



Plate 1.2 A GEOLOGICAL MAP OF THE EASTERN PART OF THE CARROCK FELL IGNEOUS COMPLEX

- | Unit A | | Unit B | |
|---------------------------|---------------------------------|--------|----|
| | A1 | | B1 |
| | A2 | | B2 |
| | A3 | | B3 |
| | Xenolith | | B4 |
| | Skiddaw Slates | | B5 |
| | Eycott Volcanic Group | | |
| | Sample locality | | |
| | Sample traverses (see App. One) | | |
| | Dip of lamination | | |
| | Contours in meters | | |
| SCALE 1:5000 0 100 metres | | | |
- NORTH ↑

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Chapter I

Introduction

1.1 Statement of the Problem

The emergence of Islamic banks in the 1970s set the beginning of a new era in the financial system of the Muslim world. More than sixty Islamic banks can be found all over the world today. With the exception of Iran and Pakistan where the whole banking system has been Islamized, the other Islamic banks operate in dual financial systems side by side with the interest-based banks.

This thesis focuses on Islamic banking in Malaysia. Only one Islamic bank; namely Bank Islam Malaysia Berhad has been established in Malaysia since 1983. Since the bank is coming to the end of its ten year monopoly in the supply of Islamic banking services; it is likely to lose its potential position in the banking sector.

A key feature of this thesis is an assessment of Bank Islam over the first eight years of its operation. It is pertinent to look at the performance of Bank Islam to this date. Whilst information on performance is relevant both to Bank Islam and its decisions regarding future marketing strategies; it is also relevant to potential competitors in the banking sector who are making decisions about entering this market post 1993.

The other key element of this thesis is a survey of Muslim bank depositors in Malaysia. The survey was designed with a view to try and understand why, in a

country whose population is predominantly Muslim (53 per cent), Bank Islam has only captured a very marginal share of deposits. After eight years in existence only 2 per cent of total commercial bank deposits were held in Bank Islam. It raises the question of whether Malaysian Muslims are not depositing in the banking system at all or whether they desire banking services but are not primarily motivated by the religious factor to bank with Bank Islam.

1.2 Outline of Chapters

The thesis develops as follows:

It starts with a survey of the overall Islamic economic system focusing on the justification for the system to Muslims and secondly on the issue of the prohibition of *riba* which forms the foundation of Islamic banking. (Chapter II). The study then proceeds through a literature survey of the development of Islamic banking both in theory and practice (Chapter III); to a presentation of the Malaysian economy and the Malaysian financial system - the context in which Islamic banking was developed in Malaysia (Chapters IV and V).

The actual development of Islamic banking in Malaysia is the story of the evolution and framework of Bank Islam Malaysia Berhad. This is the focus of Chapter VI. The performance of Bank Islam given the economic climate and the financial system in which it was forced to operate is assessed in Chapter VII. The main thrust is to examine the extent to which Bank Islam has succeeded in offering an alternative form of banking in a well-established interest-based environment; and if so how has it achieved it? Has its operation been geared purely with the economic objective of profits or does its Islamic character differentiate it from the other commercial banks in the country?

Chapter II

The Economic System of Islam

2.1 Introduction

No banking system can exist in an ideological vacuum. The conventional banking system dominating the financial world today has been fashioned according to the spirit of capitalism in which the rate of interest plays an important role. Islamic banking is no exception. Muslim economists unanimously agree that an Islamic banking system in its pure form can only be envisaged in an Islamic economy. As a prelude to the study of Islamic banking this chapter attempts to provide the justification for Islamic banking by examining the philosophical foundation and conceptual framework of such an economy. To achieve this aim the chapter is divided into the following main sections. Sections 2 and 3 following this introduction will respectively examine the ideological foundation of Islam and its implications for the economic behaviour of the individual in order to justify the need for Islamic banking by Muslims. Sections 4 and 5 will discuss the prohibition of *riba* and its economic rationalizations respectively. The Islamic alternatives to *riba* will be examined in Section 6.

