bath?"* (p. 219).

*He paid no attention to persons around him. When taken into a room, he completely disregarded the people and instantly went for objects, preferably those that could be spun* (p. 220).

*At 7½ years of age ... His relation to people had developed only in so far as he addresses them when he needed or wanted to know something. He never looked at the person while talking and did not use communicative gestures. Even this type of contact ceased the moment he was told or given what he had asked for* (p. 222).

**Case 2: Frederick W.** (First assessed at 6 years of age).

*The mother recalled that (as a baby) he was never observed to assume an anticipatory posture when she prepared to pick him up* (p. 223).

*He was led into the psychiatrist's office... He wandered aimlessly about for a few moments, showing no sign of awareness of the three adults present .... The most striking feature in his behavior was the difference in his reactions to objects and people. Objects absorbed him easily and he showed good attention and perseverance in playing with them. He seemed to regard people as unwelcome intruders to whom he paid as little attention as they would permit. When forced to respond, he did so briefly and returned to his absorption in things ... He blew out a match with an expression of satisfaction with the achievement, but did not look up to the person who had lit the match* (p. 224).

**Case 4: Paul G.** (First assessed at 5 years of age).

*He rarely responded to any form of address, even to the calling of his name* (p. 227).

*There was a marked contrast between his relations to people and to objects. There was, on his side, no affective tie to people. He behaved as if people as such did not matter or even exist. It made no difference whether one spoke to him in a friendly or a harsh way. He never looked up at people's faces. When he had any dealings with persons at all, he treated them, or rather parts of them, as if they were objects* (p. 228).
He never used the pronoun of the first person, nor did he refer to himself as Paul. All statements pertaining to himself were made in the second person, as literal repetitions of things that had been said to him before. He would express his desire for candy by saying, "You want candy". He would pull his hand away from a hot radiator and say "You get hurt" (p. 228).

Case 8: Alfred L. (First assessed at 3½ years of age).
He had a ... tendency towards developing one special interest which will completely dominate his day's activities... and it is difficult to get his attention because of his preoccupation... There has also been a problem of an over attachment to the world of objects and failure to develop the usual amount of social awareness... Language developed slowly; he seemed to have no interest in it... He still confuses pronouns... Since he talked, there has been a tendency to repeat over and over one word or statement... He prefers to play alone; he will get down from a piece of apparatus as soon as another child approaches (mother's comments: p. 233).

Case 9: Charles N. (First assessed at 4½ years of age).
The thing that upsets me most is that I can't reach my baby (mother's comments: p. 235). When he is interested in a thing, you cannot change it. He would pay no attention to me and show no recognition of me if I enter the room... The most impressive thing is his detachment and inaccessibility. He walks as if he is in a shadow, lives in a world of his own where he cannot be reached. No sense of relationship to persons... His entire conversation is a replica of whatever has been said to him. He used to speak of himself in the second person, now he uses the third person at times; he would say, "He wants" - never "I want"... When he is with other people, he doesn't look up at them... At school, he never envelops himself in a group, he is detached from the rest of the children... He has a wonderful memory for words. Vocabulary is good, except for pronouns. He never initiates conversation, and conversation is limited, extensive only as far as objects go (mother's comments: p. 236).

Case 10: John F. (First assessed at 2½ years of age).
At the end of his 4th year... he was able to form a very limited kind of affective contact, and even that with a very limited number of people. Once such a relationship had been established, it had to continue in exactly the same channels. He was capable of forming elaborate and grammatically correct sentences, but he used the pronoun of the second person when referring to himself. He used language not as a means of communication but mainly as a repetition of things he had heard, without alteration of the personal pronoun (p. 238).

Case 11: Elaine C. (First assessed at 7 years of age).
Her speech is never accompanied by facial expression or gestures. She does not look into one's face.... Her utterances are impersonal. She never uses the personal pronouns of the first and second persons correctly. She does not seem able to conceive the real meaning of these words... When she says, "Want me to draw a spider", she means, "I want you to draw a spider"... Her speech is rarely communicative. She has no relation to children, has never talked to them, to be friendly with them, or to play with them. She moves among them like a strange being, as one moves between the pieces of furniture of a room (p. 241).
The inability of these children to relate to other people was the most striking feature for Kanner, and was often identified very early in the child's life. Specific features of this social impairment included the poor or avoidance of eye contact, few if any communicative gestures, inadequate imitative ability, and the overriding preference to be apart from other people. These features represent important aspects of primary and secondary intersubjectivity, and play a vital role in the development of the self in normally developing children (see Chapter One).

In direct contrast to their poor relation to people, Kanner noted how the young people with autism tended to have a good relation to objects. He observed that for these children those objects that do not change their appearance or position, that do not interfere with the child's aloneness are readily accepted. Furthermore, eight of the eleven children studied by Kanner were reported as having good, if not exceptional, manual dexterity.

Kanner believed that these children from the start are:

... anxiously and tensely impervious to people, with whom for a long time they do not have any kind of direct affective contact (p. 249).

For Kanner this autistic aloneness constituted the first cardinal feature in the diagnosis of early infantile autism. The second cardinal feature was defined as an anxiously obsessive desire for the maintenance of sameness. This was evidenced, for example, in the children's repetitiveness and rigidity, which Kanner assumed to be governed by a dread of change or intrusion. Apart from these two features, Kanner also noted a characteristically abnormal pattern of speech in those children who came to acquire language. They were generally delayed in spontaneously putting two or more words together, but at the same time able to repeat stock words or phrases (delayed echolalia). The spontaneous words that were spoken tended to have meanings that were rigid and inflexible. Personal pronouns were repeated just as heard, so the children would refer to themselves as 'you' and to others as 'I'. The overall impression was that language was not employed flexibly as a tool to communicate with other people.

Kanner also traced the development of the disorder in his group of children. Between 5 and 6 years of age the echolalia was slowly abandoned and the children learned to use personal pronouns.
spontaneously and with adequate reference. In general their language became more communicative and their reactions to intrusions more measured. The panic tantrums subsided. Repetitiveness and rigidities developed into obsessive preoccupation. The children eventually made contact with a limited number of people, but for the prime purpose of meeting their own immediate needs. The preference for aloneness, all the same, seemed to persist.

The social impairment has also been documented as persisting into adulthood. Bemporad (1979) reported the case of Jerry Goldsmith, a 31 year old man who, as a child, had been diagnosed as autistic by, among others, Leo Kanner. Throughout his life Jerry displayed no evidence of gross brain damage, and intellectually he functioned within normal limits with no evidence of deterioration. As a baby he showed *little or no response to mothering* (no details). Motor developmental milestones (i.e., crawling, sitting and walking) were reached at an average or precocious age. By the age of two years he had not developed any recognisable speech. At three-years of age, however, he *suddenly began talking profusely but did not use speech to communicate.*

Another striking aberrant characteristic was Jerry's disregard for people and his preferring to play by himself in a darkened room. His favorite activity was spinning objects, which he would do by the hour, loudly resisting interruption ... When his mother brought him to nursery school in his 3rd year, he seemed not to even acknowledge her leaving him and calmly spent the day in a corner whirling objects ... Jerry seemed completely oblivious to the birth of a younger brother when he was 15 months old. He ignored the baby and did not express any jealousy or even appear to miss the time his mother spent with the new infant (p. 181-182).

Just before Jerry reached his fifth birthday he began to use speech for communication (no details), and concurrently began the use of pronouns appropriately.

At 11½ years of age Jerry began to perceive that he was different from his peers. He expressed a desire to be with other children but his behaviour was so inappropriate that he was either rejected or ignored.

The underlying theme behind his rationalizations was his inability to deal adequately with what he perceived as the unpredictability of other people. He simply could not empathise with others and so could not predict what they would do, which left him confused and frightened. Human beings simply did not perform repeated, identical behaviours that he could expect. Their variability was frightening to Jerry since he could not pick up the social cues that would help in anticipating behavior (p. 191).

Another striking aspect of Jerry's psychological status was an appalling poverty of inner life. He reported essentially no daydreams and did not recall nocturnal dreams. He described sexual feelings in an oblique way but no sexual fantasies ... According to Jerry, his childhood experiences could be summarized as consisting of ... confusion and terror.
The recurrent theme that ran through all of (his) recollections was that of living in a frightening world presenting painful stimuli that could not be mastered. Noises were unbearably loud, smells overpowering. Nothing seemed constant; everything was unpredictable and strange (p. 191-192).

Even as an adult, Jerry appears, at times, to understand intellectually how another person might feel, but he does not seem to be able to automatically sense in himself another's inner state (p. 195).

Bemporad believed that the need for external order ... could reflect a lack of internal order or at least the ability to organize experience into a comfortable and familiar sequence of events. This may also be understood as a disturbance in the development of the self.

Other firsthand accounts contest to the pervasive impairment in social relations, and in particular the poor capacity for social role taking (Cesaroni and Garber, 1991; Volkmar and Cohen, 1985). Cesaroni and Garber (1991), for example, comment on the social interaction and capacity for empathy of two higher-functioning people who had been diagnosed as autistic when younger. Albert was 13 years old when interviewed:

*Albert claims that he does not understand why he cannot maintain a friendship. When asked what he usually discusses with his classmates, he replies, "wind and different smells in the environment." He does not seem to see the importance of placing himself in his classmates' position to consider what they may be feeling or thinking. When prompted to try, his response is "that is boring." He may lack the ability to role-play and to recognize the roles others play (p. 310).*

The stark contrast in the capacities of relating to people as opposed to inanimate objects was referred to by Sean Barron in an auto-biographical account written by him at the age of 30 years along with Judy Barron, his mother (Barron and Barron, 1993). Sean was diagnosed as autistic at 4 years of age.

*I loved repetition. Every time I turned on a light I knew what would happen. When I flipped the switch, the light went on. It gave me a wonderful feeling of security because it was exactly the same each time. Sometimes there were two switches on one plate, and I liked those even better; I really liked wondering which light would go on from which switch. Even when I knew, it was thrilling to do it over and over. It was always the same. People bothered me. I didn't know what they were for or what they would do to me. They were not always the same and I had no security with them at all. Even a person who was always nice to me might be different sometimes. Things didn't fit together to me with people. Even when I saw them a lot, they were still in pieces, and I couldn't connect them to anything. (p. 20-21)*
Happé (1991) examined the content and style of the autobiographies of three adults with Asperger syndrome. Although the three individuals were able to reflect on their own and others' behaviour, they demonstrated limited insight into their own and others' feelings and thought processes.

From this brief survey of case material on children and adults with autism the pervasive nature of the social impairment is plain. The capacity to attune to, understand or enjoy the company of other people appears to be severely disrupted. Indeed, on closer inspection of this case material it can be seen that it is those aspects of secondary intersubjectivity considered in Chapter One that seem to be affected: these young people do not look at or engage with others to share their own experience; nor do they appear to gain from the experience of others; and they have difficulty with role-taking both in terms of imitating, understanding, and empathising with others. As the development of the interpersonal self is dependent upon the capacity to actively engage with others, it is reasonable to assume that this aspect of psychological functioning will be deficient in young people with autism. In direct contrast, and relative to these difficulties is the impressive capacity of young people with autism to negotiate their physical world. It seems reasonable to assume that in contrast to their impaired interpersonal self, the ecological self of young people with autism appears intact. The prime focus of this thesis is to examine the nature of the interpersonal self in young people with autism. The nature and development of the ecological self falls outside this remit, though it will be referred to again in the final chapter.

Current diagnostic criteria

Since Kanner's preliminary report, clinical observation and research have led to two major diagnostic classifications of this pervasive developmental disorder: Childhood Autism is detailed in the World Health Organisation's International Classification of Disease (ICD-10: World Health Organization, 1987) and Autistic Disorder in the American Psychiatric Association's Diagnostic and Statistical Manual (DSM-IV: American Psychiatric Association, 1994). According to both formulations, the disorder is defined by a characteristic type of abnormal functioning in each of three domains: impaired social interaction, impaired communication, and restricted repertoire of activities and interests. To exemplify the formal identification of abnormal functioning observed in each of these three domains, the
DSM-IV criteria for Autistic Disorder is detailed in Appendix 2.1. The criteria for the identification of the social impairment, to which much of this chapter is devoted to, involves identifying two or more of the following features: a marked impairment in the use of multiple non-verbal behaviours such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction; a failure to develop peer relationships appropriate to developmental level; a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest); and a lack of social or emotional reciprocity. These select clinical features used to formally define the social impairment in autism may each be considered in terms of the limited capacity for secondary intersubjectivity.

The prevalence of young people with autism

Lotter (1966; 1967) conducted the first epidemiological study to consider the prevalence of autism in the population. The investigator screened all children between eight and ten years of age in the county of Middlesex, at a given point in time (78,000 children in total). Employing medical records and individual interviews, a follow-up of all those children who showed some signs of autism was conducted. After this stage, 135 suspected cases were identified. These children were then individually assessed. From this sample, 35 were identified as Kanner type cases. Lotter found an incidence of 4.5 per 10,000 of the population of children aged eight to ten, and a ratio of 2.6 boys to every girl. In addition, three-quarters of the young people with autism were also mentally retarded.

Wing and Gould (1979) considered all children under 15 years of age in the London Borough of Camberwell at a given point in time (35,000 children in total). From this population, 914 young people were identified to have physical or mental handicap or behaviour disturbance. These children were then screened for the presence of at least one of the following items: impaired social interaction; impaired language development; and repetitive, stereotyped activities. As a result of this, 132 children were identified. These children were subsequently assessed in detail for their quality of social interaction, their use of speech, their capacity for symbolic, imaginative activity, their use of repetitive routines, and their overall pattern of interests.
The investigators identified 58 children whose social interaction was considered appropriate for their mental age. Of the remaining children, 74 were impaired in their social interactions. The prevalence of impairments in reciprocal social interaction was 21.2 per 10,000 children under the age of 15 years. Of this socially impaired group, 17 were identified as having a history of classic early childhood autism. The prevalence of Kanner-type autism was 4.9 per 10,000 children aged under the age of 15 years. Sixteen of the young people with autism were boys.

In the socially impaired group, all of the children displayed repetitive stereotyped behaviour, and almost all had an absence or abnormalities of language and symbolic activities. In stark contrast to this, not one of the children in the sociable group showed this pattern. This finding led Wing (1981) to define what she referred to as the autistic continuum of cases that manifest the triad of impairments in social interaction, communication, and imagination, usually associated with repetitive, stereotyped activities.

An overview of the social impairment in young people with autism

Another important aspect of the Wing and Gould study was the way they classified each of the 132 children into one of four social interaction types. Appropriate interaction described social interchanges that were suitable or apt for the child's mental age. Social aloofness covered detachment from, and indifference to others, and represented the most severe impairment of social interaction. Passive interaction described the behaviour of those who did not make spontaneous social contact but who nonetheless accepted the social approaches of others. Active, but odd interaction characterised those children who did make spontaneous social approaches, but only to indulge in their idiosyncratic preoccupation. They had no interest in, and no feeling for the needs and ideas of others.

The majority of the young people with autism in the Wing and Gould study were classed as having an aloof social manner, three were judged as being passive, and two as active but odd. Interestingly, the latter five children were considered aloof earlier in their lives. The change in social impairment has been reported by others since (Lord, 1984; Park, 1986).
Rutter (1970) reported the development of 64 children diagnosed as having autism who were, at the time of follow-up, between the ages of 15 and 29 years. Approximately half of the young people were living in institutions, and fewer than 20 percent were in employment. Only one young person was reported as being completely normal with a skilled job, living in his own flat and leading a normal social life. In half of the sample interpersonal relations tended to improve as the children grew older. A few children became somewhat outgoing, though remaining shallow in affect and lacking in empathy. More usually the young people remained reserved, without social know-how, and seemingly unaware of the feeling of others. Only half of the young people developed speech, but their talk was monotonous and flat, and they were unable to engage in normal to-and-fro conversation with others. Rutter observed that failure to make friends can be a source of distress and unhappiness, but it is not that young people with autism lack the interest or motivation to engage in friendships.

In summary, both clinical observations and empirical studies highlight the centrality of the enduring impairment in social functioning in the syndrome of autism. The social impairment may partly be understood in terms of the children's poor capacity for secondary intersubjectivity. Without the capacity to actively engage with others, it is predicted that the development of the interpersonal self will be affected. In the following section, a select number of empirical studies that have systematically explored the nature of the social impairment will be reported, and will be followed by a review of studies which have been designed to examine aspects of the self in young people with autism.

2.3 Facets of the social impairment

In Chapter One it was concluded that in normally developing children, the quality of awareness of other people develops from a primitive and apparently non-reflective form, that allows for spontaneous social reactions (primary intersubjectivity), to a more reflective, co-ordinated form as evidenced, for example, in their capacity for joint attention, social referencing, and more advanced forms of imitation and social
role-taking (secondary intersubjectivity). These capacities are important for young children's awareness of others and of themselves. In this section, consideration will be restricted to those empirical studies that have specifically examined these four important facets of social behaviour in young people with autism. A review of those studies that have explicitly focused on the capacity in young people with autism for self-recognition and self-understanding will then follow.

Both Mead (1934) and Vygotsky (1979) emphasised the importance of the ability to take the perspective of another person for social development. Joint attention interactions that focus the child's and caretaker's attention on the same object, and social referencing interactions that alert the child to the caregiver's attitudes to a shared world, are each important expressions of the child's psychological linking to and differentiation from other people. They both represent early manifestations of the kinds of social relations that are essential to self- and other-awareness, for the reason that such 'linkage' is essential for the development of awareness that 'self' and 'other' are in many respects comparable (especially, as centres of consciousness), and such differentiation is essential to awareness that 'self' is separate and distinguishable from others. In the following review a small number of studies in this area will be considered, because together these studies are perhaps the most revealing for the abnormalities observed in young people with autism.

**Joint attention**

Joint attention interactions demonstrate the capacity to not only respond appropriately to the simple gestures of another person, but to deliberately use such gestures with eye contact to co-ordinate attention with another person in order to share the experience of an interesting object or event.

Loveland and Landry (1986) considered joint attention skills and language development in 11 young people with autism, who ranged from 4¾ to 11¼ years of age, and who as a group had a mean mental age of 5¾ years (SD 26 months). All of the participants had a minimum mean length of utterance of 1.0. They were group matched with 11 children with developmental language delay for chronological age, mental age and mean length of utterance. Four tasks were administered during a play session: the
language task examined the comprehension and production of the pronouns 'I' / 'you', 'my' / 'your', and 'mine' / 'yours' (e.g., 'What do I have?' and 'Whose got the ...?'); the gesture task examined the child's comprehension of attention-directing gestures (e.g., the Shifting Gaze Task: After establishing eye contact with the child the experimenter shifted gaze to the side of the child to see whether the child turned around to search for the object of the experimenter's attention); the third task examined the comprehension of combined attention-directing words and their appropriate gestures (e.g., the experimenter shifted gaze and said to the child: 'Look at the ...'); and the final task was designed to elicit attention-directing behaviour from the child (e.g., the experimenter sat in front of and ate food liked by the child to examine whether the child would indicate her/his desire for the food or not).

The young people with autism responded correctly to only 40 percent of the language tasks (compared with 61 percent for the language delayed group), 81 percent of the gesture tasks (compared with 92 percent for the control group), and 71 percent of the language plus gesture tasks (compared with 91 percent for the control group). The between-group comparisons were all statistically significant. Regarding the within-group patterning of response, the investigators observed that the language only tasks were difficult for both groups, the gesture only tasks were easier for both groups, while the language-plus-gesture tasks were more difficult for the young people with autism but not for those with language delay. The investigators did not provide statistics to support the specificity of these within-group observations. They comment:

Apparently, as long as only a gesture is present, the developmental language delay (DLD) child and the autistic child with language can probably interpret the stimulus. When language is added, the DLD child can still interpret the stimulus, but the autistic child is less able to do so, perhaps because of an inability to focus on the gesture in the presence of language that may not be understood (p. 346).

Though, generally, the performance of the two groups was similar in terms of the number of spontaneous and elicited language and gesture joint attention responses, the language delay group used significantly more developmentally advanced gestures (i.e., pointing and showing as opposed to touching and taking) when compared to the autistic group. While touching and taking are often difficult to classify in terms of their communicative intent, pointing and showing are always used in a communicative manner. Thus, the developmental language delay children's gestures were more communicative and developmentally advanced than that of the young people with autism.
Loveland and Landry examined the response to, and use of gestures in relatively able young people with autism. Attwood, Frith and Hermelin (1988) examined young people with autism of different mental ability levels for their proficiency in understanding and expressing interpersonal gestures. There were two experiments. In the first, the young people with autism were grouped based on their intellectual ability: in the higher-functioning sub-group the nine participants ranged from 10 to 18½ years of age, and in full-scale IQ from 60 to 94 points; in the moderate-functioning sub-group the six participants ranged from 11 to 17½ years of age, and in full-scale IQ from 42 to 50 points; and in the lower-functioning sub-group the seven participants ranged from 10 to 19½ years of age, and all had full-scale IQ scores below 40 points. The moderate- and lower-functioning sub-groups were group matched for chronological age and full-scale IQ with young people with Down syndrome. All participants were assessed for their ability to respond to each of eight simple instrumental gestures (e.g., pointing to direct the participants' attention, and finger to lips to direct the participants to be quiet). In addition, all participants were assessed for their ability to express eight simple instrumental gestures on verbal request. The experimenter, for example, moved quickly toward the participant from across a large room as if to bump into her/him, saying, 'With your hands tell me to stop.'

The investigators found that all three autistic sub-groups responded appropriately to about seven of the eight simple instrumental gestures. This performance was similar to that of the respective clinical control sub-groups. In response to a verbal request to elicit a gesture, however, sub-group differences were found. The higher-functioning young people with autism produced an average of six out of eight appropriate gestures, the moderate-functioning sub-group an average of four, and the lower-functioning an average of three such gestures. The moderate- and lower-functioning clinical sub-groups performed significantly better than the young people with autism producing an average of seven and six instrumental gestures respectively.

In the second experiment Attwood, Frith and Hermelin examined the spontaneous use of gestures in young people with autism in two social situations: while in the playground and while eating their dinner. Eighteen of the young people who comprised the study group in the first experiment were compared
with 13 of the original control group for spontaneous social interactions as defined by the occurrence of gestures, speech, and facial gestures directed at another person.

The degree of mental retardation made no difference to the frequency of interaction for the young people with autism, thus the investigators combined the data from the three autistic sub-groups. Only 11 of the 18 young people with autism engaged in peer interaction, compared with all of the young people with Down syndrome. This difference was highly significant, and was reflected in the production of fewer gestures, fewer facial glances, and less speech than the control group. Finally, considering those participants who showed at least one social interaction, the average number of gestures between groups were compared. Though the autistic group interacted significantly less than the Down syndrome group in both social situations, the mean number of gestures per interaction was similar. In considering the class of gesture, there was no group difference in the mean number of deictic gestures (e.g., pointing) nor instrumental gestures (e.g., waving someone out of the way) used by the two groups. The young people with autism were not observed using expressive gestures (e.g., hugs, kisses, hands covering face in embarrassment), while 10 of the 15 control group used at least one such gesture. This difference in group performance was statistically significant.

Although the moderate- and lower-functioning young people with autism showed difficulty when asked to initiate gestures on verbal request, the results of the second experiment suggested that this difficulty was perhaps more an indication of a failure to understand the instructions rather than a failure to understand the meaning of the gestures. Spontaneous gestures were observed in the most severely retarded young people with autism.

... instrumental gestures do not depend on having a concept of mental states ... (and through them) ... one directly influences somebody else's behavior, in the same way as one would manipulate an object in order to obtain a simple physical effect. Autistic children are clearly able to do this ... Expressive gestures, in contrast, do presuppose a concept of mental states. They are not primarily aimed at influencing somebody else's behaviour. Instead they are a means of deliberately showing one's own feelings (p. 254).

More recently, Mundy, Sigman and Kasari (1994) examined the specificity of joint attention in 30 young people with autism. They too designed their study to consider the effect of developmental level on the
expression of non-verbal communication, but unlike Attwood, Frith and Hermelin, they worked with much younger children. The 'low mental age' group comprised 13 children with a mean chronological age of 3 years (SD 7 months) and a mean mental age of 18 months (SD 2 months). The remaining 17 children comprised the 'high mental age' group, and had a mean chronological age of 4 years (SD 13 months) and a mean mental age of 30 months (SD 12 months). These two sub-groups of young people with autism were matched with young people with mental retardation for chronological age and mental age, and a normally developing children for mental age only. Over the course of approximately 20 minutes, various toys were systematically presented to each child. Between each of these presentations, other situations designed to elicit non-verbal responses were set up: the experimenter clapped, sang a short song and tickled the child three times; pointed to the left, the right and behind the child while saying the child's name; and provided each child with the opportunity to roll a ball back and forth, a car back and forth, and to take turns using a comb, hat or pair of glasses in a functionally appropriate way.

In the coding schedule, 'low level joint attention behaviour', which included incidents of either eye contact while holding a toy, or alternating eye gaze between the experimenter's face and the toy, was distinguished from 'high level joint attention behaviour', which included either pointing to toys within reach, or showing or extending toys towards the experimenter's face.

The investigators found that only 19 percent of the young people with autism in the low mental age sub-group followed the experimenter's pointing. This was significantly lower compared with the two matched control sub-groups: 65 percent of the mentally retarded group, and 61 percent of the normally developing group responded. Among the high level mental age groups there were no significant differences between the three groups: 70 percent of the young people with autism, 84 percent of the children with mentally retardation, and 86 percent of the normally developing children responded appropriately to the experimenter's pointing gesture.

Mundy, Sigman and Kasari also found that the young people with autism exhibited significantly less 'low level' and 'high level' joint attention behaviour as compared with that of the two control groups, both of whom performed similarly. Furthermore, the higher mental age sub-groups displayed significantly more 'low level' and 'high level' joint attention behaviour than did the lower mental age
sub-groups. No interaction effects were found. Pair-wise group contrasts revealed that among the low mental age sub-groups, the young people with autism exhibited significantly less 'low level' joint attention behaviour as compared with the two control groups, and significantly less 'high level' joint attention behaviour compared with the normally developing group only. Among the high mental age sub-samples, no significant difference emerged in the frequency of 'low level' joint attention behaviour between the three groups, and for 'high level' joint attention behaviour the autistic group exhibited significantly less high level joint attention behaviour than the developmentally delayed group, but the difference between the autistic and normally developing groups did not reach significance.

The investigators examined the effects of intellectual functioning on non-verbal communication skills by re-grouping the two clinical samples. Thirteen young people with autism fell into a higher-functioning sub-group (mean full-scale IQ = 68 points), and 17 into a lower-functioning sub-group (mean full-scale IQ = 41 points). In responding to joint attention gestures, the investigators reported a marginal effect of intellectual functioning, with the two higher-functioning sub-groups more likely to respond by looking in the correct direction during pointing trials than the two lower-functioning sub-groups. The young people with autism in the lower-functioning sub-group displayed a more pronounced deficit on low level joint attention behaviour than did those in the higher-functioning sub-group. The two mentally retarded sub-groups performed similarly in this respect. For high level joint attention behaviour, the young people with autism in the lower-functioning sub-group displayed a more pronounced deficit relative to the those in the higher-functioning sub-group. A pattern repeated for the mentally retarded sub-groups.

To summarise at this point, in general the comprehension of joint attention skills in young people with autism appears to depend upon their chronological age and their mental ability. These same factors determine the likelihood of production of gestures, though even the most able young people with autism display difficulties with the more advanced joint attention skills. The nature of the gestures themselves are revealing.

The less advanced gestures referred to above are examples of protoimperatives. In general these types of gesture are used by normally developing children to make a request of another person. For example, the
young child may point to an object to request that another person give them a toy or food. The use of such gestures do not require an understanding of the other person's mental state. The more advanced forms of gesture are examples of protodeclaratives, and are used by normally developing children to indicate to another person. For example, the child may point in order to comment or remark on the world to another person. These gestures are used when the child wishes to influence the mental state of the other person (e.g., to make another person recognise, attend to or understand what she/he is thinking or feeling).

Baron-Cohen (1989a) considered these two different classes of pointing gesture. In the first experiment, the investigator examined the comprehension of pointing in 20 young people with autism who ranged from 6 to 16½ years of age, in non-verbal mental age from 5½ to 15½ years, and in verbal mental age from 2½ to 7½ years. The performance of this group was compared with that of 14 young people with Down syndrome who were matched for chronological age, but who had significantly lower non-verbal and verbal mental functioning. Twenty-seven normally developing children whose chronological ages were similar to the verbal mental ages of the autistic group were also included in the study. The first condition examined for the comprehension of protoimperative pointing. The experimenter said, 'I am going to use my finger to say something. What am I saying?', and pointed to one of four toys in front of the young person. A non-verbal or verbal acknowledgement that the experimenter required the young person to hand the toy to him was rated as a pass. The second condition examined for protodeclarative pointing. The experimenter said, 'Now I am going to use my finger to say something else. What am I saying?', and pointed to four objects that the young person could not see. A non-verbal or verbal response indicating that the young person understood that the experimenter wanted her/him to look at what was being pointed to was rated as a pass.

Fourteen of the 20 young people with autism, 11 of the 14 young people with Down syndrome, and 25 of the 27 normally developing children demonstrated an ability to comprehend protoimperative pointing. In contrast to this, only 2 of the 20 young people with autism, compared with 12 of the 14 young people with Down syndrome, and 26 of the 27 normally developing children demonstrated an ability to
comprehend protodeclarative pointing. The difference between the autistic and two control groups was highly significant.

In the second experiment, Baron-Cohen examined the production of pointing in 10 young people with autism who ranged from 2½ to 5 years of age, in non-verbal mental age from 1½ to 5½ years, and in verbal mental age from 1½ to 3 years. The performance of this group was compared with that of 10 young people with mental retardation who were matched for chronological age and verbal mental age. Ten normally developing children whose chronological ages were similar to the verbal mental ages of the autistic group were also included. The groups of young people were videotaped for 45 minutes in free play, and incidents of protoimperative and protodeclarative pointing were recorded.

Four of the young people with autism produced a protoimperative pointing gesture, compared with eight of the mentally retarded group and seven of the normally developing group. This group difference did not reach statistical significance. Not a single young person with autism displayed a protodeclarative pointing gesture. This performance was significantly less than the two control groups: seven young people with mental retardation and nine normally developing children spontaneously displayed protodeclarative pointing.

Interestingly then, the nature of the gestures that are responded to and used by young people with autism appears to depend upon their demands in terms of the user's understanding of mental states. This supports the observations of Attwood, Frith and Hermelin who found that young people with autism did not use expressive gestures spontaneously, and the findings of both Loveland and Laundry (1986) and Mundy, Sigman and Kasari (1994) who found that the gestures used by young people with autism were less communicative.

Indeed, Mundy, Sigman and Kasari considered the degree to which joint attention skills were related to the presentation of symptoms, as assessed using a standardised parent report measure. Joint attention was negatively and significantly correlated with both social relating (r =-0.38) and language use (r =-0.37). Thus, those young people with autism who displayed less joint attention behaviour also tended to be
perceived by their parents as displaying more disturbance in their social and language functioning than those who displayed more joint behaviour. Interestingly, joint attention was also negatively and significantly correlated with the social relating (r = -0.40) for the normal sample, demonstrating that the relationship between these two variables is not specific to autism.

Baron-Cohen (1995) proposed two evolutionary based mechanisms to account for the capacity of a child to engage in joint attention: the Eye Direction Detector (EDD) and the Shared Attention Mechanism (SAM) (see Chapter One). He suggests that EDD is intact in young people with autism, while SAM is in most cases impaired. Thus, children with autism are able to detect whether eyes are looking at them (Baron-Cohen, Campbell, Karmiloff-Smith, Grant and Walker, 1996), but as reviewed here, they show little if any joint attention behaviours. He goes on to suggest that this dissociation is consistent with the idea that children with autism can hold dyadic but not triadic representations. This pattern may also explain why young people with autism can pass visual perspective taking tasks (e.g., Hobson, 1984) but not joint attention tasks. The ability to pass visual perspective taking tasks may rely upon the capacity to hold the dyadic relationships of the form 'Agent - Relation - Object' as in, for example, 'He sees the mountain.' What is missing from these representations is the embedded term that is a necessary feature of triadic representations, and the possibility of employing other mental state terms in the relation slot. Baron-Cohen (1995) suggests that this explains why young people with autism do not show spontaneous gaze monitoring, or attempt to direct another person's attention to an object, as an end in itself.

In summary, it would appear that the deficit in joint attention in young people with autism, in terms of both their response to other people's gestures and their use of gestures to communicate to others, is more pronounced in those who are younger and intellectually lower-functioning than in those who are older and higher-functioning. Those young people with autism who do use gestures tend to use ones that are developmentally less advanced (i.e., protoimperative) than their matched control counterparts, who themselves use both protoimperative and protodeclarative gestures. The more advanced gestures require an awareness of other people who themselves have mental states. The understanding and use of gestures in joint attention interactions demonstrates the child's awareness of others who are similar, and at the same time different to the self. The pattern of impairments highlighted in this section demonstrate the
difficulty of young people with autism to engage with other people, and therefore to share with others their experiences or to share in other people's experiences. This impairment is likely to have decisive implications for the development of the interpersonal self.

Social referencing

Social referencing refers to the capacity to perceive and respond to another person's affective orientation towards objects, other people and events in the environment. It represents another example of important social functioning, where another person's attitudes to a shared world can be integrated into one's own representations of that world. The two studies to be reported here have both come from the research group in Los Angeles.

Mundy, Sigman, Ungerer, and Sherman (1986) examined the non-verbal communication skills and object play skills of 18 young people with autism, who ranged in age from 3 to 6 years of age, and had a mean mental age of 3 years. They were individually matched with young people with mental retardation for chronological age and mental age. In addition, a group of normally developing children were individually matched with the young people with autism for mental age. Among the several measures taken by the investigators, they examined the participants' 'ability to share attention by making eye contact with the experimenter while manipulating objects or alternating eye contact between the experimenter and an active mechanical toy' (p. 660). The investigators found highly significant group differences on this particular measure. In these situations, the young people with autism tended to focus their attention on the toys rather than, as the young people of both the control groups, divide their attention between the toy and the experimenter. In fact, this turned out to be the most powerful of all the non-verbal measures examined in discriminating between the groups.

These data support the hypothesis that a deficit in the development of indicating skills is a significant feature of pre-school children who are diagnosed as autistic. Since these skills normally develop in the first two years of life such a deficit likely reflects a primary psychological component of the pathology of autistic children (p. 666-667).

More specifically in relation to social referencing, Sigman, Kasari, Kwon and Yirmiya (1992) examined the responses of children with autism to negative emotion shown by other people (i.e., distress, fear and
discomfort). Thirty young children with autism, with a mean chronological age of 3½ years (SD 11 months) and a mean mental age of 2 years (SD 10 months), were matched with two groups: thirty young children with mental retardation for chronological age and mental age; and 30 normally developing children for verbal mental age. To examine the children's response to distress, the experimenter, while showing the participant how to use a wooden pounding toy and hammer, pretended to hurt herself by hitting her finger with the hammer. She then displayed facial and vocal expressions of distress without using words. Each child's response to the experimenter was videotaped. In addition, the parent of each child was trained to display mock distress, and the child's reactions to her/his parent under the same conditions were videotaped.

The investigators found that the children with autism looked at the distressed adult significantly less than did the children with mental retardation or the normally developing children; that they looked at and played with the toy significantly more than the two control groups, particularly when the adult displayed distress. Those children with autism who did look at the distressed adult, did so much later than the control groups, and were rated as showing less concern for the adult.

The second experimental condition examined the same participants' response to the expression of fear in others. The child sat between the experimenter and the her/his parent in a triangular arrangement, with the experimenter and parent facing each other. A small remote control operated robot appeared, moved towards the child and the two adults, and stopped 50 inches in front of the child. On seeing the robot, both adults modelled facial and vocal expressions of fear without using words for 30 seconds.

The children with autism looked significantly less at the adults than did the children in either of the control groups. The young people with mental retardation looked at the toy less than did those with autism, but there was no statistical difference between the autistic and normal group on this measure. Interestingly, the young people with autism were rated as significantly less hesitant than the mentally retarded children in subsequently playing with the robot: Seventeen children with autism approached the robot and played with it for an average of 6 seconds; eight of the mentally retarded group approached the toy and played with it for an average of 1.5 seconds; and fifteen of the normally developing group
approached the toy and played with the robot for an average of 3 seconds. The difference between the autistic and normal group was not significant. Across the three groups, the more a child attended to the adult's fear expression, the less likely they were to play with the robot.

In the final condition, Sigman, Kasari, Kwon and Yirmiya examined the response of the same groups of children to a milder form of negative emotion - the discomfort of others. Separately, the parent and later the experimenter lay down in the course of an interactive play session with the child, closed their eyes, and pretended to feel some discomfort for one minute.

Fourteen of the children with autism did not appear to notice their parent's discomfort, compared with just six children with mental retardation and four normally developing children: a highly significant group difference. Eighteen children with autism did not appear to notice the experimenter's discomfort, compared with eight of the mentally retarded group and seventeen of the normally developing group of children. The children with autism were also significantly less likely to touch their parent than either of the two control groups.

In a study like this, it is always difficult to know whether the participants treated the expressions of emotion as 'real'. This might possibly introduce bias insofar as the control group would take an interest in the 'acting' adult (in a way that might be somewhat independent of their reactivity to emotional expressions), whereas the autistic participants might show less interest. The attention-grabbing aspect of the emotional expressions, however, might yet be conveyed by actors.

The failure to respond to the attention and affect of other people in a shared environment again demonstrates the severity of the social impairment in young people with autism. The most striking aspect is the inability of these children to use and integrate other people's attitudes to a shared world into their representation of that world. As with the impairment in joint attention interactions, deficient social referencing is likely to have decisive implications for the development of the interpersonal self.
Imitation

Neonatal imitation was discussed earlier in this chapter. This primitive, non-reflective capacity of the new-born to register certain bodily actions of others is believed to stem from, and exemplify predisposed primary representations that enable the infant to apprehend order in her/his environment. The types of imitation to be discussed in this section differ from neonatal-imitation by virtue of the fact that they are reflective. Reflective imitation is an expression of how the normally developing child may 'link in with' the actions of other people, so that to some degree the psychological states of the participants may become co-ordinated. Abnormalities in the capacity to imitate may be indicative of deficits in the propensity to 'take the role' of the other, with the potential implications for self- and other-awareness.

Imitation has become widely accepted as a feature of the syndrome of autism, and an 'impairment in social imitative play appropriate to developmental level' is included as part of current diagnostic criteria (DSM-IV, APA, 1992). Parental reports have confirmed this clinical impression in 5-year-old children with autism, who were significantly less likely to imitate movements of another child at play than were children with mental retardation (Stone and Lemanek, 1990). In this section, a select number of empirical studies that were designed to systematically explore the nature of imitation in young people with autism will be reviewed.

In Chapter One, three types of imitation task classified by Meltzoff (1990) were considered. Most of the studies that have examined imitation in young people with autism have typically adopted a social modelling design, where the young person is required to imitate the target behaviour of another person. According to Meltzoff, this is the most basic and least cognitively complex relative to delayed imitation and social mirroring. Generally, two types of social modelling task have been employed: those that require the child to imitate another person's manipulation of an object, and those that require the participant to imitate another person's bodily action.

These two types of social modelling were used by DeMyer, Alpern, Barton, DeMyer, Churchill, Hingtgen, Bryson, Pontius and Kimberlin (1972). They observed in their Indianapolis clinic that 'psychotic' children appeared to demonstrate a specific pattern of imitation deficits relative to non-psychotic mentally retarded children. The psychotic children tended to imitate the examiner's use of
objects, but were less likely, if at all, to imitate the body actions of the examiner, and performed best with objects that 'suggested their own solution'. The mentally retarded children's performance in these three areas tended to be equivalent to their mental age. In their study, the investigators compared the performance of a mixed group of 12 psychotic children (four primary autistic; five secondary autistic; and three schizophrenic) who ranged from 3½ to 7 years of age, with five mentally retarded children matched for chronological age. There were three conditions: the spontaneous use of the objects, to establish the appropriate age level usage; the imitation of motor-object movements made by the experimenter; and the imitation of body movements made by the experimenter. The difficulty level of the tasks in each condition was matched with each child's adaptive age level, and within each condition three classes of task were interspersed: Those that were 'Possible' (i.e., appropriate for the participant's adaptive age), those that were 'Difficult' (i.e., advanced for adaptive age) and those that were 'Easy' (i.e., below the level of difficulty for adaptive age). Apart from saying, 'Look, (name of participant)', no verbal instructions were given. Each young person's performance was judged as a pass or fail by two independent raters.

The investigators found that for the spontaneous object use, the study group's performance was comparable to that of the control group for both the 'Easy' and 'Difficult' classes of tasks, but significantly below for the 'Possible' class of tasks. The study group's performance on the motor-object imitation was comparable to that of the control group on the 'Easy' class of tasks, significantly below on the 'Possible', and apparently better on the 'Difficult' (although significance levels were not reported!). Finally, the study groups' performance on body imitation was significantly below that of the control group for both 'Easy' and 'Possible' tasks. The two groups performed equally poorly on the 'Difficult' class. On all levels of task difficulty the study group performed significantly better on the motor-object imitation tasks relative to the body imitation tasks.

This pattern of findings suggest that this 'psychotic' group were specifically impaired in their ability on social modelling tasks to imitate the bodily actions of other people vis-à-vis motor-object manipulation imitations. The mental ages of the two groups in this study were not reported. If the control group were more intellectually able than the study group, the argument for specificity would be weakened. Further,
the lack of homogeneity among the study group does not allow for a specific attribution of dysfunction to autism per se.

Dawson and Adams (1984) also used bodily and motor-object imitation tasks in their study. They assessed the imitation and object permanence skills of 15 young people with autism who ranged from 4 to 6½ years of age, and in full-scale IQ from 17 to 89 points. The participants were administered four standard imitation tasks that increased in their level of difficulty. The first imitation task involved the child imitating the experimenter conducting a familiar simple action (e.g., banging a hammer on the table) and was classed at Piaget's Stage III; the second required the child to imitate the experimenter conducting a familiar, but complex action (e.g., stirring a spoon inside a pot) and was classed at Piaget's Stage IV; the third involved the child imitating the experimenter conducting an unfamiliar manual gesture, the results of which were visible to the child (e.g., opening and closing a fisted hand) and was classed at Piaget's Stage V; and the fourth involved the child imitating the experimenter conducting an unfamiliar facial gesture, the results of which were invisible to the child (e.g., wrinkling the nose) and was classed at Piaget's Stage VI. The object permanence skill of each participant was also assessed, from Piaget's Stages III to VI, using standard procedures.

Ten of the 15 young people with autism were able to perform all of the object permanence tasks, with the other five achieving Stages IV or V. In contrast to this, only three of the participants were able to perform Stage VI imitation task, with seven performing at Stages II and III. The investigators also found that high imitators tended to exhibit more interpersonal gestures (looking, simple gestures, touching, and smiling), and significantly more speech directed toward the experimenter than did the low imitators. Imitative ability, but not chronological age nor full-scale IQ, was predictive of social behaviour.

More recently, Charman and Baron-Cohen (1994) examined motor-object and bodily imitation in 20 young people with autism who ranged from 5 to 18 years of age, in verbal mental age from just under 2 to 5½ years, and in non-verbal mental age from 3 to 9½ years. They were group matched with 23 young people with mental retardation for chronological age and verbal mental age. For the motor-object imitation condition, the experimenter manipulated each of four objects three times over a 20 second
period. After the fourth item had been handled by the experimenter, each object was placed in front of the participant. If the young person did not immediately take up the object, the experimenter said, 'What can you do with this?' For the bodily imitation, the experimenter modelled four actions: a familiar visible gesture; an unfamiliar visible gesture; and two unfamiliar invisible gestures (i.e., gestures that cannot be seen by the person who enacts them). On completion of each gesture, the experimenter asked the participant, 'Can you do that?'

Charman and Baron-Cohen found that of the 20 young people with autism, 7 participants imitated three, and 12 imitated all four motor-object actions appropriately; and a single participant imitated three, and 18 imitated all four bodily actions appropriately. This pattern of performance was similar to that of the non-autistic control group, and appears to contradict earlier research findings. These investigators, however, did not match the tasks to the participants' level of ability, and the majority of those in both groups performed at ceiling. It is difficult, therefore, to justify the authors' conclusion that the participants imitative abilities were relatively unimpaired, when ceiling levels of performance preclude comparisons on the abilities across groups. It seems like the tasks administered were simply too simple to assess the relative imitative ability.

From their comprehensive review of the literature on social modelling imitation in autism, Smith and Bryson (1994) conclude that young people with autism are deficient in imitating others. They point out that in addition the behavioural repertoires of young people with autism are both limited and inflexible, and that dysfunctional movements, including motor stereotypies, perseverative responses, and Parkinsonian symptoms, appear to exist in many individuals with autism. The relationship between these different problems and the capacity for imitation is currently unclear.

There have been a few studies which have used social mirroring imitation conditions with young people with autism. Dawson and Adams (1984) presented a social mirroring imitation task after the social modelling conditions to all of their participants. To begin with, they observed the young people in a free-play condition with a set of standard toys, then recorded incidents of spontaneous imitation acts under each of three conditions: in the simultaneous imitation condition the experimenter mimicked the actions
made by the child with the toys; in the familiar scheme condition the experimenter mimicked the actions made earlier by the child in the free-play condition; and in the novel scheme condition the experimenter modelled an unfamiliar scheme. The investigators found that the low-imitative sub-group identified from the social modelling tasks were significantly more likely to respond to the experimenter when their actions were imitated than when familiar or novel actions were imitated. Under the social mirroring condition, these young people were more socially responsive, showed more eye-contact, and played with toys in a less perseverative manner than in the other imitation conditions. The high-imitative sub-group responded similarly to all conditions in terms of their social behavior and imitative behaviour.

Dawson and Galpert (1990) examined the response of 15 young people with autism to social mirroring. Their sample ranged in age from 2½ to 6½ years of age, and in full-scale IQ from 22 to 100 points. The capacity for gestural imitation was evaluated using a standardised measure. The young people were then videotaped playing alone with a set of toys, and then with their mothers. After a standard period of time, the mothers were asked to imitate their children using an identical set of toys. For the following two weeks, mothers then spent 20 minutes every day in their own homes imitating their children, using the same set of toys. At the end of the two week period, the mothers and their children returned to the laboratory. The young people were again videotaped playing alone with a different set of toys, and then with their mothers. After a standard period of time, the new toys were replaced with the original toys, and mothers were asked to imitate their children.

The investigators found that the duration of gaze at mother's face increased significantly from the baseline play condition to the social mirroring condition, and cumulatively from the first social mirroring condition to the second social mirroring condition two weeks on. Furthermore, improvement was not found to be a function of chronological age, intellectual functioning nor imitative ability.

In summary, the findings from this brief review seem to suggest that there are subtle impairments in the imitative capacities of young people with autism. In particular the capacity to form a representation of a moving object seems to be more intact than the capacity of forming a representation of another person performing bodily actions or gestures. It may be that when young people with autism encode the motor-
object action, they attend to the movement of the object itself and not to the agent of the manipulation. The capacity to hold a representation of another person conducting a bodily act, whether familiar or unfamiliar, requires the young people with autism to role-take and demands that the child adopts the stance of the other. Interestingly, the young people with autism can respond to the immediately imitated self-movements in the body of another. The child may not be responding to a matching cognitive representation, but rather resonating to something familiar and therefore unthreatening. Thus social mirroring may be less demanding, cognitively, than social modelling of bodily actions. This implies that other people and their actions are intrinsically less meaningful for young people with autism than are the movements of objects. The development of the interpersonal self is entirely dependent upon the young child 'linking in' with the other person. The impaired capacity of young people with autism to imitate the bodily actions of others provides further weight for the argument that the self in young people with autism will develop in an atypical way.

Social role-taking

Social role-taking refers to the ability of the child to 'stand in the shoes of another person'. This does not refer to visuo-spatial perspective taking ability, a skill that has been found relatively unimpaired in young people with autism (Baron-Cohen, 1989a; Hobson, 1984; Leslie and Frith, 1988). Social role-taking involves the capacity to mentally attune with another person, to demonstrate an appreciation of what they may be experiencing, and in particular their feeling mental state. Emotion recognition, understanding and expression in young people with autism has been found to be relatively impaired (e.g., Hobson and Lee, 1989; Hobson, Ouston and Lee, 1988ab; Snow, Hertzig and Shapiro, 1987). It may, therefore, be expected that these young people would be disadvantaged in tasks designed to examine social role-taking ability. Before reviewing a select number of studies that were designed to examine social role-taking, one emotion recognition study will be cited by way of an example.

Hobson, Ouston and Lee (1988a) examined emotion recognition in a group of 17 young people with autism who ranged from 13 to 26 years of age, and from 5 to 11 years in verbal mental age. These participants were individually matched with young people with mental retardation for chronological age
and verbal mental age. In the first experiment, the participants were required to sort standard photographs by facial expression (happy, sad, angry, and scared), and then by identity (two different women and two different men). The 16 cards for sorting comprised the photographs of the faces of four individuals, each posing four standard emotions. In the emotion sorting task, the participants were presented with four target photographs of a different identity to those to be sorted, posing the four standard emotions. The expression was labelled by the experimenter. The four pictures of each identity were set out in front of the participant, who was then asked to put the happy face with the happy face target, the sad face with the sad face target, etc. In the identity sorting task, the participants were presented with four target photographs of the four identities to be sorted each posing a neutral expression. The four different identities posing the same emotion were then placed in front of the participant. The experimenter pointed to each target photograph, and asked the participant to place the picture of the person under it. In the second condition, an identical set of 16 cards were presented to the participants, but the mouth had been blanked out with a white strip to reduce the emotional cues available for sorting. In the third condition the mouth and forehead were both blanked out, reducing even further the emotional cues available for sorting. The procedure reported for the first condition was adopted in the second and third conditions.

The investigators found that as the facial cues were reduced stepwise from the full-face to the blank mouth and forehead condition, so the performance on identity recognition declined at approximately the same rate for both groups. On the recognition of emotion, however, while the non-autistic participants were able to sustain a relatively high level of performance when progressively fewer cues to emotion were available, the performance of the young people with autism dropped significantly.

In the second experiment, Hobson, Ouston and Lee re-presented the first condition to the participants, but the target faces and the faces to be sorted were presented upside down. The investigators found that the young people with autism were significantly more proficient in sorting both the identity and emotion in upside down faces than were the non-autistic mentally retarded controls.

*These results provide evidence for qualitative differences in the processes or strategies of 'emotion recognition' in autistic and non-autistic individuals, differences that appeared to be specific to emotion recognition vis-à-vis identity recognition (p. 450).*
Though this study showed some methodological sophistication, there remains a question as to how far judgements of static photographs of faces are effective in assessing the perception of emotions, which naturally have a dynamic and more expressive aspect. It is possible that the group differences arose from some emotion-independent aspect of the task demands.

Those studies that have specifically examined social role-taking will now be considered. Oswald and Ollendick (1989) examined role-taking ability and social competence in a group of 10 young males with autism who had a mean chronological age of 15 years (SD = 19 months), and a non-verbal IQ of 61 points (SD = 15). They were group matched for age, sex and non-verbal intellectual functioning with a group of young people with mental retardation. They presented three role-taking tasks, all of which required non-verbal responses: a picture sequencing task, that required placing a series of pictures in the correct order to tell a story; a task to examine the ability to attribute to a puppet a belief that is known to be false; and a penny hiding game, which required the participants to inter-relate multiple cognitive elements to 'think about what another is thinking about what I am thinking'. Social competence was evaluated using a standardised teacher report measure, a standardised caregiver report, and a behaviour observation schedule.

The investigators, to their surprise, found no statistically significant group differences on the first two role-taking tasks, although they did find a highly significant difference on the penny hiding game. For the first two role-taking tasks, only the performance on the puppet task was significantly correlated with one measure of social competence (i.e., the teacher report measure). The penny task, however, was significantly correlated with all social competence measures. Oswald and Ollendick write:

... in the same way that individuals with autism tend to attend to single, limited, and often irrelevant details in making visual discriminations, our findings suggest that the autistic may be unable to attend simultaneously to the multiple, subtle, cognitive components of successful role taking and competent social interaction (p. 125).

Oswald and Ollendick, like Baron-Cohen, Leslie, and Frith (1986), examined the ability of young people with autism to take the perspective of another regarding cognitive mental states. How do young people with autism respond to the inclusion or integration of emotional mental states?
Dawson and Fernald (1987) examined the relationship between social behaviour, different perspective-taking abilities, including affective role-taking, and intellectual functioning in 16 young people with autism who ranged from 6 to 14½ years of age, and in mental age from 3½ to 8½ years. They administered five perceptual role-taking tasks (e.g., the 'upside down' test involved the use of a card with the drawing of a boy standing up on it: after establishing that the participants understood what upside down meant, they were asked to show the boy on the card to the experimenter so the experimenter could see him standing on his head); two conceptual role-taking tasks (e.g., the participants were presented with a necklace, a tie, a doll, a toy truck, and a book. They were asked to choose one of the items as a gift for mother, father, sister or brother [or friend], and self, in turn); and two affective role-taking tasks (e.g., after establishing that the participants could recognise the drawings of four faces that differed in emotional expression [happy, sad, afraid, and angry], they were asked to pick the face that went with the picture of another child with a blank face in a situation that would typically elicit one of the above emotional responses). Social behaviour was measured using the Vineland Social Maturity Scale and a Social Behaviour Rating Scale devised by the investigators. The Childhood Autism Rating Scale (CARS) was also completed to provide a measure of severity of autism.

The investigators found that perceptual role-taking was significantly correlated with scores on their 'Social Behavior Rating Scale' only; conceptual role-taking was also significantly correlated with this social measure, as well as with the total CARS score; and affective role-taking was significantly correlated with the total CARS score only. The investigators used scores from the three sets of role-taking tasks to obtain an overall perspective-taking ability score. This gross score was found to be significantly correlated with the two social measures, as well as the severity of autistic symptoms as measured by the CARS. Social behaviour was not significantly correlated with measures of mental age ability, nor chronological age. The three sets of perspective taking tasks were not controlled for their level of difficulty: the affective role-taking proving the most difficult task to complete. This study did not include control subjects, and although the within-group correlation coefficients were of interest, there remains doubt about the constraints on task performance in each condition.
Yirmiya, Sigman, Kasari, and Mundy (1992) examined the ability of young people with autism to take the perspective of another regarding emotional states. Their study group comprised 18 young people with autism who ranged from 9 to 17 years of age, and in full-scale IQ from 75 to 136 points. These high-functioning participants were matched with 14 normally developing individuals. All participants were administered a standardised task to examine their capacity for empathy. Five videotaped vignettes depicting a child experiencing one of five different emotions (happiness, anger, pride, sadness and fear) were presented. The familiarity of these emotions to all participants had been established prior to the task. After watching the vignette, participants were asked to report how they felt. A week later, the participants viewed the vignettes for a second time, and were asked to report on how the protagonist felt, and the reasons why they themselves felt as they did. The responses from this latter request were coded for their 'level of cognitive mediation', which ranged from attributing no reason for feeling as they did to explicit role-taking.

The investigators found significant group differences on each of the three empathy measures: the young people with autism performed significantly less well than the control group on labelling of emotion, empathy, and cognitive mediation. The performance of the young people with autism on both the labelling emotion and empathy task were significantly and positively correlated with both full-scale IQ and social-affective measures. Intellectual functioning, however, was not predictive of performance in the control group. The investigators were surprised at how well the young people with autism did do, despite performing less well than the normally developing children. This pattern in the associations suggest that some autistic children may use cognitive strategies in dealing with social situations. Furthermore, the investigators found that those young people with autism (full syndrome) were less able than those young people with autism (residual state) to identify the emotion felt by the protagonist. This difference in quality of diagnosis within the study group is based upon social-affective abilities rather than on cognitive abilities. One is left uncertain, however, what it really means to ask a participant in a task, what they themselves felt when looking at artificial materials. There must be considerable bias introduced into the responses, by there expectations of what it is the experimenter is seeking. Are children really made to feel 'happy' by seeing 'happy' figures in a story on a television screen?!
It would appear from the studies designed to examine social role-taking in young people with autism, that these individuals do demonstrate difficulties in their capacity to 'stand in the shoes of another'. The degree of the impairment in general appears to be related to not only mental age functioning, but to social competence. Once again, the development of the interpersonal self relies upon the young child psychologically connecting or 'linking in' with the other person. The impaired capacity of young people with autism in social role-taking provides yet further weight for the argument that the self in young people with autism will develop in an atypical way.