2.2 Ideological Foundation

An economic system may be defined as the sum total of devices (or institutions and patterns of behaviour) which through their interaction give effect to economic choice. These economic devices are based on a set of law which embodies the philo-

in the form of the *Quran* or The Holy Book and the *Sunnah* or the traditions of the Prophet Muhammad (peace be upon him). These two sources form the chief sources of Islamic law known as the *Shariah* from which the economic principles for the Muslim society are also derived. Because of their exogenous nature, the economic principles in these two major sources are constant and permanent in nature. They are not subject to change either in time or space and are therefore applicable to all Muslim societies at any age and at any level of economic development.

Besides the above two main sources, the ideological foundations of the Islamic economic system are also derived from the exercise of reason and logic or *ijtihad*.³ *Ijtihad* involves the process of rethinking, reinterpretation and also analogical deductions by reasoning of the principles and injunctions in the *Quran* and the *Sunnah*. It deals with a question of the *Shariah* that emerges in society from time to time either in the form of new social or moral problems that require solutions which have not been clearly defined in the two chief sources of the *Shariah*.

Ijtihad, therefore, forms a vital instrument that provides flexibility and dynamism into the Islamic economic system. It allows the Muslim community to deal with the economic problems of their time and exercise their judgement in providing solutions which are relevant to their current circumstances without deviating from the permanent principles in the *Quran* and the *Sunnah*. A well-known example of *ijtihad* in Islamic history is the judgement passed by Umar Al-Khattab (the second Caliph) during the year of the famine, that no thief's hand should be amputated when there is the slightest doubt that the crime was committed because of hunger and not of greed. In this example the exercise of *ijtihad* had

³ The main branches of *ijtihad* are *qiyas* (analogy), *ijma'* (consensus) and *istihsan* (deviation from *qiyas* on the basis of public interest).

the struggle for economic well-being which conforms to the moral values in the *Shariah* constitutes an act of virtue and the economic activity performed assumes an act of worship or *ibadah*. Such rationality is of course completely alien and perhaps unacceptable in the conventional economic system. This is not unusual because an understanding of the Islamic economic system cannot be gained until the ideological bases of the system embodied in the Islamic worldview are fully revealed.

It must be admitted that the task of elaborating the Islamic worldview will entail a discussion of the vast matrix of concepts, principles and ethical values found in the *Quran* and the *Sunnah*; which lies beyond the limitations of this study. However, as all these concepts are derived or linked to the fundamental concept of *Tawhid* or the oneness and the sovereignty of *Allah*, our discussion will focus on this principle and its immediate corollaries.

2.2.2.1 Tawhid

Tawhid is the key concept which forms the basis of the Islamic faith. It signifies a complete submission of a Muslim to only one god and his rejection of other sources of value. There are two sides to the process of *Tawhid*. Firstly the total submission of man to *Allah* alone implies the uniqueness of His attributes. It negates the existence of other creators worthy of worship and confirms that all other beings have to be different from Allah in every respect. As noted by Al-Habshi⁵;

The oneness or tawhid is not only confined to number but also implies the oneness or uniqueness in all His sublime qualities or attributes. All other beings have to be different from Allah in every respect. In its simplest form the difference can be in terms of degree. For example,

⁵ 1991:42.

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TITLE:
**KNOWLEDGE OF SELF AND OTHERS IN HIGH-FUNCTIONING AUTISM: AN
EMPIRICAL INVESTIGATION**

by
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School of Education
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15 AUG 1996

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DECLARATION

I confirm that no part of the material offered has previously been submitted by me for a degree in this or in any other University. In all other cases material from the work of others has been acknowledged and quotations and paraphrases suitably indicated.