Summary of the research findings

It would seem that young people with autism are impaired in their capacity for joint attention, social-referencing, imitation and social role-taking. These findings support clinical observations. In addition, however, the research findings demonstrate that these social impairments are generally more acute in younger than in older children with autism, and in those whose mental functioning is lower compared with those that are higher. One possible reason for the association between low MA and social role-taking and shared attention, is that the lack of shared attention contributes towards the autistic person's difficulty in learning from other people. Sharing a focus for attention, and linking into adults ways of construing the environment, is a vital aspect of normal learning in very young children, and people with autism who are unable to co-ordinate their attention with that of others are at a severe disadvantage in picking up not only language, but also concepts about and ways of dealing with the world. In addition, there are likely to be cognitive constraints on those aspects of social functioning that require the coordination of different sub-component abilities, and so low mental age itself (as in Down's syndrome) can act as a constraint on certain complex forms of social inter co-ordination.

There is also the issue of whether IQ, as opposed to mental age, might relate to the development of social functioning. The important point here, is that mental age is a measure of cognitive level at a given point of time; and equal levels of performance on an IQ test may be achieved in different ways by individuals who are of very low IQ (and older in CA) or somewhat higher IQ (and correspondingly lower in CA). In general, the studies of cognition in autism have characterised children in terms of high-
or low-functioning, where mental age levels generally correspond with verbal IQ levels (especially, of course, when there is a small range of age in the subjects tested). The non-verbal IQ is, however, often out of keeping with social ability, in that this appears to be a relatively 'social-independent' aspect of autistic individuals cognitive development.

Furthermore, those young people with autism judged to be less socially impaired generally perform better on these tasks than do those judged to be more socially impaired. It could be argued that to examine these 'infant' aspects of social functioning in older children may well produce confounding results. In normally developing children, these capacities are evident early in their lives, and serve as the foundations for more sophisticated social development, knitting in with other aspects of neurological, mental and physical development. It may be that if these social capacities are not realised early on, or are 'learned' in a non-spontaneous way later in life, other developmental sensitive processes evolve to compensate for the impairment. Thus those young people with autism who have the intellectual capacity may use this to compensate over time for their social impairment. Given that young people with autism are generally disadvantaged in these areas of social functioning, it may be expected that their self-understanding will be also affected. In the next section, the experimental literature on the self in autism will be reviewed.

2.4 Self-recognition and self-understanding in young people with autism

Clinical descriptions allude to abnormalities in 'the self' of young people with autism. Bettleheim (1967) discussed the child's undifferentiated self; Ornitz and Ritvo (1968) felt that the inadequate modulation of sensory input in young people with autism interferes with the development of a stable sense of self and others; a British working party, in attempting to define the impaired capacity for human relationships observed in young people with autism, included the apparent unawareness of his own personal identity as part of the diagnostic criteria of the syndrome (Creak, 1961); and the development
of social skills in young people with autism was presumed to be related to their capacity for self-awareness - that is, awareness of their own 'peculiarities' (Kanner, Rodriguez and Ashenden, 1972).

Attempts to empirically examine these clinical suggestions have met with difficulty. One reason for this may have to do with establishing an operational definition of the concept of self. In the past a rather rigid empirical definition in terms of the presence or absence of the ability to recognise the physical features of the self, as in mirror self-recognition studies, was adopted. In the following section, the early studies that have examined mirror self-recognition in young people with autism will be considered, before considering more recent investigations which have employed a broader definition and understanding of the self.

**Self-recognition in young people with autism**

Self-recognition is operationally defined as the ability of the young child to pass the rouge test (Amsterdam, 1971; Gallup, 1970). This procedure involves surreptitiously marking the face of the young child and then exposing them to their altered image (e.g., in front of a mirror). Self-recognition is confirmed if the child either touches or acknowledges the mark on her/his face. The rationale underlying the rouge test is that for a child to correctly appreciate the source of the individual depicted in the mirror, there must be a mental representation of self onto which this perception of the reflection is mapped.

Neuman and Hill (1978) examined self-recognition in seven young boys with autism who ranged from 5½ to 11½ years of age. The mental ages of these children were not reported. Their performance was compared with that of ten normally developing children who were at or above 14 months of age (i.e., at an age where self-recognition would be expected). Each participant was covertly videotaped for ten minutes, then videotaped in each of three experimental conditions. In the Choice Session each young person was seated in front of two monitors; one showing the pre-taped session, the other showing real time ongoing activity. In the Marked Session all participants were surreptitiously marked with one, two or three dots on their forehead and/or each of their two cheeks at cheekbone level, and watched their
mirror image on a television monitor for ten minutes. Those who did not demonstrate mark directed behaviour took part in a series of five ten-minute Confrontation Sessions, where they watched a monitor of their ongoing activity. The marked and choice sessions were repeated. Judgements were made on the young person's mood and activity level. The investigators also measured the amount of time spent watching the videotaped image for each session, the number of face touching incidents in the pre-tape and choice sessions, and the number of mark-directed responses from the marked session.

Neuman and Hill found that the mean number of face-touching incidents increased significantly from the pre-tape and choice to the marked sessions for both groups. They concluded that six of the seven young people with autism and seven of the 10 control participants demonstrated self-recognition in this way. The young people with autism, however, viewed their mirror image longer than their pre-taped image, which was in contrast to the control group, who spent more time looking at the pre-taped image than at their mirror image. This pattern was judged to be significant by the investigators (ANOVA, \( F = 3.4 \) (1,13), \( p<0.10 \)). Regarding the mirror reactions of the autistic group, Neuman and Hill commented:

> All of the autistic children showed intense interest in their mirror images. They made a variety of movements and watched to see if the image responded. Movements included bobbing, jumping, dancing, grimacing, and lying down. One child showed a lack of tolerance when the pretaped image did not respond to his movements. One child showed extreme avoidance of his image. Even when touching his marks he would sneak covert glances at the monitor and quickly avoid eye contact. Five of the six children who showed self-recognition deliberately rubbed and attempted to remove the marks from their faces (p. 575 - 576).

Spiker and Ricks (1984) studied self-recognition in a group of 52 young people with autism who ranged from 3½ to 12½ years of age. The mental ages of the sample was not assessed. Each participant sat on the lap of a familiar adult and faced a mirror for at least 10 seconds, or until they appeared to notice the mirror. Subsequently, and away from the mirror, rouge was surreptitiously placed on their noses while they were playing with a favourite toy. The adult then turned the young person to face the mirror. If they did not touch the mark within 15 seconds, the adult gave them a tissue without verbal comments or gestures. In addition data was collected on the presence or absence of 12 clinical features associated with autism and overall functioning levels as defined by (a) appropriateness of social interactions; (b) differentiation of significant others; (c) self-care skills; (d) communication skills; (e) academic skills; and (f) degree of bizarre psychotic behaviour.
Thirty-six of the 52 young people with autism showed self-recognition as evidenced by mark-directed response in front of the mirror. Those young people with autism who failed to show self-recognition in the mirror were significantly more likely to be mute (or lacking communicative speech) than those who did show evidence of self-recognition. Seven of the 16 non-recognisers were receiving medication. None of those who showed self-recognition were on medication. When those on medication were excluded from the analysis, the group difference in the use of communicative speech was reduced but remained significant. Overall level of functioning showed that non-recognisers were more likely to be functioning at a lower level than those who did show self-recognition.

Ferrari and Matthews (1983) began their investigation by posing the question: Can the lack of self-differentiation noted in autism be regarded as diagnostically significant for the syndrome, or rather, can it be reducible to mental age? They examined 15 young people with autism who ranged from 3½ to 10½ years of age, and who were all severely to profoundly mentally retarded. Each participant was videotaped in front of a mirror for 20 seconds before having rouge surreptitiously applied to the tip of their nose, and turned back to face the mirror for a further 20 seconds. The videotapes were scored for gaze behaviour, affective expression, vocalisations, and motor behaviours (e.g., leans toward mirror, touches mirror, touches face). A behaviour checklist was also completed by the teacher of each child to assess attention skills, stereotypic behaviour, overall cognitive skills, expressive and receptive language, self-care, interpersonal skills, emotional responsiveness, and affect giving.

Eight of the 15 children showed clear self-recognition by touching the rouge on their noses when placed in front of the mirror. Three of the non-recognisers touched the mirror as if the rouge were on the surface of the mirror, while the other four children either avoided their mirror image or reacted in an indifferent fashion. While the recognisers and non-recognisers were similar in terms of their chronological age, the former had a significantly higher mental age than did the latter. Further, recognisers were rated as significantly more attentive, higher in expressive and receptive language, more skilled interpersonally, more emotionally responsive, and more affectionate than non-recognisers. The investigators mention that these differences may be attributable to the significant group differences in mental age. The small number of subjects precluded further analysis to resolve this issue.
investigators conclude that the existence of the relationship between mental age and mirror self-recognition in young people with autism...

... undermines theoretical contentions that an undeveloped, or less than adequately differentiated, sense of self is characteristic of autism. It appears, instead, that problems related to the differentiation of the self are a reflection of a lower level of cognitive function ... rather than a phenomenon related specifically to the syndrome (p. 322).

Dawson and McKissick (1984) considered the role of sensori-motor skills in the development of self-recognition in 15 young people with autism, who ranged from 4 to 6½ years of age, and in full-scale IQ from 17 to 89 points. Each participant was assessed for their capacity to imitate at different levels of sophistication, as well as their object permanence skills. The procedure and coding system devised by Lewis and Brooks-Gunn (1979) were used to assess the capacity for self-recognition. There were three conditions in which the young people were videotaped. They were initially positioned in front of a mirror and encouraged to look at their reflection. In the second condition their noses were wiped with a clean tissue before being, once again, positioned in front of the mirror. This condition enabled the investigator to know whether wiping the nose with the tissue in itself influenced mark-directed behaviour. In the third condition rouge was applied to the nose of each participant with the tissue, and they were observed in front of the mirror for the final time. The mirror responses were coded for the presence or absence of each of the following reactions: (a) little if any response; (b) responds as if the mirror image were that of another person by smiling, waving, vocalising, touching, kissing, or kicking the mirror; (c) attempts to imitate the image by bouncing, waving, and imitating facial movements; and (d) demonstrates mark directed behaviour, or the child may show more elaborate facial imitation.

The investigators found that 11 of the 15 young people with autism exhibited self-recognition as evidenced by mark-directed behaviour. Two young people with autism imitated their image and the other two showed no response. This pattern of response was significantly different to that of the two non-rouge conditions, both of which were performed similarly. The investigators went on to consider the pattern of specific behaviours shown in front of the mirror by the young people with autism who demonstrated self-recognition, and compared this to those reported by Lewis and Brooks-Gunn for both the 21- and the 24-month-olds. Descriptively, the young people with autism were found to vocalise less than these two groups (36 percent versus 80 percent and 80 percent, respectively). Given that seven of
the eleven young people with autism who showed self-recognition were mute, however, this finding is not surprising. Also, compared with the two normal groups, the young people with autism were less likely to touch the mirror itself (45 percent versus 81 percent and 67 percent) and more likely to touch their own noses (18 percent versus 7 percent and 7 percent). Furthermore, the young people with autism were as likely to smile at their mirror image as were the 21 and 24-month-olds (73 percent versus 63 percent and 60 percent). All of the young people with autism who achieved Stages V or VI in object permanence were also capable of higher levels of self-recognition. The two participants who failed to achieve object permanence were the same two who failed to show evidence of self-recognition. The investigators observed no consistent relationship between imitation ability and self-recognition, and suggest that imitation may not be of critical importance in the development of self-recognition.

*It is likely that when an impairment in self-recognition is exhibited by an autistic child, it is a function of global mental retardation, not a specific feature of autism* (p. 392).

The investigators conclude:

*... it appears that the autistic child's lack of social relatedness and unusual motor behavior, such as staring at own hands, cannot be attributed to a basic lack of differentiation between self and others. Instead, it is likely that these children's failure to imitate others, which is one of the earliest forms of communication, along with deficits in verbal processing, account for their lack of social relatedness* (p. 393).

In summary, those young people with autism who have demonstrated self-recognition have also been found to be more intellectually able and demonstrate better social functioning than those who do not meet the criterion. This has allowed for the conclusion that impairments in the self are not syndrome specific. As commented upon earlier, however, this technique is not a comprehensive index of self-understanding: the ability to recognise one's own face altered by rouge is but a single aspect of self-identity, and cannot be regarded as fully representing, for example, the capacity for self-differentiation in young people with autism as implied by Ferrari and Matthews. A more adequate test of self-awareness might be whether young people with autism manifest signs of 'self-consciousness'. Evidence relating to this is examined in the next section.

**Self-conscious behaviour in young people with autism**

Neuman and Hill (1978) observed that none of the young people with autism who showed self-recognition demonstrated either embarrassment or self-conscious reactions, while all of the normally
developing children who comprised the control group did so. Dawson and McKissick (1984) made the same observation in their sub-sample of young people with autism who exhibited mark-directed behaviour. Spiker and Ricks (1984) judged the affective expression of their sample after the rouge placement. Of the 36 children who showed self-recognition, 30 showed neutral affective expressions in response to their image. Unfortunately, Ferrari and Matthews (1983) did not measure this aspect of self-awareness in their sample of young people with autism who showed self-recognition. The reporting of self-conscious reactions in the other three studies appeared to be incidental as none of the investigators provided the criteria used to assess self-consciousness. It is conceivable that the lack of self-conscious reactions plays a greater part in forming the clinical impression of the impaired self in young people with autism than does the child's formal ability to show self-recognition.

A more sophisticated aspect of self-consciousness is pride. Pride is assumed to require the development of a concept of self as a distinct entity, one that appears in normally developing children at around 18 months. Kasari, Sigman, Baumgartner, and Stipek (1993) considered the reactions of pride in a group of 30 young people with autism that had a mean chronological age 3 1/2 years (SD 11 months) and a mean mental age of 2 years (SD 10 1/2 months). This study group were matched with 30 young people with mental retardation for both chronological age and mental age, and 30 normally developing young people for mental age. A week prior to testing each participant's puzzle solving level was assessed. At testing, the participants were initially presented with a developmentally appropriate puzzle to complete. On completion, and after a delay of 5 seconds, the experimenter commented with a neutral affect that the participant had finished the puzzle and suggested a second puzzle. On completion of the second puzzle, and after a delay of 3 seconds, the experimenter and the parent of the young person both praised her/him. The investigators measured direction of gaze, affect response (facial, gestural and postural) and overall emotional response to completion of the task at each of three points: on completion of the first puzzle; on completion of the second puzzle; and after being praised.

Kasari, Sigman, Baumgartner, and Stipek found that the young people with autism were as likely as the two control group participants to smile on completion of the tasks. This was taken as evidence that young people with autism took as much pleasure in their achievements as non-autistic children. In
contrast to this, young people with autism were less likely to seek either the experimenter's or her/his parent's attention on completion of the task. Indeed one-third of the autistic group looked away from the experimenter on completion of the first task. Such attention seeking in toddlers is assumed to show self-reflective processes that are presumed to be associated with pride. The results failed to provide evidence for pride - in the sense of a self-reflective and socially mediated emotion - in autistic children. Young people with autism were less likely to respond positively to praise, and less likely to attempt to make contact with the praising adult by looking up or turning towards her. Indeed, young people with autism frequently avoided contact with the praising adult by looking or turning away.

In both the context of mirror self-recognition, therefore, and that of task completion in the presence of others, there does seem to be evidence for a lack of self-awareness in young people with autism. This matter has been explored further in a study that most closely approaches parts of the present investigation - a study of self-description in young people with autism.

Self-description in young people with autism

Capps, Sigman and Yirmiya (1995) were interested in how high-functioning young people with autism perceive themselves, and in particular to assess the extent to which their self-awareness was mediated by intelligence and the ability to read and share the emotions of others. They studied 18 young people with autism who ranged from 9½ to just under 17 years of age, and in full scale IQ from 75 to 136 points. This study group was closely group matched with 20 normally developing children for chronological age, full scale IQ, socio-economic status, sex and ethnicity. All participants completed the Perceived Competence Scale for Children (Harter, 1982) which taps the child's sense of cognitive, social, physical competence and general self-worth. In addition the participants were given a list of four emotions (sadness, happiness, embarrassment, and pride) and asked to tell about a time she/he had felt each emotion. Finally, the participants were shown five videotaped vignettes each involving a child-protagonist experiencing one of the following emotions: happiness, pride, sadness, fear, and anger, and asked to circle the emotion from a list of emotions being experienced by the protagonist. In addition the participant was also asked to report on her/his own emotional response to the different scenes.
The investigators found that the young people with autism perceived themselves to be significantly less competent socially (e.g., having a lot of friends, being easy to like, an important member of one's class) and physically (e.g., doing well at sports, preferring to play rather than watch) and reported significantly lower estimates of their overall self-worth (e.g., being happy with oneself) than the non-autistic controls. There was not statistical difference between the groups in the perceived cognitive competence (e.g., doing well at school; being smart). The investigators then correlated full-scale IQ with the self-competence scores. Only two significant correlation coefficients were found. For the autistic group, perceived social competence was negatively correlated with full-scale IQ ($r = -0.51$, $p < 0.04$); and for the non-autistic group, perceived cognitive competence was positively correlated with full-scale IQ ($r = +0.58$, $p < 0.01$). The investigators went on to correlate perceived social competence with the ability to talk about own emotions and others' emotions from the other tasks. The analysis suggested that the young people with autism who reported higher social competence showed greater difficulty in talking about their own emotional experiences (in terms of amount of time before responding and number of prompts used) but not in the ability to label or to empathise with an other's emotional experiences. The investigators reported a non-significant tendency for those young people with autism who perceived themselves as less socially competent as being better able to label other person's emotional experiences.

One interpretation of these findings is that autistic persons who are more intelligent and better able to read the emotions of others may acquire greater awareness of qualities that differentiate them from normal people. Their cognitive and emotional abilities may yield this knowledge by facilitating their own appraisals of self and others, and by providing access to others' appraisals of their limitations. This particularly high-functioning group may see themselves more accurately ... (p. 144).

This study was revealing for the degree to which young people with autism consider themselves to be competent. The use of a structured, closed-ended questionnaire that has been standardised on a normally developing sample of young people does not allow for a direct examination of the spontaneous self-understanding in young people with autism. It may be, for example, that dimensions of self-understanding unique to young people with autism may not be tapped using such structured self-measures. The spontaneous self-descriptions, self-depiction in drawing, and linguistic self-reference of young people with autism will be the focus of the present investigation.
Summary of research findings

It was reasoned that the difficulties in social functioning observed in young people with autism, particularly in the domains of joint attention, social referencing, imitation and social role-taking, would lead to an atypical development in the understanding of the interpersonal self. The ability to recognise the physical features of the self in higher-functioning young people with autism was taken as evidence that the self in these individuals is not impaired in any special way. This was despite the fact that in those young people with autism who did demonstrate self-recognition there was no evidence of self-conscious reactions to their own image. Formal investigations of self-conscious reactions in young people with autism are limited. In the study considered here, young people with autism despite demonstrating pleasure with their achievements, did not exhibit pride or respond positively to praise. The one recent study conducted to examine the self in young people with autism using a standardised self-report measure found that able young people with autism understood themselves as socially and physically less competent than, but equally cognitively competent as their age and mental age matched controls. They also have a lower overall sense of self-worth, and are less likely to show self-conscious emotions.

The self in young people with autism, as currently portrayed from the few empirical studies designed to examine this area, is suggestive of an atypical profile. Given the broad domain of the self, however, these findings are both patchy and inconclusive. Before reporting on the studies that have been designed in this thesis to examine the self in young people with autism, the three current theoretical approaches to understanding autism will be considered.

2.5 Theoretical approaches to self-other awareness in autism

Although the syndrome of infantile autism was identified over 50 years ago, the nature of the underlying mechanisms remain a matter of dispute. A principal empirical aim has been to identify those
psychological impairments that account for the co-occurrence of the clinical features observed: to define primary deficits. For a deficit to be classed as primary, it should be present in all young people with autism (i.e., be universal), and should distinguish them from other clinical groups (i.e., be specific to the disorder). In addition, a primary deficit should be one of the most persistent and impairing features of the disorder. In this section three theoretical approaches to autism will be considered. Each has its particular focus on what is primary to the disorder. The first approach is the Interpersonal Theory. The basis of this approach was suggested by Kanner himself, and views the social-affective deficit as primary. The second approach is the Theory of Mind, and views the cognitive impairment in the understanding of mental state terms to be primary to the disorder. The final approach that will be considered is the Executive Functioning Theory. This is a neurological-cognitive model of dysfunction and views the impairment in executive functioning as primary. Each of these approaches will be considered briefly in turn below, with examples of the classic studies conducted and cited to support the claims.

The Interpersonal model

Kanner proposed that young people with autism are born with an inability to relate to other people. He asserted that:

... the outstanding, 'pathognomonic,' fundamental disorder is the children's inability to relate themselves in the ordinary way to people and situations from the beginning of life (p. 242).

and concluded that:

...these children have come into the world with innate inability to form the usual, biologically provided affective contact with people, just as other children come into the world with innate physical or intellectual handicaps. If this assumption is correct, a further study of our children may help to furnish concrete criteria regarding the still diffuse notions about the constitutional components of emotional reactivity. For here we seem to have pure-culture examples of inborn autistic disturbances of affective contact (p. 250).

Kanner did not expand on what mechanisms or processes may underlie the constitutional components of emotional reactivity.

Bosch (1970) also felt that the inability of the child with autism to relate to others is of prime importance. In order to understand the person with autism, he attempted to define the elements of what
it takes for a normally developing child to relate to another person, and reasoned that in any form of interpersonal relationship, a shared or 'common world' is constituted. The primitive basis of this involves the understanding of the others' 'bodiliness' with facial expression, gestures, and spoken word being interpreted as manifestations of personal life. A child comes to understand the self through acting and mutual understanding with other people. Bosch distinguished between relating to things and relating to others. A person acts when in relation to things; but when in relation to another person, there is reciprocal focusing that can lead to a positive or negative agreement. In the act of reciprocal focusing a common world is constituted. In contrast to this common world, Bosch described another private, non-shared 'own world'. In this domain understanding with others has not been established, and represents the person's unique experience.

Theoretically at any point in the life history of an individual a certain relationship could be shown to exist between both worlds, and this relationship is subject to progressively evolving changes. These changes occur because other people's experiences are imitated and in this way the participation in the common world is extended; simultaneously the original experience is enriched, or on the other hand, what has been experienced by self is put into words and transferred to the area of the 'common world' (p. 55).

Bosch believed that the germ of this understanding is innate. If one accepts this assumption it follows that:

... each perception of another existence in concrete encounter can only be understood as the fulfilment of an already pre-given possibility ... a form of human existence in which all human possibilities already exist (p. 56).

The task is then to investigate in what way experiences are assigned to the common world in the course of the child's development. Bosch believed that in the new-born the 'own world' and 'common world' are un-separated. The pre-personal world is simply there, but it cannot be seen to be existing in the sense of 'for me' or 'for others'. The young child lives in a symbiotic relationship with the carer. Without proposing a possible mechanism, Bosch felt that from this starting point, experience is gradually 'distributed' to the self and others. For Bosch, there is an especially significant move from this symbiotic bond when the child takes the first steps towards having a sense of 'mine' and 'not mine'; becoming a separate personality; looking at people from different positions; reaching for things; turning to others, and crying out for something.
In the case of autism, Bosch believed that at the period in development when the child is expected to display this sense of 'mine' that the already 'latent lack of a developmental possibility' becomes evident. He describes the relationship that exists between the autistic child and the carer as remaining 'symbiotic', and that the oddities noted by carers relate to the child's lack of attempt to overcome and break out of this bond. In a symbiotic relationship the individuals live together in a close mutual dependence. It comes before the separation of own and common worlds.

More recently, Jordan and Powell (1996) proposed that what young people with autism fail to develop is an 'experiencing self'. They argue that the capacity of young people with autism to hold an image of themselves based upon autobiographical facts learned from exposure to certain situations and from what they are told by others should be relatively unaffected. The difficulty for these young people lies in their inability to evaluate themselves and their experiences in relation to themselves.

'... individuals with autism may know what sex and age they are, where they live, what they like to do and so on. But they will have more difficulty with anything that depends on their own experience of things and on knowing what it feels like to be the kind of person they are. The second aspect of self concept is liable to be totally absent in autism. Lacking a sense of themselves they will be unable to reflect on their self image and make value judgements about it. Nor are they liable to notice the reactions of others to them (as opposed to their behaviour) so they will be unable to incorporate these judgements into a sense of self-esteem.' (p. 35)

According to Jordan and Powell, one part of the self-image (the self image) should be only partially affected in autism since it is possible to build up a self image from autobiographical facts about oneself that one can learn from exposure to certain situations and from what one is told by others. In contrast, if 'the experiencing self' is lacking in persons with autism, then they will have difficulty registering and remembering their own experiencing of things, and what it feels like to be the person they are. As Jordan and Powell discuss, personal episodic memories would be impoverished.

Hobson (1982) proposed that young people with autism fail to acquire a fully developed concept of 'persons' with minds. The poor capacity for 'personal relatedness' with others was attributed to a disruption in the predisposition to spontaneously attune to bodily appearances, expressions, and actions of others. This primitive, non-reflective competence for the direct perception of, and global empathic
responsiveness to other people in normally developing children was discussed in Chapter One, and defined as the child's capacity for primary intersubjectivity. Hobson (1993c) suggests:

... that early and severe impairments in interpersonal-affective relatedness might constrain a child's understanding of persons with minds, and through this the child's capacity for creative symbolic play and for contextually appropriate forms of language and thinking (p. 216).

The theoretical approach may be best understood with reference to a specific study. Weeks and Hobson (1987) examined the salience of emotional cues in young people with autism. The study group comprised 15 young people with autism who ranged from 8½ to 22 years of age, from 18 to 50 verbal IQ points, and from 59 to 113 non-verbal IQ points. They were individually matched with 15 young people with mental retardation for chronological age, sex, and verbal IQ. The participants were given a task of sorting photographs to 'go with' one or other of a pair of target photographs showing the head and shoulders of individuals who differed in three, two or one of the following respects: facial expression (happy or not happy), type of hat (floppy or woollen), age of the person (child or adult), and sex of the person.

The investigators found that most of the non-autistic group (i.e., 10 out of 15) spontaneously sorted according to facial expression before they sorted by type of hat, but most of the autistic group (i.e., 12 out of 15) sorted according to type of hat in preference to facial expression. In the course of the experiment, as the number of contrasting features in the target photographs were progressively reduced, all 15 non-autistic children sooner or later sorted by emotional expression. In contrast, only 6 of the 15 young people with autism did so. These group difference were statistically significant. Weeks and Hobson concluded:

... that what autistic children lack is a biologically based attentiveness and emotional responsiveness to certain of the bodily features of others, including features of emotional expression. It is suggested that this abnormality in autistic children's responsiveness is part and parcel of a relatively specific impairment in discriminating expressions of emotion, and that it leads to their failure to comprehend the feelings of other people (p. 148).

Hobson (1993a) proposes:

...that what is common to autism is a sufficiently profound disruption in those forms of patterned interpersonal interchange that affect sharing, conflict, or other modes of co-ordinated experience between the child and others. Such psychological co-ordination between people, entailing not only mutual engagement but also 'mental co-ordination'
between one person and another vis-à-vis an external shared world, is what seems to be critically deficient in autistic individuals (p. 14).

A mechanism that may underlie the process of psychological co-ordination between people was referred to in Chapter One: the 'relatedness triangle' (Hobson, 1994). The triangle reflects the nature of the relations that exist between the infant, the other person and the referent. The triangulation highlights that the infant has the opportunity to register that the same object in the visually-specified world has one 'meaning-for-self' and a different 'meaning-for-other'. This leads to the capacity to adopt multiple attitudes to things and, therefore, to impute multiple meanings. From this infants discover that given, interpersonally negotiated meanings can be assigned to symbols that can then be used to carry the meanings (Hobson, 1994: p. 143). At this point in development the young child may ascribe mental states to her/himself and others. The awareness of the self, then, is facilitated through the infant's affective engagement with her/his caregiver. This approach emphasises the social-developmental paths for the acquisition of a theory of mind. In this process, self-knowledge is a crucial prerequisite for the grasp of mental states of others.

Hobson (1990) argues that autism results from the child's lack or slow development of the innate ability to relate and experience persons as persons. Young people with autism are unable to direct their attention to others and share emotional experiences with them. As a result their concept and knowledge of self and others with bodies and minds will be seriously restrained.

In summary, the Interpersonal Theory of autism asserts that young people with autism are born with an impaired capacity for primary intersubjectivity, mediated through the attunement and response to basic emotional cues. Thus, according to this model, the child is from the start disadvantaged in her/his ability to link in or engage with other people. Later in the social development of the child difficulties in joint attention, social referencing, imitation and social-role taking may be expected. In normally developing children, these more advanced forms of social functioning contribute to self- and other-awareness, and enable integration into a world of shared meaning and understanding. The Interpersonal Theory would predict the atypical development of the self and self-awareness in young people with autism.
The Theory of Mind model

'Theory of mind' has been coined to refer to the ability of children to attribute mental states to themselves and to other people, thus enabling them to understand and predict their own and others' actions. Such mental states include emotions, desires, beliefs and intentions, and are instrumental for every person to make sense of their social world (Dennett, 1978). The majority of the early research in this field was designed to examine the child's capacity to understand that a person's belief is a guiding force in their actions. Typically the methodological stance adopted follows the reasoning that a fully developed theory of mind is only attributable to children if they can demonstrate an understanding of 'false belief' - where the mental state involves a belief that conflicts with reality. It is generally agreed upon that by four years of age normally developing children are fairly proficient at reasoning about false belief. These ideas have inspired theoretical hypotheses in autism: in particular that the social abnormalities observed in young people with autism may stem from a pathological fault in the acquisition and development of the ability to understand and predict their own and other's social behaviour by inferring mental states (Baron-Cohen, 1993; Frith, 1989; Leslie, 1993).

The difficulty in understanding false belief in young people with autism was first demonstrated by Baron-Cohen, Leslie and Frith (1985). In order to illustrate the theoretical issues, this study will be described in some detail. These investigators worked with 20 high-functioning young people with autism who ranged in from 6 to 16½ years of age, in verbal mental age from 2 to 7½ years, and in non-verbal mental age from 5½ to 15½ years. Fourteen children with Down syndrome who fell in the same age range as the study group, but who were lower in both their verbal and non-verbal mental ages were also tested, as were 27 normally developing pre-school children who ranged in age from 3½ to 5½ years. The procedure involved the use of two dolls, Sally and Anne. It was established that the participants could successfully name the dolls. Sally was then made to place a marble into a basket then and then to leave the scene. In Sally's absence, Anne was made to move the marble into a box. Sally was returned. The experimenter asked the participant, 'Where will Sally look for her marble?' By pointing to the basket participants were judged to have passed the Belief Question, as they demonstrated an appreciation of the doll's false belief. By pointing to the box, however, participants were judged to have failed, by not taking
into account the doll's belief. Two control questions were also asked to ensure that the child has both knowledge of the real current location of the object and an accurate memory of the previous location: 'Where is the marble really?' and 'Where was the marble in the beginning?'

The investigators found that all of the participants were able to name the dolls successfully, and answer correctly the two control questions. Twenty-three of the pre-school children, 12 of the children with Down syndrome, and only 4 of the young people with autism passed the Belief Question on two trials. This difference between groups was highly significant.

Leslie (1987) proposed that young people with autism lack the cognitive ability to form representations of other people's representations (meta-representations) of the world, and that this impairment represented a fundamental cognitive deficit in the ability to form second-order representations (i.e., to predict a person's behaviour on the basis of her/his false belief about another person's true belief about a state of affairs). This model assumes that young people with autism can form a primary representation of self and other, but in the same sense as one would form a representation of a physical object. It assumes that young people with autism cannot understand another person's mental state. Thus, this account would predict that young people with autism should be unimpaired in self- and other-recognition, but impaired in understanding other peoples internal experiences. In normally developing children, the early growth of interpersonal understanding occurs by the 'switching on' of novel meta-representational capacities that underlie concepts of mind. An early form of meta-representation is the use and understanding of the mental state of attention (Baron-Cohen, 1989b). Baron-Cohen (1993) argued that indeed the earliest detector of autism could be the young children's lack of understanding that others look at objects selectively because they are interested in them. This account explains the clinical observation of young people with autism who may take an adult by the hand and guide them to the object they want. In the 'normal case', children use eye-gaze as a way to communicate their needs. But children with autism do not seem to use eye-gaze for understanding the goals of one's actions. Thus, the deficit in goal-detection leads to a general deficit in the ability for 'mind reading' of others' mental states (Baron-Cohen, 1993).
A strength of the cognitive account is that it allows for a mixed pattern of abilities and deficits in autism (Frith, 1989). The model predicts that those social skills that do not require meta-representation will be intact in young people with autism (e.g., face recognition, mirror self-recognition, visual perspective taking, person permanence). Those requiring meta-representational abilities (e.g., imitation of symbolic gestures, emotion recognition, conceptual role-taking) will be impaired.

The cognitive model proposes that the awareness of self and others will be impaired in young people with autism (Frith, 1989, 1993), as they cannot impute their own and others' internal states. Frith states that young people with autism, though having mental states, are not conscious of them: they are 'mind-blind' (Baron-Cohen, 1993). The young people with autism can only make sense of the physical and observable world, and not that aspect of the world that requires any mental dimension. From this it may be taken that the child with autism may hold sense of self and others as physical beings, but not as mental subjects.

A dearth of studies have been conducted since the original Baron-Cohen, Leslie and Frith (1985) experiment to examine the theory of mind deficit in young people with autism. It is not within the remit of this chapter to give a review of these findings. Suffice to report that the tendency has been to move away from artificial testing situations toward more naturalistic settings (e.g., Tager-Flusberg, 1992). In particular the claim has been levied that this approach fails to take into account the context of the social interaction, in which the use of theory of mind ability will emerge and develop. Currently, it would appear that there is a minority of high-functioning young people with autism who perform successfully on advanced theory of mind tasks (Bowler, 1992; Happé, 1994; Leekam and Prior, 1994; Ozonoff, Pennington, and Rogers, 1991). Thus the assumption for the universality of a single meta-representational deficit across all levels of autism is seriously questioned. Alternative cognitive deficits have been proposed to explain how the talented minority of young people with autism function, including impaired executive functioning, which will be briefly reviewed in the following section.

There are obvious overlaps between the Interpersonal and Theory of Mind accounts of autism. The present thesis will not be concerned with gathering evidence for or against either theory, but will pivot
around the facet of experience that each theory might stress - the individual's need to experience her/himself through others' mental attitudes.

The Executive Functioning model

Executive functioning is defined as the ability to maintain an appropriate problem-solving set for the attainment of a future goal. This ability principally demands planning ahead, inhibition of established responses, and flexibility in thinking and actions. Actions that are habitual and context-specific are distinguished from actions that are guided by a plan formulated specifically for a given task. Some of the features of young people with autism are suggestive of executive function deficits: they do not appear to be able to plan ahead; they often appear impulsive, as if unable to delay or inhibit established responses; their behaviour is often rigid and inflexible; and they are often perseverative.

The basic claim of this theoretical approach is that young people with autism are deficient in planning their actions and responses. Two standardised tasks in particular have been used to assess forward planning and capacity for flexibility: the Tower of Hanoi and the Wisconsin Card Sorting Test. Before describing a recent study considering executive functioning in people with autism, these two tasks will be described. The former task comprises a board with three vertical pegs, and three donut shaped discs of different sizes. The discs can be slipped over the vertical pegs. When the discs are stacked on the same peg from the largest to the smallest they form a tower. To begin with, the three discs are distributed among the different pegs. The task is to move the discs from one peg to another in order to build the tower on a designated peg. In moving the discs the child must respect the rule that a larger disc cannot be placed on top of a smaller one, and must try to construct the tower with as few moves as possible. Good performance requires the ability to plan ahead by selecting moves in terms of their consequences for the future. A deficit in this type of planning has been demonstrated in frontal lobe damaged adults (Shallice, 1982).

In the Wisconsin Card Sorting Test the examiner starts off by placing four cards in front of the participant. These 'key' cards vary by their colour (red, green, yellow, and blue), their shape (circle,
square, triangle, and star), and their number (one to four). Thus the cards placed in front of the participant may be, for example, one red star, two blue triangles, three yellow squares, and four green circles. The participant is given two decks of cards that vary along the same three dimensions, and asked to match the cards in the deck with the key cards. The task is, by trial and error, to discover the rule of matching (e.g., by colour, and not number or shape) by placing each card from the deck below one of the key cards. The examiner informs whether the participant is correct or not in their matching, but does not say what the sorting rule is. Once the participant has categorised ten consecutive cards correctly, the sorting principle is changed by the examiner (e.g., by shape) without explicitly informing the participant. The previous sorting principle then receives negative feedback, and the participant is expected to switch to the new sorting principle. Thus this task measures the ability to flexibly modify incorrect strategies and the ability to inhibit established responses. Performance on the Wisconsin Card Sorting Test has been found to successfully discriminate between adults with frontal lobe lesions (who seem to be unable to alter their responses when the coding principle is changed - perseveration) and those with non-frontal lobe involvement (Robinson, Heaton, Lehman and Stilson, 1980).

Once again, the theoretical approach is best understood with reference to specific studies, and two examples will be cited. Ozonoff, Pennington and Rogers (1991) examined executive functioning in 17 individuals who met criteria for autistic disorder and six individuals who met criteria for pervasive developmental disorder not otherwise specified (DSM-III-R). These 23 individuals comprised the study group, and ranged in age from 8 to 21 years, and in verbal IQ from 55 to 122 points. Twenty of the study group participants were individually matched with 20 individuals with either learning difficulties or mild mental retardation for chronological age and on aspects verbal IQ functioning (i.e., the Information, Similarities and Vocabulary sub-tests of the WISC-R or WAIS-R). As the performance IQ and full-scale IQ of the autistic group (n = 23) and the control group (n = 20) did not differ, the three additional individuals with autism were kept in the study despite their low verbal IQs. To examine executive functioning, the investigators administered the Tower of Hanoi and the Wisconsin Card Sorting Test.
The 'autistic' group obtained a significantly lower efficiency score on the Tower of Hanoi, and made significantly more perseverative responses on the Wisconsin Card Sorting Test than did the control group. The deficit in executive functioning, as measured by these measures, was universal among all of those who met criteria for autistic disorder and Asperger syndrome.

A different approach to the same issue was adopted by Russell, Mauthner, Sharpe and Tidswell (1991), who administered the 'windows task' to 11 young people with autism. This study group ranged from 7½ to 17 years of age, and had verbal mental age of 4 years or above. They were matched with 14 children with mental retardation for chronological age and verbal mental age. There were two phases to the windows task. Each participant sat opposite one of the two experimenters. Two boxes were placed between the two competitors. The first experimenter told the participant that there would always be a sweet in one of the two boxes. In the first phase neither of the two players knew which box the sweet was in. The child was told that what they had to do was to point to one of the boxes each time 'to tell [E2] where to look'. If the competitor found the sweet, they could keep it, but if they went to the box which was empty, the child won the sweet. Before each of the 15 trials, the first experimenter would remind the child that she/he could get the sweet by making the competitor go to the empty box. In the second phase of this task, the earlier solid boxes were replaced with two boxes with windows in. These boxes were positioned so that only the child could see the contents of each box. The first experimenter pointed out that it would now be easier to make the competitor go to the empty box. Before each of the 20 trials in this phase, the first experimenter would remind the child that she/he could get the sweet by making the competitor go to the empty box. Also, the first experimenter continually encouraged the child to prevent her/his competitor from winning the sweet.

The young people with autism had great difficulty in coping with this paradox. Nine of the 11 young people with autism pointed to the box with the sweet on the first test trial, compared with 3 of the 14 children with mental retardation. Furthermore, 7 of the young people with autism continued to point to the sweet throughout all of the 20 trials, whereas none of the mentally retarded control group did. This task was interpreted as illustrating the executive difficulties of young people with autism. In order to succeed, children must suppress the familiar and habitual schema of indicating the object that they want.
Instead, they must guide their response in terms of the temporary and unfamiliar plan of pointing at the empty box in order to obtain what they want. The young people with autism found this very difficult.

It has been argued that the executive tasks referred to in this section tap a primary deficit in planning. If young people with autism have problems in planning, then their own cognitive processes will be deviant, and this may distort their experience and conception of how the mind works (Harris, 1993). Thus while normally developing children think before acting, and are aware that they are thinking, the planning by young people with autism is cut across by their tendency to act in direct response to the situation presented. As a result, their introspective life will be different from that of a normally developing child.

This model proposes that frontal lobe deficits lie behind the social impairments in young people with autism. The relationship between executive functioning and social cognition is tentative. It is argued that humans require skills such as planning, anticipation, inhibition of pre-potent responses, and flexible shifting among mental schemata in their interpersonal functioning. Executive functioning skills are understood as having evolved to serve social planning in humans and other primates. In humans this skill can be applied to both the social and physical worlds. It could equally well be the case, however, that one acquires co-ordination with other people in order to leave flexibility and co-ordination in one's own thoughts, and so the functionally defined 'executive function deficits' might be the developmental outcome of social impairments, rather than primary dysfunction of the frontal lobes.

Russell (1996a; 1996b) argues that a person must experience her/his own agency in order to develop a conception of the external world and of mental life. A person knows her/his willed actions immediately in doing them, not by perceiving their nature. Intended actions have a mental component which mere bodily movements lack and this mental component, in virtue of not being in the physical world, is what grounds the category of the subjective. Russell gives an account in which a conception of self is gained through acting alongside others.

Building upon the suggestion that the auditory hallucinations and delusions of alien control of schizophrenics arise from a neurological deficit in the efference copying of willed actions, Frith and
Frith (1991) have proposed that autism is rooted in the same neurological deficit, and that what causes
the difference in symptomatology is that autism develops very early, at least before an understanding of
the basic rudiments of belief-desire psychology are in place. When schizophrenia develops it develops as
a disorder in applying the theory. Unlike Russell, Frith argues that early self-monitoring depends on the
adequate functioning of an innate belief-desire psychology at whose core is a mechanism for
representing one's own mental states; and consequently he refers to the impairment as one of
metarepresentation, after Leslie (1987). Thus Russell's position is that a conception of self and of mind
is dependent on the experience of agency, but Frith and Frith propose that a delayed or deviant
maturation of a capacity for metarepresenting mental states is responsible.

For Russell, if self-hood is constituted by agency, not by the possession of representational devices, then
it is a fundamental mistake to try to explain disorders of self- and other-awareness in terms of
representational devices alone.

Russell's own account of autism is that there is a deficit in the self-monitoring of actions, and that this
executive difficulty underlies the problems of theory of mind. Like Hobson, he believes that an autistic
person's pre-theoretical mental life is impaired. He stresses the autistic person's pervasive impairments
in agency, including their lack of spontaneity and their desire for sameness. It is difficult for them to
cope with novelty because they have to improvise. He stresses their executive dysfunction. A prime
responsibility of the executive system is to generate relevant behaviour. When this generative system is
dysfunctional, one would expect the environment, or past learning (e.g., on the Wisconsin Card Sorting
Test), or routine schema, or current drive states to determine what the organism does next - by default.
On a higher level, the generative system causes ideas to come to mind; it accounts, by definition, for
creativity. Thus children with autism may not play because they cannot generate ideas for play.

One of Russell's suggestions is that Hobson's interpersonal-cum-affective impairments in autism may be
derivatives of an impaired sense of self. But it is not clear why there should be a lack of empathy. For
Russell, self-awareness provides the bridge between early impaired agency and later mentalizing
impairments.
2.6 Conclusion

In this chapter, the clinical picture of autism was illustrated through case material. The social impairments observed in young people with autism are pervasive, and tend to carry through into adulthood. The clinical picture was further examined through findings from empirical studies. Young people with autism have been shown to be impaired in their capacity for joint attention, social referencing, imitation and social role-taking. Each of these aspects of social functioning involve coordinated communications between the young person and the other with reference to a shared world, and are each examples of secondary intersubjectivity. The development of the interpersonal self relies on these social capacities, as the young child comes to appreciate that other people are similar to, but separated from the self.

The observations and research findings reviewed above suggest that, whatever the underlying mechanisms, young people with autism may be specifically limited in their capacity for self-understanding. The studies involved in this thesis are not designed to decide among competing theories outlined, but instead to examine the 'domain of self' in young people with autism, in its own right. The intention is to map out the points of strength and/or weakness in the self-understanding of young people with autism, with specific attention to the social dimensions of this concept.

The principal thesis that is being investigated in the present series of studies is that young people with autism lack the propensity to effect intersubjective co-ordination with others and are thus less able than non-autistic children to respond to, understand and integrate other people into their representation of the world. The implications of this are that the awareness and understanding of the self, which is defined principally in relation to others, is correspondingly limited in people with autism.

In the following chapters, accounts will be given of the three approaches that were adopted. The first study to be reported employed a clinical methodology to examine the self-descriptions of young people
with autism. Elicited self-statements were recorded and coded for their content and degree of reasoning. The second study was somewhat more formal than the first, and explored the differential depiction of self and others in drawings. Finally, the third approach adopted an exacting experimental procedure to examine self- and other-reference. The understanding and use of first- and second-person pronouns was explored in young people with autism.
CHAPTER THREE: Self-understanding
3.1 Introduction

The origins and emergence of self-understanding was considered in the opening chapter. To briefly reiterate, the self was defined in terms of the self-as-subject and the self-as-object. The former represents that aspect of the self that initiates, organises and interprets experience in a subjective manner; the latter defines what is known about the self. The self-as-subject has its origins in the young child's predisposition to perceive regularity. The physical sources of direct information provide the basis for the ecological self, while the direct, non-reflective social sources of information are the basis for the interpersonal self. The interpersonal self is based upon the child's capacity for primary intersubjectivity. The young child grows and develops within a social environment, and is continually exposed to the attitudes of those key people in her/his life to her/himself. The child has the capacity to internalise these social attitudes which contribute to the ongoing development of the self-as-subject. It is assumed that the early content of the self-as-object will reflect the experience of the self-as-subject, but especially as mediated through other people's reactions to the self.

This chapter will continue to trace the typical 'chronological age based' development of self-understanding from early childhood to late adolescence. The research literature on the 'mental age based' development of self-understanding will then be considered by reviewing the evidence on the self development of individuals with mental retardation. This will be followed by a review of current ideas and research in self-understanding and autism. The model of self-understanding provided by Damon and Hart (1988) will then be detailed. Finally by way of introduction, and prior to a detailed description of the present study and its findings, methodological issues concerning the examination of self-understanding in young people with autism will be addressed.

The principal thesis is that young people with autism lack the ability to effect intersubjective co-ordination with others and are thus less able than non-autistic individuals to respond to, understand and integrate other people into their representation of the world. The implications of this are that the
awareness and understanding of the interpersonal self, which is defined principally in relation to others, is correspondingly limited in people with autism. It was hypothesised that one type of limitation would be the manner in which young people with autism spontaneously described themselves. In particular, that they would be less likely than non-autistic individuals to integrate other people into their descriptions and understanding of self. To examine this hypothesis the Damon and Hart (1988) self-understanding interview was given to a sample of high-functioning young people with autism and their matched non-autistic controls. The interview allows for a detailed examination of the participants' description and understanding of self, through the sampling of a representative set of self-statements reflecting the self-as-object.

3.2 Self-understanding from early childhood to late adolescence

In Chapter One it was concluded that the early development of self-understanding in normally developing infants and toddlers moves from a self-awareness based on self-activities, to one based on physical self-categories (including gender and size). With the emergence of language and the increased capacity of the young child to reflect on her/his world, other techniques reveal further dimensions to self-understanding. The research findings reviewed here will be divided into four broad age groups: early childhood (from 3 to 7 years of age), late childhood (from 8 to 11 years), early adolescence (from 12 to 15 years), and late adolescence (16 to 19 years).

Early childhood

According to Sheridan (1960), at three years of age the young normally developing child has a large intelligible vocabulary. She/he can readily provide her/his own name, sex and sometimes age. The ability to understand and use the first- and second-person pronouns 'I' / 'me' and 'you' is generally well established. The child has the capacity to enter into vivid make-believe play, including invented people and objects. At four years of age the child demonstrates the ability to attribute mental states to
themselves and to other people, thus enabling them to understand and predict their own and others' actions. Such mental states include emotions, desires, beliefs and intentions. The young child between three and five years of age remains heavily dependant on her/his parents for their physical, emotional and social needs.

Against this backdrop, a select review of empirical research will be presented to highlight the nature of self-understanding in early childhood. The studies cited here have employed a variety of techniques to uncover the nature of the self in young children. In eliciting a response from a child her/himself, the problems posed have been either open- or closed-ended. The former requires a self-constructed response from the participant. While such a response may be considered unbiased, other factors may intrude to prevent a full picture of the nature of the self. On the other hand, adopting a close-ended technique where the child is offered to choose between two or more other-constructed solutions may tap a wider range of understanding, but may at the same time lead the child.

An open-ended technique was also used by Secord and Peevers (1974). They asked 5-, 8-, 12-, 15- and 17-year-olds to describe themselves, three friends and a person they disliked. Considering here the younger children only, the investigators found that self-reflection in the 5-year-old group was either absent or rudimentary. The investigators found that those 5-year-olds who did respond to the question 'Now tell me what you are like?' primarily described themselves in terms of their play activities. Interestingly, their descriptions of peers, though also based on play activities, were more differentiated when it came to mentioning possessions or family settings than they were for their own self-descriptions.

Keller, Ford and Meacham (1978) examined the salience of 'activity' versus 'body-image' dimensions in the self-description of forty-eight 40- to 68-month-old children using four measures (two open-ended and two closed-ended techniques). Their first open-ended question procedure was designed to elicit 10 self-statements. The children were asked to say something that would best 'tell about you'. Their second procedure involved providing the children with the beginning of a sentence and asking them to complete it. Ten statements were elicited by posing 'Child's name] is ...' and a further ten by posing 'Child's name] is a girl/boy who ...'
The data from these two open-ended procedures were collapsed. The elicited responses were coded into one of nine categories: actions, relationships, body-image, possessions, personal labels, gender, age, evaluation and personal characteristics and preferences. The greatest percentage of these responses fell within the action category for both sexes in all age groups. It is interesting, however, that even 3-year-olds occasionally responded with psychological self-statements such as, 'I'm happy' or 'I like people' in their spontaneous descriptions of self.

The investigators went on to use two closed-ended procedures. They designed the third task to elicit three senses of self-description. The experimenter began by saying, 'Now I'm going to say something about me. And then you say some things about you. Like this. I can walk. Can you walk? (Child responds.) What else can you do? (Child responds.) And what else can you do? ...' After 15 of these action self-statements were elicited the same procedure was adopted to get 15 body-image (for example, 'I have a face'), and 15 emotion (for example, 'I am happy') self-descriptions. In the fourth task (i.e., second closed-ended procedure) action statements and body descriptions used by each child during the above procedures were paired. Fifteen of these paired statements were presented to each child, after which they she/he was asked to choose the one that best described her/him.

Responses to the first closed-ended procedure (/I can ... /I have ... /I am ...) were collapsed and coded using the same nine categories deployed on the open-ended responses. The majority of the 3-year-olds' self-statements were coded in the actions (39 percent), body-image (23 percent) and possessions (23 percent) categories. The majority of the 4-year-olds' statements were coded in the actions (39 percent) and body-image (30 percent) categories. The majority of the 5-year-olds' self-statements were coded in the body-image (40 percent) and actions (33 percent) categories. In the second closed-ended task of selecting from two statements the one that best describes self, all age groups and both sexes generally selected the action- over the body-referent statements. Thus young children express an understanding of themselves in terms of both activities and body image, though Keller, Ford and Meacham concluded that activity is the most salient dimension of self-understanding in pre-school children.
Guardo and Bohan (1971) employed a semi-structured interview to explore the sense of humanity, sexuality, individuality, and continuity in 116 children between 6- and 9-years of age. All participants were asked to assume an identity different to their own. The investigators reasoned that the child 'would not recognize and could not handle the dilemma posed unless he had a sense of identity' (p. 1912). The children were first asked if they could assume the identity of a pet, with the reasoning that if a sense of humanity did exist in their minds they would be less likely to stress the behavioural or sexual similarities/differences and to cite the 'humanness/non-humanness'. Each child's response of 'yes' or 'no' was followed up with prompts to ascertain her/his reasoning. Similarly, each child was asked if she/he could assume the identity of an opposite sex sibling or peer (to examine the child's sense of sexuality), a same-sex sibling or peer (to examine the child's sense of individuality), and themselves at birth, in the near future and in the far future (to examine the child's sense of continuity).

The 6-year-olds recognised that they were distinct sexual, human individuals in terms of their physical appearance and behavioural capacities. A 6-year old may, then, say that it would be impossible to become like a peer because that peer is shorter and not as good at net ball. The child's name was used as the basis for her/his continuity into the future, but continuity from the past was generally confusing. Self-understanding of this group was similar to that of the 7-year-olds, though in the latter continuity from the past was more frequently recognised.

Eder (1990) set out to examine the organisation of self-statements in young children and to see whether or not individual differences were evident in children's psychological self-conceptions. Psychological concepts contain two distinct types of information: conceptions of internal states and conceptions of dispositions. Internal states are common to all and not necessarily characteristic of particular individuals. Dispositions, on the other hand, are frequent, enduring tendencies that can be used to characterise specific individuals. Eder worked with sixty-one 3½-year-olds, sixty 5½-year-olds, and fifty-nine 7½-year-olds. All children were presented with 50 pairs of statements. Five statements were constructed in each of ten dimensions: achievement (works hard; enjoys demanding activities; is a perfectionist), aggression (will hurt others; is physically assertive; tries to frighten others), alienation (believes others wish her/him harm; feels unlucky; feels left out and alone), harm avoidance (avoids the
possibility of physical danger), control (does not do things on the spur of the moment; does not begin one activity without finishing the previous one), social closeness (seeks intimacy; loves people; helps), social potency (likes to stand out, influence people, to be the centre of attention), stress reaction (is upset, scared, angry), traditionalism (cares about manners; is polite), and well being (is joyful; is content; shows silliness, enthusiasm). Eder devised a forced-choice recognition task in which, after two puppets described themselves, the child was asked to recognise which puppet she/he was most like. For example, one puppet would say: 'I mostly do things that are hard.' The other would then say: 'I mostly do things that are easy.' The experimenter would then ask the child: 'How about you?'

A factor analysis was conducted on the correlation coefficients among the total scores on the nine dimensions for each age group. For the 3½-year-old group the factor accounting for the most variance was termed 'Self-control'. Here children indicated that they feel like being quiet when they are angry, they don't push in front of people in a queue, they hardly ever get grouchy, and they usually do what they are told. The second factor was termed 'General Self-acceptance'. Here children liked to play with friends and believed themselves to be a good girl or boy. The third factor, termed 'Rejection', reflected the extent to which children feel that people don't like them. For the 5½-year-olds the first two factors identified were similar to those of the 3½-year-olds and were termed 'Self-control' and 'Self-acceptance via achievement'. The latter referred to the degree of working hard, being leader, being well-behaved, and feeling liked by oneself and others. The third factor was termed 'Self-acceptance via affiliation', and stressed more the seeking and enjoyment of the company of others. For the 7½-year-olds the first factor was named 'Emotional Stability'. It described the extent to which children felt happy, cared for by others, and not angry and aggressive. The second factor was labelled 'Extroversion' and agreed with statements about teasing others, playing with friends, showing off and getting into trouble. The third factor was termed 'Determined Fearlessness' and described the extent to which children viewed themselves as being without fear and engaging in risk-taking behaviour.

All of the internal consistency associations obtained for each factor scale in each age group were good, and it was concluded from this that the factor scales tap psychologically meaningful and consistently organised self-concepts. None the less, substantial variability was found on each of the factor scales for
each age group, showing that there are individual differences in children's self-concepts. Furthermore, half of the children in each age group were re-tested one month later, and this pattern was found to remain stable.

The investigators concluded that children have rudimentary dispositional concepts of themselves by 3½-years of age. This is not to suggest that 3½-year-old children conceive themselves as 'the type of person who works hard'. Rather that they possess an elaborate self-concept enabling them to recognise behaviour and emotions as being consistent or inconsistent with their self-concept. Dispositional concepts, however, may not directly represent one's actual day-to-day behaviour. So children who indicate that they are never naughty are probably revealing that they are basically good and not angels.

Late childhood

By eight years of age Secord and Peevers (1974) found that most of their sample of children demonstrated the capacity to reflect on the self. Play activities and interests were used predominantly to describe the self, with some using self-evaluative descriptions. In addition, girls were more likely than boys to describe their physical appearance and to emphasise their relations with friends and family. While the self-statements of the 5-year-olds tended to describe typical activities (e.g., 'I play football'), those of the 8-year-olds described their activities relative to others (e.g., 'I play football better than my friends'). Thus the older children distinguish themselves from others on comparative rather than absolute terms.

Guardo and Bohan (1971) found that self-understanding in the 8- and 9-year-old children was markedly different to that in the 6- and 7-year-olds. The sexual, human, and individual distinctiveness recognised was based not only on the obvious differences in physical appearance and behaviour, but also on the more covert and personalised differences in feelings, attitudes, and mediated behaviour. For example, a 9-year-old might say that it would be impossible to assume the identity of a peer because his/her friend has different likes and dislikes. Sex differences were more apparent in the responses of the older participants. Individuality was the key dimension in the girls sense of self-identity, while sexuality or
'masculinity' was the key dimension for boys. No measures of mental ability were taken, so it is possible that this sex difference is attributable to the girls being intellectually more advanced than the boys.

Bernstein (1980) explored the self-understanding in 10-, 15-, and 20-year olds by asking them three types of interrelated questions. To begin with they considered the number of self-statement made by asking questions like, 'Everyone behaves differently in different situations with different people. List all the ways you act'. The number of different self-statements was considered to reflect the degree of differentiation. The degree of abstractness was explored by continuing, 'You have listed a number of different ways that you act. What does each of these tell you about yourself?'. Finally the investigators asked the participants to 'Put all of this together in a statement about yourself', to consider the sense of self-integration.

Bernstein found that the 10-year-old children were more likely than older groups to refer to themselves using situational (e.g., 'I go to school'), behavioural (e.g., 'I play football'), and emotional (e.g., 'I get angry with my brother') categories. They tended also to be more concrete by linking themselves to direct action in most of their statements. Integration of this 10-year-old sample was generally confined to a simple reiteration of earlier self-statements.

Early adolescence

The 12-year-old children in Secord and Peevers' study used more self-evaluative terms than did the 8-year-olds, though these evaluations were more likely to be tied to their typical activities rather than to themselves personally. Some of the children in this group used emotional terms to describe self, speaking for example of getting really mad or of having a temper. Girls emphasised more than boys the importance of behaving in certain ways and of trying to be a certain kind of person: they spoke of trying to be friendly, nice to people, and of overcoming their faults, like temper or laziness. The 15-year-old children used more self-evaluative terms than did the 12-year-olds, which were less tied to their activities and more to themselves as a person. They expressed an awareness of the uniqueness of self in relation to others, and stressed the importance of self-presentation. Sex differences were apparent. Boys
spoke of themselves, for example, as having a 'good personality', as being a 'nice-guy', as 'short tempered'. Girls referred frequently to 'shyness' and of 'getting into bad moods'. Girls stressed more than boys interpersonal relations, emphasising the importance of being friendly and of being liked by others.

Bernstein (1980) found that the 15-year-old participants were more likely than the younger children to refer to their social personality characteristics (e.g., 'I am really friendly so I can make friends easily'), their beliefs (e.g., 'I think being a good loser is important'), and their acceptance of social rules (e.g., 'My mother thinks it's wrong to cheat, so I don't'). These adolescents also linked together a variety of self-actions according to a common theme, thus demonstrating an initial abstracting from self-system characteristics (e.g., 'Going to the cinema is just one thing I do with my friends, but I also play football with them'). Finally, at this age the diversity of self-definition is recognised, but no co-ordinating principle between discrepant elements is yet constructed (e.g., 'I'm really talkative with my friends, but quiet with my family. I'm like two different people. I don't know why').

Late adolescence

The 17-year-old young adults in the Secord and Peevers study were more likely to use moral self-judgements than were the 15-year-olds. Their self-descriptions in connection with aspirations for the future, problems of self-control, and achievement of a self-ideal were in terms of what they thought they should or should not do. Most striking at this age level was the strong sense of agency and integration of personal motives to describe the self.

Bernstein found that the 20-year olds, like the 15-year-olds in his study, continued to refer to their social personality characteristics, their beliefs, and their acceptance of social rules. They differed from the younger adolescents, however, in the degree of abstractness base on an underlying dimension which provides internal consistency for behaviours that appear discrepant (e.g., 'I help my brother with his homework, but I don't help my sister because my brother really need help and my sister is lazy. It's fair to help him and not her'). This oldest group in Bernstein's study integrated principles that recognise diversity yet maintain the coherence of the self-system (e.g., 'I'm really talkative with my friends because
I feel like they believe I have something important to say. My family don't listen to what I say. I don't feel like talking for the sake of it). The principle that co-ordinates here between the two contradictory self-statements is the self's desire to engage in meaningful conversation.

Summary of research findings

From early childhood to late adolescence the individual shows some awareness of the self-as-subject and the self-as-object. The difference between the stages shows in the increasing sophistication of the understanding of self, and the integration between the categories. At each stage, however, certain categories are granted more significance by the child than are others.

In early childhood the young child tends to refer to her/himself in terms of typical activities, physical appearance and material possessions. The social sense of self is not as prominent in this age group as the physical and active, and the psychological self is restricted to an expression of basic emotions and preferences. The basis for the awareness of the social and psychological aspects of self in later stages, however, forms at this early stage with the young child's emerging capacity to understand that the beliefs, desires, feelings and play an integral part in predicting the actions and behaviour of self and others. Both the sense of self-continuity and the sense of self-distinctness at this stage of development is based on categorical identifications.

By late childhood a significant shift occurs in self-understanding. The child continues to define the self in terms of activities, but these characteristics are predominantly evaluated in relation to those of others. Further, the child considers her/his abilities in the light of others' reactions, which is the basis for the child's social self. There is a broader awareness of the differences between self and other in terms of internal mental states that influence behaviour. Personal effort, talent and wishes are understood to be important in aspects of the self. Continuity is based on enduring personality characteristics and permanent cognitive capabilities. The child's sense of distinctness from others becomes increasingly relative.
In early adolescence the dominant mode of spontaneous self-expression moves from the use of self-evaluative terms in relation to typical activities, to evaluation of themselves as individuals. The awareness of others seems to be more acute, and the self is defined in comparison to others. Furthermore, the social self becomes defined in terms of social personality characteristics as in, for example, the concern to be friendly and awareness of social rules. The psychological self includes an understanding of social skills (e.g., social sensitivity and communicative competence) and the use of more socially sophisticated internal states terms. At this stage the young person begins to consider notions of self-integration.

In late adolescence moral or personal evaluations are understood to influence the self. The emphasis on self-understanding shifts away from the constituents of the self-as-object and towards these aspects of the self-as-subject. Continuity is expressed in terms of past and future conceptions of self, and distinctness on the unique subjective experiences and interpretations of events. Finally, the young adult moves towards an integration of disparate aspects of self into an internally consistent construct system (Damon and Hart, 1982).

The development of self-understanding, as informed through the findings from research, has been considered in a normally developing, non-pathological population, where the individuals' mental age approximates that of their chronological age. Those young people whose mental age falls below their chronological age will now be considered, to explore the effect of mental age on the development of self-understanding.

3.3 Self-understanding in young people with mental retardation

It is reasonable to assume that the general impairment in conceptual ability found in young people with familial mental retardation will have a bearing on their understanding of self, though the social context within which the child develops will also play a major part in the development and construction of the
child's self. Autobiographical material from people with mental retardation confirms this. Ed Murphy, a 26-year-old man diagnosed as 'mentally retarded - cultural-familial type' was interviewed over the course of a year by Bogdan and Taylor (1976). The following extracts are taken from the transcripts derived from the interviews:

Looking back I don't think she (mother) ever stopped protecting me even when I was capable of being self-sufficient. I remember how hard it was to break away from that. She never really believed that after I had lived the first six months that I could be like everybody else ... I can remember trying to be like the other kids and having my mother right there pulling me away. She was always worried about me ... When you're growing up you don't think of yourself as a person but as a boy. As you get older it works itself out - who you are deep down - who you ought to be ... You now what you are deep inside but those around you give you a negative picture of yourself. It's that umbrella over you.

Ed Murphy had been institutionalised at 15 years of age after the death of his two parents. He described himself as being over protected by his family, of being highly dependant on others, of being aware that he was different from others but that he could not understanding why he was, of feeling lonely, and of behaving in ways that were socially naive.

In terms of formal research into this area, the self-concept of children and adults with mental retardation has been evaluated using various standardised self-report scales. Self-report scales are generally devised to reflect the 'thinking and biases of researchers ... (and not) ... the natural cognitions and concerns of respondents' (p 219, Zetlin and Turner, 1988). It is perhaps unsurprising then to find that such research has produced conflicting findings. Studies designed with the specific intention of exploring the spontaneous self-descriptions of people with mental retardation are few in number. In this section three such studies will be reviewed covering three broad age groups.

Beeghly, Weiss-Peny and Cicchetti (1990) considered the linguistic representations of the self during two early stages of language development in children with Down syndrome. The younger Down syndrome group had a mean chronological age of 4 years, a mean mental age of 2 years, and a mean MLU of 1.15. The older Down syndrome group had a mean chronological age of 6 years, a mean mental age of 4 years, and a mean MLU of 1.84. The two study groups were each compared with 3 non-mentally retarded groups: one matched for chronological age, one matched for mental age, and one matched for MLU. All participants were observed in free-play and picture book reading with their mothers. The verbal communication between all dyads was transcribed. From the transcripts the
investigators considered three measures: the proportion of self-statements describing actions and internal states; the number of different internal state labels and personal pronouns; and the degree of context appropriate use of internal state language.

Significant differences were found between the two Down syndrome groups on all three measures. The investigators also reported a significant positive correlation between MLU and the use of self-related language for both the Down syndrome and non-mentally retarded controls. Furthermore, for the majority of the language variables, the children with Down syndrome performed at a level similar to their MLU controls at both age levels. Although the use of self-related language was correlated significantly with mental age for all children, the children with Down syndrome produced significantly less mature self language than did the mental age matched control participants. Thus, the ability to talk about the actions and internal states of self is more delayed for children with Down syndrome than one might expect based on their level of cognitive development.

Bliss (1985) considered the spontaneous self-descriptions of older children with mental retardation. The participants were divided into four groups: (a) mean chronological age 11½ years, mean mental age 6½ years, mean IQ 62 points; (b) mean chronological age 15 years, mean mental age 8½ years, mean IQ 61 points; (c) mean chronological age 16 years, mean mental age 10½ years, mean IQ 67 points; and (d) mean chronological age 18½ years, mean mental age 12½ years, mean IQ 70 points. Thus the participants were grouped according to their chronological age and mental age, but broadly matched for IQ. Each participant was asked to 'tell everything she/he knew or thought about her/himself'. This was followed with further prompts such as, 'What is it you especially like / don't like about yourself?' The overall responses were considered in terms of the total number of self descriptions produced (i.e., cognitive complexity) and abstractness. The latter was operationalised in terms of the following scale: Level 1: Physical and appearance constructs; Level 2: Social role, demographic, behavioural, and specific interest, attitude and ability; Level 3: Global evaluation and general interest, attitude and ability; and Level 4: Abstract, psychologically centred constructs.
Bliss reported a general trend in both cognitive complexity and abstractness with increased mental age, which, when statistically examined, was not found to be significant. No simple effects were reported. The absence of significant age differences between the groups was attributable to the effects of intelligence on the two outcome measures. Considering the level of abstractness, the youngest group produced self-statements that were coded at all levels, with 47 percent being coded at Level 2 (e.g., 'I play a lot'), and 40 percent at Level 3 (e.g., 'I like mathematics'). The majority of self-statements produced by the three other groups fell into Level 3. Interestingly, the percentage of psychologically centred self-statements (e.g., 'I'm kind') increased across the groups from 5 percent by the youngest to 16 percent by the oldest participants. Bliss also observed a tendency for the younger group to rely on general self-statements (e.g., 'I play', 'I like my hair', 'I'm nice') while the older group used more qualified or specific self-statements (e.g., 'I give money to my friends', 'I like to work hard', 'I'm shy').

Finally, Zetlin and Turner (1988) used a sentence completion technique to identify the major categories of self-representation that adults with mental retardation use to distinguish themselves from others. The 48 participants ranged in age from 23 to 50 years, and had a mean IQ of 51. There was wide variance in terms of ability, from mildly to severely mentally retarded, and social circumstances with some living at home and others fully institutionalised. Each participant was presented with 11 sentence completion stems (e.g., 'I am ..., I can ..., I feel ..., I will ...'). The investigators found that 28 percent of all comments made reference to social conformity and dependency (e.g., 'I will do things like you want me to', 'I need help most of the time'), reflecting a strong desire to adhere to social norms and an acceptance of their need for assistance by others.

The investigators found that the adults with mental retardation featured rules and regulations to define themselves, rather than personal qualities, appearance, or social status. This latter class of self-descriptions accounted for only 12 percent of the responses. Reference to rules appeared to reflect a lack of personal agency. Reference to either activities or possessions that were seen as highly desirable made up 23 percent of all comments. The vast majority of comments recorded by the investigators explicitly or implicitly defined the self in relation to others. Further they demonstrated lack of agency, some continuity in terms of future plans.
The social context within which the self develops was stressed in Chapter One. In essence the social context is represented by the attitudes and actions directed towards the developing child by the primary care-giver. A child's sense of self emerges through social interaction. The child has the capacity to internalise these attitudes, which themselves come to underlie subsequent interactions of the child in relation to others. For example, children with 'familial' (i.e., not organic) mental retardation are more likely to experience neglect in their homes than normally developing children (Zigler, Balla and Hodapp, 1984). The precise impact on the development of self-understanding in children with familial mental retardation is not fully known.

Summary of research findings

The amount and quality of research into self-understanding in young people with mental retardation has not been as extensive as that conducted with normally developing samples. From the three studies reviewed here, self-agency has not been measured beyond a sense of being controlled by outside forces, which may reflect the social context within which these children grow. Continuity is evident, but more in terms of the future than a strong sense of the self in the past. Self-distinctness is also evident but generally at the level of categorical comparisons. The four self-as-object categories have all been evidenced in the studies reviewed. The physical and active senses of self are prominent, with particular emphasis being placed on material possessions. The social self is heavily defined by the need to make friends, dependence on others, and a need to conform to rules. The manifestation of this sense of self may be observed in the eagerness of such young people to please others. The psychological sense of self is evidence by reference to basic emotions, preferences and simple mental state terms, all of which become increasingly sophisticated in older mental age matched groups. Thus the concept of the self in those with mental retardation develops both in terms of complexity and abstractness, but is, nonetheless, delayed relative to age matched normally developing individuals.
3.4 Self-understanding in young people with autism

There is indirect evidence to suggest that young people with autism have difficulties in the understanding of self and other. For example, children with autism have difficulty with imitation (Dawson and Adams, 1984; DeMyer, Alpern, Barton, DeMyer, Churchill, Hingtgen, Bryson, Pontius, and Kimberlin, 1972) which may not only indicate an impairment in inter-personal structures of bodily co-ordination, but perhaps also reflect the child's failure to identify with personal meanings of others. Personal pronouns are also characteristically misused by children with autism (Fay, 1979; Jordan, 1989; Tager-Flusberg, 1989), and this may point to difficulties in identifying with others' use of such terms referring to self and other. Chapter Five and Chapter Six will explore the comprehension and use of personal pronouns in young people with autism.

In Chapter One the origins of the self were traced back to the biologically based capacities for non-verbal interaction with others, which allow the infant to register early forms of experience of others. Hobson (1992) argues that children with autism are able to distinguish between themselves and the physical world, as reflected in such abilities as visuo-spatial pattern recognition, understanding of means-ends relations, and awareness of object permanence; and they demonstrate agency by distinguishing between themselves as beings who can act, and things in the world they can act upon. What they lack, however, is a sense of themselves as potential objects of other people's evaluations.

... autistic children fail to be aware of themselves in the minds of others, and to arrive at a concept of self, insofar as they fail to understand the nature of other persons who have their own psychological orientations toward the world. Autistic children's lack of self-consciousness is but one manifestation of their failure to acquire such a concept. They perceive but do not conceive of "themselves" in the mirror; they show neither pride nor shame. (p 174)

This lack of engagement with others is also reflected in the specific limitations of young people with autism in their concepts of mental states such as feelings (e.g., Hobson and Lee, 1989; Yirmiya, Sigman, Kasari and Mundy, 1992), thinking and believing (e.g., Baron-Cohen, Leslie and Frith, 1985; Ozonoff, Pennington and Rogers, 1991), and desiring and pretending (e.g., Baron-Cohen, 1991; Russell, Mauthner, Sharpe, and Tidswell, 1991). It would seem likely that these children's difficulties in
attending to, recognising and conceptualising psychological states, and in predicting and explaining behaviour in psychological terms, will have a marked influence on their conceptions of themselves in relation to others.

Despite a vast amount of research having been conducted on the structure and function of the language of young people with autism, relatively little has been designed to explore their verbal self-expressions. The prime source of information in this domain will be taken from those studies that have explored the relative frequency and complexity of mental state terms in the spontaneous utterances of young people with autism.

The underlying mechanisms proposed to explain the difficulty with mental state terms in young people with autism is currently a point of debate. The line of reasoning adopted thus far was detailed by Hobson (1982). He proposed that in order to acquire knowledge of the nature of persons with minds, an individual needs to have experience of reciprocal, affectively patterned relations with others; and in order to become engaged in personal relations, an individual needs to perceive and react to the bodily appearances, expressions, and actions of others. These capacities for direct perception of, and empathic responsiveness to, the bodily-expressed attitudes of other people are biologically given. Hobson reasoned that children with autism lack such prerequisites for personal relatedness and interpersonal awareness and thus fail to develop a 'concept of persons'. As discussed in Chapter Two, Hobson's Interpersonal Theory that proposes how children with autism are limited in their understanding of mental states can be contrasted with other more cognitive theories. For example, Leslie (1987) proposed a cognitive model to account for this impairment. Children with autism are understood to lack the ability to form representations of other people's representations of the world (i.e., to know that other people know, want, feel, or believe things). The ability to impute mental states to oneself and others is said to involve a 'theory of mind'. Leslie proposes that this cognitive capacity for 'metarepresentation' in general is innate, but missing in children with autism. Whether the difficulty to understand mental state terms is affectively or cognitively based, there would be significant implications for young people with autism's self-concept.
It will be apparent that if children with autism are limited in concepts that make reference to mental state terms, their ability to characterise themselves and others as similar or different will be affected. The research conducted on the spontaneous utterances of young people with autism will now be considered.

Tager-Flusberg, Calkins, Nolin, Baumberger, Anderson and Chadwick-Dias (1990) observed six high functioning children with autism ranging from 40- to 91-months of age over an average period of 22 months to chart their language development in the home environment. They were matched with a group of six Down Syndrome children for chronological age and mean length of utterance (MLU). The transcripts were analysed using the following measures: MLU, syntax, lexical diversity, and form class distribution (i.e., nouns, verbs, modifiers, and function words).

The investigators found that in verbal children with autism performance on all measures were comparable with the control group in their development of language based on the uniform increases in MLU, the acquisition of specific grammatical structures, and the form class. Beyond an MLU of about 3.0, however, the children with autism have significantly reduced syntax compared with the control group, suggesting that although children with autism's utterances continue to grow in length, they tend to rely on a narrower range of grammatical structures in their spontaneous speech. The investigators also found that the children with autism tended to use nouns more than pronouns and that the control group tended to use pronouns more than nouns. Apart from this the investigators conclude that autism does not involve a fundamental impairment in formal aspects of language.

Tager-Flusberg (1992) went on to examine the transcripts compiled in the Tager-Flusberg et al (1990) study for the spontaneous expression of psychological states (i.e., desire, perception, emotion, and cognition). Once identified the utterances containing these states were coded according to their functional use within the conversational context. Both groups were comparable in their overall use of perception and emotion terms and in their talk about perception and emotion. The children with autism expressed significantly more desire terms (care, want, wish) than did the control group, though there was no significant difference in talk about the actual mental state of desire, or in the children's ability to discuss causal aspects of desire. The children with autism called for attention significantly less than the
control group, and used significantly fewer cognitive terms (e.g., believe, forget, guess, idea, mean) than the control group. This supports evidence that children with autism do not understand sources of knowledge, beliefs, mental entities, pretence, and deceit.

_We see, then, from the spontaneous speech data that autistic children seem to show impairments in their knowledge about cognitive states at even the earliest stages. Unlike other kinds of mental states, autistic children never spoke about cognitions as they relate to behaviour or contrast with reality (p. 169)._ This observed deficit could not be attributed to limited linguistic ability nor differences in non-verbal intelligence. As Tager-Flusberg points out, the groups were not matched on either comprehension or pragmatic skills, and this leaves open the possibility that these skills may contribute to these findings.

The data show that in this sample of high-functioning children with autism, there is not a general deficit in the acquisition of knowledge about psychological states. Rather, there appears to be two distinct strands: perceptions, desires and emotion form one strand, which is relatively unimpaired early on in autism, while attention and cognition form the second strand, which is quite specifically impaired right from the start.

Thus Tager-Flusberg's results support the theory of mind account of early development. On the other hand, there may yet be aspects of psychological states that can be learned in a relatively 'behavioural' way, and so it remains possible that the autistic persons early years of emotion terms is misleadingly proficient, with respect to the underlying understanding of what it is to have psychological states of those kinds.

Jaedicke, Storoschuk and Lord (1994) considered the ability of 15 high-functioning and 13 lower-functioning young adults with autism to use language to identify causes for emotion and to describe the subjective experience of various emotions. The high-functioning group ranged in age from 6½ to 25½ years; in verbal IQ from 85 to 114 points; and in mean length of utterance (MLU) from 3.91 to 10.93 points. They were group matched with 15 normally developing people for age, MLU and sex. The lower-functioning group ranged in age from 7½ to 19-years; in verbal IQ from 46 to 78 points; and in MLU from 3.00 to 5.92. They were group matched with 13 people with mental handicap for age, verbal IQ, MLU and sex. While being administered a standardised assessment procedure, the examiner asked each
child to say what makes her/him feel various emotions (i.e., to articulate the context for the respective emotion) until they either gave two detailed responses concerning two different emotions or until all the emotions (happy, sad, afraid, worried, and angry) had been presented. For each emotion for which a child cited a cause, the examiner also asked 'How does that feel?' or 'How does it feel to be [happy, etc.]?'

Each context cited as a cause for emotion was coded as falling into one of five event categories: success-failure (e.g., 'When I don't pass my swimming class'), interpersonal (e.g., 'Having fun, I like being with people'), safety-security (e.g., 'If I see a big dog'), material circumstances (e.g., 'Starting school again'), and denial (e.g., 'Nothing makes me angry'). Apart from those falling in the final event category, each cause was also coded for: (a) its referent (self or other); (b) whether it involved social interaction or not; (c) whether it was idiosyncratic or not; and (d) whether it represented a preoccupation or not. In response to the question, 'How does that feel?', statements were coded into six categories: abstract (e.g., 'Like there's a parade inside me'), behavioural (e.g., 'My pulse speeds up'), valence (e.g., 'Good', 'Bad'), reference to another emotion (e.g., when asked how it feels to be worried, says 'Kind of sad'), non-responsive (i.e., repeats the emotion, irrelevant response, or does not know), and tells response/cites an event (e.g., 'I go to my room').

To reduce the likelihood of a Type I error, the investigators began by comparing the combined high- and lower-functioning groups with autism with the combined control groups. Significant differences at this level were then followed up by considering the within IQ groupings. The distribution of contexts for positive emotion (i.e., happiness) did not significantly differ between the collapsed groups. The distribution of contexts for the negative emotions (i.e., sadness, fear, worry, and anger), however, showed that the autistic participants were less likely than the non-autistic group to cite failure as a cause for negative emotion. Further analysis showed that this effect was mostly attributable to the high-functioning group. The investigators then considered the contexts for positive and negative emotions combined. They found that the participants with autism emphasised material causes for emotion (e.g., living situation, food, outings and parties, presents toys and hobbies) compared with the non-autistic control group. This effect was mostly attributable to the lower-functioning group. The investigators went
on to consider the four additional characteristics of emotion causes (referent, idiosyncratic, social interaction, and preoccupation). No overall autistic versus non-autistic differences were found in referent, but individuals with autism were significantly more likely to give idiosyncratic responses, give causes that represented a preoccupation for the person, and were significantly less likely to cite interactions with people as causes of emotion. This latter finding was mostly attributable to the lower-functioning autistic group. There were no differences in the ways in which feelings were described.

These observational studies, that focus on the structure and frequency of expressive language, enable some but limited insight into the self-understanding of young people with autism. It may be concluded that their use of emotional and desire terms are comparable to mental age matched control group, though they produce fewer 'cognitive' terms. But how do young people with autism understand themselves? Do they use emotion and desire terms to define themselves? It is particularly interesting that young people with autism are less likely than matched controls to cite interaction with others as a cause of emotion.

Capps, Sigman and Yirmiya (1995) went beyond the mere frequency count of mental state terms and explored how high-functioning young people with autism perceive themselves, particularly in social-emotional domains. Specifically they were interested to examine the extent to which awareness of differences might be mediated by intelligence and by the ability to read and share the emotions of others. Their sample consisted of 18 children with autism who ranged from 9¾ to 16¾ years of age and who were all of average or above average intelligence. This study sample was group matched with 20 non-autistic individuals for chronological age, mental age, sex, ethnicity and socio-economic status.

There were three measures given to the participants. The first of these measures was a standard questionnaire which had been designed to assess perceived self-competence in each of four domains: physical, social, cognitive, and general self-worth. In the second measure, the participants were given a list of four emotions (i.e., sadness, happiness, embarrassment, and pride) and asked to relate a time in which they had felt each emotion. The third measure involved the participants viewing five videotaped vignettes each depicting a child experiencing one of five emotions (i.e., happiness, pride, sadness, fear,
and anger), after which the participant was asked to circle from a list of emotions the one being experienced by the child in the vignette, and from another list of emotions the one felt by her/himself in response to watching the vignette.

The autistic group perceived themselves to be significantly less competent than the non-autistic controls physically (e.g., doing well at sports, learning new games), socially (e.g., having a lot of friends, being easy to like), and in terms of overall self-worth (e.g., being happy with oneself). There were no group differences in their self-competence in the cognitive domain (e.g., doing well at school, being smart). Further the investigators found a significant negative association between social competence and full scale IQ scores for the study group, and a significant positive association between cognitive competence and full scale IQ scores for the control group. Those children with autism who reported higher social-competence showed greater difficulty in talking about their own emotional experience. The investigators reported a non-significant trend for those children with autism who perceive themselves as less socially competent as better able to label or empathise with other's emotional experiences.

One interpretation of these findings is that autistic persons who are more intelligent and better able to read the emotions of others may acquire greater awareness of qualities that differentiate them from normal people. Their cognitive and emotional abilities may yield this knowledge by facilitating their own appraisals of self and others, and by providing access to others' appraisals of their limitations (p. 144).

This study demonstrates that young people with autism, responding to standard items on a questionnaire, do hold self-evaluations. It still remains to examine self-understanding in young people with autism. Mavropoulou (1995) conducted a qualitative study to examine self-awareness in a group of high-functioning young people with autistic features. She administered the self-understanding interview devised by Damon and Hart (1988) to seven children with 'autistic tendencies' who had a mean chronological age of just under 12 years (SD 3½ years) and a verbal mental age (as measured using the British Picture Vocabulary Scale) of just under 8 years (SD 2½ years). This group were compared with nine children with moderate learning difficulties (mean CA 12¾ years, SD 3½ years; mean VMA 7¾ years, SD 2 years). In addition the interview was given to six adults with Asperger syndrome (mean CA 24½ years, SD 5 years; mean VIQ 90, SD 18 points). Mavropoulou described the responses made by the three groups qualitatively. Only the findings comparing those in the high-functioning autistic group with
those in the moderate learning difficulties group will be reported here. As the same self-understanding interview was used as part of the current thesis, Mavropoulou's results will be reported in some detail.

The self-understanding interview and procedure will be described in detail later in this chapter. Basically each participant is asked seven core questions that tap aspects of the self-as-subject and self-as-object. Once a child has answered one of the questions a number of probes are available to examine the depth of her/his self-understanding. This ranges from identifications that are: (i) seen as sufficient in and of themselves to express the self (Level 1); (ii) defined in comparison to others or normative standards (Level 2); (iii) instrumental in determining one's interactions with others (Level 3); and (iv) organised through systematic beliefs and life plans (Level 4).

Table 3.1 was constructed from Mavropoulou's description of results and shows the distribution of the percentage of participants in each group who provided self-statements in each self-as-subject and self-as-object categories.

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>SELF-AS-SUBJECT</th>
<th>SELF-AS-OBJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agency</td>
<td>Continuity</td>
</tr>
<tr>
<td></td>
<td>Study</td>
<td>Control</td>
</tr>
<tr>
<td>Level 1</td>
<td>57</td>
<td>56</td>
</tr>
<tr>
<td>Level 2</td>
<td>29</td>
<td>0</td>
</tr>
<tr>
<td>Level 3</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>Level 4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 3.1 Distribution of the percentage of self-statements: adapted from Mavropoulou (1995)

A single question was posed to each participant to elicit a response for each of the three self-as-subject categories. Therefore the percentages in Table 3.1 for the sub-categories represent the proportion of subjects who provided a meaningful, codable response. Six of the seven study group (i.e., 86 percent) and seven of the nine control group (i.e., 78 percent) produced a self-statement that demonstrated a sense of agency (an understanding that the self actively structures and processes one's own experiences). Most of the agency identifications were understood as important in and of themselves for both groups,
with a quarter of the study group providing an understanding that was coded at Level 2, and the same proportion of the control group at Level 3. Six of the study group (71 percent) and all of the control group expressed a sense of continuity (an understanding that the self continues to exist over time). All of these identifications were understood as important in and of themselves for both groups. Four of the study group (57 percent) and all of the control group demonstrated a sense of distinctness (an understanding of one’s self as different from others). While most of the study group who expressed a sense of distinctness understood this as important in and of itself, two-thirds of the control group understood this at Level 2.

For the self-as-object scheme four questions were put to each participant to elicit responses for each of the four self-as-object categories. For the autistic group, then, the percentage in each of the self-as-object sub-categories is a proportion of 28 (i.e., 4 x 7) and for the non-autistic control group a proportion of 36 (i.e., 4 x 9). The following observations are merely descriptive and suggestive, because statistics were not applied to these data. The study group produced somewhat more physical self-statements than the control group (86 percent against 67 percent) and were comparable in the proportion of active self-statements made (50 percent against 65 percent). Most of the physical and active self-statements for the two groups were explicated at Level 1. Mavropoulou understood this pattern of responding to reflect the fact that the physical and active aspects of the self are behavioural and therefore easier to describe. While the study group produced fewer social self-statements than the control group (8 percent against 75 percent), they were broadly comparable in the proportion of psychological self-statements made (29 percent against 41 percent). Interestingly, 39 percent of social self-statements made by the moderately learning disabled group were understood at Level 3. The study group were less likely to express themselves at this level of understanding whichever category considered.

Mavropoulou’s study uncovered an interesting pattern of response by the children in her study group compared with those in the control group. There are, however, a number of important criticisms. Firstly, the diagnosis of the seven children in the study group was not precise. They were classed as having ‘autistic tendencies’. This leaves open the possibility that a group of children meeting criteria for Autistic Disorder (see Chapter Two) would produce a different pattern. Secondly, the groups were
matched on a measure of receptive language ability. This may not necessarily reflect grammatical sophistication, which itself may contribute to the pattern of results. Thirdly, while a qualitative analysis of the patterns of response is of interest, a quantitative analysis would be more persuasive. It would be useful in this regard to have more participants in both the study and the control groups. Finally, Mavropoulou did not provide measures of inter-rater reliability for the either the identification or the coding of the elicited self-statements. These four issues will be addressed in the current study.

Summary of research findings

There has been little in the way of systematic research into the self-understanding of young people with autism. It is well established, however, that such people are generally impaired in their ability to understand and use mental state terms. It is likely that such an impairment will impact on the capacity of the young people with autism to differentiate self from other. From the findings reviewed above, it could be specifically proposed that self-understanding in terms of physical and active characteristics and possibly psychological ones that involve simple desires and emotions may be intact in young people with autism. There could, however, be a specific impairment in the use of more complex psychological and social characteristics.

The above cited studies, particularly those involving the non-clinical samples of children, illustrate how there is not only an age-related shift from defining self through external (physical, material, activity) to internal (psychological) qualities, but also an age-related tendency to integrate diverse aspects of self into a seemingly coherent system. These different perspectives on the development of the self are integrated in the model proposed by Damon and Hart (1988), which forms the theoretical underpinning of the interview used in the present study. A summary of Damon and Hart's position now follows.
3.3 A developmental model of self-understanding

Most researchers stress the 'physical to psychological' and/or the 'concrete to abstract' dimensions of self development, where higher order dimensions subsume preceding ones. Damon and Hart, however, reason that this uni-dimensional shift does not account for the variance observed: As Keller, Ford, and Meacham found, early self-understanding is not confined to an awareness of one's external, physical qualities - young children readily express self-statements that regard their active, social and psychological qualities. Likewise, late self-understanding does not solely comprise an awareness of one's psychological qualities. Damon and Hart have constructed a multi-dimensional, developmental model that respects the distinctness in the various components of self-understanding. The model is represented in Figure 3.1., the horizontal dimension of which corresponds to the self-as-subject and self-as-object. The vertical dimension in the figure represents the progression through which the components themselves develop.

All components of the self-as-subject and self-as-object undergo developmental changes throughout the period from early childhood to late adolescence. At all ages children have some understanding of each component. Knowledge of each changes with development, but never to the extent that one disappears or turns into another component. The developmental progression common to each component is hierarchical in nature, signifying a conceptual re-organisation rather than a preferential shift. There may be age related trends along the horizontal dimension, but these do not represent transformations. This original and sensitive structuring of the self accounts for the variance observed. In what follows the criteria for placing a self-statement in any of the four levels will be defined. This will be followed by a consideration of the nature of the self-as-subject and self-as-object components at each level.

From early childhood to late adolescence, the self must inevitably be conceived in terms of sets of categories, like physical characteristics, typical activities or group membership. The way in which these categorical identifications are understood and organised as the child grows older determines the level at
which the self-statement is placed. The following is a summary of these levels, as defined by Damon and Hart.

Self-statements coded at Level 1

The most basic level comprises categorical identifications which are seen as sufficient in themselves to express the self. To establish that a self-statement is appropriately placed at Level 1, the child must be probed. 'Without probing, it may be impossible to determine whether a subject offers a categorical description as a self-definer in and of itself, or whether the subject has in mind a further rationale or system of relationships underlying the categorical description.' (p 59; 1988) The kind of probe following a categorical statement will be returned to when the self-understanding interview is described.

Self-statements coded at Level 2

Comparative assessments are classed at Level 2. The self is defined in relation to others and to normative standards. The assessment may be explicit (I am better than ...) or implicit (I can't run very fast.) Thus categories of self are transformed into relational statements, and may include size, strength, appearance, abilities, effort, or any self-characteristic that can be compared against others' personal qualities or against normative standards.

Self-statements coded at Level 3

Interpersonal implications are classed at Level 3. Self-understanding focuses on characteristics of self that determine the nature of one's interactions with others. Categorical identifications with interpersonal implications are emphasised. These may include personality traits, action propensities, physical attractiveness, material appeal, or states of mind that determine the type of manner of one's interpersonal life. In Level 3 self-statements, the comparative mode of Level 2 is transformed in the assessment of
<table>
<thead>
<tr>
<th>Level and Period for Functioning in each Category</th>
<th>General Organising Principle</th>
<th>Agency</th>
<th>Continuity</th>
<th>Distinctness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Childhood</td>
<td>Categorical Identifications</td>
<td>External, uncontrollable factors determine self</td>
<td>Categorical identifications</td>
<td>Categorical identifications</td>
</tr>
<tr>
<td>Middle to Late Childhood</td>
<td>Comparative Assessments</td>
<td>Efforts, wishes and talents influence self</td>
<td>Permanent cognitive and active capabilities and immutable self-characteristics</td>
<td>Comparisons between self and other along isolated dimensions</td>
</tr>
<tr>
<td>Early Adolescence</td>
<td>Inter-personal Implications</td>
<td>Communication and reciprocal interaction influence self</td>
<td>Ongoing recognition of self by others</td>
<td>Unique combinations of psychological and physical attributes</td>
</tr>
<tr>
<td>Late Adolescence</td>
<td>Systematic Beliefs and Plans</td>
<td>Moral or personal evaluations influence self</td>
<td>Relations between past, present, and future selves</td>
<td>Unique subjective experience and interpretations of events</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical Self</th>
<th>Active Self</th>
<th>Social Self</th>
<th>Psychological Self</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bodily properties or material possessions</td>
<td>Typical behaviour</td>
<td>Fact of membership in particular social relations or groups</td>
<td>Momentary moods, feelings, preferences and aversions</td>
</tr>
<tr>
<td>Capability-related physical attributes</td>
<td>Abilities relative to others, self or normative standards</td>
<td>Abilities or acts considered in the light of others' reactions</td>
<td>Knowledge, cognitive abilities, or ability related emotions</td>
</tr>
<tr>
<td>Physical attributes that influence social appeal and social interactions</td>
<td>Active attributes that influence social appeal and social interactions</td>
<td>Social personality characteristics</td>
<td>Social sensitivity, communicative competence, &amp; other psychologically related social skills</td>
</tr>
<tr>
<td>Physical attributes reflecting volitional choices, or personal and moral standards</td>
<td>Active attributes that reflect choices, personal or moral standards</td>
<td>Moral or personal choices concerning social relations or social personality characteristics</td>
<td>Belief systems, personal philosophy, self's own thought processes</td>
</tr>
</tbody>
</table>

**Figure 3.1** The developmental model of self-understanding (adapted from Damon and Hart, 1988)
one's capacities for conducting interpersonal relationships. The main concern is now transformed from
drawing relational analogies between self and others to identifying one's manner of interacting with
others. Level 3 does have a strong social component, but Damon and Hart believe that it is inaccurate to
conflate this with the social self. The model suggests that an awareness of the social self is always
present. At every level in the self-understanding sequence there is a social-scheme conception. The
social self therefore goes beyond Level 3, and includes an array of notions that do not focus on the
implications of one's characteristics for the nature of one's interpersonal interactions.

Self-statements coded at Level 4
Systematic beliefs and plans are the hallmark of Level 4. Categories of the self are organised through
systematic beliefs and life plans. Characteristics of self draw their meaning for one's identity through
such beliefs and plans, which may include philosophical or moral belief systems, ideological choices, or
any variety of personal goals. 'The priority of the belief or plan creates a new coherence in self-
understanding, because self-defining categories are selected and related to one another only in a
manner consistent with the belief or plan.' (Damon and Hart, 1988: p. 67). Thus at this level a
consciously systematic conception of self is achieved. Level 4 has a strong psychological component but
Damon and Hart believe that in is inaccurate to conflate this with the psychological self. The model
suggests that an awareness of the psychological self is always present. Level 4 is a particular aspect of
the psychological self - one's beliefs and life plans, and a tendency to construct a coherent self-
conception based on such beliefs and plans.

Self-as-subject
The three categories, agency, continuity and distinctness, represent conceptions of the self-as-subject and
not the self-as-subject itself. Thus exploration of the self-as-subject is limited to the child's
understanding of her/his agency, continuity and distinctness. The investigators omit reflection on the
grounds of methodological difficulties. The development of each category is shown on the vertical axis
of the model. The move from one developmental level to the next represents a conceptual reorganisation
of the material used to understand the self-as-subject. In what follows the development in each category of the self-as-subject will be outlined using examples provided by Damon and Hart (1988).

The understanding of self-agency
From an individual's conception of her/his own agency derives a sense of self-autonomy: that she/he actively structures and processes her/his own experiences. The most basic understanding of self-agency (Level 1) is established with reference to supernatural, biological, or social forces that determine the existence or formation of self (e.g., How did you get to be the way you are? I just grew. What do you mean by that? My body just got bigger.). At Level 2 one's talents, abilities, wishes, motivation, or efforts influence the existence or formation of self-agency (e.g., How did you get to be the way you are? I tried really hard. What difference did that make? Well, I tried really hard to be like I am now.). At Level 3 communication with others influences the existence or formation of self-agency (e.g., How did you get to be the way you are? By talking with my parents. They helped me understand things better, even if I don't always do what they say.). At Level 4 personal or moral evaluations of life possibilities influence the existence or formation of self-agency (e.g., How did you get to be the way you are? Well, I decided to be kind to people because I've seen lots of kids hurt other kids' feelings for no reason, and it's not right or fair. Nobody should try to hurt another person's feelings or be mean to them.).

The understanding of self-continuity
From an individual's conception of her/his own continuity derives a sense of self-stability: that she/he continues to exist over time. The understanding of continuity at Level 1, defines the self with reference to simple categorical identifications. The child may state her/his own name, body, possessions, typical behaviour, stable preferences or membership to her/his social group as a basis for continuity (e.g., If you change from year to year, how do you know its still you? Because I have black hair. Why is that important? I don't know.). At Level 2 self-continuity is identified through permanent cognitive and active capabilities and permanent personal characteristics of the self. The child may identify mental, physical or personal traits or abilities (e.g., How do you know its still you? I know its me because I still
know things I knew five years ago. Is that important to you? Yeah, because I'll never forget them.). At Level 3 self-continuity is established with reference to the continuing recognition of self over time by family, friends, and the social world in general (e.g., How do you know you are always you? I'll still have my family. Why does that make a difference to you? Well, they are the ones that brought me up and taught me right from wrong.). Continuity at Level 4 is established with reference to the relation between earlier and present characteristics of the self. The child expresses an understanding that present or later aspects of self have evolved or developed from earlier ones (e.g., If you change from year to year, how do you know you are still you? By the way I feel inside. What do you mean 'By the way you feel inside'? You just know you're the same person. You know yourself.).

The understanding of self-distinctness

The understanding of distinctness over time at Level 1 is defined with reference to simple categorical identifications. As with continuity, the child may state her/his own name, body, possessions, typical behaviour, stable preferences or membership to her/his social group as a basis for self-distinctness (e.g., What makes you different from everybody else? Because there's only one person with my name. How does that make you different? I don't know.). At Level 2 distinctness is established through comparisons between self and other along isolated personality, behavioural, or cognitive dimensions. The child may compare her/his mental/physical abilities, activities, or personal characteristics with those of others (e.g., What makes you different from the other children in your class? I think I'm friendlier than most kids I know. How does that make you different? It just does.). At Level 3 self-distinctness is derived from an understanding of one's unique combination of psychological and physical characteristics (e.g., What makes you different from other children? I worry too much. I worry about things that other kids wouldn't worry about. Does that set you apart from the other kids? In some ways. Some people are alike in a few ways, but nobody's exactly somebody else.). At Level 4, self-distinctness is established by reference to one's unique subjective experiences and interpretations of the world (e.g., What makes you different from everybody else you know? Nobody else sees things or feels the same way about things as I do.).
The self-as-object

Damon and Hart have divided the self-as-object into four basic components: physical, active, social and psychological schemes. This mirrors the structure of the 'me' as set out by William James. The setting out of the self-as-object in this manner highlights the notion that each component of construing self undergoes developmental change throughout the period from early childhood to late adolescence. At all ages, therefore, children have an understanding of their physical, active, social and psychological selves. Knowledge of each scheme changes with development, but never to the extent that one component disappears or turns into another component. As with the self-as-subject, the development of each component is shown on the vertical axis of the model. The move from one developmental level to the next represents a conceptual reorganisation of the material used to understand the self-as-object. In what follows the development in each component of the self-as-object will be outlined, again using examples cited by Damon and Hart (1988).

The physical self

The physical-self at Level 1 may include the child's sex, size, race, distinctive bodily features, possessions, or physical environment. These are understood as important in and of themselves. (e.g., What kind of person are you? I'm a boy. Why is that important? It just is.) At Level 2 physical and material attributes of self reflect or influence one's capabilities relative to others or some standard (e.g., What are you like? I'm bigger than most kids. Why is that important? I can run faster than everybody). At Level 3 the self is defined by physical or material attributes that influence one's interpersonal interactions, and may reflect one's personal appeal, may affect one's social relations, or may determine one's group memberships and associations (e.g., What is the most important thing to say about you? I'm a girl. Why is that an important thing to say about you? Because girls play with girls and boys play with boys. So if someone wants to be my friend they would want to know if I was a girl or a boy.) At Level 4, physical or material attributes of self reflect one's personal philosophy, moral or ideological beliefs, or life plans and goals (e.g., What are you like? I don't have many things. Why is that important? It's not fair to have a lot of things when some people don't have anything.).
The active self

At Level 1 the active self is described in terms of typical activities that one performs, or that one is expected, allowed, or not allowed to perform (e.g., What are you like? I play football. Why is that important? I'm not sure.). At Level 2 the active self is defined in terms of actions and abilities that are compared, explicitly and implicitly, with those of others, of normative standards, or of oneself in different circumstances (e.g., What are you like? I'm not very good at school. What difference does that make? My grades are low.). At Level 3 the active self is construed in terms of activities that influence one's interpersonal appeal, social relations, or group membership (e.g., What kind of person are you? I play sports. Why is that important? Because all the other kids like athletics.). At Level 4 the active self is defined by activities that reflect one's personal philosophy, ideology, moral beliefs or life plans (e.g., What are you like? I go to church every Sunday. Why is that important? Because I want to be a good Christian.).

The social self

At Level 1 the social self is defined by the fact of one's association with others: family, friends, or other social figures, or by one's memberships in defined social groups (e.g., Describe yourself. I have a mother and father and baby brother. Why is it important to tell me about those people? I don't know. They're just my family.). At Level 2 one's abilities are considered in the light of the reactions of other people. Such reactions may include approval, disapproval, or any affective response (e.g., What kind of things make you proud of yourself? When my parents watch me play football, and I score a goal and they cheer. Why does that make you feel proud? Because they're letting me know I did well.). At Level 3 the social self is understood in terms of social and/or personality characteristics that reflect or influence one's interactions, interpersonal appeal, or group membership (e.g., What kind of person are you? I'm friendly. Why is that important? Other children won't like you if you're not.). At Level 4 social aspects of self reflect one's personal philosophy, ideology, moral beliefs or life plans (e.g., What else is
important about you? I'm a Girl Scout. Why is that important? Because we do good things. We help people. If more people did what we did the world would be a better place.

The psychological self

At Level 1 psychological attributes of self include moods, thoughts, feelings, and attitudes that have their own significance, unrelated to permanent dispositions, abilities or beliefs (e.g., What kind of person are you? I'm a happy person. Why is that important? I don't know.). At Level 2 the psychological self is constructed in terms reflecting one's cognitive capabilities, relative knowledge, or ability-related emotional states (e.g., What kind of person are you? I'm not as clever as most children. Why is that important? It takes me longer to do my homework.). At Level 3, psychological attributes of self reflect social skills or influence social interactions (e.g., What kind of person are you? I'm very smart. Why is that important? My friends only like smart kids.). At Level 4, psychological aspects of self reflect one's personal philosophy, ideology, moral beliefs or life plans (e.g., What kind of person are you? I believe in world peace. Why is that important? I don't think wars solve anything and I think we should try to keep from fighting.).

The Damon and Hart's social-cognitive model of the self represents a comprehensive approach to the study of self-understanding in children and adolescents. Their argument that all aspects of the self are present from early childhood is a significant contribution in the thinking on the self. Their model successfully integrates the self-as-subject and the self-as-object into a holistic framework which has been cleverly operationalised through their interview and coding procedures.

The demands placed upon the interviewees are by no means small. The interview would appear to rely upon the individual's memory and language skills, and indeed on the relationship with the interviewer for the disclosure of private aspects of the self. Before describing the self-understanding interview itself, likely methodological issues to do with administering the self-understanding to young people with autism will be considered.
3.5 Methodological Issues

There are two broad and inter-related methodological issues. The first concerns the suitability of the self-understanding interview as an investigative tool for use with young people with autism. Given the abstract nature of the items that comprise the self-understanding interview, how sure can one be that the questions put have been understood? Does a non-response mean that the participant does not understand the question, that the notion of self is meaningless, or that she/he does not have access to language to provide a meaningful response? The second issue concerns the selection of a control group. Only by comparing and contrasting the performance of the young people with autism with that of adequately matched control subjects can meaningful statements about the abnormalities in the nature of their self-understanding be made. The issue of suitability of the self-understanding interview applies to both the index and control groups.

To respond meaningfully to the items of the self-understanding interview a person must understand the questions, recall from memory the relevant material, and have access to sufficient language to construct an answer. In addition she/he must be motivated to do this. Children with autism are known to have difficulties with the comprehension and expression of language, and memory. What follows is a brief review of the nature of these difficulties in young people with autism.

Language comprehension

Assessing the comprehension of children with autism is extremely difficult. Clinical observations highlight a marked lack of interest by children with autism in speech:
chocolate or orange juice but ignores his parents when they give him instructions. Careful observation shows that the children's understanding is genuinely limited and that they have learned the meaning of a few words through a process of accidental operant conditioning because these words are closely connected with rewards, especially food. (p. 209; Ricks and Wing, 1975).

Further, those children with autism who demonstrate comprehension of speech may respond to questions in a concrete manner and limit themselves to the here-and-now. They have difficulty in understanding when asked to make a choice, and may automatically repeat the name of the last object mentioned whether they want it or not. Comprehension tends to be pedantic. They show confusion with idiomatic expressions, and have difficulty with understanding speech that changes with the context, such as pronouns and prepositions. Such words describe relationships rather than concrete objects or events.

How does this clinical picture compare with the findings from empirical studies in this domain? Beisler, Tsai and Vonk (1987) examined the comprehension of language in a group of 19 children with autism who ranged in age from 4 to 13 years and in non-verbal mental age from 3½ to 10 years. They were individually matched for chronological age, non-verbal mental age and sex with a group of children referred for suspected language delay. Both groups were administered the Test for Auditory Comprehension of Language (TACL: Carrow, 1973), which is used to assess receptive skills in morphology, syntax and vocabulary. The pattern of performance on this test was found to be comparable for both groups. This illustrates how language delay as well as deviance characterises children with autism, and that such abnormalities need to be taken into account when interviewing people with autism. In the present study the participants with autism were matched for receptive language ability using the British Picture Vocabulary Scale (BPVS: Dunn, Dunn, Whetton, and Pintile, 1982). This test involves showing a series of plates in which drawings are arranged in groups of four. A word is presented and the respondent is asked to point to the drawing she/he believes accompanies that word. The BPVS, therefore, may also be considered a test of conceptual understanding, insofar as the subject must recognise the correspondence between the meaning of each word and the meaning of a picture. It may be that only a minimal understanding of the concept is needed to pass an item this scale, and for this reason Wheldall and Jeffree (1974) have criticised the use of the Picture Vocabulary Test as a measure of mental age in mentally handicapped populations: such individuals may attain higher scores on such single-word vocabulary tests when they only partly comprehend the items presented. A
somewhat over-estimation of cognitive ability using the Picture Vocabulary Scale has also been shown in some young people with autism (Wetherby, Koegel, and Mendel, 1981; Tsai and Beisler, 1984). A mentally handicapped person's score on the BPVS, therefore, may be a conservative estimate of her/his limitations in understanding. While the matching of mentally retarded individuals with non-aged matched, normally developing subjects may be undermined because of this, the use of the Picture Vocabulary Scale to match two mentally retarded groups is not logically weakened.

Although the British Picture Vocabulary Scale is a test of single word comprehension, the studies of Rutter and his colleagues (Bartak, Rutter and Cox, 1975; Lockyer and Rutter, 1970) indicate how the performance on this test compares with the verbal sub-tests of the Wechsler Scales of Intelligence in revealing 'troughs' in the abilities of people with autism. Clearly it does not provide a comprehensive measure of all aspects of linguistic understanding, but it has proved useful in a number of studies for establishing matched groups of autistic and non-autistic participants who then display similar levels of performance (although sometimes contrasting profiles of performance) on language-related tasks. It therefore seemed an appropriate matching procedure for the present purposes.

The issue now concerns the feasibility of matching individuals with autism, given their known profile of linguistic and cognitive difficulties (Chapter Two), with same-aged non-autistic individuals using BPVS as a means of controlling for cognitive ability. Hobson and Lee (1989) individually matched 21 able young people with autism with non-autistic mentally retarded subjects for chronological age and performance on the BPVS. Independent raters coded the BPVS items for emotional, social, human and abstract content. Compared to control subjects, the autistic participants scored lower on emotion-related relative to emotion unrelated items, an effect that could not be attributed to the social content of the items. To underline the specificity of this finding the investigators also found that both groups achieved similar scores when responding to highly abstract relative to concrete words on the BPVS.

What are the implications of using the BPVS as a procedure to match autistic with non-autistic individuals? Comparable performance on the BPVS need not indicate that the matched groups are comparable on the general intellectual abilities that may be important for the demands of the task. A
given score may reflect very different processes underlying performance in autistic and non-autistic subjects, and such processes may be highly pertinent for the interpretation of results from the task (Hobson, 1991). There are two possible ways to reduce the possible impact of this problem. The first is to match subjects using more than one measure of cognitive ability pertinent to the demands of the task (Tsai and Beisler, 1984) as in, for example, some measure of expressive language. This point will be discussed further in the following section. The other way of reducing the impact of this problem is to design control tasks that are comparable to the index tasks in terms of their level of difficulty, but differ in their focus of inquiry. For example, an appropriate control task in the self-understanding interview may be to compare and contrast the linguistic and conceptual complexity of verbal responses to questions put to the child about the moral workings of the world, devoid of self-understanding. If the index group perform as proficiently as the control group on the control task, but perform less well on the index task, then one would have reasonable evidence for a specific deficit in the index group. Although the current study did not benefit from such a control, it was intended to examine the pattern of responses within the self-understanding interview, to see if this revealed evidence for or against the possibility that some non-specific affect of difficulty with 'abstraction' might be a factor in producing the group contrasts observed.

Language expression

One major function in the use of language and non-verbal gesture is to communicate with others, as reflected in the pragmatics of language (Bates, 1976). Children with autism who come to use language are generally impaired in the pragmatic aspects of their language. They may, for example, fail to shift appropriately from hearer to speaker role, not understand the social rules governing what is acceptable in a conversation (turn taking, asking personal questions in an impersonal context), and use a style of speech that is monotonous and pedantic. Tager-Flusberg (1981) concluded that phonological and syntactic development in children with autism, though delayed, follows the same course as normally developing children, though the semantic and pragmatic functioning is deviant. In a later study by Tager-Flusberg (1985), children with autism were compared with verbal mental age matched controls. The investigator found that while the representation of semantic knowledge in children with autism did
not differ significantly from the control group, the pragmatic aspects of speech did significantly
discriminate between the groups. Thus the pragmatic deficits appear to be the main area of deviance in
the language of children with autism.

In general, production skills may be more advanced in children with autism than their comprehension
skills (Tager-Flusberg, 1981). Here, too, however, one observes a complex mixture of abilities and
disabilities. For example, Boucher (1988) examined the performance of seven high-functioning children
with autism, ranging from just under 12 to 16 years of age, on tests of word fluency. Participants were
asked to name as many words in the space of one minute in each of four categories: (a) colours; (b)
animals; (c) foods; and (d) as many words as they could think of, termed 'miscellaneous'. Boucher found
that the performance on the three familiar categories was comparable to that of a matched control group.
On the miscellaneous word generation, however, the performance of the children with autism was
significantly below that of the control group. This was accounted for by the fact that the control group
did well on this task relative to their performance on the familiar categories, as opposed to the study
group performing less well than on the familiar categories.

It is important, therefore, to evaluate whether abnormalities in children with autism in generating
language might contribute to group differences in their responses during interview. This was controlled
by matching the young people with autism for their mean length of utterance (MLU). The MLU is
considered a general indicator of linguistic ability, and correlates highly with more sophisticated
measures of syntactic complexity in expressive language (Jaedicke, Storoschuk and Lord, 1994).

Memory

Once again, children's responses during interviews may be influenced by their abilities in remembering
things. Boucher (1981) compared the memory for recent events in a sample of 10 high-functioning
children with autism who ranged from 10½ to 16 years of age. In a standard procedure the participants
were presented with four paired associate lists, allowed to play with a combination-lock money box,
conduct a forced choice face recognition task, partake in a mock football game, allowed to play with a
box camera, and finally to draw a picture of their own choice. After a short delay each child was asked what they remembered doing in the room with the experimenter. The children with autism recalled an average of two items. This was significantly less than the average 3.7 items recalled by their matched control group. The significant difference remained when the superior performance on the verbal comprehension test was statistically controlled for. As an aside, however, Boucher does mention that *autistic children's cued recall was good* (p. 299). It is important, therefore, that the present methodological approach include efforts to cue participants in their responses to questions during the self-understanding interviews. As described above, the self-understanding interview has been designed to explore the reasoning or grounds for any self-statement elicited. It is assumed that the prompting of first responses will serve to cue the participants in the recall of the relevant material.