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ABSTRACT

The aim of this study is to examine the use of knowledge of self and others of a single group (n= 7) of children with high-functioning autism (HFA)/Asperger's syndrome (AS) in different contexts. Understanding of the self and others is defined as the ability to appreciate one's own and others' mental states. A mixed methodology, which combines experimental and naturalistic techniques was used. Thus, the fieldwork involved 5 stages: (1) experimental testing of first- and second-order theory of mind, (2) interviews on self-understanding, (3) analysis of mental state language in children and teachers in different contexts, (4) analysis of mental state language in children and their parents, and (5) ethnographic observations of the use, or absence, of skills related to social understanding of self and others. Two comparison groups were selected: 6 adults with Asperger's syndrome took part in stages (1) and (2) of the fieldwork and 8 children with moderate learning difficulties (MLD), matched on chronological age and verbal ability with the target group took part in all, except the final, stages of data collection. The main findings were: (1) Although more children with HFA/AS passed the first than the second order theory of mind task, there were no significant differences between them, the MLD group and the AS group. (2) All subjects described physical, active and psychological aspects of themselves but unlike adults with AS and MLD children, the target group did not refer to their social skills and social relationships as an important component in their self-understanding. (3) Some of the data indicated the importance of context. For example, numerous differences were observed between two contexts at school. In addition, HFA and MLD children used less mental state language at home than at school, and this was associated with less use by their parents than their teachers. Other results, however, were less clear. Thus, HFA/AS children referred to others' mental states more often at school than at home even though their teachers did not differ in the frequency of these. (4) In general, results from the opportunistic event sampling were consistent with those from experimental testing and language analysis. They did, however, help to elucidate the importance of context in the application of theory of mind. These results were interpreted in terms of the interaction between theory of mind and context, severity of autism and intelligence level within the HFA/AS group.

CHAPTER 1: INTRODUCTION

Autism has been identified as a perplexing life-long developmental disorder. The autistic handicap is primarily characterised by a "triad of impairments" in social interaction, communication and imagination (Wing & Gould, 1979). However, there is a great deal of controversy regarding the severity of symptoms in this condition. It has been suggested that autism covers "a continuum" of behavioural features, extending from severely handicapped to highly able autistic persons (Wing, 1988). Regarding the upper end of this continuum, there is a debate on whether a distinct clinical disorder defined as Asperger's syndrome (AS) (Asperger, 1944) is a milder form of typical autism, as described by Kanner (1943). This thesis has set out to investigate knowledge of self and others in individuals with high-functioning autism/Asperger's syndrome. Awareness of self and others in high-level autism has received a great deal of attention in the last decade.

Psychological research has attempted to explore the possible underlying causes of autism. In particular, a cognitive perspective has proposed that autism is the result of lack of "theory of mind" (Baron-Cohen, 1993; Frith, 1989a, 1989b), the innate ability to read one's and others' minds. In other words, it is suggested that autism represents a condition where the ability to be aware of and predict mental states (i.e., thoughts, wishes, desires, beliefs, intentions) is either missing (severe autism) or delayed (high-functioning autism). Thus, the understanding of self and others is limited to physical features and does not extend to mental dimensions as well. The evidence for this hypothesis is based on a series of rigorous experimental research projects on a series of psychological states (Baron-Cohen, 1989b, 1989c; Baron-Cohen, Leslie & Frith, 1985, 1986). However, the strength of the hypothesis of a fundamental "theory of mind" deficit in autism has been undermined by current evidence that there is "a talented minority" of individuals with high-level autism/Asperger's syndrome that are able to succeed on advanced theory of mind tests (Bowler, 1992; Happe, 1994c; Ozonoff et al, 1991a). However, the critical issue is to explain their persisting difficulties in social encounters.

Another line of cognitive research, focused on the language about mental states used by high-functioning autistic children in a naturalistic setting (Tager-Flusberg, 1992), has offered further evidence for the "cognitive deficit" hypothesis. In particular, the aim of that American study has been to look into the ways that verbally able autistic children at pre-school age talk about themselves and others in their spontaneous interactions with their mothers at home. The target group was observed to use significantly fewer terms about attention and cognition than the comparison group of children with Down's syndrome. Also, autistic children appeared to describe more often their own perceptions, desires, and cognitions; yet, they referred equally to their own and others' emotions.