**Motivation**

The final methodological issue concerns the motivation of participants. O'Dell, Dunlap and Koegel (1983 - reported in Koegel and Mentis, 1985) compared the impact of two reinforcement contingencies on the verbal responding of four children with autism. They found that compared to a schedule of reinforcement targeted to specific verbalisations, when any observable attempt to verbalise was reinforced all children achieved higher rates of correct verbal responding and progressed more rapidly. The results suggested that by reinforcing communication attempts, the children's motivation to maintain interest and attention in a task may be increased. The investigator knew all the participants well, having worked with the individuals in both the study and control groups for at least four years, and some of the young people with autism longer again. Each person who took part in this study was judged to have maintained their attention and motivation to participate throughout. The interviews were paced according to the participants' needs and routine, and stopped at the first signs of waning attention. As far as possible, therefore, steps were taken to ensure that the responses provided by the participants reflected their considered understanding of self.
3.6 A study to examine self-understanding in young people with autism

This study was designed to elicit and examine the verbally expressed self-statements of young people with autism and their matched controls, using a semi-structured interview devised by Damon and Hart (1988). It was assumed that in the course of the interview a representative sample of self-statements would be provoked reflecting the self-as-subject and self-as-object from each participant.

Participants

The study group comprised twelve young people with Autistic Disorder (8 males and 4 females) who were diagnosed by the criteria of DSM-IV (American Psychological Association, 1994). In addition, all of the young people with autism were recorded as having had an early impairment in language (i.e., did not use single words by 2 years of age nor communicative phrases by 3 years of age), precluding them from a diagnosis of Asperger Syndrome. These young people with autism also met research diagnostic criteria on the Childhood Autism Rating Scale (CARS: Schopler, Reichler, and Renner, 1986). They were administered the British Picture Vocabulary Scale (BPVS: Dunn, Dunn, Whetton, and Pintile, 1982) to provide an estimate of verbal mental age. From the transcript of each participant's self-understanding interview, the mean length of utterance (MLU) was calculated. The MLU is a simple index of grammatical development (Brown, 1973). Brown argued that if two children are comparable on MLU then they are more likely to have speech that is, on internal grounds, at the same level of constructional complexity. It is acknowledged that there are limitations in the use of MLU as a measure of grammatical complexity beyond an MLU of four (Brown, 1973), and future studies might supplement this measure with other indices of linguistic output. The MLU score was derived by taking each participant's first 50 utterances. The average number of morphemes comprising each utterance was then calculated. The exact procedure and rules for calculating the MLU is detailed in Appendix 3.1. The autistic participants were group matched with 10 non-autistic learning disabled individuals (8 males and 2 females) according to chronological age and verbal mental age. Both groups also had comparable
MLU's (Table 3.2). The control group comprised individuals whose intellectual retardation was not ascribable to a diagnosed medical condition.

<table>
<thead>
<tr>
<th></th>
<th>Autistic</th>
<th></th>
<th>Non-autistic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Autistic</strong></td>
<td>n = 12</td>
<td></td>
<td>n = 10</td>
</tr>
<tr>
<td><strong>Chronological age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (years; months)</td>
<td>15;06</td>
<td>14;08</td>
<td></td>
</tr>
<tr>
<td>Standard deviation (months)</td>
<td>42</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Range (years; months)</td>
<td>9;02 - 19;00</td>
<td>12;00 - 17;01</td>
<td></td>
</tr>
<tr>
<td><strong>Verbal mental age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (years; months)</td>
<td>6;06</td>
<td>6;06</td>
<td></td>
</tr>
<tr>
<td>Standard deviation (months)</td>
<td>19</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Range (years; months)</td>
<td>4;04 - 9;09</td>
<td>4;00 - 9;03</td>
<td></td>
</tr>
<tr>
<td><strong>Verbal IQ</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>45.97</td>
<td>45.07</td>
<td></td>
</tr>
<tr>
<td>Standard deviation</td>
<td>11.55</td>
<td>9.87</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>27 - 64</td>
<td>32 - 62</td>
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<td><strong>Mean length of utterance</strong></td>
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<td>6.04</td>
<td></td>
</tr>
<tr>
<td>Standard deviation</td>
<td>1.52</td>
<td>1.31</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>3.30 - 8.04</td>
<td>4.60 - 8.96</td>
<td></td>
</tr>
</tbody>
</table>

Table 3.2 Self-understanding study: Participant characteristics

**Method**

The self-understanding interview contains seven core items (Figure 3.2). The first four items were designed to explore the self-as-object and the last three the self-as-subject. These were presented sequentially with occasional variation to maintain the flow of the interview.

The wording of the questions was varied as required, to suit each participant's comprehension needs. The technique also allows, where necessary, new probe questions to be added in order to fully explicate each participant's line of reasoning. The general principle in probing a self statement is to continue with follow up questions until the participant repeats her/himself, gives an I don't know response, or shows marked signs of waning attention. Each interview took between 45 and 60 minutes to administer.
Scoring of the self-understanding interview

All interviews were transcribed verbatim. Each and every self-characteristic and accompanying statement explicating its meaning or importance was identified. This basic unit defines a 'chunk'. For a response to be scored, the participant does not have to elaborate upon a statement but must be given the opportunity to do so. Once identified, the chunk is then matched with a point in the Damon and Hart scoring manual (Appendix 3.2). Damon and Hart included the following additional rules for scoring identified chunks: (a) a chunk that can be coded at more than one level within a single scheme should be scored at the highest applicable level in that scheme; (b) a chunk that can be coded in two or more schemes at the same level should be given all the applicable scores; and (c) a chunk that can be coded in two or more schemes at different levels should be scored for the highest level in the various schemes.

For reliability purposes, a person was trained to identify self-statements according to the criteria outlined above. The rater, herself blind to diagnosis, then identified all chunks from two full transcripts (one from the autistic sample and his matched non-autistic counterpart). Of the 45 chunks identified by the investigator from these two transcripts, 41 (or 91 percent) were identified by the blind rater. Furthermore, the blind rater did not identify a single chunk within the two transcripts not already identified by the investigator. Following this, the same rater was trained to code chunks using the Damon and Hart scoring manual. She then coded all of the chunks identified by the investigator for seven randomly selected participants (4 autistic participants and 3 non-autistic participants). The list comprised 115 randomly ordered chunks. Kappa coefficients were calculated. For the placement of chunks among the four categories, the Kappa coefficient was 0.84, indicating 'almost perfect agreement' (Landis and Koch, 1977) between the investigator and the rater. For the placement of the chunks among the four levels, the Kappa coefficient was 0.76, indicating 'substantial agreement' between the two.

The self-statements elicited in the course of the self-understanding interview are coded into those that demonstrate an awareness of the self-as-subject and those that demonstrate an awareness of the self-as-object. These two classes of self-awareness will be considered separately.
Figure 3.2 Items comprising the Self-understanding Interview
### Table 3.3 Self-as-subject: Distribution of coded chunks

<table>
<thead>
<tr>
<th>GROUP</th>
<th>Agency</th>
<th>Continuity</th>
<th>Distinctness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autistic:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>A2</td>
<td>2 0 0 0</td>
<td>1 1 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>A3</td>
<td>1 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>A4</td>
<td>1 0 0 0</td>
<td>3 0 0 0</td>
<td>1 0 0 0</td>
</tr>
<tr>
<td>A5</td>
<td>1 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>A6</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>A7</td>
<td>0 2 0 0</td>
<td>1 1 1 0</td>
<td>0 2 0 0</td>
</tr>
<tr>
<td>A8</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>A9</td>
<td>0 1 0 0</td>
<td>3 1 0 0</td>
<td>2 0 0 0</td>
</tr>
<tr>
<td>A10</td>
<td>0 1 0 0</td>
<td>1 1 0 0</td>
<td>1 1 0 0</td>
</tr>
<tr>
<td>A11</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>A12</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 1 0 0</td>
</tr>
<tr>
<td>Sum:</td>
<td>5 4 0 0</td>
<td>10 5 2 0</td>
<td>4 4 0 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-autistic: C1</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>C2</td>
<td>0 0 0 0</td>
<td>2 1 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>C3</td>
<td>1 1 1 0</td>
<td>1 2 0 0</td>
<td>1 0 0 0</td>
</tr>
<tr>
<td>C4</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>1 0 0 0</td>
</tr>
<tr>
<td>C5</td>
<td>0 2 0 0</td>
<td>0 0 0 0</td>
<td>0 0 1 0</td>
</tr>
<tr>
<td>C6</td>
<td>0 0 1 0</td>
<td>0 0 0 1</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>C7</td>
<td>1 0 0 0</td>
<td>1 0 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>C8</td>
<td>0 0 0 0</td>
<td>1 0 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>C9</td>
<td>0 1 1 0</td>
<td>1 1 1 0</td>
<td>0 0 0 0</td>
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<td>C10</td>
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</tr>
<tr>
<td>Sum:</td>
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<td>7 4 1 1</td>
<td>12 0 1 0</td>
</tr>
</tbody>
</table>

**Results: Self-as-subject**

The number of self-as-subject statements produced by each participant is shown in Table 3.3. The mean number of chunks of each Category in the responses of each group is illustrated in Figure 3.3. The first thing to note is that the number of chunks produced by each group is closely similar: the participants in the study group produced a mean 2.58 chunks each; the control group participants a mean of 2.80. In Table 3.3 it can be seen that the distribution among the cells specifying the level of understanding was
severely skewed. Given this the data was collapsed across levels. Furthermore, as the number of self-as-subject statements produced by the two groups were not normally distributed, the use of parametric statistics was precluded. Instead the groups’ responses in each of the three categories was compared using non-parametric statistics.

The number of agency self-statements was found to be comparable between the autistic and non-autistic groups (Mann-Whitney $U = 45$, $z = -1.05$, ns), as was the number of continuity (Mann-Whitney $U = 58.5$, $z = -0.10$, ns) and distinctness self-statements (Mann-Whitney $U = 48.5$, $z = -0.89$, ns).

**Figure 3.3** Self-as-subject scheme: Distribution of the mean number of chunks (group x category)

**Examples of self-as-subject statements**

Examples of the self-as-subject statements made by the two groups will now be considered in some detail to provide a qualitative description of the nature of these statements produced by the autistic and non-autistic groups.
Self-agency

From an individual's awareness of her/his own agency derives a sense of self-autonomy: that she/he actively structures and processes her/his own experiences. Self-statements concerned with the formation, existence or control of the self fall into this category.

Seven of the twelve study group participants expressed a sense of agency, producing a total of nine such chunks; five of which were coded at Level 1 and the remainder at Level 2. Four of these statements were to do with growing-up, one was to do with having a brain that did not function properly (A7), and four were to do with making choices and doing things for oneself. Seven of the ten control group participants produced a total of twelve self-agency statements; two at Level 1, six at Level 2 and four at Level 3. For the control group four agency statements were to do with growing-up, six were to do with making decisions that improved life, and two chunks from the one participant (C9) describing how he simply does what he wants to do!

Those agency self-statements coded at Level 1 are understood in terms of supernatural, biological or social forces that influence the formation of the self. In the autistic group one participant (A2) produced two agency statements which were both to do with growing up and coded at the most basic level of understanding. For example:

Ex: How were you different fifteen years ago?
A2: Been growing up.
Ex: Growing up.
A2: Yeah.
Ex: Can you tell me about (name) growing up?
A2: Just went done on it's own.
Ex: Just happened by itself?
A2: Yeah.

Two non-autistic control participants each produced a single self-statement that was also coded at the most basic level of understanding. The following example was made by C3:

Ex: Are there any other ways you change?
C3: First y' weak.. y' weak. Y' see in Africa, and suddenly y' think about it. Suddenly y' eat, eat, eat 'till y' tough. Then that's when y' change. Change to be strong man. And if y' don't eat y' change to a weak man. Then y' can't pick up anythin'. If your a strong man, people think y' just change.. like being strong. Then emm.. feelin' weak. And people say "Last week, yeah, you used to be weak?". Now in seven weeks. now in the holiday I'll eat and I'll be tough.
At Level 2 talents, abilities, wishes or personal effort are reported to influence the formation of self. Three of the participants from the autistic group produced self-agency statements that were coded at this level. This example is from A9:

Ex: How have you changed from when you were younger?
A9: I have to do things by myself, 'cause I'm getting a big boy now.

In the control group four participants produced five self-agency statements that were coded at Level 2. This self-statement was made by C5:

Ex: How did you get to be the way you are today?
C5: I leave school. Old one.
Ex: Why did you leave your old school?
C5: Leave the school, 'cause I couldn't stand that school. They said come to a boarding school. I'd be better at boarding school. So I chose (name of school) one. And I looked around and I come here.

At Level 3 interpersonal factors influence the existence or formation of the self. While there was no such understanding among the autistic group, three of the control group each expressed one such self-agency statement with this level of explication. The following example was produced by C6:

Ex: What will you do at college?
C6: Work hard.
Ex: Is it important to work hard?
C6: Well ... I will study so hard. I do it for my mum.
Ex: Sure.
C6: I do it for my mum and my brother and my family.

At Level 4 personal or moral evaluations of life possibilities are referred to. There were no self-agency statements produced by either group that were coded at this level of explication.

In general the self-agency statements produced by the autistic group were less elaborate than those produced by the non-autistic control group. This appeared to reflect a desire on behalf of the control group to make themselves fully understood. The proportion of agency statements produced and their content was comparable between the two groups. A third of these self-statements made by the control group were understood in terms of interpersonal implications.
Self-continuity

Seven of the twelve autistic participants produced seventeen statements that demonstrated an awareness of themselves existing over time; ten of these were coded at Level 1, five at Level 2 and two at Level 3. Fourteen of these continuity statements referred to the self existing in the past (nine of these being recollections of babyhood). The other three continuity statements made reference to the self in the future: One young person (A10) said that his voice would change; another (A7) said that he would simply stay the same in the future; the other young person (A9) said that he would not change in the future because his name would stay the same. Seven of the ten control group participants produced a total of thirteen continuity statements; seven at Level 1, four at Level 2, one at Level 3 and one at Level 4. For the control group five continuity statements referred to the self in past (four made reference to the recent past, and one to when the participant was a baby). The other eight statements referred to the self in the future (six of these were to do with growing bigger).

Those continuity self-statements coded at Level 1 are understood in terms of externally observable stable physical properties, possessions or behavioural characteristics. In the autistic group one participant (A9) produced four continuity statements, three of which referred to the self in the past and one which referred to the self in the future:

Ex: Do you change from one year to the next year?
A9: We do changes don't we? We change...This is 1992. 'Til be 1993 soon.
Ex: And how about (name)? Does (name) change?
A9: No it doesn't. (Surname) doesn't change. It just be the same name.
Ex: Right the name will be the same. But (name) as a person, do you change from year to year?
A9: No I don't
Ex: Why is it important to know that you're name is the same?
A9: 'Cause my name is (name).

A technical point arises here. The investigator was responded to literally by A9 when talking about changing and year: 'This is 1992. It'll be 1993 soon'. This young person appeared to think about change before saying this, but then gave his literal response. The investigator then anchored the question to the participant himself, by asking him how A9 (name) changed. This was a modification made by the investigator to convey the meaning of the items to all participants in both groups. More typically the
young people with autism referred to themselves in the past. The following example, coded at Level 1, was given by A4:

Ex: How else were you different when you were younger?
A4: I used to … I grew up. I used to crawl and I ate sand.
Ex: Why is that an important thing to know about you?
A4: That’s what mummy told me.
Ex: Would you eat sand today?
A4: No.
Ex: And you’re not crawling any more, you can walk.
A4: Yes. I grew up.

Seven of the non-autistic control participants produced eleven self-continuity statements that were coded at this most basic level of understanding. The majority of these statements referred to the ways in which the self would be physically changing in the future. For example C1 gave the following response:

Ex: Will there be anything else about you that will change in five years time.
C1: I’ll grow to be a man.
Ex: Do you see yourself as being a boy at the moment.
C1: Yes.
Ex: Why is it important for me to know that you’ll grow into a man, (name)?
C1: I don’t know.

At Level 2 reference to self-continuity is made in relation to cognitive and active capabilities. Five of the autistic participants expressed a more developed understanding of a self existing over time. A9, for example, linked his sense of self-continuity with a developing ability:

Ex: Are there things you can do now that you couldn’t do when you were a baby?
A9: I couldn’t do anything when I was a baby. I couldn’t do puzzles or the games, but I can do them now.
Ex: And is it important to be able to do those things?
A9: Yes.
Ex: Why’s that?
A9: ‘Cause you have to work hard and think when you do puzzles and that and games.

Three non-autistic control participants each produced at least one self-continuity statement that were coded at Level 2. The following example is a statement made by C3. This young person shows awareness of the change in his speech from when he was younger, from a poorly made to a more standard type of expression:

Ex: Is there anything else about you as a person?
C2: Y’ speaking.
Ex: What about it?
C2: Sometime... sometime emm... you says "biscuit" you might go "bickie". Or like "sausages". Or like sometimes I used to have that problems.
Ex: So that you couldn't say those words?
C2: Yeah.
Ex: But you can now?
C2: I used to say "bickie".
Ex: I understand. So your speech has changed?
C2: Yeah. And I used to say "says" - toys.
Ex: Right. But you can say the words properly now?
C2: Yeah.

At Level 3 the person shows awareness of her/his continuity that is dependent on others' continuing recognition of the self over time. Only two autistic (A7 & A9) and one control participant (C9) demonstrated an awareness of self-continuity at this level of understanding:

Ex: Do you remember when you were younger?
A7: I guess when I was a baby... sort of a baby.
Ex: What kind of boy were you then?
A7: Em... I was a bit of a pain in the neck at times.
Ex: (Laughs)
A7: Sometimes I was a bit silly.
Ex: Tell me about that. Why were you a pain in the neck?
A7: I used... em... I used to be... me and my brother used to fight a lot.
Ex: I see.
A7: We used to... em... have bad fights - I've learnt that now.
Ex: Right. What did you used to fight over?
A7: We used to fight over silly things - we used to thump each other and hit each other - managed to, managed to stop that now.
Ex: What sort of things did you fight about?
A7: Just sometimes we used to fight over, fight over football and things.

This second continuity statement coded at Level 3 was expressed by A9. He identified himself as a baby in the past and his interaction with mother that influenced his mental state:

Ex: What sort of things happened to you to make you the sort of person you are today?
A9: 'Cause I was born in the stomach with mummy.
Ex: Tell me about that.
A9: I was in the stomach with mummy and I come out and I was crying a lot.
Ex: After being born?
A9: Yes.
Ex: You remember being born?
A9: I remember when my head popped out and when I was out my legs.
Ex: And what did it feel like?
A9: It feel like I was crying a lot when I first came out.
Ex: And do you know why you were crying.
A9: Well 'cause I was a bit nervous 'cause I didn't think this is the first time I was out.
Ex: Then did you stop being nervous?
A9: Yes.
Ex: What made you stop being nervous?
A9: I just cheered up again.
Ex: And what cheered you up?
A9: I'm glad to see mummy.
Ex: Then what happened.
A9: Then we meet each other and I was glad

The following example was made by a non-autistic, control participant (C9):

Ex: Is there anything else about (name)?
C9: Like I have to grow... have to grow...
Ex: Yes.
C9: And the ... and the age.
Ex: You say that you're growing. Is that an important thing for me to know?
C9: Yeah. Y' know why?
Ex: Tell me.
C9: Like.. like you wearin' that shoes and y' grow and then people won't know your growin'. Right when y' put on your shoes they're too tight for you. They're too big. People can't see you growin'.

At Level 4, self-continuity is understood in terms of the relationship between one's earlier and present characteristics of the self. Only one control group participant expressed a sense of self-continuity that was coded at this level:

Ex: So when you are 19 or 20 do you think you will be the same or different?
C6: Different.
Ex: What ways do you think you'll be different?
C6: Happy.
Ex: You'll be happier you mean?
C6: Mm.
Ex: So what sort of things will make you happier?
C6: Leave school.
Ex: Right, that will be a big thing for you.
C6: Then it will be brilliant. Get away from this stupid school.
Ex: Right so that will be very different.
C6: College.
Ex: Right, so you see yourself going on to college.
C6: Mm.

In general the proportion of self-continuity statements produced by the two groups and their levels of explication were comparable. An examination of the content, however, demonstrated that the autistic group participants tended to produce continuity statements that reflected themselves in the past (in particular their recollections of being a baby), while the control group produced statements reflecting themselves in the future (in particular of growing up and becoming bigger).
Self-distinctness

From an individual’s conception of distinctness derives the sense of individuality: that her/his experiences, perceptions, motives, and the like are unique to her/him.

Five of the twelve study group participants expressed a sense of distinctness, producing a total of eight such chunks; four of which were coded at Level 1 and the other four at Level 2. Three of these statements were to do with physical differences (hair colour, body size and voice); two were to do with behaving differently; one (A12) was to do with being special - though the young person could not specify in what way she was special compared to others; and the other (A10) made reference to having a different mother and father to everyone else. Three of the ten control group participants each produced a single self-distinctness statement; two at Level 1 and one at Level 3. For the control group two of these statements were to do with physical differences (hair colour and body size), and one was made by a young person who made a broad statement expressing how every person was unique (C5).

At Level 1 self-distinctness is based on observable physical properties and social group membership. Two young people with autism produced self-distinctness statements that were coded at the most basic level of understanding. For example:

Ex: Is there anyone in your class like you?
A9: No.
Ex: So what makes you different from them?
A9: ’Cause I just am from different colour hair.
Ex: And in any other ways?
A9: ’Cause there big... some are big and some are smaller than me.
Ex: And why is that important to know?
A9: ’Cause you have to be big.

Two non-autistic control participants each produced a self-statement that distinguished themselves from others based on physical characteristics. Both were coded at Level 1. For example:

Ex: Do you think there’s anyone else in the whole world who is like you?
C4: He like me, he... emm... different ... Matthew.
Ex: Thinking about Matthew, how is he different from you?
C4: One got brown... brown hair and one got white hair.
Ex: Is that an important difference?
C4: Yeah.
Ex: Why?
C4: ’Cause mine brown and his white.
At Level 2 self-distinctness arises from the difference between self and others in terms of character, personality or cognitive abilities. One young person with autism (A7) produced two self-distinctness statement that were coded at Level 2. He referred to his abilities to distinguish himself from the others in his school:

Ex: Are you different from the other people in the school?
A10: Yeah.
Ex: In what ways?
A10: Because I can do things and they can't.
Ex: So can you tell me the sort of things you can do that they can't?
A10: Drawing and that.
Ex: Is it important to know that you can draw and that the other people in the school can't?
A10: Yeah.
Ex: Why is that (name)?
A10: I don't know.

No non-autistic control participant produced a self-distinctness statement that was coded at Level 2. At Level 3, self-distinctness derives from a unique awareness of unique combination of physical and psychological characteristics. Only one non-autistic control participant (C5) gave a description of herself as distinct from others that was coded at Level 3:

Ex: Do you think there is anyone who is exactly like you in the whole world?
C4: Could be. Could be. I never met anyone like me.
Ex: You've never met anyone like you?
C4: No.
Ex: So what makes you different to anyone else?
C4: Every person is different to other people. That's how I know the difference between my friends. Me and Lucy like the same music, but we're not the same.
Ex: And how are you different?
C4: We just are.

At Level 4, self-distinctness is understood in terms of one's unique subjective experiences and subjective interpretations of the world. There were no self-distinctness statements made by either clinical group that could be coded at this level.

In general the proportion of self-distinctness statements produced by the two groups were comparable. The small number of such statements makes it difficult to know if the differences in terms of content and level of explication between the two groups is important or not.
A post hoc examination of the associations among verbal mental age and verbal IQ and the production of self-as-subject statements was conducted by calculating Spearman Rank Correlation Coefficients. It was assumed that the expression of self-as-subject statements (being abstract in nature) would be associated with verbal mental age. One-tail tests of significance were therefore conducted. The coefficients are shown in Table 3.4.

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Table 3.4 Self-as-subject: Spearman Rank Correlation Coefficients for performance with verbal mental age and verbal IQ

Verbal ability was found not to be significantly correlated with the number of self-as-subject statements made by either of the two clinical groups.

**Summary of results: Self-as-subject**

Both groups expressed differentially the senses of agency, continuity and distinctness, and this pattern of differentiation between the two groups was comparable. The proportion of agency statements produced and their content was similar between the two groups, although a third of these self-statements made by the control group were understood in terms of their interpersonal implications. The proportion of self-continuity statements produced by the two groups and their levels of explication was also similar, although in terms of the content the autistic group tended to make continuity statements that reflected themselves in the past, while the control group produced statements reflecting themselves in the future. Finally, the small proportion of self-distinctness statements produced by the two groups was also similar.
The expression of self-as-subject statements was not significantly correlated with verbal mental age or verbal IQ.

**Results: Self-as-object**

The number of self-as-object statements produced by each participant is shown in Table 3.5. This data set was analysed using a repeated measures analysis of variance. Here the two groups (autistic and non-autistic) were compared for their pattern of performance across sixteen categories: four categories (Physical, Active, Social and Psychological) by four levels (Level 1 to Level 4).

<table>
<thead>
<tr>
<th>CATEGORY</th>
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<tr>
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<td>0 2 0 0</td>
</tr>
<tr>
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<td>2 0 0 0</td>
</tr>
<tr>
<td>A7</td>
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<td>0 1 0 0</td>
<td>1 1 3 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
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<td>8 1 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>5 0 0 0</td>
</tr>
<tr>
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<td>4 1 0 0</td>
<td>0 0 0 0</td>
<td>2 5 0 0</td>
</tr>
<tr>
<td>A10</td>
<td>4 0 0 0</td>
<td>2 1 2 0</td>
<td>1 1 0 0</td>
<td>2 2 0 0</td>
</tr>
<tr>
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<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 2 0</td>
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<tr>
<td>A12</td>
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<td>1 0 1 0</td>
<td>0 0 0 0</td>
<td>2 1 0 0</td>
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<td>23 12 4 1</td>
<td>9 3 5 0</td>
<td>19 14 1 0</td>
<td></td>
</tr>
</tbody>
</table>

| Non-autistic:  |          |        |        |              |
| C1             | 0 2 1 0  | 0 0 0 0| 0 0 0 1| 0 0 0 0      |
| C2             | 6 0 1 0  | 1 0 0 0| 0 2 0 2| 2 1 2 3      |
| C3             | 3 0 1 1  | 0 0 1 0| 0 0 2 2| 1 2 0 3      |
| C4             | 0 0 1 0  | 3 0 1 0| 3 0 4 0| 2 1 2 0      |
| C5             | 2 0 3 0  | 0 0 0 0| 0 2 0 2| 2 1 0 1      |
| C6             | 2 1 3 0  | 0 0 2 0| 1 0 5 0| 0 0 3 0      |
| C7             | 2 1 0 0  | 1 0 1 0| 0 0 6 0| 0 0 0 0      |
| C8             | 0 0 2 0  | 0 0 1 2| 3 1 3 1| 1 1 3 0      |
| C9             | 0 1 2 0  | 0 0 1 2| 0 0 2 0| 0 0 0 0      |
| C10            | 2 1 1 0  | 1 1 1 0| 0 0 3 0| 0 0 2 0      |
| Sum: 17 6 15 1| 16 4 10 2| 11 3 30 7| 6 6 16 4    |

**Table 3.5 Self-as-object: Distribution of coded chunks**
The model specified analysed: (i) the between-subjects effects (i.e., collapsing conditions); (ii) the within-subject effects for category and for level (i.e., collapsing groups); (iii) the two first order interactions: 'group by category' and 'group by level'; and (iv) the second order interaction: 'group by category by level'. This analysis takes into consideration the fact that the same participants in each group are involved in the sixteen different conditions.

The analysis of variance revealed no main effect of group ($F_{1,20} = 0.84, \text{ ns}$). There was a significant main effect of category ($F_{3,60} = 3.10, p < 0.05$). The distribution of chunks across the four different categories, after collapsing both group and level, was as follows: 34.23 percent were coded in the physical category, 20.80 percent in the active category, 22.82 percent in the social category, and 22.15 percent in the psychological category. The analysis also revealed a significant main effect of Level ($F_{3,60} = 19.57, p < 0.001$): after collapsing both group and category, 45.64 percent were coded at Level 1, 20.13 percent at Level 2, 28.86 percent at Level 3, and 5.37 percent at Level 4.

This backdrop allows for interpretation of the first order interactions involving the group comparisons. There was a significant group by category interaction ($F_{3,60} = 6.44, p < 0.005$). This is represented graphically in Figure 3.4. The difference between the category means for the two groups were further examined using the Scheffé's post hoc test (as stipulated in Lee, 1975). To reduce the likelihood of a Type 1 error, the alpha value was set at 0.01. The formula and calculation of these comparisons are reported in Appendix 3.3. The critical difference score, $S_{(p<0.01)}$, was found to equal 2.08. The only between-group category difference score that was greater than the critical difference score was found for the social statements, where the autistic group produced a mean of 1.42 social chunks compared with 5.10 by the non-autistic control group. The difference in the mean number of self-statements produced by the two groups for the physical (autistic 5.25 and non-autistic 3.90), active (3.33 and 2.20) and psychological (2.83 and 3.20) was not significant.
The analysis of variance also revealed a significant group by level interaction (F\textsubscript{3,60} = 17.72, p < 0.001). This is represented graphically in Figure 3.5. There is a within-group downward pattern in the distribution of mean number of chunks produced by the young people with autism, which falls from a mean of 8.00 chunks for Level 1, to 3.42 chunks for Level 2, 1.25 chunks for Level 3 and a low of 0.17 chunks for Level 4. The non-autistic control within-group patterning for the distribution of mean number of chunks among the four levels shows that 4.00 are coded at Level 1, 1.90 at Level 2, 7.10 at Level 3, and 1.4 at Level 4. The difference between the level means for the two groups were also examined using the Scheffé's post hoc test. To reduce the likelihood of a Type 1 error, the alpha value was set at 0.01. The formula and calculation of these comparisons are reported in Appendix 3.3.

The critical difference score, S\textsubscript{(p<0.01)} was found to equal 2.28. The between-group level difference scores exceeding this critical difference score were found for both Level 1 and Level 3. The post hoc analysis of difference between the means, therefore, demonstrated that the autistic group were significantly more likely than the control group to express self-statements that were coded at Level 1, while the control group were significantly more likely than the study group to express self-statements that were coded at Level 3.
The second order interaction of group by category by level failed to reach significance ($F_{9,180} = 1.08, ns$). The difference between the mean number of chunks produced by each group within each category and level is graphically represented in Figure 3.6. There are a number of interesting trends shown here that will be considered in the following section.
Examples of self-as-object statements

The pattern of each group's response to the four self-as-object categories will be considered qualitatively in this section. The number of self-statements, the level at which they were coded and their content will be commented upon. Examples of self-statements made by each group at each level will be provided.

The physical self

Physical self-statements define the self in terms of physical-body or material possessions. All twelve autistic participants produced a total of sixty-three such statements: forty-five were coded at Level 1, twelve at Level 2, five at Level 3, and one at Level 4. In fact, the highest number of self-statements fell into the class of physical self at Level 1 for the study group. The range of physical or material attributes, in order of magnitude, included reference to distinctive bodily features (17 chunks); gender (15 chunks); size (13 chunks); personal physical environment (6 chunks); age and possessions (3 chunks each); name and clothing and physically similar to mother (2 chunks each). All ten non-autistic participants produced a total of thirty-nine physical self-statements: seventeen at Level 1, six at Level 2, fifteen at Level 3 and one at Level 4. The content of these statements included reference to distinctive bodily features (10 chunks); size (8 chunks); gender and possessions (4 chunks each); age and physical health (3 chunks each); occupation and personal physical environment (2 chunks each); name, physically similar to peer and quiet (1 chunks each).

Physical self-statements that are coded at Level 1 ascribe physical characteristics and material possessions as having significance in and of themselves. The individuals in the study group, on average, produced 3.75 such chunks compared with 1.7 by the control group. The following example of a physical self-statement coded at this most basic level of understanding was produced by an autistic participant (A2):

Ex: (Name), how would you describe yourself?
A2: Don't know. Boy.
Ex: Why is it important for me to know that you're a boy?
A2: Because it just is.
This example was fairly typical in terms its terseness of those self-statements made by the young people with autism that were coded at this level. The following example was given by a participant in the control group (C1), who identified the colour of his skin (a distinctive bodily feature), with no further explication:

**Ex:** What sort of person are you?  
**C1:** (Name)?  
**Ex:** Yeah. Tell me about (name).  
**C1:** Brown.  
**Ex:** Brown, right.  
**C1:** An' I got brown hair.  
**Ex:** Why is it important for me to know that you're brown?  
**C1:** I don't know.

At Level 2 physical and material attributes of the self influence or reflect the nature of one's activities or capabilities. The participants in the study group produced an average of 1.00 chunk each as compared with 0.60 in the control group. An example of this more developed sense of physical self was given by a participant from the autistic group (A6), who made reference to his abilities in relation to his gender:

**Ex:** How would you describe yourself?  
**A6:** Big boy.  
**Ex:** Why is it important for me to know that you're a big boy?  
**A6:** Have to get on.  
**Ex:** Get on?  
**A6:** To do the work  
**Ex:** So you're a big boy because you have to do the work?  
**A6:** Yeah.

The following example of a physical self-statement coded at Level 2 was expressed by a participant in the control group (C6):

**Ex:** Is there anything else about you?  
**C6:** Yes, I'm tall.  
**Ex:** Tall, right. Is that important?  
**C6:** Yes.  
**Ex:** Why, why is it important to be tall?  
**C6:** I like, I like being tall. See how my friends gettin' tall, and I might get tall.

At Level 3 physical and material attributes of self influence one's social appeal, social interactions, social relations or group membership. The autistic group produced an average of 0.42 chunks compared with...
1.50 made by the non-autistic control group that fell into this level of understanding. Here A3 identified his birthday and age in relation to his social relations:

Ex: Is there anything else about (name) that's important to know?
A3: My birthdays in 27 of December.
Ex: So how old will you be on your next birthday?
A3: Thirteen.
Ex: Is that an important thing to know about (name)?
A3: Mmm (nods head). Be on your own when you're thirteen?
Ex: In what way will you be on your own?
A3: I won't have no adults or that I think.
Ex: So what sort of things will you have to do if you're on your own?
A3: I have to ask all the people if they got anythings.
Ex: So you're going to have to do this all yourself now?
A3: Yes I have to.

The following example of a physical self-statement coded at Level 3 was provided by C8, who identified his age in relation to a future social relationship:

Ex: How would you describe yourself?
C8: Me age. I'm older.
Ex: Okay. And why is that important?
C8: 'Cause I be ... In case I get married, I suppose, to my girlfriend.

At Level 4, physical self-statements are understood in terms of their influence on one's personal philosophy, moral standards or lifestyle. Only two participants, one autistic and one non-autistic, each expressed one physical self-statements that was coded at this level:

A12: I'm grown up.
Ex: What do you mean when you say you are grown up?
A12: Um, I think I'm a different person when I am older.
Ex: How will you be different?
A12: Um, I think I'll probably change my attitude a bit when I'm older.
Ex: Attitude to anything in particular?
A12: Um, nothing much.

And for the control group:

Ex: What else are you proud of?
C3: My teeth.
Ex: Why is it important to know about your teeth?
C3: There white when you brushin' your teeth.
Ex: Right. Is it important to brush them.
C3: Its important to look after y' teeth and y' body.
In general, the young people with autism each produced an average of 5.25 physical self-statements, the majority of which were coded at Level 1: the highest number of self-statements fell into this class for the study group. Most of the young people with autism made reference to their distinctive bodily features, their gender and the size of their body. This non-autistic control participants produced an average of 3.90 physical self-statements, the majority of which were coded at Levels 1 and 3. Most of the control participants made reference to their distinctive bodily features and body size. The difference in the mean number of physical self-statements between the two groups was not significant.

The active self

Active self-statements are concerned with activities or abilities. Ten of the twelve autistic participants produced a total of forty active self-statements: twenty-three were coded at Level 1, twelve at Level 2, four at Level 3, and one at Level 4. The self-activities referred to ranged, in order of magnitude, from learning activities (e.g., reading, writing, drawing) (14 chunks), sport activities (10 chunks), general physical activities (e.g., playing, jumping) (8 chunks), work related activities (e.g., cooking, cleaning) (5 chunks), to leisure activities (2 chunks). One young person (A10) said that he would 'kill people' because he was fed-up with the sounds they made. Nine of the ten non-autistic participants produced a total of twenty-two active self-statements: six at Level 1, four at Level 2, ten at Level 3 and two at Level 4. The content of these statements included reference to sport activities (9 chunks), general physical activities (7 chunks), learning activities (6 chunks), and work related activity (1 chunks).

At Level 1 active attributes of self reflect the activities that one performs, or the activities that one is allowed or forbidden to do. The study group participants produced an average of 1.92 such chunks as compared with 0.6 for the control group. The following example was made by a young person with autism (A12), who described a typical activity with no further explication:

Ex: Is there anything else that you are proud of about yourself?
A12: I can draw and that.
Ex: Right. Is it important to be able to draw?
A12: Yeah.
Ex: Why is it important to draw?
A12: I don't know.
The following example of an active self-statement coded at Level 1 was produced by a participant from the control group (C10):

Ex: How would you describe yourself (name)?
C3: I play football every Tuesday.
Ex: Why do you like football?
C3: It good.
Ex: Is it important to play football?
C3: Yeah.
Ex: Why is that (name)?
C3: 'Cause it is (laughs).

Active self-statements coded at Level 2 consider self-activities relative to either other abilities of the self or against the abilities of others. The study group participants produced an average of 1.00 chunks as compared with 0.4 for the control group. The following example from a study group participant (A3).

He referred to his ability to climb like a super-hero:

Ex: What sort of things are you good at?
A3: Climbing.
Ex: Right, you are good at climbing.
Ex: And what sort of things do you do as Spider-man?
A3: Go out and ... go out and go 'Chuuuu', that's how ... that's his web.

The next example of the active self coded at Level 2 was made by a control group participant (C8):

Ex: What kind of person is (name)?
C8: A good footballer.
Ex: Why is that important to know about you?
C8: We play matches in masses of different schools. Sometimes we won some and sometimes we won a lot, lose a lot I mean.
Ex: And when you say good footballer, do you play a particular position?
C8: Mid-field.
Ex: Are you better in mid-field than at other areas on the pitch?
C8: Yeah (nods).
Ex: What makes you good in mid-field?
C8: I can go up sometimes and then go back.

At Level 3 active attributes of self influence one's social appeal, social interactions or group membership. Three young people with autism made a total of four active self-statements that were coded at Level 3. This compared with seven control group participants who made a total of ten such statements. For example, this self-statement was made by a young person with autism (A4):
What would you like to do?
A4: Drive a car.
Ex: And why is it important to drive a car?
A4: Because then you can visit your friends.
Ex: Right.
A4: Russell or Steven. You can visit them.
Ex: Why is it important to visit friends?
A4: If you like them, it's nicer to visit them.

The following example was made by a control group participant (C8):

Ex: What do you like most about yourself (name)?
C8: I'm coming up to be a boxer.
Ex: Why is it important to know that about you?
C8: 'Cause me brother got me into the club.

At Level 4 the active attributes of self influence or reflect one's personal philosophy, moral standard or lifestyle. One young person in the autistic group made an active self-statement that was coded at Level 4, as he believed that jumping about was a bad thing to do, and that by not jumping he would not only be more relaxed but also be a 'normal boy':

Ex: And how will you do that (relaxing)?
A1: By getting rid of it.
Ex: Getting rid of what?
A1: The bad things.
Ex: Okay. And can you tell me a bit more about the bad things?
A1: That I don't jump about.
Ex: Jump about. Is that a bad thing?
A1: Yeah.
Ex: So why don't you jump about now?
A1: 'Cause I'm a normal boy.
Ex: Is it important to be a normal boy?
A1: Yeah.
Ex: Why is it important to be a normal boy?
A1: I'm a normal boy not jump about.

Two of the non-autistic control participants each produced an active self-statement that were coded at Level 4. The following example was made by C1:

Ex: What sort of things are good for you?
C1: Going on bikes, go to the gym.
Ex: Why is that?
C1: Because those are my favourite things I enjoy. They're good for me.
Ex: You enjoy doing them. And is it important to do the things that you enjoy?
C1: Yeah.
Ex: Why is that?
In general, the autistic participants produced an average of 3.33 active self-statements. Approximately two-thirds of these statements were coded at Level 1 and the other third at Level 2. Most of the self-activities referred to learning activities, sport activities and general physical activities. The non-autistic participants produced an average of 2.2 such self-statements. Half of these self-statements were made with an understanding of their interpersonal implications (i.e., Level 3), while the other half were divided between Levels 1 and 2. Most of the active self-statements made by the non-autistic group referred to sport activities, general physical activities and learning activities. The difference in the mean number of active self-statements between the two groups was not significant.

The social self

Social self-statements are concerned with social personality characteristics, social interactions or social relations. Nine young people with autism made a total of seventeen social self-statements: nine were coded at Level 1, three at Level 2 and five at Level 3. The content of these self-statements included eight that were implicitly social (i.e., being human, normal, nice or good), seven that were explicitly social (i.e., being kind, getting on with others, helping others, someone who lives alone and as someone who teases others), and two other social self-statements that referred to needing help from others and being liked by others. The ten non-autistic control participants made a total of fifty-one social self-statements: eleven were coded at Level 1, three at Level 2, thirty at Level 3, and seven at Level 4. Social self-statements that were coded at Level 3 made up the largest class of self-understanding for the control group. In terms of the content, five were implicitly social (i.e., two referred to themselves as being nice and three to being good). The remainder of the self-statements made by the non-autistic control group were explicitly social: twenty-seven were of a general nature (e.g., being helpful, being friendly, being fair, being bullied by others, going to social club and sharing with others), ten referred to having friends and nine to being a member of a family.

At Level 1 social attributes of self reflect one's membership in social groups. The study group participants produced an average of 0.75 such chunks compared with 1.1 by those in the control group.
The over half of the social self-statements made by the autistic group were coded at this level. One young person with autism (A2) made reference to being human:

Ex: What sort of person are you?
A2: Human.
Ex: What do you mean by that?
A2: Doing the job like cleanings, hooverings, sweepings.
Ex: Are they jobs that you can do?
A2: Yeah.
Ex: Is it important to know that you are human?
A2: Yeah.
Ex: Why is that?
A2: Doing the jobs.

The terms human, normal, nice and good are implicitly social. The manner in which these implicitly social terms were used by the young people with autism was, however, more akin to a physical description: most of these statements were expressed in a matter-of-fact manner with no deeper understanding or explication. Twenty percent of the social self-statements made by the non-autistic control group were coded at Level 1. For example, C2 gave the following description:

C2: I've got a girlfriend. Emma. Sometimes we shout at each other, but we don't.
Ex: And is your girlfriend here in the school?
C2: She live in Harlow.
Ex: Why is it important to have a girlfriend?
C2: I like them.
Ex: Apart from liking them, why is it important to have a girlfriend?
C2: I go out with them.
Ex: Why is it important to go out with them?
C2: Girls got boyfriends, in' it?
Ex: Yeah.
C2: And I got girlfriend.
Ex: So it's important to go out, because that's the way it is?
C2: Yeah.

At Level 2 the self's activities or abilities are considered with reference to the reactions of others. Three young people with autism each made one such statement. The following example was made by A4:

Ex: What kind of person is RC?
A4: A good boy.
Ex: A good boy - right. Is it important for me to know that you're a good boy?
A4: Yes.
Ex: Why is that?
A4: Because I like watching children's BBC a lot.
Ex: Right you like watching children's BBC a lot and is that when you are being a good boy?
A4: I watch things on TV - I watch children's ITV or children's BBC.
Ex: Why is it important for me to know that you are a good boy?
A4: Because, er because anybody who is naughty is just going to get angry by everybody.
Three social self-statements coded at Level 2 were made by a single participant from the control group (C8). The following is one such statement:

Ex: Is there anything else you like about yourself?
C8: Helping my brother.
Ex: And why is that important?
C8: Emm, like he's bringing me back from the pub late and have to watch something and can't watch it on mum's television and I let him watch my television.

At Level 3 social attributes of self reflect the self's personality characteristics or group membership that influence the nature of one's social interactions. Three young people with autism made a total of five such self-statements. For example A7 gave the following self-statement:

Ex: What sort of person are you?
C7: I'm autistic.
Ex: What does it mean to be autistic?
C7: Autistic. It means, it means you need help.
Ex: Mm.
C7: You're different to normal people. Normal people are the only ones ... Some people have been trained to know all about it. They can actually help you.
Ex: In what ways do you need help?
C7: With jobs and working.

All of the participants in the non-autistic group made at least one social self-statement that was coded at Level 3. Indeed the highest number of chunks were recorded for this class of self-statement for the control group. The following example was made by C4:

Ex: What sort of person are you?
C4: I ... help juniors.
Ex: Why do you help (name)?
C4: Help with the juniors. When I ... When I ... When I teachers the juniors, that not in here, but old school. I help with the juniors in my old school play the football team.
Ex: Right, so you helped the juniors to play football.
C4: Yeah. Then do it best, they play football. And I be their coach. And when they got a goal like four-nil, then get a cup, I be happy. And my people be happy as well.

At Level 4 social attributes of the self reflect or influence one's personal philosophy, moral standards or lifestyle. There were no such self-statements made by the study group. Four non-autistic control participants produced seven such self-statements. An example was provided by C8:
Ex: Is there anything else about yourself that's important to know?
C8: I'm friendly
Ex: Why is it important to be friendly?
C8: If I didn't have friends I'd feel terrible. Me and Lucy are best friends. We going to get a flat together.

In general the participants with autism made an average of 1.42 social self-statements, the majority of which were coded at Level 1. Approximately half of the social self-statements produced by this group were implied rather than made explicit. Not one young person with autism made reference to friends or being part of a social group. In stark contrast to this pattern, the non-autistic control participants each made an average of 5.10 social self-statements, two-thirds of which were coded at Level 3. This class represented the highest number of self-understanding statements for the control group. The vast majority of the social self-statements explicitly acknowledged others. For example, through being helpful or friendly to others, by referring to friends and family. The autistic group were significantly less likely than the control group to produce social self-statements.

Psychological self
Psychological self-statements are concerned with emotions, thoughts or cognitive processes. Twelve young people with autism made a total of thirty-four psychological self-statements: nineteen were coded at Level 1, fourteen at Level 2, and one at Level 3. Psychological self-statements coded at Level 1 made up the third largest class of self-understanding for the study group. The content of the self-statements could be divided into those that expressed either a preference or an emotional state. The preferences, which could be positive (i.e., 'I like ...') or negative (i.e., 'I don't like ...) were sub-divided into four categories: there were 7 preferences for material items (e.g., food, blue-tac, videos); 10 activity preferences (e.g., swimming, playing games, working); 6 social preferences (i.e., not like someone because of what they did; like playing with others; like myself; not like crowds; not like the way people talk); and 2 psychological preferences (i.e., like to think; like doing sums). In addition five participants from the study group expressed 10 emotional states to define themselves (e.g., happy, excited and upset).

Nine of the ten non-autistic control participants made a total of thirty-two psychological self-statements: six were coded at Level 1, six at Level 2, sixteen at Level 3, and four at Level 4. Psychological self-
statements coded at Level 3 made up the third largest class of self-understanding for the control group. The content of the psychological self-statements was sub-divided as follows: 1 preference for material/physical item (i.e., like own hair); 1 activity preference (i.e., like playing the piano); 6 social preferences (i.e., like girls; dislike boys; like myself; like playing with friends; not like the way self behaves; and like help when reading); and 2 psychological preferences (i.e., like to think; and like to learn). One young person in the control group (C8) mentioned the importance of learning in understanding himself. The majority of psychological self-statements for the non-autistic control group, however, fell into the expressed emotional states: there were 21 such statements (e.g., happy, upset, angry, ashamed and anxious) made by seven non-autistic participants.

Psychological self-statements that are coded at Level 1 include moods and feelings that have significance in and of themselves. The study group produced an average of 1.58 such chunks compared with 0.6 for the control group. Typically, the autistic participants expressed a preference for activities or material items. The following example was made by a young person with autism (A9):

A9: I like videos most of the time.
Ex: Do you have a favourite video?
A9: Wrestling one's usually. mostly.
Ex: Can you tell me a little bit about the wrestling?
A3: I just like them wrestling, that's all.
Ex: And why do you like the wrestling?
A3: I just do. It's my favourite.

The expression of emotional states was less typical for the study group. The following is an example made by one of the autistic participants (A8):

Ex: What sort of person are you, (name)?
A4: It's a happy.
Ex: Is it important to be happy?
A4: Yes it is.
Ex: Why is that?
A4: 'Cause it is.

A young person from the non-autistic group (C4) made the following psychological self-statement that was coded at Level 1:

Ex: How would you describe yourself?
C3: He happy.
Ex: Right, you're happy. Is it important to know that about you (name)?
At Level 2, the psychological self-statements reflect one's cognitive capabilities, acquired knowledge or activity related emotional states. The autistic group produced an average of 1.17 such self-statements compared with 0.6 by the control group. In the first of the following two examples, the young person with autism identified herself as excited because of Christmas, and in the second, the young person mentioned his preference for reading to read:

Ex: Is there anything else about you?
A8: I'm excited.
Ex: Tell me about that.
A8: It's about Christmas.
Ex: Oh, I get excited about Christmas as well.
A8: Yes I do.
Ex: What sort of things are you looking forward to?
A8: Christmas dinner. Christmas tea.
Ex: Anything else?
A8: And the presents.
Ex: What sort of presents will you get?
A8: By Father Christmas.

Ex: And do you like anything else about yourself?
A10: I like reading to myself as well.
Ex: Are you a good reader?
A10: Yes I am.
Ex: Is it important to be a good reader (name)?
A10: Yes it is.
Ex: Why's that.
A10: 'Cause you have to learn to read.
Ex: Right.
A10: That is truly right.
Ex: So you've learned to read and you say that you enjoy reading. Why is it important to learn?
A10: 'Cause it is, 'cause you have to learn.

A control group participant produced the following psychological self-statements, coded at Level 2 that expressed his capacity to learn:

Ex: What ways do you change from year to year?
C8: When you go to a different class you learn more skilled and different class.
Ex: You learn more?
C8: Yeah.
Ex: And why is that important?
C8: Important to come up to leaving age and you start doing more. And you have to start doing BTEC and art work. Properly things.
Ex: And why is it important to do more as you come up to leaving age?
When you grow up and leave school, people ask you what your work is and you explain it straight away.

Psychological self-statements at Level 3 reflect or influence a person's social interactions. One young person with autism produced one self-statement that was coded at this level. He described becoming angry with two peers who had an irritating habit. He did not want others to think that he was the same as them:

Ex: How else would you describe yourself?
A7: Yes. Describe myself. Sometimes when I get - sometimes I do get wound up - that's hard.
Ex: Right.
A7: Sometimes I can control it. I'm getting good at controlling it now.
Ex: Right. Is it important to control it?
A7: It is.
Ex: Why is that?
A7: It is. It's very important to control it. I mean you're actually really cross.
Ex: And what sort of things make you feel cross?
A7: It's when I am - do you mind if I actually tell you?
Ex: No, if you don't mind telling me, I'd love you to tell me.
A7: It's about another person if that's OK.
Ex: That's OK.
A7: Sometimes Stuart and Darren when they make that kissing noise - I guess they can't help it.
Ex: Ah right.
A7: I get a bit wound up sometimes.
Ex: So how does it make you feel when they do that kissing noise?
A7: Embarrassed, because other people will see them do that and they will think I am the same as what they are.

The control group participants produced an average of 1.6 such self-statements. The following example was made by C9:

Ex: Are there things about yourself that you don't like?
C9: People winding me up all the time.
Ex: Right. And why does that happen?
C9: I don't know why. They just get at me and I fall into their trap and get really wound up. I got a viscous temper on me.
Ex: So having a temper on you: Is that something you're not proud of?
C9: Yeah.
Ex: So how do you control that?
C9: I'm not sure. The only one who can calm me down is my brother. If I really lose my temper he's the only one who can calm me down.
Ex: Right. So do people here wind you up as well when your brother is not around?
C9: Mmm.
Ex: So how do you manage to control yourself or calm yourself down when your brother isn't around?
C9: I just calm myself down. Do what he tells me.
Ex: What sort of things do they do to wind you up?
C9: Curse my mum, tell me my family is dead, tell me that my brother is gay or something.
Ex: Why do people say these things?
C9: I don't know.
At Level 4, psychological self-statements reflect one's personal philosophy, moral standards or lifestyle. There were no incidents of a psychological self-statement coded at Level 4 for the autistic group. Two non-autistic participants made four psychological self-statements that were coded at Level 4. In the following example, C2 defined himself in terms of his personal philosophy:

Ex: You mentioned that you'd get more sensible. Why is it important to be more sensible?
C2: Y' know like.. you be silly when you go to work.. like you be muckin' around.. 'tend there's in good work, yeah, very. Ad y' dealin' with glass.. and glass.. and y' workin' with glass and y' makin' the glass. Like, you be silly, yeah? Like you be silly and put your hands ... got the.... put your hands on the.. emm.. put, like it's a hot thing... it's a hot like hot steam engine.. then you put the glass in there then it comes out then you put the iron in.. then that'll be emm... that'll be emm.. being silly. And then y' probably gets uptight and 'phone the police. And people thinks.. other people thinks y' being stupid. Then.. then when y' like ehh.. wife hears about it, the wife might run away from the house and like y' got no house to.. ain't got no girls to live in, then you'll be eh.. all on y' own.

In general the autistic group participants produced an average of 2.92 psychological self-statements each which were coded at Levels 1 and 2. For the autistic group, psychological self-statements coded at Level 1 made up the third largest class of self-understanding. Over 70 percent of these statements were to do with activity, material, social and, to a lesser extent, psychological preferences. The remainder of the psychological self-statements made by the autistic group defined their emotional states. The non-autistic control participants produced an average of 3.2 psychological self-statements, the majority of which were coded at Level 3. Psychological self-statements coded at Level 3 made up the third largest class of self-understanding for the control group. Sixty-five percent of these self-statements referred to an emotional state, and the remaining preference statements were mostly to do with social preferences. The difference in the mean number of psychological self-statements between the two groups was not significant.

A post hoc examination of the correlation among verbal mental age and verbal IQ and the production of those self-statements considered more abstract (including those defining social and psychological characteristics, and those coded at Levels 3 and 4) was undertaken by calculating Spearman Rank Correlation Coefficients. As it was expected that these dependent variables would be associated with mental ability, one-tail tests of significance were conducted. The coefficients are shown in Table 3.5.
Table 3.5 Self-as-object: Spearman Rank Correlation Coefficients for performance with verbal mental age and verbal IQ

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For the autistic group verbal ability, and in particular verbal mental age, was positively correlated with the number of psychological self-statements made. The number of social self-statements nor those statements coded at Level 3 and 4 were not found to correlate with verbal ability. For the non-autistic group too the number of social self-statements did not correlate with verbal ability. The psychological self-statements were, however, negatively correlated with verbal IQ. A negative correlation was also found between verbal ability, in particular verbal mental age, and the production of self-statements coded at Level 4. Thus the lower functioning control group participants made more psychological and Level 4 coded self-statements than did the higher functioning subjects. Finally, a positive correlation was found between verbal ability, and in particular verbal mental age and Level 3 coded self-statements for the non-autistic control group.

**Summary of results: Self-as-object**

A quantitative analysis of the pattern of self-as-object statements between the two clinical groups revealed a comparable mean number of physical, active and even psychological descriptions. The autistic group, however, provided significantly fewer social self-statements than did the control group. In addition, the young people with autism were significantly more likely than the control group to produce self-statements that were coded at Level 1, and significantly less likely to produce Level 3 explications.
Although the content of the physical and active descriptions were broadly similar for the two groups, a qualitative difference was uncovered in the content of the social and psychological self-statements. Approximately one-half of the social self-statements produced by the autistic group were judged as implying social awareness (e.g., by referring to themselves as 'good' or 'nice'). Though the other half of such statements demonstrated explicit awareness of self in relation to others, not one social self-statement referred to friends or being a member of a social group. In contrast to this, the majority of the social statements made by the non-autistic control group explicitly acknowledged others in the definition of self. A large proportion of these statements made reference to friends.

The psychological self-statements made by the autistic group were predominantly classed as expressions of preference to 'do' or 'possess' things, with only one-third of statements referring to emotional states. The majority of the control group's psychological self-statements referred to emotional states. Further, those preference statements recorded made reference to social likes or dislikes (e.g., 'I like being with friends'). Verbal ability was found to be positively correlated with the number of psychological self-statements made by the autistic group, and negatively associated with the number of psychological and Level 4 self-statements by the control group. Level 3 coded statements for the control group was found to be positively correlated with verbal ability.

The pattern of results from the participants with autism, according to which they have a steady decrease in the prevalence of chunks from the different categories, diverges from that which one would expect from typically developing younger children, insofar as the 'social' category is little used, not only in relation to the physical and active categories but also in relation to the psychological category. This is not the pattern as reported for typically developing youngsters. The declining scores on each successively higher level might be more in accord with the picture in typically developing young children, but here the current control group do provide a contrasting pattern.
3.7 Summary of findings and discussion

In the self-as-subject scheme, the autistic group and the non-autistic control group both gave a similar profile of responses in the number of statements expressing agency, continuity and distinctness. The proportion of agency statements produced and their content was similar between the two groups, although a third of these self-statements made by the control group were understood in terms of their interpersonal implications. The autistic group, by contrast, did not produce any self-agency statements that were coded at Level 3. The proportion of self-continuity statements produced by the two groups and their levels of explication was also similar, although in terms of the content the autistic group tended to produce continuity statements that reflected themselves in the past, while the control group produced statements reflecting themselves in the future. The proportion of self-distinctness statements produced by the two groups was also similar. The expression of self-as-subject statements was not correlated with verbal mental age or verbal IQ.

In the self-as-object scheme, autistic and matched non-autistic control groups produced a comparable number of physical, active and psychological descriptions. The autistic group, however, provided significantly fewer social self-statements than did the control group. Further, the autistic group produced significantly more self-statements that were coded at Level 1, and significantly fewer at Level 3 than did the control group.

The content of the physical and active self-statements were broadly similar for the two groups. That of the social and psychological self-statements were qualitatively different: half of the social self-statements produced by the autistic group implied social awareness. The other half of these statements made explicit their awareness of self in relation to others, but were devoid of reference to friends or group membership. The majority of the social statements made by the control group explicitly acknowledged others in their definition of themselves with a large proportion of these making reference to friends. Most of the psychological self-statements made by the autistic group were predominantly classed as
expressions of material/physical and activity preferences. Only one-third of these statements referred to emotional states. In contrast to this the majority of the control group’s psychological self-statements referred to emotional states, with those preference statements made referring to social likes or dislikes. Verbal ability was found to be positively and significantly correlated with the number of psychological self-statements made by the autistic group. These same category of self-statements were found to be negatively and significantly associated with verbal ability in the control group. Also the number of Level 4 self-statements made by this group were negatively correlated with verbal ability. Level 3 coded statements for the control group was found to be positively correlated with verbal ability.

It is curious that taken individually, the negative correlation between verbal IQ and the use of psychological categories should be significant for the non-autistic participants. The content of the psychological self-statements for the control group was predominantly to do with emotional states, while for the autistic group it was generally to do with preferences. It seems likely that, because the psychological category was mainly occupied by the most ‘basic’ desire and emotion terms, such terms are more common in those who are able to use self-reflective terms at all, and who adhered to a form of communication in which unsophisticated (but nevertheless psychological) expressions convey something of their state. It is not clear, however, why such communication should be less frequent in those of higher verbal IQ, except that they become more sophisticated in their general talk about themselves.

These results indicate that young people with autism are less likely than non-autistic matched controls to view themselves in the context of their relationships and interactions with others, and is suggestive of a specific impairment in the interpersonal self of young people with autism. This is especially interesting, in view of the emphasis which theories of self-development have given to a person’s evaluations of self both through and in relation to other people.

It is of note that although young people with autism were comparable to control participants in tending to describe themselves in physical and active terms they did also refer to psychological self-statements in the form of simple emotions and preferences. This study serves to illustrate how with relatively able and verbally articulate autistic individuals, it may be appropriate to consider not only limitations in
'emotional' or 'theory of mind' concepts, but also and more specifically their restricted ways of thinking in the social-relational dimension.

In general the results from this study are in keeping with findings of Mavropoulou (1995). In particular, Mavropoulou found that most of her children with 'autistic tendencies' produced self-statements that demonstrated an understanding of their agency, continuity and distinctness. Further, these self-statements were generally coded at Level 1. The present study broadly supports this finding, although the proportion of self-statement arising in the different self-as-subject categories do appear different in the two studies: Mavropoulou's study group produced a greater proportion of agency and distinctness self-statements than did the autistic group in the current study. In terms of the self-as-object statements both studies found a remarkably similar pattern of difference between the study and control groups: Mavropoulou reported broadly similar proportions of physical, active and psychological descriptors for her two clinical groups. The major difference appeared to be in the number of social self-statements, with her study group producing fewer of these statements relative to her control group. This pattern was also observed in the current study. The majority of Mavropoulou's study group produced self-statements that were coded at Level 1, while her control group's self-statements were coded mostly at Level 1 and some at Level 3. Most notable is the high proportion of social self-statements produced by the control participants that were coded at Level 3. This pattern was broadly similar to that found in the present study.

It remains to consider whether the results might reflect a general developmental delay in the autistic vis-à-vis non-autistic participants. For example, as detailed in the Introduction to this chapter, relatively high proportions of physical and active self-statements, and relatively few 'social' self-statements have been reported for young normally developing children (Guardo and Bohan, 1971; Keller, Ford and Meacham, 1978). It is difficult to exclude this possibility, although the similarity between the groups on measures of verbal ability would suggest that such delay might be specific to development in self-understanding. Given that the two groups produced similar numbers of self-statements, and that they had similar abilities in the comprehension and production of language as estimated by the British Picture Vocabulary Scale and from their mean length of utterance, it is unlikely that group differences
could be accounted for by general cognitive-linguistic discrepancies between the groups. Having said this, it is possible that a 'general' lack of productiveness in language might have contributed to autistic participants' brevity of response to questions. This matter could be addressed in future studies, by including control questions, not related to self-description, which would reveal whether or not autistic participants give brief responses when discussing matters in general. Such control questions would also establish whether there are differences in memory and motivation (as discussed earlier) which might contribute to the interview responses of autistic and control subjects.

A matter of both theoretical and methodological importance is that the concept of self is only one of many concepts that may be difficult for persons with autism to grasp. For example, Hobson (1993) has discussed how the concept of anything is established through social processes of agreement alongside an individual's own constructive understanding, and this implies that a child needs to have some awareness of what it is to be corrected if he or she is to acquire concepts. Moreover, the person with autism has a different pattern of relatedness both to the personal and non-personal world, and this means that he or she will lack experiences that are necessary foundations for concepts such as those to do with mental life, and probably many others.

From a methodological perspective, it would require a detailed examination of a number of concepts, perhaps especially abstract concepts, before one could claim that concepts of self were the only ones that were abnormal. Having said this, the focus of the present study is on the ways in which the autistic person's concept of self contrasts with that of non-autistic people. The concept of self has by its nature important social and psychological components, and so it is an especially interesting concept to examine from these perspectives. On the other hand, it would be expected that other concepts with social and psychological aspects would also be abnormal in persons with autism - as has been demonstrated in the 'theory of mind' domain, for example. The point is that the present study is intended to map those specific respects in which the concept of self is different in persons with autism. Providing that the results reveal a qualitative difference in this respect, it will remain for future studies to examine how far this kind of difference is limited to self-concepts or has more general implications for concept development.
In summary, this detailed study of autistic and matched non-autistic participants has yielded evidence that autistic individuals differ from those without autism in focusing less on social self-characteristics, and in understanding themselves without reference to their interactions with others. In the next chapter the depiction of the self in young people with autism through their human figure drawings will be considered.
CHAPTER FOUR: Self-depiction in human figure drawing
4.1 Introduction

Several mediating factors come to play in the child's production of the human figure drawing. Prominent among these are her/his capacity to hold mental representations and the nature of the representations held. The relatively 'standard' emergence of the former is the justification for using the human figure drawing as an index of cognitive development. The latter is a function of maturation and personal experience, and the justification for the use of the human figure drawing as a projective measure. The human figure drawing may be particularly revealing when the child comes to represent her/himself.

Clinically the human figure drawings of children have been used to assess aspects of their personality. This clinical method assumes that young children unwittingly project emotional aspects of themselves into the fabric of their drawing (e.g., Koppitz, 1968; 1984; Machover, 1949), and that disturbance can be identified from the assessment of emotional indicators within the human figure drawing. Studies that have been designed to examine the reliability of these assumptions have generally failed to support specific correspondence between a given feature and an emotional state per se, although good reliability has been found between global impressions of the human figure drawing and the child's adjustment (e.g., Roback, 1968).

More typically children's human figure drawings have been used as an index of cognitive development. For example, as a measure of intellectual functioning (Goodenough, 1926) or as clues to general constraints on internal representational change and flexibility (Karmiloff-Smith, 1990). The use of human figure drawings as measures of cognitive development will be considered later in this introduction. To begin with, however, the progress toward representational drawing in normally developing children will be outlined, with particular reference to human figure drawing. Such a description allows for an evaluation of the 'pathological case' in terms of whether such children's drawings are developmentally delayed or deviant. Following these sections, the drawings of children
with mental retardation and of children with autism will be considered with the specific emphasis of examining the emergence of representation in these two populations.

The conceptual framework underlying the present study is derived from Hobson’s social-affective theory of autism, which was detailed in Chapter Two. In essence, it is taken that young people with autism lack the ability to effect intersubjective co-ordination with other people and are thus less able than non-autistic individuals to respond to, understand and integrate others into their representation of the world. The implications of this are that the awareness and understanding of the self, which is defined principally in relation to others, is correspondingly limited in people with autism. This study was designed to explore whether or not this limitation would be evidenced in the differentiation shown between self and others in the human figure drawings of young people with autism. Two studies were completed to examine this thesis. To begin with a group of young people with autism and their individually matched non-autistic controls completed two standard isographic tasks, a drawing of a house, and three human figure drawings: a woman, a man, and a drawing of the self. Comparisons of the self and same-sex, and the female and male figures were made to examine the capacity to draw distinct classes of human figure in terms of their form (i.e., how the features used to construct the human figures were differentially represented) and style (i.e., the manner in which the figures were differentially drawn). A second study was designed to examine the specificity of the findings by including a control task that required the participants to depict three items from a class of non-human object (i.e., buildings). A different sample of young people with autism and their matched controls completed the original battery of drawings as well as three types of building which could be compared with the human figure drawings.

4.2 The emergence of representation in children's drawings: the normal case

Luquet (1927) set out three main stages of development in children's drawings. Broadly, these three stages signal three separate representational periods; (a) the pre-schematic stage (from 20 to 36 months)
covers the child's earliest scribbles and gradual attempts to draw forms that represent some object; (b) the schematic stage (from 3 to 8 years), in which the child draws 'what he knows rather than what he sees'; and (c) the increasingly naturalistic stage (from 8 years onward), where the child draws relatively true-to-life representations of visual scenes from one fixed viewpoint.

The pre-schematic stage

Most children start scribbling between the ages of 12 and 18 months. Such early drawings may take the form of either (a) whirls, loops and circles or (b) multiple, densely patterned parallel lines (Golomb, 1981). The child seems unconcerned to preserve her/his scribbles and frequently obliterate earlier marks with further scribbles. It has been concluded from this that scribbles in themselves are not representational. This view, however, emphasises the final product rather than the process itself. Cox (1993) points out that children of 18 months of age are routinely engaged in representational or symbolic behaviour through language and play and that it would be extraordinary to find no representation in their drawing activities. She observed that at 18 months of age children may interpret their accidental marks as representing some object (for example, a round scribble may be referred to by the child as a balloon). By 20 months of age they consistently make deliberate marks to 'stand for' given objects. The child's 'scribbles' can be named just before or just after they are drawn, but they bear little if any resemblance to the real object and generally cannot be later identified by the drawer (Cox, 1992). The temporal difference between the ability to hold a mental representation (as evidenced in the child's language and play) and the capacity to depict the abstraction on paper, demarcates a lag between the former cognitive capacity and the ability to achieve the fine eye-motor co-ordination which is necessary to construct a drawing (Cox, 1993). Thus it is during this stage, Cox suggests, that children learn to co-ordinate fine hand and eye movements.

The coming together of the capacity to represent, the concern to achieve a visual resemblance between the drawing and what it stands for, and the improved eye-hand co-ordination brings the child into the schematic stage.
The schematic stage

The first truly representational drawings are fairly minimal, depicting only a few features necessary for suggesting an object. The child at this stage, however, still has a limited repertoire of drawing skills. For the most part the skill comprises the drawing of lines and circular forms. There are several demands placed upon a child who sets out to represent an object in a drawing: she/he must recall the different components that make up the object; must know how they are drawn; must co-ordinate them in the correct spatial arrangement on the page; and must depict an object that is three-dimensional.

At this stage the child's drawings are viewed as more 'symbolic' than naturalistic: they represent prototypes, or schemes, rather than actual objects. The child draws what she/he knows rather than what she/he sees. This is most evident in the child's drawings of the human figure. To begin with the human figure is drawn as a circular form to which is fastened one or two long lines representing the legs, making the figure look like a tadpole (see Figure 4.1).

![Figure 4.1 Example of a 'tadpole' figure: Self-figure drawn by Tom at 3 years 9 months of age]
Sometimes two horizontal lines are added as arms to the circle or to the vertical lines. Generally the arms are omitted in the beginning, and the child is more likely to add details to the head, although the details may not always be correctly placed within or around the head.

Generally by 5 years of age the child has found a certain mode of representation of a person, where the major body parts are all included: the trunk is distinguishable from the head; body parts such as hands and feet are included; and the figure generally contains more detail (see Figure 4.2).

![Figure 4.2 An example of a self-figure drawn by Sinéad at 4 years 7 months of age](image)

In these drawings each of the body parts has its own line or boundary. Though more realistic than the tadpole figure, the human figure here is still a symbolic expression, a writing down of the conceived characteristics of the person.

By about six years of age most children have replaced the single lines used to represent the arms and the legs with a 'bound' region - a pair of lines closed at each end (see Figure 4.3). There is also a move
towards shared boundaries. Each feature is given its own space and other items generally do not cross these boundaries.

By eight years of age more attention is paid by the child to the shape of the trunk, and shoulders tend to be introduced. Often the neck and shoulders are joined together, forming a continuous outline with the arms opening out into the body segment. At this time also the drawing of the figure in profile may be evidenced.

![Figure 4.3 An example of a 'parachuting' human-figure drawn by Sinéad at 5 years 8 months of age](image)

The naturalistic stage

From eight years of age onwards, the schematic forms gradually disappear, and the child's drawing changes little by little through the addition of more life-like forms and proportions (see Figure 4.4). The child becomes increasingly concerned with not only the writing down of conceptual content, but also the characterisation of the formal relationships by integrating the various parts. The contours of human figure are generally sketched. The shift from depicting bounded regions to contour sketching is an
intellectual as well as artistic shift. During this stage the child's ability to observe improves greatly. The earlier tendency to change size and form of important body parts gradually disappears and is replaced by an abundance of small details. The child shows increasing interest in the portrayal of sexual characteristics, and in the characterisation of specific kinds of person (policeman, sailor, princess) through the use of typical details, and begins to represent activity in the human figure drawings as, for example, in depicting the figure walking or playing. Löwenfeld (1957) observed that for some children the attention to detail detracts from the whole figure, which may lose 'life' and make a somewhat rigid impression on the observer. Profile drawings become increasingly common. The representation of three-dimension is one of the last things to be mastered, and it is a stage not reached by all children.

At puberty the child loses spontaneity as the observing and reflective attitude that is developed towards the environment is turned inward. The young person no longer enjoys the working process, but the result of the work becomes more important. Indeed many young people develop such a degree of self-criticism that their drawing activity stops completely.
Although the sequence of the stages outlined above appears to be fixed, the rate of progression through them does vary, and the point at which the development stops is dependent on individual factors. An important variable affecting the development of children's drawings is their cognitive development. In the following section, the attempts to use this fixed sequence to construct a measure of intellectual functioning will be considered, and will include a select review on the drawing development of young people with mental retardation. This will be followed by more recent work that has used the drawings of children to evidence change in their internal representational ability.

4.3 The human figure drawing as an index of cognitive development

In general it is found that the number of features drawn to represent the human figure in normally developing children increases from their first representational attempts to puberty. On these grounds, and the fact that the concept of a person was thought to be universal with minimum variation from culture to culture, Florence Goodenough (1926) devised the Draw-a-Man test to measure intellectual functioning. Three prime aspects of the drawings were considered in her evaluation: the number of details; the correct proportion between various parts of the body; and motor co-ordination. The latter was defined as the fluency of lines and the integration of the various parts. For an item to be included in the evaluation, it had to appear more frequently with increasing age, and differentiate between children of the same age who were either slow or quick learners.

In the 1920's, the idea of a 'general intelligence' was dominant. Drawing tests were believed to reflect this g-factor, which itself was thought to be relatively unaffected by cultural or social factors. In this context Goodenough assumed that aspects of drawing performance correlated with the child's mental age, and thus could be used as a measure of intelligence. By the 1960's, however, the notion of general intelligence was partly replaced by one of specific abilities, themselves strongly influenced by socio-cultural factors. At this time Harris (1963) undertook to revise and develop the Draw-a-Man test as a measure of conceptual maturity (i.e., to measure the ability to form increasingly abstract concepts). He
included several more items than earlier defined by Goodenough. Harris observed that girls' drawing ability tended to be more advanced than that of boys, and so modified the procedure to include the Draw-a-Woman test: the child would draw both the figure of a woman and of a man, and the average score taken. Two sets of norms, one for girls and the other for boys, was established. The drawing test was considered to tap the child's actual rather than potential level of cognitive maturity.

The use of drawings to assess a child's intellectual ability presents a number of difficulties. The two forms of the test have been compared by Vane (1967) using the Binet scales and by Pikulski (1972) using the Wechsler Intelligence Scales for Children. Both studies reported that the Harris form provided measures of intelligence that were generally lower than that obtained through the standard methods. Vane suggested that Harris may have obtained his norms from a sample with a higher intellectual level. If this is the case the normative differences between Goodenough's and Harris' versions of the test may reflect differences in sampling rather than actual changes in drawing performance over time. The use of drawings to assess cognitive ability is, these days, generally included within a battery of other tests. For example, McCarthy (1972) has included a broad array of tests, along with normative data, that tap various skills and abilities, including drawing. In particular, the scales include a task to draw a human figure (Draw-a-Child task) and another to copy a number of increasingly complex geometric designs (Draw-a-Design task). The Goodenough-Harris and McCarthy Draw-a-Child scoring systems have been shown to provide standard scores that are highly significantly correlated ($r = +0.89$), and both have been shown to be correlated significantly with the WISC-R Full Scale standard score (i.e., Goodenough-Harris, $r = +0.73$; McCarthy, $r = +0.68$) (Naglieri and Maxwell, 1981).

More recently Karmiloff-Smith (1990) used children's drawings to analyse internal representational change and flexibility. Her thesis opens with the question: How is knowledge acquired? In addition to that which is innately specified and that which comes about as a result of interaction with the social and physical environments, Karmiloff-Smith suggests that knowledge may also be gained from exploiting knowledge already represented by re-representing it at different levels of abstraction. She also argues that such representational redescription may account for representational flexibility and creativity. Children's drawings have been used to exemplify this process.
... over time in early childhood, children spontaneously build procedures for drawing a house, a man, an animal. This often involves a laborious developmental process, but by around 4-5 years of age children can run these procedures efficiently and in an automatized fashion. When children are asked to draw a house, for example, they do so rapidly and well. When they are asked to draw a house that does not exist, they are forced into operating in some way on their internal representation. As long as one focuses on subjects who have no difficulty in the actual planning and execution of the drawing itself, then an analysis of the types of modification that children produce will allow the researcher to capture essential facets of the constraints on representational change (Karmiloff-Smith, 1990; p. 61).

Karmiloff-Smith tested twenty-two 4-6 year olds and thirty-two 8-10 year olds. They had all achieved behavioural mastery for the drawing of a man, house and animal. They were subsequently asked to draw a man / house / animal that did not exist. Apart from two children in the younger group, all participants were able to produce non-existent subjects in their drawings. These drawings were then analysed for the different types of modification introduced. The vast majority of the younger group altered their drawings by changing the shape and size of features, changing the shape of the whole figure, and omitting features. In contrast to this, the older group, while showing the types of alteration described for the younger group, also introduced new features, altered the position or orientation of the figure, and included elements from other conceptual categories (e.g., drawing legs on a house).

This pattern of difference was taken as evidence for the notion that at a first level of redescription the internal representation of the knowledge is specified as a sequentially fixed list, embodying the sequential constraints inherent at the procedural level (p. 73).

At later levels of redescription the ... internal representation becomes specified as a structured, yet ordered set of manipulable core features (p. 76-77).

Knowledge embedded in procedures like, for example, drawing has to be redescribed and represented explicitly in central processing to become available in cross-domain relationships. They then form part of the basis for normal children's spontaneous theory building about their physical and social environments.

... development involves representational redescription, a process that increases the flexibility and manipulability of the knowledge stored in the mind, by turning information that is in the mind into progressively more explicit knowledge to the mind (Karmiloff-Smith, 1994; p 698).

If human figure drawings reflect the capacity for concept formation, then it is reasonable to assume that children with mental retardation will produce drawings that are developmentally depressed relative to
same aged, normally developing children. In the following section two important studies which have been designed to consider the drawing ability in young people with mental retardation will be reported.

### 4.4 The drawing development of young people with mental retardation

At the beginning of this century, there were two schools of thought about the drawings of children with mental retardation. On the one hand it was believed that these children's drawings were deviant, fundamentally different to those of normally developing children. A heavy emphasis was placed on the deficiency in detail, lack of organisation, faulty proportions and the inclusion of bizarre or irrelevant detail (e.g., Burt, 1921; Earl, 1933). On the other hand, Rouma (1913: reported in Mortensen, 1984) claimed that children with mental retardation produced drawings essentially similar to younger age normally developing children. Thus this view stressed delay rather than deviance. In an attempt to resolve this issue, Golomb and Barr-Grossman (1977) considered the drawings of children with non-specific learning difficulties who ranged from 4½ to 13 years of age, and in full scale IQ from 40 to 76 points. The drawings of these children were compared to mental age matched, normally developing children. They found that the structures of the figures drawn by the two groups were similar, the only difference being that learning disabled children with mental ages of 4 and 5 years tended to draw more details than did the normal group of that chronological age. The investigators found no statistical difference between the two groups in terms of the organisation of the drawings, the proportion of the drawings, or in the addition of bizarre details.

This conclusion was backed up by Cox and Howarth (1989). They considered the drawings of 15 children with severe learning difficulties (SLD) who ranged from 6 to 11 years of age, and in verbal mental ability from 3 to 5 years of age. The drawings of this sample were compared with two normally developing control groups, one matched for chronological age and the other for verbal mental age. It was predicted that the spontaneous human figure drawings and the cued productions of the SLD children would exhibit a developmental delay (i.e., be more like those of younger children with similar
verbal mental age) responding in an immature but not abnormal way. All participants completed the Draw-a-Man task, the body-proportion task, and a copying-lines control task. The body-proportion task (Freeman, 1975) comprises a series of five human figures with no arms. Each figure has a circular head with features attached to a plain circular body. The head-to-body ratio of the figures vary. Freeman found that tadpole drawers tended to place the arms on the largest circle, irrespective of whether it represented the head or the body. Cox and Howarth asked each subject to show them their own arms and then to draw the arms on the incomplete figures. As a control task, children were asked to copy four randomly presented lines: a vertical, a horizontal, a right 45 degree oblique, and a left 45 degree oblique.

Two independent judges classified the human figure drawings into one of five categories: (a) scribble; (b) scribble but distinct form; (c) tadpole; (d) transitional; and (e) conventional. The primary aged children responded as expected for their chronological and mental ages, all drawing conventional human figures. This pattern differed significantly from that of the other two groups, both of which showed a greater range of responses. The majority of the SLD and nursery groups drew tadpole figures. The SLD group, however, were more inclined to draw 'tadpole' and 'scribble but distinct form' figures while the nursery group were more inclined to draw 'tadpole', 'transitional' and 'conventional' figures, though this group difference did not reach statistical significance. The investigators concluded that SLD subjects demonstrated a developmental delay rather than a specific abnormality, though they did draw attention to the fact that the SLD group appeared to lag behind the nursery group. All of the primary group placed the arms on the trunk when completing the body-proportion task. Both the SLD and the nursery groups tended to place the arms on the head as the head/body ratio increased. This effect appeared more marked for the SLD group. This discrepancy was not explored statistically. For the copying-line task the correctness of the lines was decided upon by two independent judges. All of the primary group subjects were judged to be correct on all four lines. Their performance was significantly different to that of both the SLD and verbal mental age matched nursery groups, who did not differ significantly in their pattern of responding, though the SLD group showed more of a 'verticalization' effect than the nursery group. Cox and Howarth concluded that:

... in responding in a similar way as children matched to their mental rather than chronological age, SLD children demonstrate a developmental delay rather than a specific abnormality (p. 338).
The non-significant differences between the SLD and nursery groups were attributed to the fact that the SLD group's mental age was on average eleven months younger than that of the nursery group.

### 4.5 The drawing development of young people with autism

Several detailed descriptions of single case studies have suggested that certain people with autism have an unusual drawing ability that is out of keeping with their general intelligence (e.g., Sacks, 1985; Selfe, 1977, 1983; Wiltshire, 1991). Selfe (1983) constructed a detailed psychological profile of six young people with autism who were identified as having exceptional drawing ability. At the time of the investigation the individuals ranged from 10 to 26 years of age, and all were severely learning disabled. Selfe traced the development of graphic representational ability using a parent questionnaire which was designed to explore drawing behaviour and drawing development. The findings were supplemented with examples from the collections of each person's early and current drawings. By way of comparison, the investigator gave the drawing development questionnaire to the parents of eight normally developing children (no demographic details were provided).

Selfe found that the young people with autism all began to draw much later than did the normally developing group. This was accounted for by the fact that none of the six children with autism scribbled: at their first attempt all produced a recognisable object! (This observation brings into question the suggestion made by Cox (1993) that it is during the scribbling stage that children learn to co-ordinate fine hand and eye movements). The earliest representations made by the young people with autism covered a wide range of unconventional subjects: churches, yachts, windows, horses, flowers and cars, with only two of the children including human figures among their first subjects. By contrast all of the normally developing children in the control sample spontaneously drew human figures as well as houses as their first subjects. Of these earliest representations, the children with autism were not concerned to name or describe their drawings, and they did not seek approval for producing them. For all of the
normally developing children the communication with others and seeking approval went 'hand-in-hand' with the drawing activity itself. Later representations in the drawings of the children with autism remained unconventional and unusual, and were often the subject of obsessional interest to the individual. Further the children with autism did not copy their drawings, but drew them entirely from memory. All parents of the children with autism believed that their children demonstrated an early understanding of drawing perspective and proportion, which is in direct contrast to the parents of the normally developing children. Finally, the normally developing children were all prepared to distort the outline of their figure in order that it fit onto the page. Not one of the children with autism, however, would sacrifice realism to completeness. All of the parents of the children with autism believed that their children had a good idea of the finished drawing in advance.

The detailed and interesting data collected by Selfe relied in the most part upon the recall of parents. Such retrospective data is subject to heavy bias. Furthermore, it is not possible to know from this study whether the pattern of development charted by Selfe is specific to young people with autism or partly attributable to the fact that they were learning disabled and/or to some uncontrolled factor associated with their exceptional drawing ability. More recently a number of tightly controlled studies have been conducted to explore directly the drawings of children with exceptional drawing ability.

Hermelin and O'Connor (1990) compared accuracy and artistic merit in the drawings of eight idiot-savants (four of whom were autistic) with that of eight artistically able normally developing children. Their study group had a mean age of 25½ years (SD 6 months), a mean non-verbal IQ of 72 points, and a mean verbal IQ of 67 points. The control group had a mean age of just under 14 years (SD 2 months), and were judged to be of average intelligence. Both groups were equally proficient on the Goodenough-Harris Draw-a-Man test for drawing talent. Each participant was asked to make four drawings of a three-dimensional scene. The scene comprised four figures in a fixed position: a cow eating grass, a fir tree, a woman standing holding a tray, and a man riding a horse. The first drawing was made from memory after a 20 second exposure. The second was made with the scene in front of the participant, who was asked to draw the scene as they imagined it to look from the side (i.e., from the experimenter's perspective who was sitting at an angle of 90 degrees to the participant). For the third drawing, the
scene was left in front of the participant and she/he was asked to draw the scene as seen. Finally the investigators asked the participants to copy a photograph of the model that itself remained in view for the duration of the drawing. The accuracy of each of the four figures was measured in terms of their location relative to the other figures, their orientation, and their degree of detail. Artistic merit of each drawing was judged on a 15-point scale by five people experienced in judging and assessing drawings.

The investigators found that on all dimensions scored for accuracy, the normal children were more adept than the idiot-savants. In contrast, however, regardless of the type of drawing condition, the ratings for artistic merit were equal for the two groups. Hermelin and O'Connor concluded that while the accuracy of drawings may be related to intelligence, the artistic quality of the graphic production is not. Their finding gives weight to the clinical impression that aspects of drawing ability may be out of keeping with intellectual functioning. The participants in this and the Selfe study were specifically selected for their outstanding drawing ability. What of those young people with autism whose ability to draw is not outstanding?

There has been little systematic research to explore whether, in general, the drawings of children with autism are in some way or ways remarkable relative to their intellectual functioning. Fein, Lucci, and Waterhouse (1990) were interested in the clinical observation of over-focused attention in children with autism who tend to show obsessive concern with environmental detail. The investigators stated that both fragmentation and overlap in the drawings of children with autism reflect over-focused attention. Fragmentation was defined as either segmentation in the production of the drawing, so that the final figure had a disjointed appearance, or actual separation of the figure's parts. Overlap was defined as the drawing of a single feature of the figure over a different feature of the same figure. Fein, Lucci and Waterhouse examined the drawings of 34 young people with autism who ranged from 5½ to 17½ years of age, whose mean verbal IQ was 61 points (SD 4). They were matched with 33 normally developing children, who ranged from 2½ to 10 years of age, for their performance on the Draw-a-Design sub-test of the McCarthy Scales of Children's Abilities (McCarthy, 1972). All participants were administered the remaining items of the McCarthy Scales, which included the Draw-a-Child task. The Draw-a-Design and Draw-a-Child drawings were scored for fragmentation and overlap by a single blind rater.
The investigators found no significant group difference in the fragmentation of either the Draw-a-Design or Draw-a-Child figures, though for the latter the investigators did report a tendency for the participants with autism to fragment their human figure drawings (7 out of 34) compared to the non-autistic controls (2 out of 33). Overlap in the Draw-a-Design figure was observed in five young people with autism compared with just one control-participant: a non-significant, but directional finding. The investigators did find, however, that the participants with autism were significantly more likely to display overlap in their human figure drawing than were their non-autistic counterparts. This pattern of performance was not related to chronological age, verbal nor non-verbal mental age. The investigators concluded from these rather equivocal results that the findings may reflect some aspect of abnormal cognition. Overlapping and fragmentation may both be associated with a narrowing of attention, the former representing a more extreme form than the latter. The child with autism, they proposed, not only withdraws attention from a part of the design already completed, and fails to integrate it with the part being worked on, but the very existence of the previously done part is blotted out and its portion of space is not reserved. The investigators further proposed that children with autism may lack the capacity to understand or conceive of the human figure as an integration of parts to form a whole, and indeed that the human figure is not inherently more whole for the child than an arbitrarily produced geometric design. Thus the parts produced from memory, while no fewer than those produced by non-verbal mental age matched normal children, lacked the integration of the normal children's productions.

Fein, Lucci and Waterhouse matched their autistic sample with typically developing children with the same non-verbal mental functioning. This leaves open the possibility that their principal finding of more overlap in the human figure drawings of young people with autism is a function of general mental retardation rather than autism per se.

Lewis and Boucher (1991) examined the drawings of children with autism in terms of their content and the strategies used for generating ideas. Their group of subjects were 12 relatively able autistic children, who had a mean chronological age of 13 years, a mean non-verbal mental age of 11¼ years, and a mean verbal mental age of 7½ years. The investigators did not select the participants for their drawing ability.
These participants were individually matched for chronological age, non-verbal and verbal mental age. In operationalising drawing skill, Lewis and Boucher considered: (a) devices giving photographic realism (proportionality, diminishing size with distance, occlusion, and representation of three-dimensions); (b) spatial relationships (between objects in a drawing, and between objects and the edge of the page); and (c) amount of detail. The investigators were interested in both the content of the drawings (complexity of the drawings and the topics represented) and the strategies employed (generative ability and degree of relatedness among topics of drawings).

The drawings from both groups were collected during several sessions spread over the course of a year. The participants were initially requested to draw anything they liked and then to give their drawing a title. For the following nine pictures they were given the same instructions apart from being asked to draw pictures different to those already drawn. Before they drew their picture they were given the opportunity to look at their earlier drawings. For the remaining ten pictures the children were told that they must not copy anything they could see. Each child produced a total of 20 drawings. Lewis and Boucher found no significant group differences on drawing skill on any of the measures employed. Many of the children in both groups used devices giving photographic realism at a level commensurate with their non-verbal ability; most of the children showed the ability to relate objects to one another, and to the page; and the amount of detail was comparable for both groups. In terms of content, too, the difference between the groups was not significant, though interestingly the young people with autism drew more pictures of people than did controls, including more pictures of themselves. Furthermore, the human figure drawings made by the young people with autism were as mature (as measured on the Goodenough scales) as those of their non-autistic controls. Finally, in terms of generating ideas, the children with autism were as likely as the control participants to copy or trace drawings (i.e., for drawings 1 to 10). Group differences did emerge, however, when the drawings were classified according to the subjects represented: the children with autism were significantly more likely to produce drawings that were related to each other than were the non-autistic control participants. The investigators concluded that autistic children have impaired generative ability, or fail to use their generative ability to produce varied sets of drawings.
This study demonstrated that young people with autism were as proficient in their drawing ability and skill as individuals matched for both chronological age and mental age. The principal finding concerned the study groups impaired generative ability relative to the control group. There was no control, however, on the demands placed upon the young people with autism to understand the instructions given to them. How can one know whether or not the study group actually understood that they were not to draw pictures drawn earlier? Could the presentation of earlier drawings not have served to cue the study group into drawing similar pictures? Similarly, given the procedure used to collect the data, could not the young people with autism be responding to situational cues? For example, they go with a certain person to a certain room to do a certain task. Given the tendency of young people with autism to enter into routine and repetitiveness, could the fact that they produce similar drawings be a function of the procedure rather than an inability to generate alternative ideas?

Charman and Baron-Cohen (1993) specifically set out to see whether the talented minority of young people with autism share some common cognitive characteristics with the untalented majority of young people with autism. In particular they were interested to see whether a group of young people with autism, not selected for their drawing ability, demonstrated precocious visual realism or not. Visual realism refers to the individual's ability to draw what is actually seen, and to override what they know about the object being drawn. This ability is generally observed in the naturalistic stage of drawing development. The investigators also examined whether drawing ability in children with autism would be enhanced by the social context of the drawing or not. The study sample comprised 17 young people with autism who ranged from 6 to 18 years in age, in non-verbal mental age from 4½ to 11 years, and in verbal mental age from 2½ to 9½ years. These participants were group matched with 15 young people with mental retardation for chronological age. The control group had mean non-verbal mental age and a verbal mental age that were significantly lower than those of the study group. A second control group comprised 16 normally developing children whose mean chronological age was 5½ years. It was assumed that the latter group's verbal and non-verbal mental ages were equivalent to their chronological age.
There were three drawing tasks involving a mug, a wall, and a cube. In the first task the participants were given a mug to examine and identify. It was then positioned in front of the participant with its handle occluded, and the participants were asked to draw exactly what they could see. These instructions were given to see whether the participants drew what they actually saw (i.e., visually real drawings) or what they knew (i.e., intellectually real drawings) of the mug. In the wall task there were two conditions. The participants were first shown a ball and a toy wall. The ball was placed in front of the participant so that it was partially occluded by the wall. The participants were again asked to draw exactly what they could see. In the second condition, the ball was replaced with a doll whose head and shoulders were the only parts visible. The participants were told that the doll was hiding from her mummy, and again asked to draw exactly what they could see. It was assumed that these two variants were identical in visual terms, but socially different such as to allow a test of whether 'social' objects (and the mental state of the social object) would affect participants' drawing ability. In the final drawing task the participants were asked to name the different colours on the face of a cube. The cube was placed in front of the participants and they were asked to draw exactly what they could see. On completion of this drawing the participants were provided with ten coloured pens and asked to colour in their cube. They were asked to make it look exactly like the cube from where they were sitting. The order of presentation of the three tasks was randomised. Within the wall task, the ball condition always preceded the doll condition.

The investigators found no statistical difference between the groups in terms of the production of visually real drawings on the mug task, the doll condition of the wall task or the cube task. On the Ball task, however, 47 percent of the young people with autism produced a visually real drawing while none of the mentally retarded control group did so - a statistically significant difference. The two control groups did not differ significantly in their performance on the Ball task. The relative increase in visually real drawings when the ball was replaced by the doll, was shown by the normal group (from 20 percent to 60 percent) and mentally retarded group (from 0 percent to 43 percent), but not by the autistic group (from 47 percent to 53 percent).

Those young people with autism who produced visually real drawings tended to have higher chronological ages, higher verbal and non-verbal mental ages than those who did not (although this was
not found to be statistically significant). No such trends were reported for the mentally retarded group. For the normal group, those subjects who produced visually real drawings had significantly higher chronological ages than those who did not on the Ball, Doll and Cube tasks. The investigators concluded that the development of drawing by children with autism follows the same developmental pattern seen in other groups, at approximately equivalent levels on non-verbal mental age. They further concluded that the mentally retarded group, unlike the autistic group, were able to exploit the mental state of the doll to produce a more visually real drawing. This latter conclusion is flawed, however, as the mentally retarded group were performing at floor level on the comparison ball task. It is possible, for example, that the clinical control group did not initially understand the nature of the task.

Eames and Cox (1994) also considered visual realism in the drawings of 13 children with autism who had a mean chronological age of 13½ years, and a mean non-verbal mental age of 8½ years. This group were compared with three others: a normally developing group who were matched for chronological age (mean non-verbal mental age 14½ years); a normally developing group matched for non-verbal mental age (mean chronological age 7 years); and a group of children with Down syndrome who were matched for both chronological age and non-verbal mental age. The investigators argued that it was more appropriate to used non-verbal mental age to match groups, as drawing itself is a non-verbal, spatial activity. Visual realism was assessed using a battery of drawing tasks. For example, using two cubes the children were asked to firstly copy the cubes placed one beside the other, then to copy the cubes placed one on top of the other, and finally to copy the cubes one placed behind the other. There were thirteen other such drawing tasks.

The two normally developing control groups performed similarly on each of the individual drawing tasks. This is somewhat surprising, given the fact that there is a six year difference in the ages of the two groups! Closer inspection of the number of children in each group passing the tasks shows that the chronological age group were performing almost at ceiling. The two clinical groups were also judged to have performed similarly on each of the drawing tasks.
The investigators then scored each drawing for degree of visual realism (from 0 to 2) for all of the participants. Unfortunately, neither the criteria used to allocate these scores nor inter-rater reliability indexes were provided. The visual realism scores were summed across the 14 drawing tasks to provide each participant with a total visual realism score. The normally developing chronological age matched group obtained a mean visual realism score of 27, which was significantly higher than any of the other groups. The normally developing mental age matched group obtained a mean score of 20, which was significantly higher than that of the two clinical groups. The autistic group obtained a mean score of 15 which was significantly higher than that obtained by the Down syndrome group (12). The low performance of the clinical control group may be partly attributed to the fact that this group were six months behind on their mean non-verbal mental ages relative to the autistic group. Finally, visual realism scores were significantly correlated with chronological age and non-verbal mental age for the two normally developing control groups but not for the two clinical groups. The investigators considered that they had provided strong evidence that children with autism do not display pictorial ability higher than one would expect in a group of non-verbal mental age matched controls. Indeed the performance of the autistic group was lower than that of normal children with similar non-verbal mental ages, but higher than the Down's group. The investigators concluded:

_We assume therefore that gifted drawers possess, or have acquired, their drawing techniques as a result of their own individual interests or aptitudes rather than as a result of any propensity specific to or enhanced by their autism_ (p. 239).

It may be concluded from the studies reviewed in this section that young people with autism, not selected for their outstanding drawing skill, are as proficient as their mental-aged matched non-autistic counterparts in their ability to draw: they use a comparable number of features to construct their figures, and they are as likely as them to depict visually real drawings. There is some evidence to indicate, however, that different processes may underlie the construction of the drawings of young people with autism, including narrowing of attention and impaired generative ability. In a more general way, these studies also underline the powerful influence of intellectual functioning in the production of children's drawings.
Summary of research findings

The principal themes that have emerged from previous research may be summarised as follows. Typically, there appears to be a relatively fixed sequence in the development of children's drawings. The representation of specific objects occurs at the beginning of the schematic stage, and it is at this stage that children may be observed to copy simple line drawings. Differentiation within and between the drawings of the human figures tends to occur towards the end of this stage. All of these developments are tied to intellectual functioning. This has been confirmed from the examination of the drawings of children with mental retardation. These children tend to pass through the early developmental drawing stages but at a slower rate. Children with autism, not selected for their outstanding drawing ability, appear to operate at a comparable level of drawing skill as their mental age matched counterparts, though there is some evidence to suggest that the processes underlying the drawings of children with autism may be different.

To examine the drawings of young people with autism in a systematic manner the above review makes explicit a number of methodological points that require attention. In the following section a several such points will be considered.

Methodological issues

The capacity to draw a representational figure typically emerges at around four years of age. Thus as a criterion for inclusion into the present study, only young people with autism with a verbal mental age of four years or above were studied. Further, as drawing development is strongly related to intellectual functioning, the control group comprised young people with mental retardation who were matched for both chronological age and verbal mental age. In this way between-group variance may be more confidently attributed to the autism per se, rather than cognitive developmental effects.

The third methodological issue concerned the drawing task itself. To establish that the human figure drawings constructed by the young people with autism were related to their general drawing skill, and to
therefore exclude the possibility that there was a specific abnormality in this regard, an examination was made of the drawing performance on a non-human figure drawing (i.e., a house), and on two isographic tasks. Performance on these drawing tasks was used as a measure of general drawing ability against which the self-human figure drawing was compared. These three methodological issues were considered in the first study. A second study was undertaken to consider the specificity of the findings from Study I by including a control task. Study II and its findings will be reported after Study I.

4.6 Study I: Self-depiction in the drawings of young people with autism

On the grounds that individuals with autism lack the ability to effect intersubjective co-ordination with others and are thus less able than non-autistic individuals to respond to, understand and integrate other people into their representation of the world, the following study was designed to examine whether or not young people with autism expressed the same degree of differentiation in form and style between both their self and same-sex human figure drawings, and their female and male human figure drawings as their non-autistic matched counterparts. To examine this two studies were conducted. The first study was designed to consider the between- and within-group performance on three classes of drawing task: human figure drawing, non-human figure drawing, and isographic drawing. It was intended to compare the self and same-sex, and the male and female human figure drawings in terms of both the form and the style used to differentially represent each pair. The profound and pervasive social impairment generally found in individuals with autism was the basis upon which the following prediction was made: that the internal representations of the self and of others would be less differentiated for young people with autism compared with non-autistic mentally retarded children, and that this could be evidenced in their drawings of self and others. Drawing also from the results of other relevant studies, it was hypothesised that different psychological mechanisms may underlie the construction of human figure drawings for young people with autism than for the non-autistic controls. The corresponding prediction was that the correlation coefficients among the different classes of drawing would differ in the two groups.
Participants

Fourteen young people with autism (3 females and 11 males) comprised the study group. They were all diagnosed for Autistic Disorder as defined by the criteria of DSM-III-R (American Psychological Association, 1987), and met research diagnostic criteria on the Childhood Autism Rating Scale (CARS: Schopler, Reichler, and Rener, 1986). The British Picture Vocabulary Scale (BPVS: Dunn, Dunn, Whetton, and Pintile, 1982) was administered to provide an estimate of verbal mental age and verbal IQ.

The study group were then individually matched with 14 non-autistic individuals with mental retardation (5 females and 9 males) according to both chronological and verbal mental age and therefore verbal IQ (Table 4.1). The control group comprised individuals whose intellectual retardation was not ascribable to a diagnosed medical condition.

<table>
<thead>
<tr>
<th></th>
<th>Autistic n = 14</th>
<th>Non-autistic n = 14</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chronological age</strong></td>
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<tr>
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<td>14:03</td>
</tr>
<tr>
<td>Standard deviation (months):</td>
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<tr>
<td>Range (years; months):</td>
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<td>11:11 - 16:10</td>
</tr>
<tr>
<td><strong>Verbal mental age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>6:03</td>
</tr>
<tr>
<td>Standard deviation (months):</td>
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<td>14</td>
</tr>
<tr>
<td>Range (years; months):</td>
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<td>4:06 - 8:00</td>
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<tr>
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<td>45</td>
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<tr>
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<td>28 - 63</td>
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<td><strong>Draw-a-Design (raw score)</strong></td>
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<td></td>
</tr>
<tr>
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<tr>
<td>Standard deviation:</td>
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<tr>
<td>Range:</td>
<td>3 - 17</td>
<td>4 - 19</td>
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</table>

Table 4.1 Drawing study I: Participant characteristics

The general drawing ability of the two groups in the present study was assessed through the use of the Draw-a-Design sub-test of the McCarthy Scales of Children's Abilities (McCarthy, 1972), and was
comparable in the two groups (Table 4.1). The Draw-a-Design and similar isographic tasks are traditionally used to determine a child's general level of non-verbal intellectual functioning. The participants were supplied with a nine-page booklet, the pages of which were divided equally into two sections. For the first three items the experimenter drew a standard geometric design on the top section of the page and the participant was asked to copy the same figure on the bottom section. The remaining six geometric designs were pre-drawn in the top section of the page, and the participants were asked to copy each figure in the bottom section of the page. There was no time limit for any of the drawings. This measure provides a gross index of drawing ability, without placing further demands on the child to recall information from memory. It is reasonable to assume that if two children perform similarly on this task then they are more likely to have comparable perceptual and eye-hand co-ordination skills.

Method

There were three broad classes of drawing tasks that were completed by all participants; human figure drawings, a single non-human figure drawing, and two isographic tasks. All participants were assessed individually with the tasks being presented in a fixed order. It is acknowledged that specific and/or non-specific order effects may influence the performance of later drawing tasks. These were not controlled for, and represent a limitation of the present study. The order of the drawing tasks was as follows:

Human figure drawings

Each participant was supplied with a plain white sheet of A4 size paper (i.e., 29.5 cm. by 21 cm.), a pencil and an eraser. The experimenter said: 'Draw a picture of a person'. There was no time limit. On completion of the first human figure drawing each participant was asked to confirm the sex of the figure drawn. This was noted on the back of the paper. The first drawing was removed and the participant was given another sheet of paper. The experimenter said: 'You have just drawn a picture of a girl/woman / boy/man. Now draw a picture of a girl/woman / boy/man', thereby instructing the participants to draw a person of the opposite sex to that drawn first. On completion of the participant's second human figure, the drawing was removed and a third sheet of paper provided. The experimenter said: 'Now draw a picture of yourself.'
Non-human figure drawing

The drawing of a house was subsequently collected to compare spontaneous drawing ability on a non-human figure with that on a human figure drawing. Each participant was supplied with a plain white sheet of A4 size paper, a pencil and an eraser. The experimenter said: 'Draw a picture of a house'. There was no time limit. This particular figure was chosen as the drawing of a house tends to be among the first representational figures spontaneously drawn by most children (Lark Horowitz, 1967). Furthermore, it was assumed that a house would be a concept familiar to all of the young people in both clinical groups.

Isographic drawings

As described earlier, the Draw-a-Design sub-test of the McCarthy Scales of Children's Abilities was given to all participants. On completion of this task the booklet was removed and the complex geometric figure shown in Figure 4.5, was presented. This figure was originally devised by Rey (1941) to investigate perceptual organisation and visual memory in brain-damaged subjects. Osterrieth (1946) standardised Rey's procedure and collected normative data from 295 individuals from four years of age to adulthood. The Rey-Osterrieth complex figure has proved especially useful for evaluating the ability to plan, organise, and assemble complex information (Binder, 1982). In the present study each participant was supplied with a plain white sheet of A4 size paper, a pencil and an eraser. The Rey-Osterrieth complex figure was placed above the sheet of paper and the participant instructed to copy the figure as best they could. There was no time limit.

Figure 4.5 The Rey-Osterrieth complex figure
Coding of drawings

The three human figure drawings and the nine items comprising the Draw-a-Design sub-test were scored using McCarthy's standardised scoring procedures (McCarthy, 1972). The non-human figure was scored using an analogue scale devised by the investigator. This analogue scale is set out in Appendix 4.1. The complex figure was scored using a coding scheme adapted from Osterrieth by Taylor (1959). This coding scheme is set out in Appendix 4.2. The data derived from the scoring of these drawing tasks is displayed in Table 4.2 for the autistic group, and in Table 4.3 for the non-autistic group.

To evaluate differentiation between the human figure drawings, the investigator made judgements on the difference in both form and style between each participant's drawing of: (a) the self and same-sex human figures; and (b) the female and male human figures. Form was defined principally in terms of the structure of the figure, and judged by comparing the way in which the features (as defined by McCarthy) used to construct the two human figures were differentially represented. 'Clear difference' was judged if the majority of the features used to draw the two human figures were represented differently. 'Some difference' was judged if at least two features, but no more than one-half of the features used to draw the two human figures were differentially constructed. 'No difference' was judged if none or just one of the features drawn were different. The judgement of the difference in style between the two pairs of human figures was more qualitative than that of the difference in form. There were five items to be considered in the judgement of style: difference in (a) the size of the human figures, (b) the orientation of the human figures (e.g., face-on versus profile), (c) the portrayal of action, (d) shading and/or heaviness of the line, and (e) placement on the page of the two human figures being compared. A 'clear difference' in style was judged if one item was obviously different, or if two or more of the items were slightly different. 'Some difference' in style was judged if at least one item was slightly different. 'No difference' in style was judged if none of the items were different between the two human figures being compared. (See Appendix 4.3 to view the coding sheets used to assess difference in form and style).

219
A second rater who was blind to both the clinical diagnosis of the participants and the purpose of the study, scored all of the drawings of ten participants (five randomly selected from the autistic group and their five matched non-autistic counterparts) for the purpose of examining reliability. The degree of agreement was evaluated by calculating the Kappa coefficient, which takes into account the likelihood of chance agreement between the raters. The Kappa coefficients for the scoring of drawings were all above 0.81, indicating 'almost perfect agreement' (Landis and Koch, 1977) between the judgement of the experimenter and that of the blind rater.

The same blind rater scored all 28 participants' two contrasting human figure pairs for difference in both their form and style. All of the Kappa coefficients were above 0.75, indicating 'substantial agreement'. The exact coefficients are displayed in Appendix 4.4.

**Analysis of data and results**

The overall performance of the autistic group with that of the non-autistic group on the six drawing tasks was first examined. The principal prediction was then examined by considering the degree of differentiation in both form and style between the self and same-sex, and the male and female human figure drawings.

<table>
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<tr>
<th>Participant number</th>
<th>Human figure (female) max. score 20</th>
<th>Human figure (male) max. score 20</th>
<th>Human figure (self) max. score 20</th>
<th>Non-human figure (house) max. score 20</th>
<th>Draw-a-Design max. score 19 max. score 36</th>
<th>Complex figure max. score 36</th>
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Table 4.2 Study 1: Total scores on the drawing tasks by the autistic group
Within-group associations among verbal mental age, verbal IQ and task performance, of verbal mental ability and expression of differentiation, and of performance among classes of drawing task will be considered when the present results are taken along with those from Study II. These correlation analyses will follow after the reporting of the findings from Study II.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Human figure (female)</th>
<th>Human figure (male)</th>
<th>Human figure (self)</th>
<th>Non-human figure (house)</th>
<th>Draw-a-Design</th>
<th>Complex figure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>max. score 20</td>
<td>max. score 20</td>
<td>max. score 20</td>
<td>max. score 20</td>
<td>max. score 19</td>
<td>max. score 36</td>
</tr>
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<td>6</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>.0</td>
</tr>
<tr>
<td>2</td>
<td>11</td>
<td>9</td>
<td>11</td>
<td>6</td>
<td>6</td>
<td>6.5</td>
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<td>10</td>
<td>10</td>
<td>10</td>
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<td>6.0</td>
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<td>16</td>
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<td>9</td>
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<td>3.0</td>
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<td>12</td>
<td>19.0</td>
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<td>9</td>
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<td>10</td>
<td>19</td>
<td>16</td>
<td>13</td>
<td>22.0</td>
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<tr>
<td>10</td>
<td>15</td>
<td>17</td>
<td>10</td>
<td>15</td>
<td>17</td>
<td>23.0</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
<td>9</td>
<td>11</td>
<td>7</td>
<td>4</td>
<td>7.0</td>
</tr>
<tr>
<td>12</td>
<td>19</td>
<td>18</td>
<td>19</td>
<td>15</td>
<td>16</td>
<td>29.0</td>
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<td>13</td>
<td>19</td>
<td>19</td>
<td>17</td>
<td>20</td>
<td>16</td>
<td>32.0</td>
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<td>17</td>
<td>14</td>
<td>20</td>
<td>19</td>
<td>33.0</td>
</tr>
</tbody>
</table>

Table 4.3 Study I: Total scores on the drawing tasks by the non-autistic group

**Drawing task performance: Between-group comparisons**

The mean number of features drawn by the autistic group to construct the three separate human figures, the non-human figure, and the mean scores on the two isographic tasks were statistically compared with that of the non-autistic mentally retarded control group using the independent subjects design t-test. Table 4.4 shows the group means and standard deviations across the six tasks, and the resulting t-test statistics with their two-tailed probabilities.

The analysis revealed no statistically significant differences between the two groups in their performances on the male- and self-human figure drawings, the non-human figure drawing, nor the two isographic tasks. Thus the mean number of features drawn by each group to represent the male- and self-human figures, and the house were comparable. The level of drawing skill, as gauged from each group's
performance on the two geometric figure copying tasks, was also comparable. The control group did, however, use more features to represent the female-human figure than did the autistic group.

<table>
<thead>
<tr>
<th></th>
<th>Human figure (female)</th>
<th>Human figure (male)</th>
<th>Human figure (self)</th>
<th>Non-human figure (house)</th>
<th>Draw-a-Design</th>
<th>Complex figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autistic</td>
<td>11.29 SD 3.34</td>
<td>11.50 SD 3.30</td>
<td>11.71 SD 3.62</td>
<td>12.07 SD 4.32</td>
<td>12.79 SD 4.19</td>
<td>19.29 SD 11.03</td>
</tr>
<tr>
<td>Non-autistic</td>
<td>14.14 SD 3.65</td>
<td>12.71 SD 3.89</td>
<td>13.07 SD 3.73</td>
<td>12.92 SD 4.70</td>
<td>11.50 SD 4.72</td>
<td>17.71 SD 11.58</td>
</tr>
</tbody>
</table>

\[ t (df 34) = -2.16, p < 0.05 \]  
\[ t (df 34) = -0.89, \text{ ns} \]  
\[ t (df 34) = -0.98, \text{ ns} \]  
\[ t (df 34) = -0.50, \text{ ns} \]  
\[ t (df 34) = 0.76, \text{ ns} \]  
\[ t (df 34) = 0.37, \text{ ns} \]

Table 4.4 Study I: Between-group comparison of mean total scores

Differentiation of the human figure drawings

Study I was designed to examine the prediction that young people with autism would show less differentiation among their human figure drawings than their matched non-autistic control counterparts. Two particular contrasts were made: the self and the same-sex human figure drawings; and the female and the male human figure drawings. The approach adopted to examine these contrasts involved an analysis of the difference between the pairs of human figures in terms of both their form and style. To reiterate, the differentiation between two drawings in terms of form was judged by comparing the ways in which the features used to construct the two human figures were differentially represented. The differentiation in terms of style was more global than that of form, and included differences in the size of the human figures, in the orientation of the human figures, in the portrayal of different actions, in shading and/or heaviness of the lines between figures, and in placement on the page of the human figures.

Table 4.5 shows the judged difference in form between the self and the same-sex human figure drawings for the autistic and the non-autistic groups. Scores of '0' were given for no difference, '1' for some difference, and '2' for clear difference. The resulting ordinal data sets for the two human figure comparisons were statistically analysed using the Mann-Whitney U Test. As predictions regarding the
direction of difference were made a priori, the one-tail probabilities associated with the z-scores are reported.

<table>
<thead>
<tr>
<th></th>
<th>No difference</th>
<th>Some difference</th>
<th>Clear difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Autistic</strong></td>
<td>6</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td><strong>Non-autistic</strong></td>
<td>2</td>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

Mann-Whitney  

\[
U = 54.0 \quad z = -2.1503 \quad p < 0.05
\]

1-tailed

Table 4.5 Differentiation in terms of form: Self versus same-sex human figure drawings

The pattern of difference in form between the two groups for this comparison was found to be statistically different \((U = 54.0, z = -2.15, p < 0.05)\).

<table>
<thead>
<tr>
<th></th>
<th>No difference</th>
<th>Some difference</th>
<th>Clear difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Autistic</strong></td>
<td>7</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td><strong>Non-autistic</strong></td>
<td>2</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

Mann-Whitney  

\[
U = 54.0 \quad z = -2.1503 \quad p < 0.05
\]

1-tailed

Table 4.6 Differentiation in terms of style: Self versus same-sex human figure drawings

The difference in style between the self and the same-sex human figure drawings for the two groups is shown in Table 4.6. Once again, the pattern of group difference for style was statistically significant \((U = 54.0, z = -2.15, p < 0.05)\).

Table 4.7 shows the difference in form as judged between the female and male human figure drawings for the autistic and the non-autistic groups. The difference in the pattern of performance between the two clinical groups was found to be significant \((U = 62.5, z = -1.76, p < 0.05)\).
Table 4.7 Differentiation in terms of form: Female versus male human figure drawings

<table>
<thead>
<tr>
<th></th>
<th>No difference</th>
<th>Some difference</th>
<th>Clear difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autistic</td>
<td>5</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Non-autistic</td>
<td>1</td>
<td>7</td>
<td>6</td>
</tr>
</tbody>
</table>

Mann-Whitney $U = 62.5$ $z = -1.7610$ $p < 0.05$ 1-tailed

Table 4.8 Differentiation in terms of style: Female versus male human figure drawings

<table>
<thead>
<tr>
<th></th>
<th>No difference</th>
<th>Some difference</th>
<th>Clear difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autistic</td>
<td>9</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Non-autistic</td>
<td>3</td>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>

Mann-Whitney $U = 51.5$ $z = -2.3092$ $p < 0.05$ 1-tailed

Summary of findings from Study I

In most respects, young people with autism were found to be as proficient in their level of drawing ability as their non-autistic matched controls. The autistic group used a similar number of features as their matched counterparts to depict their drawings of a male and the self, and their drawing of a house, and were as skilled as the control participants on two standard geometric copying tasks. They did, however, use fewer features than the non-autistic control group to depict the female human figure. This finding was unexpected. It appeared that the control group used more features to depict their female
human figure than their male and self-human figures, rather than the autistic group using less features to depict their female human figure than any other of their human figure drawings.

Against this backdrop, the human figure drawings were examined for characteristics beyond the number of features drawn. As predicted, the autistic group were less likely than the non-autistic group to depict differences between the self and same-sex and the female and male human figures in terms of both form and style. The mentally retarded group, then, drew highly differentiated human figures by altering the form and style of the features used to depict their self and same-sex drawings, and their female and male drawings.

Study I established that the human figure drawings constructed by the participants were developmentally comparable to their general drawing skill, as manifest in the drawings of a non-human figure and on two isographic tasks. To examine the specificity of the group difference in the differentiation of the human figures, it would have been necessary to have included a control task that required the participants to draw something conceptually similar, but non-social through which differentiation in form and style could have been judged. As the results stand, it could be that poor differentiation in form and style is a feature common to all drawings (human and non-human) of young people with autism. In this case, for example, the lack of differentiation might be understood in terms of the tendency for impaired generative ability (Lewis and Boucher, 1991). To control for this possibility, a second drawing study was conducted that included a control task to examine for the ability to show differentiation in form and style among three kinds of non-human figures. To allow for an integration of the results from the first and second study for certain purposes, a new autistic sample was chosen who were comparable with the original sample in terms of chronological age and verbal mental age.
4.8 Study II: Self-depiction in the drawings of young people with autism

Participants

Ten young people with autism (1 female and 9 males) comprised the study group. They were all diagnosed for Autistic Disorder as defined by the criteria of DSM-III-R (American Psychological Association, 1987), and met research diagnostic criteria on the Childhood Autism Rating Scale (CARS: Schopler, Reichler, and Rener, 1986). The British Picture Vocabulary Scale (BPVS: Dunn, Dunn, Whetton, and Pintile, 1982) was administered to provide an estimate of verbal mental age.

The study group were individually matched with 10 non-autistic individuals with mental retardation (1 female and 9 males) according to both chronological and verbal mental age (Table 4.9). The control group comprised individuals whose intellectual retardation was not ascribable to a diagnosed medical condition.

<table>
<thead>
<tr>
<th></th>
<th>Autistic n = 10</th>
<th>Non-autistic n = 10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chronological age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (years; months):</td>
<td>14;02</td>
<td>13;10</td>
</tr>
<tr>
<td>Standard deviation (months):</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Range (years; months):</td>
<td>11;11 - 16;08</td>
<td>11;09 - 17;05</td>
</tr>
<tr>
<td><strong>Verbal mental age (based on BPVS)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (years; months):</td>
<td>5;07</td>
<td>5;10</td>
</tr>
<tr>
<td>Standard deviation (months):</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td>Range (years; months):</td>
<td>3;8 - 8;05</td>
<td>4;0 - 8;05</td>
</tr>
<tr>
<td><strong>Verbal IQ (based on BPVS)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean:</td>
<td>38</td>
<td>43</td>
</tr>
<tr>
<td>Standard deviation:</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Range:</td>
<td>26 - 55</td>
<td>25 - 61</td>
</tr>
<tr>
<td><strong>Draw-a-Design (raw score)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean:</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Standard deviation:</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Range:</td>
<td>4 - 19</td>
<td>5 - 17</td>
</tr>
</tbody>
</table>

Table 4.9 Drawing Study II: Participant characteristics
Method

The procedure to administer the human figure drawings and the isographic drawing tasks was followed as detailed under the Method section of Study I. In place of the non-human figure task the following procedure was observed:

Non-human figure drawings

Each participant was supplied with a plain white sheet of A4 size paper (i.e., 29.5 cm. by 21 cm.), a pencil and an eraser. The experimenter said: "Draw a picture of a house." There was no time limit. On completion the first drawing was removed and the participant was given another sheet of paper. The experimenter said: "You have just drawn a picture of a house. Now draw a picture of a school." On completion of the participant's second building, the drawing was removed and a third sheet of paper provided. The experimenter said: "Now draw a picture of a church."

Coding of drawings

The three human figure drawings and the nine items comprising the Draw-a-Design sub-test were again scored using McCarthy's standardised scoring procedures (McCarthy, 1972). The non-human figures were scored using an analogue scale devised by the investigator (see Appendix 4.1). The complex figure was scored using a coding scheme adapted from Osterrieth by Taylor (1959) (see Appendix 4.2). The data derived from the scoring of these drawing tasks is displayed in Table 4.10 for the autistic group, and in Table 4.11 for the non-autistic group.

Differentiation between the self and same-sex human figures and the female and male human figures was judged in terms of form and style, as detailed in Study I. In addition the non-human figure drawings were also compared for the degree of differentiation in form and style. More specifically, the house was compared with the school to provide the first contrast, and the school was compared with the church to give the second contrast.
Form was defined principally in terms of the structure of the figure, and judged by comparing the way in which the features (as defined in the analogue scale) used to construct the two non-human figures were differentially represented. 'Clear difference' was judged if the majority of the features used to draw the two non-human figures were represented differently. 'Some difference' was judged if at least two features, but no more than one-half of the features used to draw the two non-human figures were differentially constructed. 'No difference' was judged if none or just one of the features drawn were different. The judgement of the difference in style between the two pairs of non-human figures was more qualitative than that of the difference in form. There were four items to be considered in the judgement of style: difference in (a) the size of the non-human figures, (b) the perspective of the non-human figures (e.g., face-on versus side), (c) shading and/or heaviness of the line, and (e) placement on the page of the two non-human figures being compared. A 'clear difference' in style was judged if one item was obviously different, or if two or more of the items were slightly different. 'Some difference' in style was judged if at least one item was slightly different. 'No difference' in style was judged if none of the items were different between the two non-human figures being compared. (See Appendix 4.4 to view the coding sheets used to assess difference in form and style).

Analysis of data and results

The overall performance of the autistic group with that of the non-autistic group on the eight drawing tasks was first examined. The principal issue was then examined by considering the expression of differentiation in both form and style between the self and same-sex, and the male and female human figure drawings and comparing this with the difference in form and style between the house and the school, and the school and the church drawings.

This between-group analysis was followed by a within-group examination of the associations among verbal mental ability, verbal IQ and task performance.
### Table 4.10 Study II: Total scores on the drawing tasks by the autistic group

<table>
<thead>
<tr>
<th>Participant number</th>
<th>Human figure</th>
<th>Non-human figure</th>
<th>Draw-a-Design</th>
<th>Complex figure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>female</td>
<td>male</td>
<td>self</td>
<td>house</td>
</tr>
<tr>
<td>1</td>
<td>11</td>
<td>12</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>13</td>
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<tr>
<td>3</td>
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<td>4</td>
<td>4</td>
<td>9</td>
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<tr>
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<td>10</td>
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<tr>
<td>10</td>
<td>14</td>
<td>16</td>
<td>13</td>
<td>18</td>
</tr>
</tbody>
</table>

### Table 4.11 Study II: Total scores on all drawing tasks by the non-autistic group

<table>
<thead>
<tr>
<th>Participant number</th>
<th>Human figure</th>
<th>Non-human figure</th>
<th>Draw-a-Design</th>
<th>Complex figure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>female</td>
<td>male</td>
<td>self</td>
<td>house</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
<td>10</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>13</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>12</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>12</td>
<td>12</td>
<td>11</td>
<td>16</td>
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<tr>
<td>6</td>
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<td>14</td>
</tr>
<tr>
<td>7</td>
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<td>18</td>
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<td>12</td>
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<tr>
<td>10</td>
<td>14</td>
<td>13</td>
<td>14</td>
<td>14</td>
</tr>
</tbody>
</table>

### Drawing task performance: Between-group comparisons

The mean number of features drawn by the autistic group to construct each of the three human figures, the three non-human figures, and the mean scores on the two isographic tasks were statistically compared with that of the non-autistic mentally retarded control group using the independent t-test. Table 4.12 shows the group means and standard deviations across the eight tasks, and the resulting t-test statistics with their two-tailed probabilities.
Table 4.12 Study II: Between-group comparison of mean total scores

<table>
<thead>
<tr>
<th></th>
<th>Human figure</th>
<th>Non-human figure</th>
<th>Draw-a-Design</th>
<th>Complex figure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>female</td>
<td>male</td>
<td>self</td>
<td>house</td>
</tr>
<tr>
<td>Autistic</td>
<td>11.80</td>
<td>12.00</td>
<td>11.30</td>
<td>11.90</td>
</tr>
<tr>
<td>SD</td>
<td>3.91</td>
<td>4.19</td>
<td>3.68</td>
<td>3.84</td>
</tr>
<tr>
<td>Non-autistic</td>
<td>11.20</td>
<td>11.40</td>
<td>11.10</td>
<td>13.20</td>
</tr>
<tr>
<td>SD</td>
<td>2.00</td>
<td>2.37</td>
<td>2.23</td>
<td>3.22</td>
</tr>
</tbody>
</table>

\[
t (df = 18) \quad 0.43 \quad 0.39 \quad 0.15 \quad -0.82 \quad -0.56 \quad -1.34 \quad -0.46 \quad 0.10
\]

\[
p \text{ (two-tailed)} \quad \text{ns} \quad \text{ns} \quad \text{ns} \quad \text{ns} \quad \text{ns} \quad \text{ns} \quad \text{ns} \quad \text{ns}
\]

Table 4.12 Study II: Between-group comparison of mean total scores

The analysis revealed no statistically significant differences between the two groups in their performance on the three human figure drawings, the three non-human figure drawing, and the two isographic tasks. Thus the mean number of features drawn by each group to represent the female-, male- and self-human figures, and the house, school and church were comparable. The level of drawing skill, as gauged from each group's performance on the two geometric figure copying tasks, was also comparable.

**Differentiation of the human figure drawings**

Study II was designed to explore more specifically the prediction that young people with autism would show less differentiation among their human figure drawings vis-à-vis their non-human figure drawings than their matched non-autistic control counterparts. Apart from attempting to replicate the principal finding of Study I, Study II further examined the contrasts between the house and school, and the school and church figure drawings. As in Study I, the approach adopted to examine these contrasts involved an analysis of the difference between the pairs of non-human figures in terms of both their form and style.

Table 4.13 shows the judged difference in form between the self and the same-sex human figure drawings for the autistic and the non-autistic groups. Scores of '0' were given for no difference, '1' for some difference, and '2' for clear difference. The resulting ordinal data sets for the two human figure comparisons were statistically analysed using the Mann-Whitney U Test. As predictions regarding the direction of difference were made, the one-tail probabilities associated with the z-scores are reported. The pattern of difference in form between the two groups was found to be statistically different \( U = 17.0, z = -2.69, p < 0.005 \).
The difference in style between the self and the same-sex human figure drawings for the two groups is shown in Table 4.14. This pattern of group difference in style was found to be statistically significant \((U = 26.0, z = -2.07, p < 0.05)\).

<table>
<thead>
<tr>
<th>No difference</th>
<th>Some difference</th>
<th>Clear difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autistic</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Non-autistic</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>

Mann-Whitney \(U = 26\) \(z = -2.07\) \(p < 0.05\) 1-tailed

Table 4.14 Differentiation in terms of style: Self versus same sex human figure drawings

The difference in style between the female and the male human figure drawings for the two groups is shown in Table 4.15. This pattern of group difference in style was found to be statistically significant \((U = 18.5, z = -2.71, p < 0.005)\).

<table>
<thead>
<tr>
<th>No difference</th>
<th>Some difference</th>
<th>Clear difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autistic</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Non-autistic</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Mann-Whitney \(U = 18.5\) \(z = -2.71\) \(p < 0.005\) 1-tailed

Table 4.15 Differentiation in terms of form: Female versus male human figure drawings
Table 4.15 shows the difference in form as judged between the female and male human figure drawings for the autistic and the non-autistic groups. The difference in the pattern of performance between the two clinical groups was found to be highly significant ($U = 18.5, z = -2.71, p < 0.005$).

<table>
<thead>
<tr>
<th></th>
<th>No difference</th>
<th>Some difference</th>
<th>Clear difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autistic</td>
<td>8</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Non-autistic</td>
<td>2</td>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

Mann-Whitney $U = 19.0$ $z = -2.64$ $p < 0.005$

Table 4.16 Differentiation in terms of style: Female versus male human figure drawings

The difference in style between the female and male human figure drawings for the two groups is shown in Table 4.16. The statistical difference between the two clinical groups in their patterns of performance was highly significant ($U = 19.0, z = -2.64, p < 0.005$).

It may be concluded from the examination of the human-figure drawing contrasts that the young people with autism exhibited less differentiation in both form and style in their depiction of human-figure drawings. The differentiation in both form and style among non-human figure drawing contrasts will now be examined.

Table 4.17 shows the judged difference in form between the house and the school figure drawings for the autistic and the non-autistic groups. As with the human-figure drawings, scores of '0' were given for no difference, '1' for some difference, and '2' for clear difference. The resulting ordinal data sets for the two non-human figure comparisons were statistically analysed using the Mann-Whitney $U$ Test. As predictions regarding the direction of difference were not made, the two-tail probabilities associated with the $z$-scores are reported. The pattern of difference in form between the two groups was found not to be statistically different ($U = 34.5, z = -1.55, ns$).
Table 4.17 Differentiation in terms of form: House versus school figure drawings

The difference in style between the house and the school figure drawings for the two groups is shown in Table 4.18. This pattern of group difference in style was found to be statistically significant ($U = 27.5, z = -2.03, p < 0.05$).

Table 4.18 Differentiation in terms of style: House versus school figure drawings

Table 4.19 shows the judged difference in form between the school and the church figure drawings for the autistic and the non-autistic groups. The pattern of difference in form between the two groups was found not to be statistically different ($U = 48.0, z = -0.22, ns$), but it will be noted that this was because of near-ceiling effects.

Table 4.19 Differentiation in terms of form: School versus church figure drawings
The difference in style between the school and the church figure drawings for the two groups is shown in Table 4.20. This pattern of group difference was not statistically significant ($U = 38.0$, $z = -0.98$, ns).

<table>
<thead>
<tr>
<th></th>
<th>No difference</th>
<th>Some difference</th>
<th>Clear difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autistic</td>
<td>2</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Non-autistic</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

Mann-Whitney $U = 38.0$ $z = -0.98$ $ns$

Table 4.20 Differentiation in terms of style: School versus church figure drawings

The data collected in Study II enabled a more stringent analysis of the specificity of group differences in the lack of differentiation of human figures. This was achieved by calculating, for each individual participant, the difference between contrast scores in the case of human vis-à-vis non-humans. Thus the two groups could be compared.

Thus scores were calculated by subtracting each participant's first human contrast score from their first non-human contrast score, and their second human contrast score from their second non-human contrast score for both form and style. The analysis of these difference scores amounted to a group by 'difference score' repeated measures analysis. The difference scores ranged from -2, indicating maximum human drawing contrast and no difference in the non-human figure contrast, to +2 indicating maximum non-human contrast and no difference in the human contrast. The resulting difference scores were statistically analysed using the Mann-Whitney $U$ Test. As predictions regarding the direction of difference were made, the one-tail probabilities associated with the $z$-scores are reported.

Tables 4.21 and 4.22 show the pattern of difference scores for form between the first and second non-human and human contrasts respectively.
Both analyses demonstrated highly significant differences between the two groups in their pattern of difference scores. Thus, the study group were significantly more likely to show a greater contrast in form between their non-human figure drawings than they were between their human figures, compared with the non-autistic control group. Tables 4.23 and 4.24 show the pattern of difference scores for style between the first and second non-human and human contrasts respectively.
Non-significant differences between the two groups in their pattern of difference scores for style was revealed for both contrasts. Thus, the study group showed no specific lack of differentiation in style with human figure drawings.

<table>
<thead>
<tr>
<th>Difference between scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Autistic</td>
</tr>
<tr>
<td>Non-autistic</td>
</tr>
</tbody>
</table>

Mann-Whitney  

Table 4.24 Differentiation in terms of style: Second non-human contrast - second human contrast

Summary of findings from Study II

Young people with autism were found to be as proficient in their level of drawing ability as their non-autistic matched controls. The autistic group used a similar number of features as their matched counterparts to depict their human and non-human figure drawings, and were as skilled as their non-autistic control counterparts on the two standard geometric copying tasks.

When the degree of differentiation was examined between the human figures the autistic group were less likely than the non-autistic group to differentially depict the self and same-sex, and the female and male human figures in terms of either their form or style. In contrast to the autistic group, therefore, the mentally retarded group drew highly differentiated human figures by altering the form and style of the features used to depict their self and same-sex drawings, and their female and male drawings.

An examination of the differentiation between the non-human figures drawn by the autistic group revealed a contrasting pattern to that observed between their human figure drawings. The two clinical groups performed comparably in drawing the house and school differently in terms of the form of the
drawings. The young people with autism, however, were significantly less likely to differentiate these two classes of buildings in terms of their style. The two groups performed similarly (and without a significant difference) in the degree of differentiation shown in terms of both form and style for the drawings of the school and the church. Broadly, then, both groups drew differentiated non-human figures by altering the form and in some cases the style of the features used to depict their house and school drawings, and their school and church drawings.

In general the findings of Study I were successfully replicated in Study II. In addition the results from Study II established that the lack of differentiation among the human figure drawings by the autistic group was not a generalised phenomenon, in that they were as likely to depict difference in form among their drawings of buildings as were the non-autistic control group.

A more stringent analysis comparing the difference scores between the non-human and human contrasts revealed that the two groups differed in the ways they differentiated the forms of the human vis-à-vis non-human drawings. The autistic group were significantly more likely than the non-autistic group to differentially represent features on the non-human drawing tasks vis-à-vis the human drawing tasks. On the other hand, the autistic individuals were as likely as the non-autistic control group to differentiate the human and non-human figures in terms of style. Thus the findings provide evidence that young people with autism appear to be specifically impaired in their capacity to depict differentiation in human figures vis-à-vis their non-human figures in terms of form.
First human figure drawn: Man  
Score = 16/20

Second human figure drawn: Woman  
Score = 15/20

Third human figure drawn: Self  
Score = 14/20

Figure 4.6a Human figure drawings of a young person with autism

238
First non-human figure drawn: House
Score = 12/20

Second non-human figure drawn: School
Score = 12/20

Third non-human figure drawn: Church
Score = 11/20

Figure 4.6b Non-human figure drawings of a young person with autism
First human figure drawn: Woman
Score = 18/20

Second human figure drawn: Man
Score = 10/20

Third human figure drawn: Self
Score = 19/20

**Figure 4.7a** Human figure drawings of a young person with mental retardation
First non-human figure drawn: House  
Score = 16/20

Second non-human figure drawn: School  
Score = 12/20

Third non-human figure drawn: Church  
Score = 11/20

Figure 4.7b Non-human figure drawings of a young person with mental retardation
Examples of the human and non-human figures drawn by a member of the autistic group are shown in Figures 4.6a and 4.6b. The scores reflecting the number of features drawn to depict the different figures are provided under each drawing. The scores for the difference in form and style between the human and non-human comparisons are displayed in Table 4.25.

<table>
<thead>
<tr>
<th></th>
<th>Self versus same-sex</th>
<th>Female versus male</th>
<th>House versus school</th>
<th>School versus house</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FORM</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>STYLE</strong></td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Table 4.25** Details of scores achieved on drawing tasks by the autistic participant

Examples of the same classes of drawing made by a member of the non-autistic control group are shown in Figures 4.7a and 4.7b. This participant's difference scores are displayed in Table 4.26.

<table>
<thead>
<tr>
<th></th>
<th>Self versus same-sex</th>
<th>Female versus male</th>
<th>House versus school</th>
<th>School versus house</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FORM</strong></td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>STYLE</strong></td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**Table 4.26** Details of scores achieved on drawing tasks by the non-autistic participant

**Within-group correlation analyses**

The prime purpose of the correlation analyses was to examine how verbal mental ability correlated with performance in terms of both the participants' total scores and the different classes of drawing, and the depiction of differences in form and style. Inter-task correlation coefficients were also conducted to examine the relationship among different classes of task performance.
Task performance and verbal mental ability

Given the comparability of the participants and methods of Study I and Study II, the two groups were collapsed in order to examine the effects of verbal mental age and verbal IQ on task performance. Performance by each group on the first drawn human figure, the drawing of the house and the two isographic tasks were considered. The results of this analysis are displayed in Table 4.27.

<table>
<thead>
<tr>
<th></th>
<th>First human figure drawn</th>
<th>First non-human figure drawn</th>
<th>Draw-a-design</th>
<th>Complex figure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Autistic group</strong></td>
<td>VMA</td>
<td>$r +0.2716$ ns</td>
<td>$r +0.5842$ p &lt; 0.005</td>
<td>$r +0.5686$ p &lt; 0.005</td>
</tr>
<tr>
<td></td>
<td>VIQ</td>
<td>$r +0.2024$ ns</td>
<td>$r +0.4955$ p &lt; 0.01</td>
<td>$r +0.6188$ p &lt; 0.005</td>
</tr>
<tr>
<td><strong>Non-autistic group</strong></td>
<td>VMA</td>
<td>$r +0.4804$ p &lt; 0.01</td>
<td>$r +0.5105$ p &lt; 0.01</td>
<td>$r +0.4492$ p &lt; 0.05</td>
</tr>
<tr>
<td></td>
<td>VIQ</td>
<td>$r +0.5084$ p &lt; 0.01</td>
<td>$r +0.5614$ p &lt; 0.005</td>
<td>$r +0.4402$ p &lt; 0.05</td>
</tr>
</tbody>
</table>

Table 4.27 Pearson Correlation Coefficients for verbal mental ability and task performance

The correlation analysis revealed that the autistic group's performance on the human figure drawing was not significantly correlated with either verbal mental age or verbal IQ. Drawing performance on the non-human figure and the two isographic tasks was significantly correlated with verbal mental ability. By contrast, the non-autistic control group's performance on all drawing tasks were significantly correlated with verbal mental ability. Thus although the scores of the two groups were not significantly different on the drawings of the human figures, the pattern of inter-correlations among tasks suggested that different psychological mechanisms may play a part in the construction of the human figure for the autistic group.

Differentiation and verbal mental ability

The relationship between cognitive verbal ability and the capacity to depict the human figure drawings and the non-human figure drawings differently in terms of form and style was examined by calculating Spearman rank correlation coefficients. The results of the correlation analysis for the human figure
contrasts are shown in Table 4.28. These coefficients are based upon the results from Study I and Study II (i.e., twenty-four subjects). The coefficients for the non-human figure contrasts are displayed in Table 4.29. These coefficients are based upon the results from Study II only (i.e., ten subjects).

<table>
<thead>
<tr>
<th>N = 24 pairs</th>
<th>Self versus same-sex human figure drawing</th>
<th>Female versus male human figure drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Autistic group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VMA</td>
<td>$r_s = +0.2305$</td>
<td>$r_s = +0.3873$</td>
</tr>
<tr>
<td>VIQ</td>
<td>$r_s = +0.2972$</td>
<td>$r_s = +0.5001$</td>
</tr>
<tr>
<td><strong>Non-autistic group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VMA</td>
<td>$r_s = +0.5394$</td>
<td>$r_s = +0.3316$</td>
</tr>
<tr>
<td>VIQ</td>
<td>$r_s = +0.5491$</td>
<td>$r_s = +0.3007$</td>
</tr>
</tbody>
</table>

*Table 4.28* Spearman Rank Correlation Coefficients for cognitive verbal ability and differentiation depicted between human figure drawings

The depiction of difference in *style* between the self and same-sex human figures was significantly correlated with verbal IQ for the autistic group ($r_s = +0.5001$, $p < 0.05$). This was the only significant correlation among these measures for the study group, and there were no significant correlation coefficients for the control participants. Inspection of Table 4.28 suggests, however, that this may not represent a marked contrast between the groups.

The non-autistic group’s depiction of difference in *form* between the self and same-sex human figures was found to be significantly correlated with both verbal mental age ($r_s = +0.5394$, $p < 0.01$) and verbal IQ ($r_s = +0.5394$, $p < 0.01$). Here there was a striking contrast with the results from the autistic participants, for whom these correlation coefficients were low and not significant. Once again, therefore, there was suggestive evidence that different processes might underlie the drawings of human figures by non-autistic and autistic individuals.
The depiction of difference in style between the school and church figures for the autistic group was highly significantly correlated with both verbal mental age ($r_s = +0.8257, p < 0.005$) and verbal IQ ($r_s = +0.8808, p < 0.001$). This pattern of association for verbal mental ability and depiction of difference in style between the school and church figures was also observed for the control group: verbal mental age $r_s = +0.6974, p < 0.05$) and verbal IQ $r_s = +0.7106 (p < 0.05)$. In addition for the control group, verbal mental age was found to be significantly correlated with the depiction of difference in style between the house and the school ($r_s = +0.6615, p < 0.05$). The interesting finding here is the broad similarity in the pattern of significant findings for each of the two groups, in contrast with the difference found in the pattern among the human figure drawings. This must be interpreted with some caution, however, as the numbers of participants contributing to these results are low.

**Inter-task associations**

The relationship between the three classes of drawing task for each group was considered by calculating Pearson Product Moment correlation coefficients among the first human figure drawn, the first non-human figure drawn (i.e., the house) and the two isographic tasks. The results of this correlation analysis for the autistic group is shown in Table 4.30, and for the non-autistic group in Table 4.31.
Performance on all drawing tasks for the autistic group were highly significantly positively correlated with each other. Thus performance on any one drawing task was predictive of performance on any other drawing task despite the class of drawing. For the non-autistic group performance on the non-human figure drawing and the two isographic tasks were all highly significantly positively correlated with each other. While performance on the human figure drawing was also highly significantly positively correlated with performance on the non-human figure drawing, and was significantly positively correlated with performance on the simple geometric copying task, the correlation failed to reach significance for performance on the complex geometric copying task. The between-group contrast in the different pattern of associations among the human figure drawings and the isographic tasks is of interest, and may point again to the effect of different underlying mechanisms in the construction of the human figure drawing by the autistic group compared with the non-autistic control group.
Overview of the correlation analyses

The patterns of correlation among tasks were interestingly different for the autistic vis-à-vis the non-autistic group. Unlike the non-autistic participants, the autistic group's performance on the human figure drawing was found not to be significantly correlated with either verbal mental age or verbal IQ. On the other hand, for both groups drawing performance on the non-human figure and the two isographic tasks was significantly correlated with verbal mental ability. Thus there appeared to be a specific contrast between the groups in the processes underlying the human figure drawings.

The second pointer to specific between-group differences in human figure drawings was the fact that only for the non-autistic participants was the ability to show differentiation between self and same-sex human figure drawings significantly correlated with verbal mental age and verbal IQ. These group differences will be considered further in the discussion of results.

4.9 Summary of findings and discussion

The findings from both Study I and Study II revealed that in certain respects, the young people with autism were as proficient in their level of drawing ability as their non-autistic matched controls. The autistic group used a similar number of features as their matched counterparts to depict their human and non-human figure drawings, and were as skilled as their non-autistic control counterparts on the two standard geometric copying tasks. These findings are in keeping with those of other studies that have been designed to examine the drawing ability of children with autism who have not been selected for their drawing skill (Charman and Baron-Cohen, 1993; Eames and Cox, 1994; Lewis and Boucher, 1991). The findings of the present study refine this picture by demonstrating that within the three classes of drawing task (i.e., human figure, non-human figure, and isographic), the level of performance between the two clinical groups was comparable in specific respects.
Study I and Study II both found that relative to the non-autistic group, the autistic group were less likely to differentially depict the self and same-sex, and the female and male human figures in terms of their form or style. In contrast to the autistic group the mentally retarded group drew highly differentiated human figures by altering the form and style of the features used to depict their self and same-sex drawings, and their female and male drawings. A conclusive statement regarding the specificity of the poor differentiation among human figure drawings for the autistic group could not be made without examining their ability to show differentiation on a non-human class of drawings. Study II introduced a control condition to examine differentiation among three buildings.

An examination of the differentiation between the non-human figures drawn by the autistic group revealed a contrasting pattern to that observed between their human figure drawings. The two clinical groups performed comparably in drawing the house and school differently in terms of the form of the drawings. The young people with autism, however, were significantly less likely to differentiate these two class of buildings in terms of their style. The two groups performed similarly in the degree of differentiation shown in terms of both form and style for the drawings of the school and the church. Broadly, then, both groups drew differentiated non-human figures by altering the form and in some cases the style of the features used to depict their house and school drawings, and their school and church drawings.

The difference scores between the non-human and human contrasts was also analysed. This analysis revealed that the autistic group were significantly more likely than the non-autistic group to differentially represent features (form) on the non-human drawing tasks than they were on the human drawing tasks. This was not the case for differentiation in terms of style. Thus the findings provide evidence that young people with autism appear to be specifically impaired in their capacity to depict differentiation in human figures vis-à-vis their non-human figures in terms of form.

The findings from these two studies provide evidence that the human figure drawings of the autistic group were as developed, in terms of the number of features used to depict them, as the non-autistic
control group. The manner in which these features were depicted, however, clearly distinguished between the two clinical groups. In order to depict differences among human figures that are drawn to represent a particular person (e.g., the self, mother, or father) or class of person (e.g., a female or male) an awareness of the differences between self and others, and of the difference among others is necessary. This degree of social awareness was not evidenced among the young people with autism relative to their non-autistic matched controls.

The depiction of difference in form between the contrasting pairs of human figures for the autistic group was not dependent on verbal mental ability. For the non-autistic control group the depiction of form between the female and male human figures was not associated with verbal mental ability, but that between self and same-sex human figures was. How might this difference be explained? The difference between the depiction of the female and the male is more explicit than the difference between the self and same-sex figure. The awareness and thus the depiction of oneself as different from others requires the capacity to reflect upon and cognitively process information on aspects of the self that do differentiate self from other. If this is true, it could explain why those young people with mental retardation with higher verbal mental ages showed significantly more differentiation than those with lower verbal mental age.

The argument for a social basis to the depiction of human figure drawings is given further weight from the pattern of correlation coefficients among the drawing tasks for the two groups. As presented in detail earlier, the correlation coefficients suggested that the mechanisms underlying autistic participants' drawings of the first human figures were specifically different from those of control participants. Firstly, these drawings demonstrated a higher correlation with the isographic tasks; and secondly, the degree of contrast between the self and same-sex figure was not related to verbal ability (although this might be attributable to the lesser degree of differentiation between these figures for the autistic participants). Indeed, it is noteworthy that the correlation coefficients between verbal ability and self versus same-sex human figure drawings are higher than those between verbal ability and female versus male human figure drawing only in the non-autistic group. This suggests that in the non-autistic group, cognitive function has a particular role to play in the more sophisticated differentiation needed for the former (self
versus same-sex) distinction. One interpretation of these results is that performance on those tasks which require social understanding is specifically impaired in persons with autism, but that in addition, more general cognitive factors also come into play when non-autistic individuals attempt to differentiate self from other in subtle respects.

To explain the pattern of results obtained, therefore, it is proposed that two distinct underlying mechanisms have a bearing on the different tasks. It is suggested that social mechanisms play an important role in the understanding and construction of the human figure drawings in the mentally retarded control participants. Non-social mechanisms are important for the construction of isographic tasks. It is suggested that young people with autism are specifically impaired in the social mechanisms.

What does it mean, then, for a young person with autism to draw a human figure? Conceivably, without the social mechanisms that guide the non-autistic control group participant's drawings, the young people with autism reproduce a schema or template of the human figure. The fact that the human figure drawings were not related to verbal mental age for the autistic group supports this notion: it appears that only a modest amount of cognitive processing is required to produce the already existing schema. In contrast, the autistic group's non-human and two isographic drawing tasks were significantly associated with verbal mental age. Both these classes of task require additional cognitive processing.

It is of note that all of the young people with autism produced adequate representations of the human figure when asked to do so. They all identified their first drawing as a girl/woman or boy/man, went on to draw a human figure of the opposite sex, and then drew a self-figure which resembled their earlier drawn human figures. All of the young people with autism drew a head, two eyes and a mouth in their representation of their self figure. Furthermore, the majority of the autistic group drew a nose (16 out of 18), legs and feet (14 out of 18), a trunk (13 out of 18), arms and legs (13 out of 18) and hair (11 out of 18). This pattern was similar to the non-autistic controls. On this level, therefore, there appears to be a rudimentary identification of self with other human forms. As postulated in the review, this may be considered as an expression of the self-as-object: a manifestation of the physical self. On the other hand, significantly fewer of the young people with autism were concerned to represent themselves with
features distinct from those already drawn whether deliberately in terms of the forms used, or incidentally in terms of the style used to differentiate the self from the same sex figure. The lack of differentiation using these last two methods of expression may reflect the poor awareness of others as distinct from self.

To conclude, it was predicted that relative to non-autistic control participants, the poor integration of other people into the self-understanding of children with autism would be reflected in their depiction of self vis-à-vis their depiction of others. The results of the present study confirm this prediction, though further work to confirm the specificity of the impairment is required.

In the following two chapters the final set of studies will be presented. These have been designed to examine a specific expression of self, that of the comprehension and production of the first- and second-person pronouns 'I' / 'me' and 'you'.
CHAPTER FIVE: Pronoun understanding and use: Part one

The findings from this and the following two pronoun experiments have been recently published in a single paper:


I am indebted to both Peter Hobson and Shulamuth Chiat for their advice and support in writing this paper.
5.1 Introduction

Two studies have been reported so far that were each designed to examine a particular aspect of the self in young people with autism. The self-descriptions of participants were elicited through the use of a semi-structured interview, and provided highly suggestive evidence for a specific impairment in the interpersonal self of young people with autism. It was of interest that in the course of this interview this sample of able young people with autism generally used first- and second-person pronouns proficiently. Occasionally, however, irregular references to themselves were observed. For example, in response to the question, 'What sort of person are you inside?' one young person with autism replied, 'It's a happy'. There were also occasions when the name was employed to refer to self instead of a first-person pronoun. Another aspect of self that may reflect this specific impairment is self- and other-reference.

The principal thesis is that young people with autism lack the ability to effect intersubjective co-ordination with others and are thus less able than non-autistic individuals to respond to, understand and integrate other people into their representation of the world. The implications of this are that the awareness and understanding of the self, which is defined principally in relation to others, is correspondingly limited in people with autism. In the set of three experiments to follow, this thesis will be examined from the perspective of self- and other-reference as indicated by the comprehension as production of the first- and second-person singular pronouns, 'I' / 'me' and 'you'. The use of these 'shifting reference' terms requires an appreciation of different people's co-ordinated and complementary psychological orientations within communicative contexts. It was predicted that, compared with matched non-autistic control individuals, young people with autism would have greater difficulty in comprehending, and a lesser propensity and/or ability to produce, personal pronouns vis-à-vis proper names compared with matched non-autistic young people with mental retardation.

In this chapter, the emergence of first- and second-person pronouns in normally developing children will be traced, and the prerequisites for these terms' comprehension and use considered. A select number of
studies that have examined personal pronouns in young people with autism will then be reviewed. Finally, the first of three experiments designed to systematically examine the comprehension and use of 'I' / 'me' and 'you' in young people with autism will be reported.

The first experiment deployed a visuo-spatial role-taking task to examine the comprehension and production of the first- and second-personal singular pronouns. The second and third experiments employed head and shoulder photographs of the young people themselves, two familiar class-mates, and the experimenter to examine self- and other-recognition and identification through the participant's comprehension and use of 'I' / 'me' and 'you'. These final two experiments will be reported in Chapter Six.

5.2 Personal pronoun comprehension and use in normally developing children

Charles Cooley (1908) observed his daughter from birth up until just before her third birthday, with the specific intention of recording her explicit understanding and use of self- and other-reference words and the contexts within which they emerged. He was particularly interested in how the term 'I' was acquired.

*It is evident that the learning of 'I' offers a somewhat peculiar problem. The reason is the apparent impossibility of learning its proper use by direct imitation. As used by other persons it never, apparently, means the same thing as when used by the child. An apple is an apple to all alike, but 'I' is different for every user of the word (p. 340).*

Cooley observed that his daughter began to demonstrate a sense of power over other persons at three-months of age: she cried to be picked up, cried in protest to being laid down, and cried for her bottle; she demonstrated anger at being neglected, and was calmed when held. A sense of pride in control over her own body and over material objects was observed at four months of age. These were viewed by Cooley as early manifestations of a sense of appropriation, which he assumed as fundamental for the later use of self-words.

*Those cases where the thing appropriated is not a material object but the attentions of other people are especially pertinent. They seem to be the beginnings of that desire for control over them, for social power, which plays so large a part in the mature self (p. 343).*

254
The correct understanding of the personal pronouns 'I' / 'my' and 'you' / 'your' when used by other people was achieved at 19 months of age. For example, Cooley reported that his daughter correctly responded when asked to 'touch your/my nose'. At this time also she referred to other people by name, but did not as yet use any linguistic reference for herself. At 22 months of age, the word 'I' was used imitatively and embedded in stock phrases as in 'I see' and 'I do'.

Cooley argued that through the regular and consistent emphasis, and the appropriate actions that accompany the use of 'I' and 'me' and 'my' by others, the subjective meaning of 'I' becomes attained by the child.

*These indications awaken his own self-feeling, already existing in an inarticulate form. He sympathizes with them and reproduces them in his own use of these words. They thus come to stand for a self-assertive feeling or attitude, for self-will and appropriation (p. 341).*

The earliest and correct use of 'I' and other first-person pronouns was observed at 23 months. Its use was not contained in stock phrases, but was observed in proper context, and often expressed with emphasis. The 'I' was not used to refer to the physical self, but to a self-assertive feeling that was linked with an action or emphasis expressive of that feeling. Interestingly, at the same time as the emergence of 'I', Cooley observed that his daughter began to use the word 'baby' to refer to her physical self. He felt that this physical term was learned by direct imitation and association, like the name of any other visible object. He concluded:

*I' is social in that the very essence of it is the assertion of self-will in a social medium of which the speaker is conscious ... 'I' is addressed to an audience - usually with some emphasis - and its purpose is to impress upon that audience the power ('I make go'), the wish ('I go play and pile'), the claim ('my mama'), the service ('I get it for you') of the speaker. Its use in solitude would be inconceivable (though the audience may, of course, be imaginary) ... 'I' is a differentiation in a vague body of personal ideas which is either self-consciousness or social consciousness ... In the use of 'I' and of names for other people, the ego and alter phases of this consciousness become explicit (p. 342).*

Broadly, the time scale for the emergence of first person pronoun usage outlined by Cooley has been confirmed and refined through the systematic study of the language development of normally developing children. Charney (1980) examined the understanding of 'my' and 'yours' in 21 normally developing 1½- to 2½-year-olds, and their spontaneous use of personal pronouns. Charney found that very few pronoun
reversals occurred, and those that did appeared to be momentarily confused, as the children used the pronouns correctly at other times in the course of the study. 'My' was produced correctly in self-reference before it was understood from the speaker's perspective. As observed by Cooley, Charney found that early use of 'my', 'I' and 'me' were always part of particular actions, like claiming a desired object whether they were used as single-word utterances or embedded in stock phrases. The speaker's 'my' was associated with the adult's actions: the child would imitate the entire activity, including the adult phrase, in which the pronoun as an undifferentiated unit was embedded. These early first-person pronouns, then, had no independent meaning, and were repeated as wholes that included the actions of the speaker rather than the experience of the listening child. Also, they did not shift from person to person: they only applied to the child her/himself. The earliest understanding of 'your' was in reference to the child being addressed, and was not understood when the child observed other people being addressed. From these findings Charney concluded:

... normal children do not have to master the shifting reference of a pronoun nor do they have to differentiate it from its surrounding linguistic context in order to avoid pronoun reversals. What is probably required is the ability to represent oneself as separate from others and thus to perceive oneself in relation to others. The young child, whose representation of you is restricted to understanding its meaning when he is addressed, must be able to recognize that he is being addressed, which in turn requires an awareness of himself (as addressee) in relation to others (as speakers). The child who imitates I in connection with its original speaker's action (and thus uses it correctly) must be able to realize that the speaker's experience is separate from his own, yet is an experience with which he can identify, and later imitate (Charney, 1981: p. 41).

This position accords with Cooley. The existence of an underlying social mechanism that enables proper comprehension and use of personal pronouns (Bosch, 1970; Charney, 1980; Cooley, 1908) has been challenged. The complexity of 'shifting reference' has been viewed by others as a problem that requires cognitive mechanisms. The normally developing child who is coming to employ first- and second-person pronouns, must perceive other people in terms of their current and respective speech roles in discourse, and come to understand that I am 'I' to myself, and that you are 'I' to yourself; that you are 'you' to myself, and that I am 'you' to yourself. This converts the problem into one of logistics and reasoning, rather than social identification and emotional resonance. The logistic nature of 'shifting reference' has led some theorists and researchers to stress the cognitive or linguistic factors, that are primarily non-social, as underlying correct personal pronoun assignment (e.g., Fay, 1971). The issue has been
examined by studying normally developing children who make errors in their understanding and use of personal pronouns.

The period during which a child is learning to produce and understand first- and second-person pronouns correctly often lasts up to a year from the time they are first produced embedded in stock phrases. They are acquired gradually, with occasional pronoun errors observed. Normally developing children are more likely to confuse 'I' and 'you' in comprehension than in production during this period. The reversal of 'I' and 'you' in production when they are observed, are thought to result from the child's difficulty in understanding that 'I' and 'you' are always used and understood from the speaker's own point of view. It has been suggested that a kind of non-egocentrism is necessary for the child to grasp the shifting reference of such terms (de Villiers and de Villiers, 1974).

Loveland (1984) reasoned that the basis for acquiring 'I' / 'you' may be found in the young person's efforts to disentangle the difference between his own and other people's points of view on a concrete, spatial level, and proposed that until this primitive difference in spatial point of view is understood, the notion of speaker's point of view remains to some degree confusing to the child. Loveland conducted two studies to examine the developmental relationship between understanding differences in spatial point of view and correct comprehension and production of the first and second personal pronouns 'I' and 'you'.

The first study was cross-sectional, and examined the performance of 27 young children who ranged from 2 to 3½ years of age. The children's performance on visuo-spatial tasks were compared with their performance on language tasks. The visuo-spatial tasks were presented in pairs, in each of four increasingly demanding conditions: (a) the experimenter attempted to elicit a hiding response from the child, then hid an object herself to see whether the child would look for it; (b) the experimenter shifted gaze to see if the child would follow her line of regard, then made a protodeclarative gesture to see if the child would show interest in something she/he could not see; (c) the experimenter encouraged the child to show a picture and then an object to their caregiver, to see if she/he would orientated the picture/object for an accurate inspection by her/his caregiver. The child was judged to have demonstrated some knowledge that points of view differ if she/he succeeded in this third pair of tasks;
and (d) the experimenter presented a card with a picture on both sides to the child to examine whether
the child could appreciate that while she/he is looking at one picture the experimenter must be looking
at the other, then the experimenter examined whether the child could appreciate that an object visible to
her/him only could not be seen by the experimenter, and vice versa. The child was judged to have
demonstrated a full understanding of the ways in which points of view differ if she/he succeeded in this
fourth and final pair of tasks. The language tasks were designed to assess the comprehension and
production of the personal pronouns 'I' and 'you'. For example, to assess comprehension the child and
experimenter held a different toy each. The experimenter asked, 'What do I/you have?'; to assess
production, the experimenter asked 'Who has the (toy)?'

Loveland found that the five children who showed no understanding of the possibility of differing points
of view (i.e., who passed the first and second pair of spatial tasks but not the third or fourth) did not use
pronouns correctly; the eleven children who showed some knowledge of the possibility of differing
points of view (i.e., who passed the third pair of spatial tasks but not the fourth) made some errors; and
the ten children who showed full understanding of differing points of view (i.e., who passed the fourth
pair of spatial tasks) made no pronoun errors. The level of advancement was not clearly related to
chronological age.

The second study conducted by Loveland was a longitudinal follow-up of nine children just under two-
years of age, who were in the process of learning 'I' / 'you' correctly. These children were visited at
home, and the four pairs of spatial tasks were administered. In the course of the visit the experimenter
made broad judgements of personal pronoun comprehension and use. Loveland found that the personal
pronouns, 'I' / 'you' were not free of errors for any child before the fourth pair of spatial tasks were
passed, suggesting that progress in acquiring the 'I' / 'you' pronouns is related to increasing knowledge
about points of view.

The results of both Studies I and II support the hypothesis that children learn to apply the
notion of speaker's point of view to the use of I/you pronouns by first mastering the notion
of differing spatial points of view (p. 554).

Loveland goes on to argue that this developmental relationship does not imply that knowledge about
points of view alone is sufficient to explain all aspects of the acquisition of 'I' / 'you' pronouns. Rather,
the pattern of acquisition described involves the child's attempt to master the correct application of the pronouns. The deictic function of these terms, Loveland argues, provides a clear link between the child's growing understanding of the visual/spatial relations among persons and her/his emerging ability to refer to persons.

The issue of 'shifting reference' has also been examined by studying atypical children who make more persistent errors in their understanding and use of personal pronouns than do some normally developing children. Chiat (1982) conducted a detailed single-case study on a persistent pronoun-reversing child. Chiat reported that such reversals though frequent, were not consistent. The child used first- and second-person pronouns correctly as well as incorrectly. Furthermore, while first person pronouns were used correctly and incorrectly, second person pronouns were almost always used incorrectly. Thus, pronoun reversal, though occurring in reference to self and other, occurred significantly more often in reference to the other.

This peculiar distribution of the pronouns shows that the child had not actually reversed the pronouns, treating you as speaker and I as addressee, since this would result in consistent errors. Nor had the child neutralised the distinction between 1st and 2nd person pronouns, using them fully interchangeably, since this would result in a random distribution of correct and erroneous usage (Chiat, 1986; p 389).

In addition, Chiat (1982) formally examined the comprehension of the pronouns 'I' and 'you', and found that the child's performance was near perfect, indicating that he had made a clear distinction between the forms which he appeared to confuse in production. Chiat concluded that pronoun reversal did not reflect an identification of pronouns with proper names, which would result in consistent reversal in production, and parallel errors in comprehension. Rather, the investigator argued that the child did control adult person distinctions (as shown by the performance in the comprehension assessment), and suggested that reversal in production was not due to any confusion about the semantics of pronouns, but to a confusion about their pragmatic function. That is, the child appeared to have created novel pragmatic functions for pronouns, using pronouns correctly to reflect the self's perspective, and incorrectly to take up the other's perspective. Pronoun reversal, then, represented an imposed non-adult function of shifting perspective on the yet unacquired normal adult function of defining speech role, and not a confusion between persons.
Pronoun difficulties have also been observed in children who have been blind from birth. Fraiberg and Adelson (1977) studied such a group of congenitally blind children who were not significantly delayed in their overall language development, nor mentally retarded or neurologically impaired. Nevertheless, these children exhibited a distinct delay in the acquisition of correct 'I' / 'you', up to five years of age or later in some cases. The investigators suggested that blindness impairs the child's ability to form a mental representation of the self that might allow the child to see her/himself as others see her/him (i.e., to appreciate another person's point of view). Fraiberg and Adelson argued that the mental representation of the self is a crucial achievement that makes possible the correct use of 'I' / 'you'.

In summary, it would appear that there are a number of important developmental factors that have been posited to underpin the ability to use personal pronouns proficiently. It has been proposed that the young child must develop a non-egocentric stance to appreciate the 'shifting reference' terms 'I' and 'you', and must first hold a mental representation of self before the correct use of 'I' and 'you' is achieved. It has been demonstrated that the capacity to understand the visuo-spatial perspective of the speaker and addressee emerges at the same time as correct pronoun usage. Each of these factors require an awareness of other as similar, but distinct from the self. Cooley suggested that the 'I' is understood through the young child's experience of others' regular emphasis on, and consistent associative actions in relation to the term. 'I' comes to be used by the child as a self-assertive feeling or attitude for self-will and appropriation.

The debate as to whether social or non-social factors play a leading role in the comprehension and production of personal pronouns has also been brought to the field of autism. In the next section, a select number of studies that have examined the understanding and use of personal pronouns in young people with autism will be reviewed.
5.2 Personal pronoun comprehension and use in young people with autism

Leo Kanner (1943) gave prominence to the children's abnormal use of personal pronouns. He wrote:

*But the absence of spontaneous sentence formation and the echolalia type reproduction has, in every one of the eight speaking children, given rise to peculiar grammatical phenomenon. Personal pronouns are repeated just as heard, with no change to suit the altered situation. The child, once told by his mother, "Now I will give you your milk", expresses the desire for milk in exactly the same words. Consequently, he comes to speak of himself always as "you", and of the person addressed as "I". Not only the words, but even the intonation is retained (p. 244).*

From a clinical perspective, Bettleheim (1967) believed that young people with autism deliberately avoided using the personal pronoun 'I' in early parts of their development to mentally defend themselves against their own identity. Bosch (1970) maintained that the reversal of the pronouns 'I' and 'you' resulted from the inability of the young people with autism to differentiate themselves from others, and to view themselves in relation to them.

Charney (1981) reasoned from the findings of her research with normally developing 1½- to 2½-year-olds (Charney, 1980), that young people with autism imitate first- and second-person pronouns in association with their own experience when they heard the word; that they are replicating a multisensory experience. She points out that reversed 'you' is more frequent than reversed 'I' (which is sometimes absent altogether) because the experiences that would be most salient to the child are those relating to her/himself - that is, those where the speaker would use the word 'you'.

In contrast to this explanation, the reversal of personal pronouns has been understood in terms of the tendency for young people with autism to echo (Bartak and Rutter, 1974; Kanner, 1943). Bartak and Rutter (1974) tested eight young people with autism who were each capable of some degree of spontaneous speech, who displayed spontaneous, immediate echolalia, but who had never uttered 'I' spontaneously. The young people with autism ranged from 6½ to 12 ¾ years of age, in non-verbal IQ from 40 to 100 points, and from 3 to 6½ years in verbal mental age. They presented grammatical three-word sentences, each containing a personal pronoun (I / you / he / she / me) and two other words. Six
sentences were constructed so that each personal pronoun occurred as either the first word (e.g., 'I am big'), the second word (e.g., 'Can I come?'), or the last word of the sentence (e.g., 'How can I?'). Each participant was presented with all 90 sentences over the course of three structured play sessions.

Bartak and Rutter found that the frequency of echoing of pronouns in the final sentence position (mean score = 29) was higher than for either the first position (mean score = 16) or the middle position (mean score = 17). When each participant's pattern of performance was considered, however, it was found that only three young people with autism responded with echolalic repetition of the last word, while the other five responded with the whole utterance. The results were held up to provide evidence that at least in their echolalic utterances, young people with autism do not refuse to echo 'I' per se in the way that had been suggested by Bettelheim (1967).

On the contrary, they support the view that failure to use I reflects an accidental combination of its usual sentence position and the tendency of some autistic children to echo only the final part of sentences which they hear (p. 221).

Fay (1971) suggested that personal pronouns do serve as differentiated, meaningful units for young people with autism, but that the meaning is incorrect. The young people with autism may understand 'you' always means her/himself rather than who is being addressed. This comes about, according to Fay, because of the individual's primitive verbal level: she/he is not yet able to cope with the shifting reference of 'I' and 'you' from person to person. Delayed echolalia is understood to also reflect this low level of verbal development: the inability to understand much of the language heard.

These accounts do not explain, however, the abnormal pronoun use in the non-echolalic utterances of young people with autism, nor the reported instances of 'third-person' self-references by the use of names and the pronouns 'he' / 'she', nor the occasions on which the children seem to substitute unusual passive constructions for what would normally be expressed in assertive first-person statements (e.g., Bosch, 1970).

A more radical approach has been to consider whether limitations in self-other differentiation and/or self-conception might underlie both the confusions with personal pronouns and the tendency to echolalia (Mahler, 1968; Hobson, 1990). As Kanner's (1943) account illustrates, echolalia is the use of someone else's language unmodified according to the vantage point of the child in the child's own setting. Instead
of relating the other person's utterance to that person's attitude and then 'identifying' with the other person's stance, autistic children tend to adopt speech forms that correspond with their experience of the circumstances in which the words are uttered and to repeat utterances as heard (Charney, 1981). According to this perspective, impairments in personal-social understanding might be at the root of autistic children's linguistic 'role-taking' deficits.

The controversy has mostly been based on clinical observation of young people with autism. Is there more than anecdotal evidence that difficulties with personal pronouns in young people with autism extend beyond instances that might plausibly reflect a tendency to echolalia? Controlled experiments on the issue are surprisingly rare. Jordan (1989) examined first and second person pronoun comprehension and production in eleven young people with autism, who ranged from 6½ to 16½ years of age, and in verbal mental age from 3½ to 9½ years. They were group matched with eleven young people with mental retardation for chronological age and verbal mental age, and with eleven normally developing children for verbal mental age. The comprehension of 'me' / 'you' was measured using ten simple instructions for each pronoun, such as 'Make the doll kiss you/me'. Pronouns were elicited by the experimenter manipulating the items in relation to herself or the young person, and asking ten questions for each pronoun, such as 'Now the puppet's tickling ...?'

Jordan found that all three groups performed at or near ceiling on the comprehension tasks. On the other hand, ten of the eleven young people with autism responded with their own name or the pronoun 'I' to the majority of actions directed at themselves, where the target response was 'me'. This compared with all of the young people with mental retardation, and ten of the normally developing children responding with the target response (i.e., 'me') to the majority of actions. Similarly, when the actions were directed towards the experimenter, ten of the young people with autism responded with the experimenter's name or with the pronoun 'I' to the majority of actions, while all of the participants in both groups produced the target pronoun (i.e., 'you') to the majority of actions. This pattern of results is suggestive that the children were using abnormal forms of self- and other-reference, not merely echoing.
Oshima-Takane and Benaroya (1989) have suggested that one of the reasons that individuals with autism might have difficulty in learning personal pronouns, and in particular the second person pronoun 'you', is that when witnessing a conversation between two other people, they do not attend to the ways in which one person addresses the other as 'you'. Such observations from the non-addressee position can help to disambiguate the meaning of 'you' by revealing that the term shifts across individuals according to whom is being addressed by the speaker. These authors conducted an exploratory study of four children with autism, and noted that the one child who improved in the use of 'you' was the child who had best attended to the conversation between two adults, and who was therefore in a position to learn the correct use of the second person pronoun. On this very circumstantial evidence, they concluded that autistic children could process information provided by others' use of pronouns, but may fail to attend to such information.

Jordan and Powell (1995) consider that in addition to this effect, it may also be a problem for children with autism to understand that the speaker intends that the term 'you' is to apply to the addressee, for reasons to do with their limited understanding of mental states. Moreover, lacking a sense of an 'experiencing self', they are likely to have little understanding of conversational roles, and may not express agency ('I do it') or the recipient role ('me').

Drawing upon the writings of de Villiers and de Villiers (1974), Bruner (1975) and Charney (1981), Hobson (1990) has suggested that the inability or delay in recognising reciprocal roles in dialogue arises through the failure of young people with autism to apprehend, (a) the commonality between the experiences of themselves and others, and (b) the differentiation of different people's affective-conative attitudes and perspectives. Such explanations prompt questions both about the basic constituents of or substrates for a sense of agency and possession which Bosch (1970) has considered to be deficient in autistic individuals, and about the sequelae to impairments in recognising persons as persons, such as autistic children's limited capacity for self-consciousness and self-reflection (Hobson, 1990). Each of these levels of explanation might be relevant for the children's difficulties in recognising people as centres of subjectivity and as the occupants of reciprocal roles in discourse.
An investigation by Silberg (1978) illustrates how studies of personal pronouns promise to elucidate such abstruse matters of self-development. Silberg examined the development and context use of first-, second- and third-person pronouns in the spontaneous speech of 23 children who met criteria for childhood psychosis (14 of whom were diagnosed autistic). The full sample ranged from 5 to 16 years of age. In the course of a 30 minute play session, three activities were presented to stimulate conversation. The first activity examined reference in relation to possession. The young person, the experimenter, and a male puppet were each given a bag of sweets, and given a chance to hide their bag in the room. The young child was told that whoever found the sweets could keep them. The second activity examined reference in relation to action. After the participant, experimenter and puppet bowled down some skittles, the experimenter asked the young person, 'What happened?'. The third activity examined reference in relation to description. The young person was asked to draw a picture of her/himself, and then one of a family member, friend or teacher. While the child drew, she/he was asked, 'How are you different from me?'; 'How is your friend different from you?'; and 'How am I different from your friend?'

The mean length of utterance was calculated for each participant in the 30 minute session, and four levels defined: Level I (1.0 to 1.5 words); Level II (1.7 to 2.1 words); Level III (3.0 to 3.7 words); and Level IV (3.9 to 5.1 words).

The investigator found that at mean length of utterance Level I, there was no significant differences among the mean numbers of 'I', 'you' and 'he' utterances. On the other hand, there was a rapid increase in the use of 'I' at Levels III and IV and an increase in the use of 'you' at level IV. Only children with a short mean length of utterance (i.e., Levels I and II) made the error of using their proper names instead of first-person pronouns and echoing the questions instead of responding, but all subjects tended to use neuter pronouns instead of personal pronouns (e.g., 'it fell', 'that happened'). In addition, there was suggestive evidence that the children first used personal pronouns to express possession, then to indicate action, and finally to apply description. In the absence of a control group, however, it was not possible to judge how far this pattern deviated from that in comparable non-autistic young people.

In summary, although the first- and second-person singular pronouns are amongst the first to be acquired by normal children, little is known about the usage of these pronouns in different contexts. The facts that sporadic use of pronouns often precedes more systematic and frequent use, that it is often
difficult to determine whether the pronouns have achieved 'syntactic independence' from the phrases in which they are embedded, and that 'errors' may reflect specialised rather than deficient forms of pronoun usage (Chiat, 1982), each contribute to the difficulties in establishing a 'normal' developmental timetable for increasingly adult-like pronoun usage. It follows that in order to establish abnormal patterns of pronoun use in atypical groups of children in specific (and often rather contrived) experimental settings, comparisons with the performance of control groups in the same settings is vitally important. For this reason, the present set of studies were conducted with groups of autistic and non-autistic subjects who were very closely matched for chronological age and verbal ability.

5.4 Personal pronouns in young people with autism: Experiment I

The aim of the first experiment was to investigate comprehension and production of the personal pronouns 'I' and 'you' in young people with autism as these terms referred to the child and the experimenter seeing different pictures. Control tasks that were designed to test for the influence of pronoun-independent demands of the visuo-spatial tasks, included tests of comprehension in which proper names were employed in place of personal pronouns. To reiterate, it was predicted that young people with autism would have greater difficulty in comprehending, and a lesser propensity and/or ability to produce, personal pronouns vis-à-vis proper names compared with matched non-autistic young people with mental retardation.

Participants

The study group comprised twenty-five young people with autism (five females and twenty males) who were diagnosed according to the criteria of DSM-III-R (American Psychological Association, 1987). Each of these individuals had suffered early onset of social impairments characteristic of autism, which were currently manifested along with typical deficits in the realms of communication, imaginative activity and stereotyped behaviour. They were given the British Picture Vocabulary Scale (Dunn, Dunn,
and Whetton, 1982) to provide an estimate of verbal mental age. The autistic group were then divided into higher- and lower-functioning sub-groups based on their performance on the verbal comprehension measure. The young people with autism were individually matched with 25 young people with mental retardation for both chronological age and verbal mental age (Table 5.1). The control group comprised individuals whose mild intellectual retardation was not ascribable to any diagnosed medical condition.

<table>
<thead>
<tr>
<th></th>
<th>Autistic Higher-functioning</th>
<th>Autistic Lower-functioning</th>
<th>Non-autistic Higher-functioning</th>
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<td>14:09</td>
<td>17:02</td>
<td>14:09</td>
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<tr>
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<td>43</td>
<td>54</td>
<td>34</td>
</tr>
<tr>
<td>Range (years; months):</td>
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<td>8:04 - 19:06</td>
<td>12:00 - 25:08</td>
<td>8:11 - 18:07</td>
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<td>Verbal mental age</td>
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<tr>
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<td>4:07</td>
<td>6:11</td>
<td>4:09</td>
</tr>
<tr>
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<td>8</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Range (years; months):</td>
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<td>3:05 - 5:05</td>
<td>5:06 - 8:01</td>
<td>3:04 - 5:10</td>
</tr>
</tbody>
</table>

Table 5.1 Pronoun Experiment One: Participant characteristics

Preliminary survey of personal pronoun understanding and usage

In order to set the scene for the present study, the class teacher or immediate supervisor of each participant was asked to complete a screening questionnaire that covered a range of clinical features corresponding with DSM-III-R diagnostic criteria, and that required them to indicate the presence or absence of problems with the production of personal pronouns such as 'I', 'my', 'mine', 'you', 'your', 'yours', 'we' and/or 'us'. In addition, the deputy-head teacher or workshop supervisor who also knew the students well, was asked whether the young person had current difficulties in the comprehension and/or production of the pronouns 'I' and 'you', and if so to provide recent examples of such difficulties. The results were that no non-autistic mentally retarded participants were reported as showing abnormality in the use of personal pronouns, but 17 out of 25 young people with autism (nine higher- and eight lower-functioning participants) were reported to do so by both independently-rating teachers (Chi square =
22.8, \( p < 0.001 \), and a further two participants were said to do so by one of the respondents. A typical example cited was that of a young boy who approached his teacher on her return from sick leave and said, 'I'm better now'.

Experimental procedures

The first pronoun study comprised three conditions: firstly, baseline procedures to test the participants' capacity to accomplish tasks of the form employed; secondly, tests of the comprehension of personal pronouns vis-à-vis personal names; and thirdly, tests of the spontaneous production of personal pronouns. Each participant was tested in two sessions each lasting about 15 minutes, and conducted on different days. Each session began with a Production task, which was followed by either the baseline procedure, or by the Comprehension task. The aim was to reduce the degree to which the questions of the Comprehension tasks might influence participants' responses in the Production tasks. Within this fixed arrangement, there was a counterbalanced order of presentation of different versions of the Production and Comprehension tasks, in a manner to be described. Matched pairs of subjects performed all tasks in exactly the same order.

For simplicity, the baseline procedures, Comprehension tasks and Production tasks will be described in that order. It needs to be remembered that this does not correspond with their order of presentation.

'Baseline' procedures

Two conditions were designed to examine the participants' ability to meet basic task-demands for the study, and in particular to assess their ability to register and recall relevant information and to make appropriate verbal responses. In neither of these 'baseline' conditions were personal pronouns employed.
Baseline 1: Naming pictures according to position.

Method
This was always the first 'baseline' procedure to be conducted. The experimenter sat opposite the participant across a table. The procedure was videotaped, and the participant's replies to the experimenter's questions were coded from this record. The experimenter was well known to all of the participants, but he confirmed that each individual knew his name.

The experimenter introduced a 32 cm by 26 cm white cardboard sheet, on each side of which was fixed a 10 cm by 7 cm line drawing of a familiar object (e.g., a picture of a hat on one side and a picture of a drum on the other side of the sheet). The experimenter ascertained that the participant could provide a name for each picture, and then rehearsed these names until the participant could recall what was on either side of the sheet.

The experimenter then held the cardboard sheet vertically between himself and the participant, so that each could see one picture only, and such that both were able to see each other's eyes over the top of the sheet. The experimenter asked, 'What's on this side?', as he made an expansive hand gesture that indicated his own side of the sheet. If necessary, participants were allowed to look over the sheet, although few in fact needed to do so. After the participant had replied, the experimenter gestured to the participant's side of the sheet without pointing to the drawing itself and asked, 'What's on this side?'

Subsequently two further sheets with new pictures were employed in the same way, except that on one occasion the experimenter began by indicating the participant's side of the sheet and followed by indicating his own side.

Results
Every single participant of both groups correctly named the picture on her/his own side of the sheet, and all but one young person with autism and two non-autistic individuals correctly named each of the
pictures that were on the experimenter's side. Almost all participants, therefore, were proficient in
naming the pictures according to their respective positions.

Baseline 2. Naming pictures according to point of view

Method
For this condition, the experimenter was accompanied by an adult accomplice. Both adults sat opposite
one another, whilst the participant sat to one side between them. The seating was arranged so that when
one of the sheets was held between the adults such that the experimenter saw one picture and the
accomplice saw the other, the participant was able to adopt an 'edge-on' view of the sheet and see both
pictures.

The experimenter introduced one of the sheets, and demonstrated to the participant which picture was
on either side until the participant could remember them. This experimenter then placed the card
vertically upright between himself and the accomplice, and conducted a procedure which recurred in
subsequent tasks, and which was termed the 'systematic turning' procedure. This technique was designed
to induce participants into making errors if they were inattentive or were otherwise less than fully
confident in responding to the questions posed.

For the present task, the 'systematic turning' procedure was conducted with proper names, as follows:

(a) the experimenter asked, 'What can (name of accomplice) see?';
(b) when the participant had replied, the experimenter turned the sheet and asked, 'What can
(name of accomplice) see?' This meant that the question had not changed but the position of the
pictures and therefore the correct response had changed;
(c) without turning the sheet, the experimenter asked, 'What can (name of experimenter) see?'
Here only the question had changed, so that the correct response changed accordingly;
and (d) the experimenter turned the sheet, and asked, 'What can (name of experimenter) see?' Thus the question remained the same but the correct response changed according to the changed perspective.

A second cardboard sheet with a new picture on each side was then introduced and the sequence proceeded thus:

(e) the experimenter asked, 'What can (name of accomplice) see?';

(f) without turning the sheet, the experimenter asked, 'What can (name of experimenter) see?';

(g) the experimenter turned the card, and asked, 'What can (name of experimenter) see?';

and (h) the experimenter again turned the card, and asked, 'What can (name of accomplice) see?'

In the latter case, there was both a change in question and a change in visual perspectives, but the correct response remained the same as for the preceding question.

Throughout this task, and indeed throughout all subsequent occasions on which this 'systematic turning' procedure was used, the participants were informed that they could look at the picture (or, when appropriate, look over the sheet) as and when they needed to. This was not supposed to be a test of memory.

Results

Each participant made a total of eight responses, four of which referred to what the experimenter could see, and four to what the accomplice could see. Within each group, there were minimal differences in the number of errors in response to questions about what the experimenter could see vis-à-vis what the accomplice could see, and therefore groups were compared on total scores. Nineteen out of 25 young people with autism and 10 out of 25 non-autistic individuals responded correctly throughout (employing Yates' correction, Chi square = 5.255, df = 1, p<0.025). In fact, only two young people with autism and six non-autistic individuals made more than one out of eight incorrect responses, and of these, only one person with autism and three non-autistic individuals made more than two errors. A high proportion of the participants of each group, therefore, were very consistent in responding correctly. In fact, a greater
number of young people with autism performed perfectly in naming which picture each of the two named adults could see.

TASK 1(a): Comprehension of personal pronouns using a visuo-spatial task

Method
The experimenter and the participant sat opposite one another. The experimenter held a new set of sheets, each with a different picture on each side, vertically between himself and the participant. He began by teaching the participant what was on each side of the sheet, and then followed the 'systematic turning' procedure. To examine comprehension of the first- and second-person pronouns 'I' and 'you', the procedure was as follows:

(a) 'What can you see?';
(b) (turn sheet) 'What can you see?';
(c) 'What can I see?';
(d) (turn sheet) 'What can I see?';
(e) (introduce a new sheet) 'What can you see?';
(f) 'What can I see?';
(g) (turn sheet) 'What can I see?';
and (h) (turn sheet) 'What can you see?'

The 'systematic turning' procedure was designed to test the comprehension of the first- and second-person pronouns. It was assumed that the demands of this procedure would provoke a difficulty if there was any uncertainty in the understanding of 'I' or 'you'. For example, the last item in the series differed from the previous one in the question posed and in the visual perspective entertained by the participant and by the experimenter, but the correct response remained the same. As a control task, the 'systematic turning' procedure was repeated with two new picture sheets, except that the experimenter used the participant's name instead of 'you', and his own name instead of 'I', in each of the questions.
The sequence of the questions and actions of the 'systematic turning' procedure were fixed, but a random half of the young people with autism along with their matched non-autistic counterparts performed the 'personal pronouns' task before the 'names' control task, and half performed the tasks in the reverse order. These two tasks always followed one another in the same testing session.

It was predicted that young people with autism would be specifically impaired in their comprehension of the first- and second-person pronouns 'I' or 'you' compared with their understanding of the respective names, vis-à-vis the matched control group.

Results
There were four questions each that featured 'I', 'you', the experimenter's name and the participant's name, so that the maximum total score was 16. Fifteen out of 25 young people with autism and 16 out of 25 non-autistic individuals achieved the maximum score of 16 correct responses. There was broad comparability across groups in the numbers and distribution of errors. Wilcoxon's matched-pairs signed-rank test was employed to test for differences between groups in overall responding, as well as in participants' replies to 'I', 'you', the experimenter's name and the participant's own name considered separately. There were no significant group differences.

It had been predicted that autistic subjects would have more difficulty in responding to questions involving personal pronouns than those involving proper names. To examine this prediction directly, the results from those participants who made one or more errors overall were examined for each individual's relative performance on 'you' vis-à-vis her/his own name questions, and on 'I' vis-à-vis the experimenter's name questions (Table 5.2). There is only the most tentative evidence to suggest that young people with autism might have had relatively more difficulty than non-autistic individuals in responding to 'you' rather than to their own name. In this as in other respects, the group similarities in performance on this task were far more striking than the differences. Thus, the prediction concerning group differences in first- and second-person singular pronoun comprehension were not borne out.
### Scoring Categories

<table>
<thead>
<tr>
<th></th>
<th>Referring to S ('you')</th>
<th>Referring to E1 ('I')</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Autistic</td>
<td>Non-autistic</td>
</tr>
<tr>
<td>More correct responses on pronouns:</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Equal:</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>More correct responses on names:</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Number of participants:</td>
<td>10</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 5.2 Comprehension Task 1(a): Performance of those subjects who made at least one error overall

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**TASK 1(b): Production of personal pronouns using a visuo-spatial task**

**Method**

There were two versions of this task, which were presented in counterbalanced order. One was administered at the beginning of the first testing session, and one at the beginning of the second session. In both forms of the task, the experimenter first reminded the participant of the names of himself and the adult accomplice - a procedure that may have influenced how participants responded in the task itself. The experimenter then introduced one of the cardboard sheets with a different picture on each side, and by showing and naming each picture to the participant several times, taught her/him which picture was on either side of the sheet.

i. The experimenter - accomplice condition.

In this task, the experimenter and the accomplice sat opposite one another with the sheet held vertically between them, and with the participant sitting to one side with an 'edge-on' view. In this way, the experimenter and the accomplice could each see only one picture (e.g., the experimenter could see a teddy bear and the accomplice a spade), while the participant could see both pictures.

The experimenter asked the participant, 'Who sees the teddy bear?', and then 'Who sees the spade?' Subsequently, the experimenter produced another sheet with new pictures, and asked similar questions but this time naming first the picture in front of the accomplice; and then a third new sheet was
introduced, and the experimenter repeated the same questions, again referring first to the picture in front of himself. Participants, therefore, made six responses in all, three of which should have made reference to the experimenter - to whom the participant might refer to by name or 'you' - and three of which should have referred to the accomplice - to whom the participant might refer to by name or 'him'.

ii. The experimenter - participant condition.

For this version of the task employing new pictures, the experimenter and the participant sat opposite one another. The experimenter posed similar questions about who could see what, in the same order as previously. The issue was whether in indicating who could see each picture, participants referred to the experimenter and themselves by personal pronouns ('you' and 'me' / 'I'), by names or by other terms.

Results

Responses were initially categorised as follows: (a) 'correct' versus 'incorrect', where 'correct' meant any verbal response that unambiguously referred to the person who could see the picture in question, whatever descriptive term was used; and (b) within the 'correct' category: 'personal pronoun' versus 'name' versus 'other term'. As it turned out, all correct responses involved personal pronouns or names, so the category of 'other term' was dropped. Subsequently, a more detailed analysis according to 'sub-categories' of response was conducted, in a manner to be described later. Throughout, each of the diagnostic groups was considered as a whole, and then divided in half to form an higher-functioning sub-group and a lower-functioning sub-group (see Table 5.1 for participant characteristics).

The data was analysed in two ways. The first approach was to classify participants according to their predominant mode of response. For example, in the case of a participant who in the 'experimenter-participant condition' employed the personal pronoun 'you' on at least two out of the three occasions of referring to the experimenter, this would have been accounted her/his predominant response. The second approach was to consider the numbers of utterances in each response category made by individuals within the respective matched pairs of participants, and to test for group differences by a non-parametric matched-pairs analysis. In this case each and every response, rather than each participant's predominant
mode of response, contributed to the group comparisons. These analyses were supplemented by an examination of the quality of the responses made by the participants of each group.

i. The experimenter-accomplice condition.

The results are shown in Table 5.3. With this initial method of classifying participants, there were no significant group differences.

<table>
<thead>
<tr>
<th>'Predominant response' categories</th>
<th>Autistic Group</th>
<th>Non-autistic Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Group</td>
<td>Sub-groups (upper / lower)</td>
</tr>
<tr>
<td>Correct - pronoun ('you')</td>
<td>8</td>
<td>(7 / 1)</td>
</tr>
<tr>
<td>Correct - name</td>
<td>10</td>
<td>(5 / 5)</td>
</tr>
<tr>
<td>Incorrect</td>
<td>7</td>
<td>(1 / 6)</td>
</tr>
<tr>
<td></td>
<td>12*</td>
<td>(8*/ 4)</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>(5 / 4)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>(0 / 4)</td>
</tr>
</tbody>
</table>

Referring to the accomplice

| Correct - pronoun ('him')        | 0              | (0 / 0)            |
| Correct - name                  | 19             | (12 / 7)           |
| Incorrect                       | 6              | (1 / 5)            |
|                                  | 3              | (1 / 2)            |
|                                  | 17             | (12 / 5)           |
|                                  | 5**            | (0 / 5**)          |

* One participant used the pronoun 'we'
** One participant was 'incorrect' in not referring to E2, but used a 'correct' egocentric pronoun, 'me'

Table 5.3 Production Task 1(b): Number of individuals in each 'predominant response' category

Table 5.3 reveals that the pattern of responding across the higher- and lower-functioning sub-groups was broadly similar in each diagnostic group. Although there was some indication that higher-functioning participants (especially young people with autism) might be more likely than lower-functioning participants to call the experimenter 'you', this difference was not statistically significant. Almost every one of the incorrect responses were made by lower-functioning participants who responded to the question, 'Who sees the X?' by indicating or referring to a picture, in most cases the picture just mentioned in the question. These participants gave the appearance that they failed to grasp what was
being asked. The exceptions were one young person with autism who instead of referring to the experimenter, responded with the adult accomplice's name; and one non-autistic individual who instead of referring to the accomplice, replied with the 'egocentric' pronoun 'me' (which was accompanied by correct use of 'you' for the experimenter, and was itself correct insofar as the participant could indeed see the picture, but which has been included as an 'incorrect' response insofar as there was no acknowledgement that the accomplice could see the picture as well).

The pattern of results also show that there was no evidence to support the prediction that, compared with non-autistic control participants, higher-functioning young people with autism would be less likely to use the pronoun 'you'. Amongst the correctly responding lower-functioning participants, four out of eight non-autistic individuals called the experimenter 'you', but only one of the six young people with autism did so - a suggestive but non-significant finding, (p < 0.23, Fisher's exact test, one-tailed). Also, three of the non-autistic participants consistently referred to the accomplice as 'him'. This term was never used at all by the young people with autism (p < 0.11, Fisher's exact test, one-tailed). Finally, when asked, 'Who can see [the picture facing the experimenter]?', only one participant, a higher-functioning non-autistic individual, consistently employed the pronoun 'we' rather than 'you'. This was counted as a 'correct pronoun' response, since it was indeed the case that both the experimenter (who was being responded to) and the participant could see the picture in question.

When matched pairs of participants were compared for the number of correct pronouns and the number of correct names employed (rather than according to the 'predominant response' of each subject), there were again no significant group differences.

ii. The experimenter - participant condition.

The results are shown in Table 5.4. Eight of the 25 young people with autism and 12 of the 25 non-autistic individuals predominantly used the pronoun 'you' when referring to the experimenter; 8 young people with autism and 7 non-autistic individuals used the experimenter's name; and 9 young people with autism and 6 non-autistic individuals made incorrect responses, often referring to the picture (e.g., with the participant uttering 'Spade, spade', while touching the picture of the spade).
Once again there were no significant group differences. As in the previous results, there was a marginally greater number of non-autistic individuals than young people with autism whose predominant response was to call the experimenter 'you'. (In fact, ten of the non-autistic participants and six of the young people with autism responded in this way across both the experimenter - accomplice and the experimenter - participant conditions: \( p = 0.18 \), Fisher's exact test, one tailed.)

<table>
<thead>
<tr>
<th>'Predominant response' categories</th>
<th>Autistic Group</th>
<th>Non-autistic Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Referring to the experimenter</strong></td>
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<td></td>
</tr>
<tr>
<td>Correct - pronoun ('you')</td>
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<td>12</td>
</tr>
<tr>
<td></td>
<td>(7 / 1)</td>
<td>(8 / 4)</td>
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<tr>
<td>Correct - name</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>(4 / 4)</td>
<td>(4 / 3)</td>
</tr>
<tr>
<td>Incorrect</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>(2 / 7)</td>
<td>(1 / 5)</td>
</tr>
</tbody>
</table>

| **Referring to self**           |               |                   |
| Correct - pronoun ('me' or 'I') | 17            | 16                |
|                                  | (11 / 6)      | (9 / 7)           |
| Correct - name                   | 5             | 4                 |
|                                  | (2 / 3)       | (3 / 1)           |
| Incorrect                        | 3             | 5                 |
|                                  | (0 / 3)       | (1 / 4)           |

Table 5.4 Production Task 1(b): Number of individuals in each 'predominant response' category

Significant group differences did emerge, however, when a distinction was made between the higher- and lower-functioning sub-groups of the 17 young people with autism and the 16 non-autistic individuals who gave correct pronouns when referring to themselves. Table 5.5 shows the number of individuals whose predominant response was to use the pronoun 'I' and the numbers who predominantly used the pronoun 'me'.

Whereas non-autistic individuals were divided equally in their correct use of 'I' and 'me', a large majority of pronoun-using young people with autism employed the pronoun 'I' in such responses as 'I can' and 'I
"can see the X", but not the pronoun 'me'. This significant contrast (with Yates' correction, Chi-square = 4.04, p < 0.05) had not been anticipated a priori. In fact, one of the two young people with autism who used 'me' did so perseveratively in response to all questions, so that only one person with autism was using the term 'me' discriminatively. Matched-pairs analysis of the numbers of responses in each category made by all individuals of the two diagnostic groups confirmed that young people with autism used significantly more 'I' pronouns (Wilcoxon's T = 11.5; N = 13, 12 ties; p < 0.025, 2-tailed) and non-autistic individuals used significantly more 'me' pronouns (Wilcoxon's T = 7; N = 10, 15 ties; p < 0.05, 2-tailed).

<table>
<thead>
<tr>
<th>Autistic Group</th>
<th>Non-autistic Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>'Predominant response' categories</td>
<td></td>
</tr>
<tr>
<td><strong>Total Group</strong></td>
<td><strong>Total Group</strong></td>
</tr>
<tr>
<td><strong>Sub-groups</strong></td>
<td><strong>Sub-groups</strong></td>
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<tr>
<td><strong>(upper / lower)</strong></td>
<td><strong>(upper / lower)</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>'Referring to self'</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>T':</strong></td>
<td>15</td>
</tr>
<tr>
<td><strong>Me':</strong></td>
<td>2</td>
</tr>
</tbody>
</table>

* This participant was using the term 'me' perseveratively

**Table 5.5** Production Task 1(b): Performance of those participants using correct pronouns to refer to themselves

There was also a significant difference in the predominant categories of response among participants who failed to refer to the experimenter correctly. Five of the 9 young people with autism made incorrect responses which predominantly contained first-person singular pronouns, but none of the 6 non-autistic individuals with incorrect responses showed this pattern (p = 0.04, Fisher's Exact test, two-tailed). On closer inspection, only 3 of the 5 young people with autism were pronoun reversing, making statements that would have meant they could see a picture that was out of sight (a response that was never seen among the non-autistic participants): the two remaining young people with autism were correctly responding 'I can't' (rather than the experimenter can). In other words, the response of these latter two participants appeared to exemplify consistent egocentrically correct usage of the first-person pronoun 'I'.
5.5 Summary of results and discussion

It was predicted that young people with autism would be specifically impaired in their comprehension and production of the first- and second-person pronouns 'I' and 'you' compared with their understanding of the respective names, vis-à-vis the matched control group. When teachers were asked to report about each participant, whether or not she/he sometimes showed abnormal use of the personal pronouns 'I', 'me' and 'you' in the course of everyday life, this was reported to be the case for 19 of the 25 young people with autism but not one of the non-autistic participants.

Two baseline procedures were first administered to all participants to establish that the demands inherent in the visuo-spatial task could be met. The participants of each diagnostic group were able to indicate the two different pictures seen by the experimenter and the accomplice respectively, when the pictures were also in view of the young person and when the experimenter and the accomplice were named.

The prediction that young people with autism would demonstrate difficulties in their comprehension of the pronouns 'I' and 'you' was not supported by the findings of this experiment. Despite the fact that the visuo-spatial tasks were designed to tax the participants' adjustment to switching pronoun-anchored perspectives, the majority of participants were able to comprehend pronouns in a near-perfect manner. Even amongst the minority of participants who made errors, there was little indication that incorrect responses reflected difficulties with the 'pronoun content' of the task, since incorrect responses were as likely when the experimenter's questions involved names as when personal pronouns were used. This finding is in keeping with that of Jordan (1989), who found that pronoun comprehension in young people with autism was similarly unaffected.

In the production of personal pronouns there was suggestive evidence that abnormalities existed for young people with autism relative to the non-autistic control individuals. In both conditions where participants were asked, 'Who can see the X?' from the adult's perspective, a number of the autistic
group responded with the person’s name rather than the pronoun ‘you’. Furthermore, those five young people with autism who failed to refer to the experimenter correctly used responses that contained ‘I’: three of these five individuals demonstrated pronoun reversal, while the other two produced an egocentric response, ‘I can’t’. Not one of the non-autistic group produced such errors. Those young people with autism who used the first-person pronoun were significantly more likely to refer to themselves with ‘I’, while the non-autistic individuals used the word ‘me’. Again, this was in keeping with the findings of Jordan, whose sample of young people with autism were more inclined to use the first-person pronoun ‘I’ than they were the term ‘me’. Overall, however, most of the errors in production of the present experiment were attributable to failures in grasping the point of the question: ‘Who can see the X?’ , and there was no group difference in this regard.

There are a number of possible reasons why group differences in the comprehension and production of pronouns did not manifest as predicted under these experimental conditions, despite teacher’s reports to the contrary.

Loveland (1984) presented a visuo-spatial task to normally developing 2- to 3½-year-olds, very much like the one used in the baseline condition reported here. Loveland found that if a child could demonstrate an appreciation of the ways points of view differ (i.e., that while she/he is looking at one picture the experimenter must be looking at the other), they were more likely to use personal pronouns proficiently. The vast majority of participants in the present study demonstrated that they could indeed understand that points of view differ, and based on this one would predict proficient comprehension and use of personal pronouns. Although comprehension was intact, a subtle pattern of difference in the use of pronouns was found relative to the performance of the non-autistic mentally retarded group. This subtle difference in pronoun use could not be attributed to a lack of appreciation of the ways points of view differ.

Does this pattern of suggestive findings represent a developmental delay, such that given further time a relatively proficient use of the pronouns ‘I’ / ‘me’ and ‘you’ could be achieved, or is it that they highlight
the result of an atypical development, such that these terms do not hold the same meaning for young people with autism as they do for non-autistic individuals?

The young people with autism who took part in this study were selected on the grounds of their relatively high language ability, and they were all beyond seven years of age. Kanner (1943) observed that between five and six years of age, all of the language able children who had demonstrated 'pronoun reversal' learned to use personal pronouns spontaneously and with 'adequate' reference. It is conceivable that the suggestive differences observed in the present study represents a 'residue' of earlier difficulties. The tendency for young people with autism to refer to the experimenter by name rather than 'you', and the use of 'I' in stock phrases rather than the use of an assertive and centrally located 'me' also suggest that these young people, relative to non-autistic mentally retarded individuals, come to use personal pronouns via a different developmental route. Tentatively, it is suggested that while the non-autistic individuals achieve this end through identification with others, young people with autism learn pronoun understanding and use through continual exposure and correction from others. One relevant factor may be that young people with autism are subject to intensive tutoring in pronoun usage, and highly structured situations such as those employed in the visuo-spatial tasks might have enabled them to apply their hard-won understanding more effectively. Indeed, Tager-Flusberg (1989) reported that young people with autism make errors in but a small proportion of their pronoun-containing utterances. This observation highlights the need for further study of the particular situations in which correct or incorrect pronouns are used.

To address this, the two experiments to be reported in Chapter Six were designed with a somewhat less structured, more naturalistic approach relative to the visuo-spatial tasks. The photographs of the participants, of two familiar peers and of the experimenter were systematically presented to examine first-, second- and third-person pronoun comprehension and use. By asking 'Who is this?' rather than 'Who can see the X?', it becomes possible to avoid embedded pronouns of the form 'I can' and promote, if present, a sense of agency and possession captured in the use of 'me'.

282
CHAPTER SIX: Pronoun understanding and use: Part two
6.1 Introduction

A number of important developmental factors have been posited to underpin proficient personal pronoun comprehension and use. It has been suggested that the young child need to develop a non-egocentric stance to appreciate the 'shifting reference' terms 'I' and 'you' (de Villiers and de Villiers, 1974), and need to first hold a mental representation of self before the correct use of 'I' and 'you' is achieved (Fraiberg and Adelson, 1977). Loveland (1984) demonstrated that the capacity to understand the visuo-spatial perspective of the speaker and addressee emerges at the same time as correct pronoun usage. Each of these factors require an awareness of other as similar, but distinct from the self. Cooley (1908) considered the meaning of the 'I' to the young child, and suggested that the term is understood through observing other persons' regular emphasis on, and observation of actions in relation to the term. 'I' comes to be used by the child as a self-assertive feeling or attitude for self-will and appropriation. The use of these 'shifting reference' terms requires an appreciation of different people's co-ordinated and complementary psychological orientations within communicative contexts.

It was predicted that, compared with matched non-autistic control individuals, young people with autism would have greater difficulty in comprehending, and a lesser propensity and/or ability to produce, personal pronouns vis-à-vis proper names compared with matched non-autistic young people with mental retardation. In the first experiment designed to test this hypothesis, the prediction was not conclusively borne out. It was reasoned that the tight structure of the visuo-spatial tasks themselves may have assisted the 'learned' understanding of these personal pronouns. Thus, the hypothesis was examined employing a more 'naturalistic' and somewhat less structured design relative to the first experiment.

In the set of two experiments to follow, this thesis will again be examined from the perspective of self- and other-reference as indicated by the comprehension as production of the first- and second-person singular pronouns, 'I' / 'me' and 'you'.
6.2 Personal pronouns in young people with autism: Experiment II

The purpose of this second experiment was to investigate how autistic individuals compared with non-autistic people in their comprehension and use of personal pronouns when referring to photographs of themselves, familiar peers and the experimenter. Again, it was predicted that young people with autism would be less able to comprehend, and less likely to produce, personal pronouns in these circumstances. Experiment II was conducted at one sitting, and was immediately followed by a different form of 'photographs' task, to be described as Experiment III.

Participants

The groups comprised the same participant pairs who had been involved in the first experiment, except that a single pair of participants in the middle of the higher-functioning sub-group were no longer available and were replaced by another pair who were of similar age and identical ability. The participant characteristics are shown in Table 6.1.

<table>
<thead>
<tr>
<th></th>
<th>Autistic</th>
<th>Non-autistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Higher-functioning n = 13</td>
<td>Lower-functioning n = 12</td>
</tr>
<tr>
<td>Chronological age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (years; months):</td>
<td>16;02</td>
<td>14;09</td>
</tr>
<tr>
<td>Standard deviation (months):</td>
<td>41</td>
<td>43</td>
</tr>
<tr>
<td>Range (years; months):</td>
<td>12;09 - 23;01</td>
<td>8;04 - 19;06</td>
</tr>
<tr>
<td>Verbal mental age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (years; months):</td>
<td>6;09</td>
<td>4;07</td>
</tr>
<tr>
<td>Standard deviation (months):</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Range (years; months):</td>
<td>5;07 - 8;02</td>
<td>3;05 - 5;05</td>
</tr>
</tbody>
</table>

Table 6.1 Pronoun Experiments Two and Three: Participant characteristics
Experimental procedures

There were two tasks, each with 'Comprehension' and 'Production' sub-tests. Task 2.1 concerned the pronouns 'me' and 'you', and Task 2.2 concerned the pronouns 'I' and 'you'. Although for simplicity the Comprehension will be described before the Production sub-tests, the Production sub-tests of Tasks 2.1(b) and 2.2(b) were always presented (in counterbalanced order) as the first two sub-tests. Thus participants' responses were not shaped by the experimenter's use of pronouns in the Comprehension sub-tests, which were presented subsequently (again, with the sub-tests of Task 2.1(a) and Task 2.2(a) counterbalanced for order).

TASK 2.1: The 'paired' photograph task I

Method

The materials for this task comprised the following head-and-shoulder photographs: (a) two slightly different photographs of the experimenter, (b) two slightly different photographs of the subject, and (c) one photograph each of two familiar class-mates.

One week prior to the task, and outside the experimental situation, the experimenter ascertained that the participant knew the names of the experimenter and of each class-mate. The photographs were not used at this preliminary stage, to avoid influencing the participants' naming of the photographs. Instead, during a break-time the experimenter touched the respective class-mates while asking the participant 'Who is this?'.

2.1(a) Comprehension of 'me' and 'you'

The method consisted of presenting pairs of photographs to the participants, and giving a simple instruction on each occasion: 'Point to the picture of...'. Whenever photographs of the participant or experimenter were being referred to, the experimenter would use the pronouns 'you' and 'me'
respectively. When photographs of the participant or the experimenter were paired with that of a classmate, the experimenter would refer to the latter by first name. The task was conducted in an informal and relaxed manner, with no other instructions, checks or corrections.

There was, however, a strict underlying structure to the task. The experimenter always sat to the right of the participant. Three pairs of photographs - of the experimenter and participant, of the participant and first class-mate, and of the second class-mate and experimenter, respectively - were presented in succession. There were two modes of presentation, administered in counterbalanced order, as indicated in Figure 6.1.

Figure 6.1 indicates not only the temporal and spatial aspects of task presentation, but also the order in which the experimenter pointed to the photographs. For example, the first pair of photographs always showed the experimenter and the participant; the photograph of the experimenter was always nearest to the participant, and half the participants were first required to point to 'you' and then to 'me', and half to
'me' and then to 'you'. Whenever the contrast was between a class-mate and either the experimenter or the participant, the class-mate was always the last to be indicated. If this particular method had not been followed, participants would have been able to respond to the 'pronoun' question by excluding the peer as the correct choice.

2.1(b) Production of 'me' and 'you'

The method for the Production task was very similar to that of the Comprehension task already described, except that the experimenter asked a simple question as he pointed to each picture in turn: 'Who is this a picture of?' Each participant was given the task only once. There were again two alternative orders in which pairs of photographs were presented, exactly as in Figure 6.1.

Results

It was predicted that young people with autism would comprehend and produce personal pronouns with less consistency than non-autistic control individuals. The most effective way of presenting the results, however, is through Chi-square (i.e., two-tailed) analysis of contingency tables. It will be noted that on one occasion there was a significant one-tailed result despite a non-significant Chi-square.

2.1(a) Comprehension of 'me' and 'you'

For convenience, the Comprehension data will be considered first. The results were straightforward. Every single participant within each diagnostic group responded perfectly throughout.

2.1(b) Production of 'me' and 'you'

In the Production task, every participant named her/his two peers correctly. Moreover, every occasion of pronoun use was correct - there was no instance in which the participant called the experimenter 'me' or her/himself 'you'. There were two opportunities in which 'me' and two in which 'you' responses might be given. When each type of pronoun was considered separately, therefore, a given participant might fall into one of three categories: (a) using the personal pronoun only (e.g., 'me' for both pictures of
him/herself); (b) using the personal pronoun on one occasion and a first name (i.e., her/his own name, or that of the experimenter) on another; or (c) using names only.

*Production of 'me'*

The results are shown in Table 6.3. The patterns of performance observed in the two groups differed significantly (Chi-square = 6.14, df = 2, p < 0.025). Table 6.3 indicates, however, that this difference was attributable almost entirely to contrasts among the lower-functioning subjects (Chi-square = 6.35, df = 2, p < 0.025): whereas 10 out of 12 of the lower-functioning autistic subjects exclusively employed first names for themselves, only 4 out of 12 non-autistic participants did so and more than half this group always responded to the photograph by calling themselves 'me'. Of the 4 non-autistic individuals who used 'me' on one occasion and his/her name on the other, all began by using pronouns but then seemed to shift strategy as the test proceeded. There was a significant difference within the autistic group (only), between higher- and lower-functioning sub-groups of subjects, with the higher-ability subjects being more likely to use the pronoun 'me' (using Yates' correction, Chi-square = 8.98, df = 1, p < 0.01).

<table>
<thead>
<tr>
<th>'Predominant response' categories</th>
<th>Autistic Group</th>
<th>Non-autistic Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Group</td>
<td>Sub-groups</td>
</tr>
<tr>
<td></td>
<td>(upper / lower)</td>
<td>Total Group</td>
</tr>
<tr>
<td></td>
<td>(upper / lower)</td>
<td>Sub-groups</td>
</tr>
<tr>
<td>Correct - pronoun ('you'):</td>
<td>7 (6 / 1)</td>
<td>13 (7 / 6)</td>
</tr>
<tr>
<td>Correct - pronoun and name:</td>
<td>1 (1 / 0)</td>
<td>1 (1 / 0)</td>
</tr>
<tr>
<td>Correct - name:</td>
<td>17 (6 / 11)</td>
<td>11 (5 / 6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Referring to self'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct - pronoun ('me' or 'I'):</td>
</tr>
<tr>
<td>Correct - pronoun and name:</td>
</tr>
<tr>
<td>Correct - name only:</td>
</tr>
</tbody>
</table>

Table 6.3 Production Task 2.1(b): Number of individuals in each response category
Production of 'you'

The results are also shown in Table 6.3. Although the overall group differences in patterns of performance were not significant (Chi-square = 3.09, df = 2, ns), there was a significant difference between higher- and lower-functioning young people with autism (Chi-square = 6.01, df = 2, p < 0.025), in that only in the former sub-group were pronouns employed with any frequency. It is apparent how closely similar the performance of the higher-functioning young people with autism is to that of both the higher- and lower-functioning non-autistic participants. When the lower-functioning sub-groups were compared according to the directional hypothesis that fewer autistic than non-autistic participants would use personal pronouns, the sub-group differences were found to be significant: only 1 out of 12 lower-functioning participants used the personal pronoun 'you' to refer to the experimenter, but 6 out of 12 non-autistic participants did so (p = 0.034, Fisher's exact test, one-tailed).

When individuals were categorised according to their use of pronouns across the first- and second-person conditions, the patterns of similarity amongst the higher-functioning young people with autism and the higher- and lower-functioning non-autistic participants were sustained. Once again, the lower-functioning young people with autism were exceptional in that 10 out of the 12 individuals of this sub-group but only 4 out of 12 lower-functioning control subjects used no personal pronouns at all (Chi-square = 6.48, df = 2, p < 0.025).

Task 2.2: The 'paired' photograph task II

Method

The design of the 'paired' photograph Task II was similar to that of Task I, except that the six photographs were now of (a) the participant wearing a hat, (b) the participant wearing a scarf, (c) the experimenter wearing a hat, (d) the experimenter wearing a scarf, (e) the first class-mate wearing a hat, and (f) the second class-mate wearing a scarf.
Once again, the Production task always preceded any Comprehension task. The two orders of items within the Comprehension and Production tasks were exactly as in Task I. The questions posed, however, were different. In the Comprehension task, the questions were 'What am I / are you wearing?' and 'What is [named class-mate] wearing?' In the Production task, the questions took the form: 'Who is wearing the hat/scarf?' Again, responses were recorded verbatim.

Results

To reiterate, it was predicted that young people with autism would comprehend and produce personal pronouns with less consistency than non-autistic control individuals. Once again the results are presented through Chi-square (i.e., two-tailed) analysis of contingency tables.

2.2(a) Comprehension of 'I' and 'you'

Although the Comprehension task always followed Tasks 2.1 and 2.2 tests of Production, it is convenient to consider this first. There were only four incorrect responses, all made by lower-functioning participants as follows: one young person with autism, making three of these errors, consistently responded to the comprehension questions involving pronouns, by saying the name of each person and what they were wearing in both photographs. On one occasion after the experimenter repeated the question 'What are you wearing?' this young person named the correct item of clothing. In contrast to the questions involving pronouns, those involving the class-mates' names were answered immediately and correctly. The fourth comprehension error was made by a non-autistic participant.

2.2(b) Production of 'I' / 'me' and 'you'

The results are shown in Table 6.4.

Production of 'I' / 'me'

The overall group difference in patterns of responding was significant (Chi-square = 6.70, df = 2, p < 0.01). Table 6.4 illustrates how again, the diagnostic group difference is attributable to the contrast
between lower-functioning sub-groups of participants, with 9 out of 12 young people with autism and 3 out of 12 non-autistic participants using only proper names for themselves (Chi-square = 6.60, df = 2, p < 0.025). The contrast between the higher- and lower-functioning sub-groups of young people with autism is also highly significant in this respect (employing Yates' correction, Chi-square = 9.14, df = 1, p < 0.005).

<table>
<thead>
<tr>
<th>'Predominant response' categories</th>
<th>Autistic Group</th>
<th>Non-autistic Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Group</td>
<td>Sub-groups (upper / lower)</td>
</tr>
<tr>
<td></td>
<td>Total Group</td>
<td>Sub-groups (upper / lower)</td>
</tr>
<tr>
<td>Referring to experimenter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct - pronoun ('you')</td>
<td>8</td>
<td>(7 / 1)</td>
</tr>
<tr>
<td>Correct - pronoun and name</td>
<td>0</td>
<td>(0 / 0)</td>
</tr>
<tr>
<td>Correct - name only</td>
<td>17</td>
<td>(6 / 11)</td>
</tr>
<tr>
<td>Referring to self</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct - pronoun ('me')</td>
<td>8</td>
<td>(6 / 2)</td>
</tr>
<tr>
<td>Correct - pronoun ('I')</td>
<td>6</td>
<td>(6 / 0)</td>
</tr>
<tr>
<td>Correct - pronoun ('me' and 'I')</td>
<td>1</td>
<td>(0 / 1)</td>
</tr>
<tr>
<td>Correct - pronoun and name</td>
<td>0</td>
<td>(0 / 0)</td>
</tr>
<tr>
<td>Correct - name only</td>
<td>10</td>
<td>(1 / 9)</td>
</tr>
</tbody>
</table>

*Table 6.4 Production Task 2.2(b): Number of individuals in each response category*

Participants who used only personal pronouns were categorised according to their usage of the pronouns 'I' (as in 'I am wearing the X') and 'me'. The results are also shown in Table 6.4. The numbers of participants were small and the group differences non-significant. It may be noted, however, how a relatively large number of higher-ability young people with autism responded by saying 'I am wearing the X' and how the use of 'me' was very rare amongst lower-functioning participants of either diagnostic
group. In addition, two young people with autism made unusual responses by pointing to themselves (correctly) and saying: 'That one'.

**Production of 'you'**

The results are shown in Table 6.4. The overall significant diagnostic group difference (Chi-square = 6.90, df = 2, p < 0.01) is largely but not exclusively attributable to the contrast between lower-functioning sub-groups of participants (Chi-square = 8.77, df = 2, p < 0.005). All but one of the lower-functioning young people with autism always referred to the photograph of the experimenter by the experimenter's name, whereas two-thirds of lower-functioning non-autistic participants called him 'you' at least once (and in most cases twice). The difference between higher- and lower-functioning participants was significant only in the case of young people with autism (employing Yates' correction, Chi-square = 4.03, df = 1, p < 0.05).

**Performance across Tasks I and II**

Since participants' performance across tasks was relatively consistent, little additional information was revealed by separate examination of the use of 'I' / 'me' and 'you' across the two tasks. A summary of overall pronoun use is given in Table 6.5.

<table>
<thead>
<tr>
<th>'Predominant response' categories</th>
<th>Autistic Group</th>
<th>Non-autistic Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Group</td>
<td>Sub-groups (upper / lower)</td>
</tr>
<tr>
<td>Correct - pronoun ('you' / 'I' / 'me')</td>
<td>7 (6 / 1)</td>
<td>11 (6 / 5)</td>
</tr>
<tr>
<td>Correct - pronoun and name</td>
<td>8 (6 / 2)</td>
<td>10 (6 / 4)</td>
</tr>
<tr>
<td>Correct - name only</td>
<td>10 (1 / 9)</td>
<td>4 (1 / 3)</td>
</tr>
</tbody>
</table>

Table 6.5 Production across Tasks 2.1(b) and 2.2(b): Individual s' patterns of performance
The significant result is that lower-functioning young people with autism differ both from lower-functioning non-autistic participants (Chi-square = 6.48, df = 2, p < 0.025) and from higher-functioning young people with autism (Chi-square = 11.55, df = 2, p < 0.005) in their predominant use of names rather than personal pronouns.

6.3 Personal pronouns in young people with autism: Experiment III

The purpose of this final experiment was to explore further how participants would use personal pronouns as applied to photographs. As previously, the specific prediction was that young people with autism would be less inclined to refer to a photograph of themselves as 'me' and to a photograph of the experimenter as 'you'.

TASK 3: The 'stacked' photograph task

Method

The participants were the same 25 matched pairs of young people with autism and non-autistic individuals with mental retardation who took part in the previous experiment of naming photographs. The materials comprised one head-and-shoulders photograph of the participant, one of the experimenter, and six of individual familiar class-mates. These were stacked into a pile which was placed in front of the participant. There were two versions of the task. In one, the top three photographs were of classmates, the next was a photograph of the participant, the next three were class-mates, and the final photograph was of the experimenter. In the other version, the positions of the photographs of the experimenter and the participant were exchanged. Each participant took only one version of the task, with alternate pairs of participants across the gradient of ability performing the first version, and alternate pairs the second.
Having placed the pile of eight photographs in front of the participant, the experimenter said: ‘Here are some more pictures. Tell me who they are’. Prior to and throughout the task, the experimenter made a concerted effort to engage the participant, and specifically to be available for eye contact. The intention was that such engagement might have a bearing on the participants’ use of personal pronouns (perhaps especially ‘you’) rather than names.

Results

(i) Production of ‘me’

Each participant made a single response to the photograph of her/himself (saying either ‘me’, or using his/her name), and a single response to the photograph of the experimenter (saying either ‘you’, or using the experimenter’s name).

The results for the use of ‘me’ are given in Table 6.6.

<table>
<thead>
<tr>
<th>'Predominant response' categories</th>
<th>Autistic Group</th>
<th>Non-autistic Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Group</td>
<td>Sub-groups (upper/lower)</td>
</tr>
<tr>
<td>Referring to experimenter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct - pronoun (‘you’):</td>
<td>6</td>
<td>(5 / 1)</td>
</tr>
<tr>
<td>Correct - name:</td>
<td>19</td>
<td>(8 / 11)</td>
</tr>
<tr>
<td>Referring to self</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct - pronoun (‘me’):</td>
<td>12</td>
<td>(9 / 3)</td>
</tr>
<tr>
<td>Correct - name only:</td>
<td>13</td>
<td>(4 / 9)</td>
</tr>
</tbody>
</table>

Table 6.6 Production Task 3: Number of individuals in each response category
Despite the fact that the method had been successful in eliciting varied responses from the participants of each diagnostic group, there were no significant group differences. It will be noted that the lower-functioning subjects of each group tended to name themselves rather than use the pronoun 'me', and the higher- versus lower-functioning contrast was significant for the autistic group (p = 0.047, Fisher's exact test, two-tailed).

(ii) Production of 'you'

The results for the use of 'you' are given in Table 6.6. In accord with the prediction, young people with autism were less likely than non-autistic participants to call the experimenter 'you' (p = 0.044, Fisher's exact test, one-tailed). Broadly speaking, this pattern was manifest in both higher- and lower-functioning young people with autism, and in this experiment the difference between the two sub-groups of young people with autism was not significant. Out of the six young people with autism and the thirteen non-autistic participants who used the pronoun 'you', all six of the young people with autism and eleven of the non-autistic participants also used the pronoun 'me' to refer to themselves. On the other hand, there were six young people with autism and four non-autistic participants who used the pronoun 'me' but not the pronoun 'you'.

6.4 Summary of findings

In Experiment Two, involving the pairs of photographs, nearly all participants comprehended personal pronouns when the experimenter used these in relation to photographs of himself and the young person ('Point to picture of me/you' and 'What am I/you wearing?'). On the production tasks, lower-functioning differed from higher-functioning young people with autism and from both lower- and higher-functioning non-autistic individuals, in referring to photographs of themselves by name rather than by the pronoun 'me' (in response to: 'Who is this a picture of?') or 'I' / 'me' (in response to: 'Who is wearing the X?'). The lower-functioning young people with autism were also exceptional in their predominant use of proper names rather than the personal pronoun 'you' to refer to photographs of the experimenter. A further
observation was that although fewer young people with autism than non-autistic individuals used first-person pronouns when asked 'Who is wearing the X?', a relatively large proportion of the correct responses of the young people with autism took the form 'I am wearing the X', rather than 'me'. In this task only, the use of 'me' was very rare amongst lower-functioning participants of either diagnostic group.

In the third experiment, when given a stack of photographs of people and instructed to 'Tell me who they are', there was no significant group difference in the way participants referred to photographs of themselves. Young people with autism across lower- and higher-functioning sub-groups were, however, less likely to call the experimenter 'you'.

The purpose of these two experiments was to attempt to examine pronoun comprehension and use in a more naturalistic, less structured design than was used in Experiment One. In the first experiment, which used visuo-spatial tasks to examine the hypothesis, all participants of both groups performed well on the comprehension tasks, and a subtle pattern of suggestive group difference arose from the production tasks. Reasoning that the structure of the visuo-spatial tasks may have aided the young people with autism in their performance, the photograph tasks were administered. Theses tasks did indeed open wider the gap in performance in the production of pronouns in the young people with autism, though the difference was mostly attributable to the lower-functioning group.

Further observations

Teachers and workshop supervisors had reported that 19 out of 25 young people with autism exhibited difficulties with first- and second-person pronouns in the course of their everyday life. By stark contrast, not a single person in the non-autistic control group was reported as displaying such difficulties. This striking group difference was not reflected in the results from the formal tests. In part this might have been because non-specific test demands had constrained the performance of non-autistic participants and so masked group differences, but the group similarity in the patterns of error with the comprehension and (in part) the production of pronouns vis-à-vis names renders this unlikely. An alternative possibility
is that the structure of the experimental situation enabled autistic individuals to perform adequately so that an underlying deficit or abnormality in pronoun comprehension and use was obscured, although it might have been manifest in other circumstances. A single example may illustrate this point. I had tested a 19-year old person with autism on the visio-spatial tests, and he had performed perfectly throughout; but as he turned to leave he said: 'Thank you for seeing you Tony' (a statement that happened to be recorded on videotape). This sentence construction is so unusual and so clearly non-echolalic, that it prompts one to be circumspect about drawing firm conclusions about this person's seeming competence with personal pronouns. In the following section the findings of all three experiments will be discussed.

6.4 General discussion of all pronoun experiments

The findings from all three experiments designed to examine first- and second-person pronoun comprehension and use will be considered. The two groups of participants employed in this study demonstrated many group similarities in performance on the pronoun tasks. In Experiment One, concerned with viewpoints in relation to pictures, the majority of participants were able to comprehend pronouns in a near-perfect manner, and the errors that occurred were not specific to the comprehension of pronouns vis-à-vis names. Most of the errors in production were attributable to failures in grasping the point of the question: 'Who can see the X?', and the only group difference was that very few young people with autism said 'me'. In only one form of task was there any evidence of 'pronoun reversal' in the productions of young people with autism, and then only in three such individuals. In the remaining Experiments Two and Three (the Photograph tasks), errors in comprehension were again exceedingly rare. In the paired photograph task, the significant group differences concerned the propensity of the lower-functioning young people with autism to use proper names in referring to photographs of themselves and the experimenter. The tendency to name the experimenter rather than call him 'you' was also a feature of responding in the young people with autism in the 'stacked' photograph task.
Having stated this, it is important to stress that young people with autism and non-autistic participants were matched according to a measure of verbal mental age. This means that they were already selected according to an index of linguistic ability, and it remains an open question whether the relatively poor performance by young people with autism on the British Picture Vocabulary Scale compared with other aspects of non-verbal cognitive function (e.g., Lockyer and Rutter, 1970) might yet prove to reflect limitations in interpersonal role-taking. More specifically, the poor performance of young people with autism in identifying the named pictures of the British Picture Vocabulary Scale might partly derive from a restricted vocabulary that arises out of their relative incapacity for engaging in 'co-referencing' with other people (Hobson, 1989, 1991). If this is so, then to match participants according to their British Picture Vocabulary Scale scores might be to 'control out' some of the variance due to a possible deficit in the self/other understanding of young people with autism, a deficit which might also contribute to personal pronoun difficulties. This is especially to be borne in mind, given that the participants were of relatively high verbal mental age. All one can infer is that for such advanced individuals tested in these formal experimental settings, there was no indication that young people with autism have a specific incomprehension of personal pronouns vis-à-vis other aspects of their language function, nor were they making significantly more errors than control participants in pronoun production. This does not rule out the possibility that errors in comprehension and/or production are prevalent in less linguistically able young people with autism, nor that such errors would be absent in other situations. Indeed, the survey of teachers' judgements provided evidence that a large majority of the present young people with autism, but not a single non-autistic participant, tended to make occasional errors in pronoun production in the course of everyday life.

Therefore the focus shifts on to the possibility that even amongst young people with autism who have acquired relative proficiency in personal pronoun use, there might be indication that something is abnormal about the content of their understanding of 'I' / 'me' and 'you', and/or something atypical in the attitudes they adopt when employing these pronouns. Such abnormalities might be reflected in unusual patterns of usage rather than in incorrect use. Fairly consistent group differences of these kinds were observed in the present study. Most strikingly, young people with autism who employed correct pronouns in the visuo-spatial role-taking Task I were less likely than control participants to employ the
pronoun 'me' and more likely to use the pronoun 'I' in such responses as 'I can see the X'. In the photograph naming tasks they were less likely to employ the pronoun 'me' than to name themselves (in Experiment Two but not Experiment Three) and less likely to employ the pronoun 'you' than to name the experimenter (in Experiments Two and Three). This pattern was most marked for lower-functioning participants, and accord with the results reported by Jordan (1989) and Silberg (1978) using different methodological approaches.

Amongst the alternative interpretations that might be offered for these findings, several appear to be implausible. Firstly, the young people with autism did not consistently 'avoid' personal pronouns: in Experiment One they were more likely than control participants to employ the pronoun 'I', and in Experiment Three they were not significantly less inclined than control participants to use the pronoun 'me'. Secondly, the experimental design allows little scope for explaining the results in terms of echolalia. A possible partial exception here is that the tendency of young people with autism to respond to a question such as 'Who can see the X?' with 'I can see the X' might be counted as a form of mitigated echolalia, or at least a relatively stereotyped and 'echo-like' response compared with the reply 'me'. Thirdly, there is little reason to suppose that the autistic subjects' performance might reflect general linguistic delay rather than more specific pronoun difficulties. Participants were matched according to an index of verbal ability, and although performance on the British Picture Vocabulary Scale is unlikely to be representative of all aspects of language function, it is a test on which autistic individuals are known to achieve low scores (Lockyer and Rutter, 1970). Moreover, at times young people with autism were using relatively advanced grammatical forms (e.g., 'I can see the X') in place of less advanced forms of pronoun ('me'). For example, Wells (1985) reported that 50 percent of a sample of normal children were using the pronoun 'me' by 21 months of age, but only at 30 months were half the sample using modal verbs (e.g., 'I can..') to express an ability. In addition, the present experiment was focused on participants' choices of person-referring terms in particular tasks, rather than upon their potential to use the terms at all. Although it is quite possible that some participants - and particularly the sub-group of lower-functioning young people with autism who used names throughout the photographs tasks - may have been using proper names in order to avoid problematic pronouns, few participants made errors with pronouns. Given that all participants could comprehend pronouns, it cannot be assumed that there was a
general delay in pronoun comprehension or production. It is also of note that amongst non-autistic participants, those of lower-functioning were not significantly different from higher-functioning individuals in their use of pronouns, although a possible trend towards such a difference occurred in Experiment Three.

Before considering a further interpretation of the results, it should be acknowledged that a number of factors might have served to obscure or exaggerate differences in pronoun usage between the two clinical groups. It has already been observed how considerable effort is devoted to language tuition in the schools, and it is difficult to evaluate the influence of such training on task performance. Obviously, children have to have relevant abilities to take advantage of the training they are offered, and they cannot learn speech roles 'by rote'. On the other hand, the way in which individuals name themselves in photographs - and even normal children and adults use proper names to refer to photographs when they would not be used to refer to persons (Chiat, 1986) - might well be influenced by teaching with similar kinds of material. The effects of possible response biases are also difficult to estimate; for instance, young people with autism might have been relatively more likely to 'perseverate' with the use of names in some of the experimental tasks (although not all the results conform to this suggestion). Finally, the possibility exists that higher-functioning young people with autism might have learnt more conventional patterns of pronoun usage by abnormal cognitively-mediated compensatory strategies rather than by normal processes of acquisition.

The question arises whether it might have been appropriate to test for the production of personal pronouns after comprehension of these same pronouns had been tested, for the reason that then participants would have been more aware of the possibility that such terms would be 'expected' in the task. This approach was not adopted for the reason that the intention was to elicit the 'natural' responses of the children, and it was considered that group differences might have arisen on the basis of the non-autistic participants' greater sensitivity to the implicit demands of the experimenter. Such sensitivity was not the focus of study, and the methodology adopted was neutral in relation to the particular terms that participants selected in responding to the questions posed.
There remains some uncertainty as to the explanation of the autistic participants’ greater use of ‘I see it’, rather than ‘me’, in the early part of the pronoun tasks. For example, it is commonly observed that people with autism may echo the speech of others, and this might have biased participants who were being asked to say who sees a given picture. Moreover, the use of elliptical forms rather than full clause structures may reflect either more advanced or less complex grammatical usage, depending on other aspects of the language context. These are matters that require further investigation.

To conclude, however, a final interpretation of the results will be considered. Perhaps they reflect abnormalities in the way young people with autism ‘sense’ and (probably) conceptualise self and other in relation to one another. In the present study, such abnormalities were not manifest as deficits in ‘role-taking’, because many of these particular individuals could comprehend and employ the pronouns ‘I’, ‘me’ and ‘you’ in speech-role-appropriate ways, and ‘pronoun reversals’ were rare. Rather, there seemed to be a relative lack of an expression of self-agency or understanding of other-agency in the responses of young people with autism. In Experiment One, responses such as ‘I can see X’ is or can be relatively ‘mechanical’ and less ‘self-anchored’ then the term ‘me’, which stands alone as an emphatic contrast to ‘you’ (participants were not judged to have stressed or emphasised the pronoun ‘I’ in this context). Or again, the use by young people with autism of names and not pronouns for photographs might have reflected a relatively detached, almost ‘third-person’ attitude to the depiction of themselves and that of the experimenter. In contrast, non-autistic participants seemed to identify with the photographs of themselves, and to see and care about the photographed person as ‘me’: The images were infused with the participants’ and experimenter’s sense of agency as well as formal identity. Young people with autism seemed not to become engaged nor to confer ‘subjectivity’ in this way.

When considering such an account, it is essential to recognise that the experiments involved more than participants responding to sets of materials. They also involved the current interpersonal relations (and background relationships) between the participant and the experimenter. In this regard, it is relevant to note that the young people with autism had had long-standing contact with the experimenter, and that care was taken to make efforts to engage all participants on a personal level during the tasks themselves. Despite this, the current behaviour of young people with autism suggested a relative lack of engagement
with the experimenter, and this may have directly influenced their relatively greater use of nouns than pronouns in the photograph tasks. In other words, the present testing situation may have highlighted deficits in the interpersonal sphere that constitute the background to the specific problems for young people with autism in acquiring as well as using personal pronouns.
CHAPTER SEVEN: Summary of findings and general discussion
7.1 Synopsis

The syndrome of childhood autism has been a topic of intense clinical and empirical interest since its discovery by Leo Kanner in the mid-20th century. As the 21st century approaches, the study of autism has not only provided rich insight into the nature of the syndrome itself, but has served to challenge and inform theories of normal child development. Autism is a truly a tragic disorder. The triad of impairments that define the syndrome include problems in the domains of social functioning, communication and in restricted patterns of behaviour and imagination. The series of studies described in this thesis were an attempt to apply a scientific methodology to a particular aspect of interpersonal functioning in young people with autism - that of the self and self-understanding. The intention was to define more precisely the nature of this facet of the social impairment. The studies focused on the description of self, the depiction of self, and references to self in young people with autism.

In Chapter One, the self was defined in terms of two simultaneously operating parts: the self-as-subject and the self-as-object. The former represents that aspect of the self that initiates, organises and interprets experience in a subjective manner; the latter defines what is known about the self. The self-as-subject has its origins in the young child's predisposition to perceive consistency and regularity in her/his environment. The physical sources of direct and immediate information available to the newborn provide the basis for the ecological self, while the direct, non-reflective social sources of information are the basis for the interpersonal self. These early face-to-face, spontaneous, and coordinated communications between the young child and her/his caregiver are examples of primary intersubjectivity. The interpersonal self is based upon the child's capacity to spontaneously engage with her/his caregiver. The reactions of young children to their physical and social environments at this early stage in their development, are based upon predisposed capacities to hold primary representations of the world. The young child grows and develops within a social environment, and is continually exposed to the attitudes of those key people in her/his life to her/himself. These social attitudes become internalised, and contribute to the ongoing development of the self-as-subject.
Primary representations are direct perceptions of reality. Reflective forms of self-awareness involving constructed mental models, require the capacity to separate from this immediate perceived reality (i.e., to hold secondary representations). It is assumed that the content of the self-as-object will reflect the experience of the self-as-subject, but especially as mediated through other people's reactions to the self. At this stage in their development children also demonstrate a new quality of awareness of other people, as evidenced by their considered reactions towards them, particularly in joint attention, social referencing, imitation, and social role-taking. These co-ordinated communications between the child and her/his caregiver are examples of secondary intersubjectivity.

Through being in relation with others, the young child continually experiences the attitudes, conveyed through gestures, of those key people in her/his life. Attitudes themselves are characterised by a regular mental stance in relation to an object or person, with an associated affect. These social attitudes become internalised (Mead, 1934), and shape the self-as-subject, providing the young child with a growing sense of agency, continuity, and distinctness. As the developing child's cognitive capacities emerge that enable her/him to classify, to self-reflect, and to comprehend and produce language, her/his experiences can be objectified and rendered as symbols that convey meanings to be communicated and shared. This is the domain of the self-as-object.

The purpose of this thesis was to examine specific domains of the self in young people with autism. Prior to this, the clinical features that comprise the syndrome of autism were considered in Chapter Two, and evidence reviewed to show that aspects of secondary intersubjectivity which are vital to the development of the self in normally developing children (e.g., joint attention, social referencing, imitation and social role-taking), are each impaired in subtle ways in young people with autism. This has led to the argument that fundamental to these difficulties lies an impaired capacity for primary intersubjectivity: the inability of young people with autism to intuitively apprehend basic human forms and patterns of feeling in other people, upon which the secondary forms of intersubjectivity are built. As the self develops through experiences with other people, it was reasoned that aspects of the interpersonal self in children with autism will develop in an atypical way. Indeed, aspects of the interpersonal self may be more affected
than those of the ecological self, but this consideration falls outside the remit of this thesis. It was predicted that the self-understanding of young people with autism would reflect the affected interpersonal self through the lack of prominence and integration of other people in their self-definition.

Early studies examining the self in children with autism considered self-recognition ability, and found that intellectually and socially higher-functioning children are more likely to demonstrate self-recognition than lower-functioning children. The demonstration of self-conscious emotion, however, even in these higher-functioning individuals, was found to be impaired. A recent study, using a structured self-report questionnaire, demonstrated that able young people with autism had a lower overall sense of self-worth, and viewed themselves as socially and physically less competent than non-autistic individuals. To date, however, the self-understanding of young people with autism in terms of the integration of other people into their self-definition has not been subject to formal, quantitative examination. The present set of studies was designed to explore this aspect of social understanding in young people with autism.

Methodologically, when examining psychological functioning in young people with autism it is vital to distinguish between a specific deficit in performance on a task, and a deficit due to 'general' forms of cognitive disability. In the present series of studies, this problem was addressed in two ways. Firstly, where possible, control tasks were designed to impose the same cognitive demands upon the participants as the study tasks themselves. The purpose of this was to ascertain that performance on the study task was not attributable to the 'general' cognitive demands of the task (Hobson, 1991). Secondly, all of the tasks were presented to groups of individuals who were not autistic and who were individually matched with the young people with autism for chronological age and some aspect of 'general' (or more specifically, verbal) mental ability. The purpose of this matching was to ascertain that group differences in self-depiction and self-understanding was not attributable to general intellectual impairment nor to developmental status, and therefore specific to autism (Hermelin, 1978; Hobson, 1991; Yule, 1978). Before discussing the theoretical implications of the findings and possible future investigations, a summary of the results of the experimental tasks will be given.
7.2 Summary of findings

In this section the principal findings from each study will be outlined, and the methodological shortcomings considered. The thesis was that young people with autism would experience and conceptualise themselves in ways that are qualitatively different from non-autistic people of the same chronological and mental age. It was anticipated that young people with autism would demonstrate a relative lack of prominence and integration of other people in their self-understanding, would show less differentiation in their drawings of themselves vis-à-vis others, and would have specific difficulties in the understanding and use of personal pronouns. These hypotheses was explored by a combination of clinical and experimental methodologies: The evaluation of participants' self-descriptions through semi-structured interviews; the assessment of participants' self-depiction through their human figure drawings; and the investigation of linguistic self- and other-reference through formal experimental studies of first- and second-person pronoun comprehension and use.

Self-understanding in young people with autism

The first study examined the elicited self-statements of young people with autism by administering the self-understanding interview (Damon and Hart, 1984). The awareness of the self-as-subject, and understanding of the self-as-object, were systematically examined in a sample of twelve young people with autism and ten non-autistic control counterparts.

In keeping with the hypothesis, it was predicted that the elicited self-statements of young people with autism would be less likely to contain reference to other people relative to those of the non-autistic control group.

Both groups expressed differentially the senses of agency, continuity and distinctness, and this pattern of differentiation between the two groups was comparable. The proportion of agency statements produced
and their content was similar between the two groups, although a third of these self-statements made by the control group were understood in terms of their interpersonal implications. The proportion of self-continuity statements produced by the two groups and their levels of explication was also similar, although in terms of the content the autistic group tended to make continuity statements that reflected themselves in the past, while the control group produced statements reflecting themselves in the future. Finally, the small proportion of self-distinctness statements produced by the two groups was also similar. The expression of self-as-subject statements was not significantly correlated with verbal mental age or verbal IQ.

A quantitative analysis of the pattern of self-as-object statements between the two clinical groups revealed a comparable mean number of physical, active and even psychological descriptions. The autistic group, however, provided significantly fewer social self-statements than did the control group. In addition, the young people with autism were significantly more likely than the control group to produce self-statements that were coded at Level 1, and significantly less likely to produce Level 3 explications.

Although the content of the physical and active descriptions were broadly similar for the two groups, a qualitative difference was uncovered in the content of the social and psychological self-statements. Approximately one-half of the social self-statements produced by the autistic group were judged as implying social awareness (e.g., by referring to themselves as 'good' or 'nice'). Though the other half of such statements demonstrated explicit awareness of self in relation to others, not one social self-statement referred to friends or being a member of a social group. In contrast to this, the majority of the social statements made by the non-autistic control group explicitly acknowledged others in the definition of self. A large proportion of these statements made reference to friends.

The psychological self-statements made by the autistic group were predominantly classed as expressions of preference to 'do' or 'possess' things, with only one-third of statements referring to emotional states. The majority of the control group's psychological self-statements, on the other hand, referred to emotional states. Further, those preference statements made all referred to social likes or dislikes (e.g., 'I like being with friends'). When the levels of explication were examined it was found that the autistic
group were significantly more likely than the control group to express self-statements that were coded at the most basic level of understanding (i.e., Level 1), while the control group were significantly more likely than the study group to reason the importance for a given self-statement in terms of its interpersonal implications (i.e., Level 3).

Verbal ability was found to be positively correlated with the number of psychological self-statements made by the autistic group, and negatively associated with the number of psychological and Level 4 self-statements by the control group. Level 3 coded statements for the control group was found to be positively correlated with verbal ability.

These findings were in keeping with predictions from the hypothesis, and may serve to extend our understanding of the self in young people with autism. They provide evidence for a specific impairment in the capacity of young people with autism to integrate other people into their self-understanding relative to chronological age and mental age matched controls. The most likely explanation is that this reflects the lack of interpersonal integration of others in the self-concepts of young people with autism. It is not accounted for by intellectual functioning, nor indeed the ability to express abstract concepts about the self (as evidenced in the similar expression of psychological self-statements). The finding is further underlined by the lack of social explication (i.e., Level 3) across the other three categories of self-as-object.

This study was not designed to control for the 'general' lack of productiveness in the language of young people with autism. Although this would not be relevant for ratings of the self-categories produced since the numbers of these were equal for each group, the more productive individuals might have a greater probability of obtaining higher levels of explication. An appropriate control task is also needed to investigate the possibility that the related factor of imaginativeness (i.e., the diversity of descriptive features) might explain some of the group difference. Here a possible control task would be to ask the participants to describe something non-personal that can be understood on a number of levels. A television may be described in terms of its appearance and physical location; in terms of what programmes may be viewed on it; in terms of its internal workings (real or imagined); and/or in terms of
its impact on society (real or imagined). The difficulty of matching emotion or social tasks with those devoid of emotion or social content, but that are similar in terms of their cognitive demands, has been commented upon by Hobson (1991). Such control tasks will be required, however, to examine for the specificity of abnormalities in the self-description of young people with autism in greater depth.

Self-depiction in the human figure drawings of young people with autism

The second set of studies examined the depiction of self in young people with autism by considering their human figure drawings. In Study I, fourteen young people with autism were individually matched with fourteen non-autistic individuals for chronological age and mental age. They were each requested to draw a female, a male and a self-human figure, a non-human figure of a house, and two standardised isographic tasks. This procedure was repeated and extended in Study II to include two more non-human figures (i.e., a school and a church). Ten young people with autism and their individually matched counterparts participated in this second study. In keeping with the hypothesis, it was predicted that, relative to non-autistic control participants, the poor integration of other people into the self of young people with autism would be reflected in their depiction of self vis-à-vis their depiction of others.

The findings from both Study I and Study II revealed that in certain respects, the young people with autism were as proficient in their level of drawing ability as their non-autistic matched controls. The autistic group used a similar number of features to depict their human and non-human figure drawings, and were as skilled on the two standard geometric copying tasks as their non-autistic control counterparts.

Study I and Study II both found that relative to the non-autistic group, the autistic group were less likely to differentially depict the self and same-sex, and the female and male human figures in terms of their form or style. In contrast to the autistic group the mentally retarded group drew highly differentiated human figures by altering the form and style of the features used to depict their self and same-sex drawings, and their female and male drawings.
An examination of the differentiation between the non-human figures drawn by the autistic group in Study II revealed a contrasting pattern to that observed between their human figure drawings. The two clinical groups performed comparably in drawing the house and school differently in terms of the form of the drawings. The young people with autism, however, were significantly less likely to differentiate these two class of buildings in terms of their style. The two groups performed similarly in the degree of differentiation shown in terms of both form and style for the drawings of the school and the church. Broadly, then, both groups drew differentiated non-human figures by altering the form and in some cases the style of the features used to depict their house and school drawings, and their school and church drawings.

The analysis of the difference scores between the non-human and human contrasts revealed that the autistic group were significantly more likely than the non-autistic group to differentially depict form on the non-human drawing tasks than they were on the human drawing tasks. This was not the case for differentiation in terms of style. Thus the findings provide evidence that young people with autism appear to be specifically impaired in their capacity to depict differentiation in human figures vis-à-vis their non-human figures in terms of form.

The depiction of difference in form between the contrasting pairs of human figures for the autistic group was not dependent on verbal mental ability. For the non-autistic control group the depiction of form between the female and male human figures was not associated with verbal mental ability, but that between self and same-sex human figures was.

The findings from the correlation analysis provided evidence that different processes may be operating in the construction of the human figure drawings by the two groups. One interpretation was that in the non-autistic individuals, some special (and perhaps social) mechanisms played an important role in their construction of the human figure drawings, whereas different (perhaps non-social) mechanisms were important for their construction of isographic tasks. This distinction was not apparent in the results with the young people with autism. These findings, taken with the poor differentiation among human figure
drawings, were compatible with the suggestion that young people with autism are specifically impaired in the social mechanisms.

Bearing this in mind, a likely explanation of the findings is that while young people with autism hold a representation of self as a physical human form, subtle differences between self and other are either not matters of which they are aware, or are aspects of the young people with autism that fail to find expression in human figure drawings.

Methodological refinements to the design of the drawing studies might include the investigation of more explicit classes of human figure. How does a young people with autism differentially depict, say, her/his mother, father, friend? What about, for example, a traffic-warden, a soldier or a sailor? It may also be fruitful to exploit the methodology of Karmiloff-Smith to examine creativity and flexibility in the internal representational capacity of young people with autism. How would a young people with autism represent a 'man / house that doesn't exist'?

Self-reference in the language of young people with autism

The third set of studies examined self- and other-reference in young people with autism by considering both their comprehension and production the personal pronouns 'I' / 'me' and 'you'. Twenty-five young people with autism and their individually matched counterparts were administered a visuo-spatial role-taking task and two photograph self- and other-recognition tasks.

It was reasoned that the poor integration of others in the self-understanding of young people with autism would be evidenced in the verbal referencing of self and other. It was specifically predicted that young people with autism would be impaired in their comprehension and production of the personal pronouns 'I' and 'you' relative to the non-autistic control participants. To examine this, three experiments were designed that systematically pitched the comprehension and use of the participant's and experimenter's names against the respective first- and second-person pronouns. The first experiment employed a series
of visuo-spatial role-taking tasks, while the other two studies used photographs of the self, the experimenter and familiar peers to examine the hypothesis.

Reports by teachers and workshop supervisors provided evidence that abnormalities in personal pronoun usage were prevalent among the young people with autism who took part in the three experiments. The same survey conducted with the teachers and workshop supervisors of the matched non-autistic individuals demonstrated that not one young person had problems in this respect. This stark group difference in personal pronoun usage was not apparent when the comprehension and production of personal pronouns were subject to systematic investigation.

In Experiment One, concerned with viewpoints in relation to pictures, the majority of participants were able to comprehend pronouns in a near-perfect manner, and the errors that occurred were not specific to the comprehension of pronouns vis-à-vis names. Most of the errors in production were attributable to failures in grasping the point of the question: *Who can see the X?*, and the only group difference was that very few young people with autism said *'me'*. In only one form of task was there any evidence of 'pronoun reversal' in the productions of young people with autism, and then only in three such individuals. In Experiment Two (the 'pairing' photograph tasks) and Experiment Three (the 'stacking' photograph tasks), errors in comprehension were again exceedingly rare. In the paired photograph task, the significant group differences concerned the propensity of the lower-functioning young people with autism to use proper names in referring to photographs of themselves and the experimenter. The tendency to name the experimenter rather than call him *'you'* was also a feature of responding in the young people with autism in the 'stacked' photograph task.

The findings from these experiments were taken to reflect abnormalities in the way young people with autism 'sense' and (probably) conceptualise self and other in relation to one another. These abnormalities manifest as a relative lack of an expression of self-agency or understanding of other-agency in the responses of young people with autism, and not in deficits in 'role-taking'. The first-person pronoun *'I'* was generally used by young people with autism as part of a stock phrase: responses such as *'I can see X'* is or can be relatively 'mechanical' and less 'self-anchored' then the term *'me'*, which stands alone as an
emphatic contrast to the other; the use by young people with autism of names and not pronouns for photographs was also understood to reflect a relatively detached, almost 'third-person' attitude to the depiction of themselves and that of the experimenter. This quality of response was in contrast to the non-autistic participants, who seemed to identify with the photographs of themselves, and to see and care about the photographed person as 'me': The images were infused with the participants' and experimenter's sense of agency as well as formal identity. Young people with autism seemed not to become engaged nor to confer 'subjectivity' in this way.

The tasks designed were simple, straightforward to administer, and they maintained the interest of all the participants who took part in the experiments. It is likely that these tasks would be revealing if used with younger people with autism who are in the process of acquiring language, to examine their early comprehension and use of first- and second-person pronouns. This should parallel a systematic examination of the spontaneous, everyday use of self- and other-reference terms in young people with autism, noting the contexts within which they arise or fail to arise.

Methodological refinements to explore further the principal thesis may include a study in which the photographs in Experiment Two are substituted for items that belong to the participant, the experimenter and the two class-mates. The participant is then asked: 'Whose is the X?', which would allow for an examination of the possessive pronouns 'mine' and 'yours'. It is predicted that the understanding and use of these terms would be impaired in young people with autism, and would provide a stronger index of the lack of agency and involvement suggested from the findings of the reported pronoun experiments.

Furthermore, to examine the notion that young people with autism fail to integrate other people into their understanding of self, an exploration of this understanding and use of the personal pronouns 'we' / 'us' and 'them' / 'they' adopting a similar methodology to that used here, would be informative. In contrast to this, the comprehension of non-personal pronouns and diectic terms such as 'it' / 'that' / 'there' / 'here' could be examined to see whether the problem lies in pronoun and/or diectic terms generally, or whether personal-pronouns are specifically affected. If it was demonstrated that there was
indeed a specific problem with personal pronouns vis-à-vis non-personal pronouns, the thesis that the integration of others into the understanding of the self would become increasingly plausible.

7.3 Implications of the research findings

This thesis was designed to increase understanding of a certain aspect of the social impairment in young people with autism. In general, the findings from each study provide support for the notion that the development of the self is intimately tied up with the capacity to relate to other people, and lends weight to the developmental pathway referred to in Chapter One. In particular, the findings support the idea that young people with autism may be specifically impaired in their capacity to evolve fully elaborated concepts of self, and this impairment might arise from their abnormality in relating to other people. They fail to develop a comprehensive understanding of self which integrates a sense of other people, including the social attitudes of other people in relation to themselves. The use of an open ended clinical methodology, a semi-clinical approach, and a tightly controlled experimental design provided convergent evidence in these respects.

The findings have both theoretical and clinical implications. On a theoretical level, the self-understanding study illustrated how, with relatively able and verbally articulate autistic individuals, it may be appropriate to consider not only limitations in 'emotional' or 'theory of mind' concepts, but also and more specifically their restricted ways of understanding thinking in the social-relational dimension. For example, although young people with autism contrasted with non-autistic control participants in tending to describe themselves in physical and active terms, especially with low-level statements, they also referred to simple emotions and preferences. The abnormalities were neither confined to, nor especially marked in 'theory of mind' or emotion-related domains. The 'domain of the self' requires study in its own right.
The results from the drawings and pronoun studies point in the same direction, in that in neither case could the results be explained in terms of limitations in mental state understanding, or (in any direct way) in terms of deficient understanding of emotions. Once again, it is arguable that only a theory which addresses the structure of the self - and its weaknesses in autism - will be able to encompass the phenomena highlighted here. Such a theory, drawing upon such writers as W. James, C.H. Cooley, G.H. Mead, G. Bosch, U. Neisser and R.P. Hobson was outlined in the early chapters of this thesis.

The ecological self and the interpersonal self rely on the capacity of the individual to apprehend regular and consistent patterns in her/his environment. The salience of social gestures over non-social cues serves to ensure the importance of other people in the development of the normally developing young child. The normally developing child can respond to the 'meaning' of social gestures within a relatively wide range of expression. The fact that such gestures do not have the same attraction for young people with autism (e.g., Weeks and Hobson, 1987) implies a very different development of mind. This thesis has attempted to highlight possible implications of limitations in interpersonal engagement. Nonetheless, young people with autism continue to search for order and regularity in their physical world.

If this account is accurate, then there are clinical implications of how a shared world could be brought to the mind of a person with autism. Social mirroring studies have shown that young people with autism become more socially responsive when their own actions are imitated by another person (Dawson and Galpert, 1990). The person is displaying actions that are familiar to the child, and at least some degree of interpersonal mental co-ordination may be achieved. Or again, there may be different kinds of opportunity for increasing the chance that young people with autism may be enabled to 'link in with' other people - not least, by allowing regularity in the routines of the day, and adjusting to the child's own preferences and states by allowing specific activities in particular places and times, and attempting to understand the child's immediate concerns and perspectives. Only when 'sharing' of mental states or attitudes have been achieved, can one hope to enable the child to adopt alternative perspectives - not least, on her/his own attitudes and actions.
7.4 Future investigations

The limitations of the studies reported here have been considered, and future investigations should include the proposed methodological refinements. In this section, a number of additional studies that might shed further light on the self-understanding in young people with autism will be considered. Such studies may be divided into longitudinal and cross-sectional studies.

Longitudinal studies

In general, to make more precise statements about the development of self and self-understanding in young people with autism, it would be important to define the individuals into sub-groups. Thus a matrix of sub-groups in terms of chronological age, verbal and non-verbal intellectual functioning, social functioning and severity of autism should be considered. The children comprising these sub-groups should be individually matched with other children for chronological age, sex, and some measure of early developmental functioning (e.g., the Vineland Adaptive Behavior Scales: Sparrow, Balla and Cicchetti, 1984). In addition, to provide an accurate developmental picture, it would be of interest to examine the self in these groups from as young an age as possible, and to follow them up into early adolescence. Within this time frame, the capacity for primary and for secondary intersubjectivity should be systematically measured at regular intervals, in relation to developing aspects of 'non-social' cognitive function such as Piagetian sensori-motor development.

The first set of possible studies involve the co-operation and participation of the primary caregivers to chart the development of the young child. The common theme is to measure the development of the ecological vis-à-vis the interpersonal self. Caregivers might be asked to complete a questionnaire every three months, covering items to do with the child's self-description, self-evaluation, physical self-recognition, emotional self-regulation, and self-agency (e.g., Stipek, Gralinski and Kopp, 1990). Along with this, observations and experiments on aspects of the ecological self and the interpersonal self, such
as those designed by Bullock and Lütkenhaus (1990) for infants, might be conducted to show points at which specific divergence occurs in the two lines of development.

It is predicted that the findings from such a study would reveal that the ecological self in young people with autism develops in a manner similar to their matched controls. Fundamentally, they should be expected to demonstrate the capacity to negotiate or relate to the physical environment, in a manner that is out of keeping with specific difficulties in relating to others, which would be intimately tied to the emergence of self and self-understanding. The control group of young people with mental retardation would also demonstrate how far the emergence and nature of self- and other-awareness is dependent upon the degree and quality of engagement with others early in life, and how far 'non-social' cognitive factors play a constraining role.

Cross-sectional studies
In this section a number of experimental studies are proposed that may allow for a further and more detailed examination of the principal thesis. These proposed studies have been designed to explore the atypical development of the self in higher-functioning young people with autism who have developed the capacity to understand and use language.

One approach is to examine the self in young people with autism by exploring their reasoning about the actions of other people. The hypothesis is that young people with autism will be less proficient in attributing mental states to different 'self-actions' or 'self-attitudes' of others than non-autistic individuals. Participants could be shown vignettes of another person displaying different expressions that reflect various self-responses. For example, they might watch a videotaped person expressing hurt in each of four contexts: (a) after having bumped her/his knee on the floor; (b) after running a long distance; (c) after being excluded from a group of friends; and (d) while standing by her/his dead pet. Each vignette is designed to portray the response of the other's physical, active, social and psychological self. The participant would be asked to spontaneously comment and then to respond to specific prompts. A task to control for the demands of this proposed condition is problematic. The capacity to view a scene
and to then reason about it would certainly need to be established. It is possible that the participants' capacity to reason about mechanical devices of increasing complexity as displayed on a video-monitor may assist in this. It is predicted that young people with autism would show specific impairments in their capacity to understand the social self portrayed, but relatively less difficulty in understanding the physical, active and even certain levels of the psychological self of others vis-à-vis the performance of non-autistic individuals.

The above study could be complemented by asking the young person to talk about similar situations which reflect different aspects of her/his own self: 'Have you ever fallen over? ... walked for a long time? ... been alone? ... lost someone/something?' Then: 'What happened? How did you feel? What did you think?' The nature of this questioning in itself may be problematic for young people with autism, and would only be appropriate for those who have demonstrated the capacity to understand hypothetical situations. With such high-functioning individuals, one could also pose a number of contrasting, 'What if ...' problems, again with the purpose of exploring the nature of the social reasoning used by young people with autism, and contrasting this with their non-social reasoning. For example, the participants could be asked 'What if there were no plants in the world?' and compare the reasoning with 'What if there were no people in the world apart from you?' and 'What if there was no gravity?' vs. 'What if there were no other girls/boys?' It is predicted that young people with autism would again show a specific difficulty in integrating others into their understanding of the world.

Another final possibility would be to explore the degree of integration of others in the mind of the person with autism, is to directly examine 'other-understanding'. One method could be to administer an analogous version of the self-understanding interview that has been constructed to examine 'other-understanding'. Thus, participants would be asked to consider a person whom they know well (probably a parent). The experimenter would ask a range of questions to elicit 'other-as-subject' and 'other-as-object' statements, and examine the understanding of these statements. It is predicted that the understanding of familiar people will be limited by the same constraints found in the self-understanding of young people with autism.
7.5 Conclusion

This thesis attempted to examine whether certain aspects of self-understanding in young people with autism are 'atypical' relative to individually matched young people with mental retardation. Evidence emerged in three separate domains of self-understanding, approached through three contrasting methodological techniques, to suggest that there are indeed relatively specific abnormalities in the self-conception, self-depiction and self-reference of young people with autism. Such evidence appears to justify more extensive theoretical and empirical work on the development of 'the self' in autism - work which also promises to highlight issues for the development of self in children who are not autistic.
References


Baron-Cohen, Campbell, Karmiloff-Smith, Grant and Walker, 1996


322


Chiat, S. (1982). If I were you and you were me: The analysis of pronouns in a pronoun-reversing child. *Journal of Child Language, 9*, 359-379.


325


329


Appendix 2.1 Diagnostic criteria for autistic disorder


1. A total of six (or more) items from A, B, and C, with at least two from A, and one each from B and C.

A. Qualitative impairment in social interaction, as manifest by at least two of the following:

i marked impairment in the use of multiple non-verbal behaviours such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction

ii failure to develop peer relationships appropriate to developmental level

iii a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest)

iv lack of social or emotional reciprocity

B. Qualitative impairments in communication, as manifest by at least one of the following:

i delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes such as gesture or mime)

ii in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others

iii stereotyped and repetitive use of language or idiosyncratic language

iv lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level

C. Restricted repetitive and stereotyped patterns of behaviour, interests, and activities, as manifest by at least one of the following:

i encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus

ii apparently inflexible adherence to specific, non-functional routines or rituals

iii stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements)

iv persistent preoccupation with parts of objects

2. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years: (a) social interaction; (b) language as used in social communication; or (c) symbolic or imaginative play.

3. The disturbance is not better accounted for by Rett's Disorder or Childhood Disintegrative Disorder.
Appendix 3.1 Rules for calculating mean length of utterance (MLU)

1. Start with the second page of the transcription unless that page involves a recitation of some kind. In this latter case start with the first recitation-free stretch. Count the first 100 utterances satisfying the following rules. (A 50-utterance sample may be used for preliminary estimate.)

2. Only fully transcribed utterances are used; none with blanks. Portions of utterances, entered in parentheses to indicate doubtful transcription, are used.

3. Include all exact utterance repetitions (marked with a plus sign in records). Stuttering is marked as repeated efforts at a single word; count the word once in the most complete form produced. In the few cases where a word is produced for emphasis or the like (no, no, no) count each occurrence.

4. Do not count such fillers as mm or oh, but do count no, yeah, and hi.

5. All compound words (two or more free morphemes), proper names, and ritualised reduplications count as single words. Examples: birthday, rackety-boom, choo-choo, quack-quack, night-night, pocketbook, see saw. Justification is that no evidence that the constituent morphemes function as such for these children.

6. Count as one morpheme all irregular pasts of the verb (got, did, went, saw). Justification is that there is no evidence that the children relates these to present forms.

7. Count as one morpheme all diminutives (doggie, mommie) because these children at least do not seem to use the suffix productively. Diminutives are the standard forms used by the child.

8. Count as separate morphemes all auxiliaries (is, have, will, can, must, would). Also all cantenatives: gonna, wanna, hafia. These latter counted as single morphemes rather than as going to or want to because evidence is that they function so for the child. Count as separate morphemes all inflections, for example, possessives {s}, plural {s}, third person singular {s}, regular past {d}, progressive {ing}.

9. The range count follows the above rules but is always calculated for the total transcription rather than for 100 utterances.

Brown (1973; p. 54)
Appendix 3.2 The self-understanding interview score sheet

**Physical Self Scheme**
Statements concerned with the physical body or material possessions: "I'm really tall"; "I have a bike".

<table>
<thead>
<tr>
<th>Level 1: Physical and material attributes of self have significance in and of themselves</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Identification or description of one's size</td>
</tr>
<tr>
<td>b. Identification of one's gender</td>
</tr>
<tr>
<td>c. Identification of one's race</td>
</tr>
<tr>
<td>d. Identification or description of one's other distinctive bodily features</td>
</tr>
<tr>
<td>e. Identification of one's age</td>
</tr>
<tr>
<td>f. Identification of one's dress or clothing accessories</td>
</tr>
<tr>
<td>g. Identification of one's physical environment</td>
</tr>
<tr>
<td>h. Identification or description of one's possessions</td>
</tr>
<tr>
<td>i. Identification or description of one's voice</td>
</tr>
<tr>
<td>j. Description of aesthetic quality of one's appearance</td>
</tr>
<tr>
<td>k. Description of one's bodily health and functioning</td>
</tr>
<tr>
<td>l. Identification of one's name</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2: Physical and material attributes of self influence or reflect the nature of the self's activities or capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Reference to one's abilities or activities in relation to one's size</td>
</tr>
<tr>
<td>b. Reference to one's abilities or activities in relation to one's gender</td>
</tr>
<tr>
<td>c. Reference to one's abilities or activities in relation to one's race</td>
</tr>
<tr>
<td>d. Reference to one's abilities or activities in relation to one's other distinctive bodily features</td>
</tr>
<tr>
<td>e. Reference to one's abilities or activities in relation to one's age</td>
</tr>
<tr>
<td>f. Reference to one's abilities or activities in relation to one's dress or clothing accessories</td>
</tr>
<tr>
<td>g. Reference to one's abilities or activities in relation to one's physical environment</td>
</tr>
<tr>
<td>h. Reference to one's abilities, occupation or activities in relation to one's possessions</td>
</tr>
<tr>
<td>i. Reference to one's abilities or activities in relation to one's voice</td>
</tr>
<tr>
<td>j. Reference to one's abilities or activities in relation to the aesthetic quality of one's appearance</td>
</tr>
<tr>
<td>k. Reference to one's abilities or activities in relation to one's body's health and functioning</td>
</tr>
<tr>
<td>l. Reference to one's abilities or activities in relation to one's name</td>
</tr>
<tr>
<td>Level 3: Physical and material attributes of self influence or reflect the self's social appeal, social interactions, social relations or group membership</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>a. Identification or description of one's size in relation to one's social aspects</td>
</tr>
<tr>
<td>b. Identification or description of one's gender in relation to one's social aspects</td>
</tr>
<tr>
<td>c. Identification of one's race in relation to one's social aspects</td>
</tr>
<tr>
<td>d. Identification or description of one's other distinctive bodily features in relation to one's social aspects</td>
</tr>
<tr>
<td>e. Identification or description of one's age in relation to one's social aspects</td>
</tr>
<tr>
<td>f. Identification or description of one's dress or clothing accessories in relation to one's social aspects</td>
</tr>
<tr>
<td>g. Identification or description of one's physical environment in relation to one's social aspects</td>
</tr>
<tr>
<td>h. Identification or description of one's possessions in relation to one's social aspects</td>
</tr>
<tr>
<td>i. Identification or description of one's voice in relation to one's social aspects</td>
</tr>
<tr>
<td>j. Identification or description of one's physical environment in relation to one's social aspects</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 4: Physical and material attributes of self influence or reflect the self's personal philosophy, moral standards or lifestyle</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Identification or description of one's size in relation to one's moral aspects</td>
</tr>
<tr>
<td>b. Identification of one's gender in relation to one's moral aspects</td>
</tr>
<tr>
<td>c. Identification of one's race in relation to one's moral aspects</td>
</tr>
<tr>
<td>d. Identification or description of one's dress or clothing accessories in relation to one's moral aspects</td>
</tr>
<tr>
<td>e. Identification or description of one's physical environment in relation to one's moral aspects</td>
</tr>
<tr>
<td>f. Identification or description of one's possessions in relation to one's moral aspects</td>
</tr>
<tr>
<td>g. Identification or description of one's voice in relation to one's moral aspects</td>
</tr>
<tr>
<td>h. Description of aesthetic quality of one's appearance in relation to one's moral aspects</td>
</tr>
<tr>
<td>i. Description of one's body's health and functioning in relation to one's moral aspects</td>
</tr>
<tr>
<td>j. Identification of one's name in relation to one's moral aspects</td>
</tr>
</tbody>
</table>

Active Self Scheme

Statements concerned with activities or abilities: "I play football"; "I can run fast".

<table>
<thead>
<tr>
<th>Level 1: Active attributes of self reflect the activities that the self performs, or the activities that are allowed, forbidden or demanded of the self</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Description of one's typical activities</td>
</tr>
<tr>
<td>b. Description of one's activities in a particular time, place or social context</td>
</tr>
<tr>
<td>c. Description of one's activities forbidden or allowed to one</td>
</tr>
<tr>
<td>d. Description of activities one must or must not do</td>
</tr>
<tr>
<td>e. Identification of one's occupation</td>
</tr>
</tbody>
</table>
Level 2: Active attributes of self are abilities considered relative to either other abilities of the self or to the abilities of other people

| a. | Comparisons between one’s abilities or inability in different activities |
| b. | Explicit comparisons between one’s abilities or inability and those of other people |
| c. | Implicit comparisons between one’s abilities or inability and those of other people |
| d. | Explicit comparisons between one’s style of activities and that of other people |
| e. | Implicit comparisons between one’s style of activities and that of other people |
| f. | Assessment of one’s general activity level |

Level 3: Active attributes of self influence the self’s social appeal, social interactions or group membership

| a. | Identification of one’s specific activities that influence one’s social aspects |
| b. | Identification of one’s specific abilities or general action potential in relation to one’s social aspects |

Level 4: Active attributes of self influence or reflect the self’s personal philosophy, moral standards or lifestyle

| a. | Reference to one’s motivation for learning or improving one’s abilities on the basis of moral aspects |
| b. | One’s choice of activities, occupation or status on the basis of moral aspects |

Social Self Scheme

Statements concerned with social personality characteristics, social interactions or social relations: “I’m shy”; “I fight with my friend”.

Level 1: Social attributes of self reflect the fact of self’s membership in social groups

| a. | Identification of one’s family relations and memberships |
| b. | Identification of one’s friendship relations |
| c. | Identification of one’s other particular social relations, group membership or status |
| d. | Description of one’s social environment |

Level 2: Self’s activities or abilities are considered with reference to the reactions of others

| a. | Explicit consideration of one’s activities in terms of another person’s or society’s (e.g. jail) reaction |
| b. | Identification of one’s activities in terms of approval or disapproval of particular others |
| c. | Identification of one’s abilities in terms of approval or disapproval of particular others |

Level 3: Social attributes of self reflect self’s personality characteristics or group membership that influence the nature of self’s social interactions

<p>| a. | Reference to one’s social characteristics or group membership that influence the nature of self’s social interactions |
| b. | Reference to one’s group membership that influence one’s social interactions or social appeal |</p>
<table>
<thead>
<tr>
<th>Level 4: Social attributes of self reflect or influence the self's personal philosophy, moral standards or lifestyle</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Reference to one's family relations and membership in relation to one's morals</td>
</tr>
<tr>
<td>b. Reference to one's friends in relation to one's morals</td>
</tr>
<tr>
<td>c. Reference to other particular social relations, group memberships or status in relation to one's morals</td>
</tr>
<tr>
<td>d. One's mode of interacting with others in relation to one's morals</td>
</tr>
</tbody>
</table>

**Psychological Self Scheme**

Statements concerned with emotions, thoughts or cognitive processes: "I'm a happy person"; "I think well".

<table>
<thead>
<tr>
<th>Level 1: Psychological attributes of self are moods and feelings that have significance in and of themselves</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Identification of one's mood or feeling</td>
</tr>
<tr>
<td>b. Statements of one's preference</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2: Psychological attributes of self reflect one's cognitive capabilities, acquired knowledge or activity related emotional states</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Reference to one's learning or knowledge</td>
</tr>
<tr>
<td>b. Reference to one's cognitive capabilities for learning (e.g., memory, intelligence, attentiveness)</td>
</tr>
<tr>
<td>c. Comparison between one's knowledge in one area versus another</td>
</tr>
<tr>
<td>d. Explicit comparisons between one's knowledge and that of others</td>
</tr>
<tr>
<td>e. Identification of one's emotions or feelings arising from one's activities (e.g., fun)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 3: Psychological attributes of self reflect or influence social skills or social interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Reference to one's interpersonal understanding</td>
</tr>
<tr>
<td>b. Reference to one's communicative competence</td>
</tr>
<tr>
<td>c. Reference to one's special knowledge of particular others</td>
</tr>
<tr>
<td>d. Identification of one's emotions or feelings arising from one's social relations</td>
</tr>
<tr>
<td>e. Identification of one's psychological attributes that influence one's social interactions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 4: Psychological attributes of the self are personal philosophy, moral standards or lifestyle</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Explanation of one's stable beliefs, values or life philosophy</td>
</tr>
<tr>
<td>b. Reference to one's stable orientation towards the world in general</td>
</tr>
<tr>
<td>c. Reference to one's understanding of the world, or to the process of understanding the world</td>
</tr>
</tbody>
</table>
### Agency: Statements concerned with the formation, existence or control of self:
- "I got to be the way I am because my parents taught me";
- "Everything I do, I do because I want to do".

### Level
1. Supernatural, biological or social forces influence the existence or formation of the self
2. Talents, abilities, wishes, motivation or efforts of the self influence the existence or formation of the self
3. Communication with others influences the existence or formation of the self
4. Personal or moral evaluations of life possibilities influence the existence or formation of the self

### Continuity: Statements that defend or explain the sense of self continuity over time

#### Level 1: Reference to one's continuity in relation to stable physical properties, possessions and behaviours. The self's continuity over time is defended by reference to externally observable physical or behavioural characteristics of self.

- Identification of one's name as the basis for continuity
- Identification of one's body as the basis for continuity
- Identification of one's possessions as the basis for continuity
- Identification of one's stable behaviour as the basis for continuity
- Identification of one's stable preferences as the basis for continuity
- Identification of one's social membership group as the basis for continuity

#### Level 2: Reference to one's continuity in relation to one's cognitive and active capabilities. At Level 2 the child moves away from a simple physicalistic assertion of self-sameness to an explanation that includes psychological characteristics, which themselves are immutable and permanent.

- Reference to one's stable knowledge as the basis for continuity
- Reference to one's memory as the basis for continuity
- Reference to one's abilities in relation to one's continuity

#### Level 3: Reference to one's continuity in relation to recognition from others. At Level 3 self continuity is related to the social context that extends beyond the self. One's sense of self continuity is in part dependent upon others' continuing recognition of the self over time.

- Reference to physical properties that lead to recognition from others
- Identification of continuity by recognition from family members
- Identification of continuity by recognition from friends

#### Level 4: Reference to one's continuity in terms of the relationship between one's earlier and present characteristics of the self.

- Identification of one's personal feelings and one's self knowledge in relation to one's continuity across time
- Identification of one's orientation towards the world in relation to one's continuity across time
Distinctness: Statements that defend or explain the sense of distinctness from others

<table>
<thead>
<tr>
<th>Level 1: Reference to one's distinctness as based upon physicalistic features. The self's distinctness is asserted on the basis of observable physical properties and social group memberships, which may include the self's appearance, name, typical activities or social groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Identification of one's name in relation to a sense of distinctness from others</td>
</tr>
<tr>
<td>b. Identification of one's physical properties in reaction to a sense of distinctness from others</td>
</tr>
<tr>
<td>c. Identification of one's possessions in relation to a sense of distinctness from others</td>
</tr>
<tr>
<td>d. Identification of one's social membership groups in relation to a sense of distinctness from others</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2: Reference to one's distinctness as stemming from differences between self and other along one character, personality or cognitive dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Sense of distinctness in relation to one's abilities as compared to the abilities of others</td>
</tr>
<tr>
<td>b. Sense of distinctness in relation to one's cognitive capabilities as compared to those of others</td>
</tr>
<tr>
<td>c. Sense of distinctness in relation to one's activities as compared to the activities of others</td>
</tr>
<tr>
<td>d. Sense of distinctness in relation to one's personality characteristics as compared to those of others</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 3: Reference to one's distinctness as deriving from a unique combination of psychological and physical characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. A sense of distinctness in relation to one's identification of a unique combination of psychological and physical characteristics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 4: Reference to one's distinctness as a consequence of the self's own unique subjective experiences and subjective interpretations of the world</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Identification of one's distinctness in relation to one's personal feelings</td>
</tr>
<tr>
<td>b. Identification of one's distinctness in terms of one's orientation towards the world</td>
</tr>
</tbody>
</table>
Appendix 3.3 Post hoc comparisons using Scheffe's test

For a contrast to be significant it must exceed the following quantity:

\[ S_C = \sqrt{A - 1} F_{100(1-\alpha)} (A - 1, d_{f_E}) \times \sqrt{\text{MS}_E \times \sum (w^2/E)} \]

where  
- \( A \) is the number of means in the set
- \( \text{MS}_E \) is the mean error sum of squares
- \( w^2 \)'s are the coefficients of the contrasts being tested (for any contrast simply describing the difference between two means, the two \( w \) coefficients are 1 and -1)
- \( E \)'s are the numbers of scores for the various means

Adapted from Lee (1975; p 301)

1. Self-as-object: Category by Group comparisons:

\[ S_C = \sqrt{7 \times 2.95} \times \sqrt{1.14 \times 0.1833} = 2.0773 \]

<table>
<thead>
<tr>
<th></th>
<th>Physical</th>
<th>Active</th>
<th>Social</th>
<th>Psychological</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autistic</td>
<td>5.25</td>
<td>3.33</td>
<td>1.42</td>
<td>2.83</td>
</tr>
<tr>
<td>Non autistic</td>
<td>3.90</td>
<td>2.20</td>
<td>5.10</td>
<td>3.20</td>
</tr>
</tbody>
</table>

\[ X_{\text{Aut}} - X_{\text{NonAut}} \]

- \( p = \) ns
- \( p = < 0.01 \)
- \( p = ns \)
- \( p = < 0.01 \)
- \( p = ns \)

2. Self-as-object: Level by Group comparisons:

\[ S_C = \sqrt{7 \times 2.95} \times \sqrt{1.37 \times 0.1833} = 2.2772 \]

<table>
<thead>
<tr>
<th></th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autistic</td>
<td>8.00</td>
<td>3.42</td>
<td>1.25</td>
<td>0.17</td>
</tr>
<tr>
<td>Non autistic</td>
<td>4.00</td>
<td>1.90</td>
<td>7.10</td>
<td>1.40</td>
</tr>
</tbody>
</table>

\[ X_{\text{Aut}} - X_{\text{NonAut}} \]

- \( p = < 0.01 \)
- \( p = ns \)
- \( p = < 0.01 \)
- \( p = ns \)
Appendix 4.1 Coding scheme for scoring the house figure

1. Boundary 1
Floor, two walls, ceiling as represented through square (floor may be bounded by bottom of page).

- 2 points - all features connected and approximately at right angles to each other
- 1 point - all features not connected or connected but not at right angles to each other

2. Boundary 2
- 2 points - good attempt at 3D representation
- 1 point - poor attempt at 3D representation

3. Roof 1
- 2 points - structure attached to top of 1 with oblique angles rising to point or flat
- 1 point - structure to top of 1 not necessarily attached no oblique angles

4. Roof 2
- 2 points - attachment of chimney/aerial to the roof; upright
- 1 point - attachment of chimney/aerial to the roof; oblique angle

5. Window 1
- 2 points - one or more indicated in the shape of a continual square/rectangle
- 1 point - one or more indicated broken or not square

6. Window 2
- 2 points - window panes/curtains indicated in at least one window; symmetrical
- 1 point - window panes/curtain indicated in at least one window; not symmetrical

7. Window 3
- 2 points - one or more windows showing both good symmetry and proportion to the body of the house
- 1 point - one or more windows showing either good symmetry or proportion to the body of the house

8. Door 1
- 2 points - represented by two sides and a top attached to the base of the boundary; right angles
- 1 point - any representation not attached to base or attached with n right angles

9. Door 2
- 2 points - door furniture; proportion appropriate to size of the door
- 1 point - door furniture; proportion inappropriate to the size of the door

10. Door 3
- 2 points - door shows both good symmetry and proportion to the body of the house
- 1 point - door shows either good symmetry or proportion to the body of the house

344
Appendix 4.2 Coding scheme for the scoring the complex geometric figure

1. Cross upper left corner, outside of rectangle
2. Large rectangle
3. Diagonal cross
4. Horizontal mid-line of 2
5. Vertical mid-line
6. Small rectangle, within 2 to the left
7. Small segment above 6
8. Four parallel lines within 2, upper left
9. Triangle above 2 upper right
10. Small vertical line within 2, below 9
11. Circle with three dots within 2
12. Five parallel lines within 2 crossing 3, lower right
13. Sides of triangle attached to 2 on right
14. Diamond attached to 13
15. Vertical line within triangle 13 parallel to right vertical of 2
16. Horizontal line within 13, continuing 4 to right
17. Cross attached to 5 below 2
18. Square attached to 2, lower left

Scoring:

Consider each of the 18 units separately. Appraise accuracy of each unit and relative position within the whole of the design. For each unit count as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct</td>
<td>- placed properly</td>
<td>2 points</td>
</tr>
<tr>
<td></td>
<td>- placed poorly</td>
<td>1 point</td>
</tr>
<tr>
<td>Distorted/incomplete</td>
<td>- placed properly</td>
<td>1 point</td>
</tr>
<tr>
<td></td>
<td>- placed poorly</td>
<td>½ point</td>
</tr>
<tr>
<td>Absent/not recognisable</td>
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<td>0 points</td>
</tr>
<tr>
<td>Maximum</td>
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<td>36 points</td>
</tr>
</tbody>
</table>

From E.M. Taylor, 1959 (adapted from Osterrieth, 1944)
Appendix 4.3 Coding scheme to assess difference in form and style between human figure drawings

1. Self-figure versus the same-sex figure

<table>
<thead>
<tr>
<th>Feature</th>
<th>Self-Figure</th>
<th>Same-sex Figure</th>
<th>Difference</th>
<th>Yes / No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hair</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Eyes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nose</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mouth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neck</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trunk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arms &amp; hands</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legs &amp; feet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clothing</td>
<td></td>
<td></td>
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</table>


2. Female figure versus the male figure

<table>
<thead>
<tr>
<th>Feature</th>
<th>Female Figure</th>
<th>Male Figure</th>
<th>Difference</th>
<th>Yes / No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hair</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eyes</td>
<td></td>
<td></td>
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<tr>
<td>Nose</td>
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<tr>
<td>Mouth</td>
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<tr>
<td>Neck</td>
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<td>Trunk</td>
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</tr>
<tr>
<td>Arms &amp; hands</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Legs &amp; feet</td>
<td></td>
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</tr>
<tr>
<td>Clothing</td>
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346
Appendix 4.4 Coding scheme to assess difference in form and style between non-human figure drawings

1. House versus school drawings

<table>
<thead>
<tr>
<th>Feature</th>
<th>House Figure</th>
<th>School Figure</th>
<th>Difference</th>
<th>Yes / No</th>
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</thead>
<tbody>
<tr>
<td>Boundary 1</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Boundary 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roof 1</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Roof 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Window 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Window 2</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Window 3</td>
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</tr>
<tr>
<td>Door 1</td>
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</tr>
<tr>
<td>Door 2</td>
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<tr>
<td>Door 3</td>
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D =

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<tr>
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<th>Difference</th>
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<tbody>
<tr>
<td>Size</td>
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<tr>
<td>Orientation</td>
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<tr>
<td>Shading</td>
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<tr>
<td>Placement on page</td>
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D =

2. School versus church drawings

<table>
<thead>
<tr>
<th>Feature</th>
<th>School Figure</th>
<th>Church Figure</th>
<th>Difference</th>
<th>Yes / No</th>
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</thead>
<tbody>
<tr>
<td>Boundary 1</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Boundary 2</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Roof 1</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roof 2</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Window 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Window 2</td>
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</tr>
<tr>
<td>Window 3</td>
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<tr>
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D =

<table>
<thead>
<tr>
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<th>Difference</th>
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<tbody>
<tr>
<td>Size</td>
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<tr>
<td>Orientation</td>
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<td>Shading</td>
<td></td>
</tr>
<tr>
<td>Placement on page</td>
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</tr>
</tbody>
</table>

D =

347
## Appendix 4.5 Inter-rater reliability coefficients

<table>
<thead>
<tr>
<th>Human figure (woman)</th>
<th>Human figure (man)</th>
<th>Human figure (self)</th>
<th>Non-human figure (house)</th>
<th>Draw-a-Design</th>
<th>Complex figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kappa coefficient*</td>
<td>0.94</td>
<td>0.95</td>
<td>0.95</td>
<td>0.90</td>
<td>0.90</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>0.86</td>
</tr>
</tbody>
</table>

* Based on the drawings of 10 participants

<table>
<thead>
<tr>
<th>Self vs. same-sex figures</th>
<th>Female vs. male figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Style</td>
</tr>
<tr>
<td>Kappa coefficient*</td>
<td>0.85</td>
</tr>
</tbody>
</table>

* Based on the human figure drawings of 36 participants

### Interpretation of Kappa Coefficient

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Strength of Agreement*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;0.00</td>
<td>Poor</td>
</tr>
<tr>
<td>0.00 - 0.20</td>
<td>Slight</td>
</tr>
<tr>
<td>0.21 - 0.40</td>
<td>Fair</td>
</tr>
<tr>
<td>0.41 - 0.60</td>
<td>Moderate</td>
</tr>
<tr>
<td>0.61 - 0.80</td>
<td>Substantial</td>
</tr>
<tr>
<td>0.81 - 1.00</td>
<td>Almost Perfect</td>
</tr>
</tbody>
</table>

*Landis and Koch (1977)*