In contrast, a social-affective theory has argued that autism is best viewed as a case where the inborn ability to form emotional relationships with people is lacking (Hobson, 1990b, 1992, 1993a, 1994). In particular, Hobson (1994) explicitly states that the innate tendency to perceive others' bodily actions and respond to affective attitudes in others, and therefore "share experiences", suggested as the basis for mental understanding of the social world, is deficient. Thus, autism is a disorder with a primary social-affective deficit. Moreover, Hobson (1993a) suggests that individuals with autism have limited capacities for self-reflective awareness: they do not have a concept of themselves and others as persons with mental attitudes; their knowledge of their own self and others is confined largely to physical characteristics rather than affective mental states. This hypothesis has been supported through experimental research on recognition and expression of emotions (Hobson, 1986a, 1986b), joint attention skills (Kasari et al, 1990) as well as social interactions of autistic children (Sigman et al, 1986; Sigman & Mundy, 1989).

It is clear that the strands of the existing literature make a powerful case for an impairment (either cognitive or affective) in the ability of able autistic children to reflect on their own and others' mental states. In essence, it is predicted that the understanding of self and others in the majority of the autistic population will not go beyond non-mental

aspects of themselves and others. Even bright autistic persons are not expected to have a rich mental life and deep inner experiences (Hurlburt et al, 1994).

Understanding oneself and others is a fundamental human concern that starts early and continues throughout life. The nature of self (cognitive and emotional) has a deep and strong effect on the action and behaviour of individuals. Also, the context of social interaction provides a valuable framework for the cognitive/affective development of self in normal and atypical persons. These views on the role and importance of self and the context in which it evolves have been the theoretical grounds for this research. Further, my hope was that the study of this central area of social cognition would allow me to take a new look at the intricate clinical picture of autism. Moreover, the dominant methodological paradigms in the study of autism have used experimental techniques and these raise questions about whether their findings can be generalised to natural situations. Therefore, the need to compare autistic children's performance in different settings has guided my choice of this particular research design.

The primary aim in this thesis has been to gain an *understanding* of how children with high-functioning autism/Asperger's syndrome think about themselves and others. The objective has been less to prove and test a hypothesis than to examine the quality of knowledge about self and others in different contexts. It needs to be made clear that the notion of "self" adopted in this study is in line with the dominant cognitive paradigm in autism. That is, the definition of "self" in this research includes only awareness of mental states (i.e., beliefs, feelings, desires, perceptions).

Moreover, this study purports to investigate whether the use of knowledge of self and others, reflected in language about their own and others' mental states, is associated with the social context and the participants in it. Hence, the aim is to extend current knowledge about autistic children's understanding of their own and others' inner states by looking further at these children's verbal interactions within real-life social settings.

Thus, this research will draw theoretical attention to the contribution of the social environment in the use of the ability of autistic persons to be aware of their own and others' psychological states. In particular, it will attempt to investigate whether significant others encourage or inhibit the cognitively constrained ability for introspection in high-level autism. Research on the development of mental understanding has demonstrated that the role of socialising agents in normal children is critical (Dunn, 1988, 1993). It would be interesting to explore this theoretical position in an autistic group, as the fundamental deficit lies in social interaction. Curiously, there has not been much research in this direction.

Consequently, it was necessary to look for methods that would provide empirical information on the nature of awareness of self and others in high-functioning autism/Asperger's syndrome demonstrated in experimental situations as well as real-life social contexts. Information is drawn from five sources:

1. *Experimental Situation.* A group of children with high-functioning autism/Asperger's syndrome was tested on two different tasks of theory of mind, that have been extensively used in the cognitive tradition, and compared with adults with Asperger's syndrome and children with moderate learning difficulties (MLD).
2. *Semi-structured Interviews.* All groups were individually administered an interview on self-understanding. They were asked to describe spontaneously different aspects of themselves.
3. *Systematic Observations of the Use of Language on Mental States of the Self and Others in the Natural Context of School.* Conversations between children and their teachers during one-to-one and group sessions at school were observed for the target group and the comparison group of children with MLD.

4. *Systematic Observations of the Use of Language on Mental States of the Self and Others in the Natural Context of Home.* Verbal interactions between children with HFA/AS and their parents were observed at home. Similar data were obtained from the same group of children with MLD.
5. *Observations of Use/Non-Use of Mental Understanding of the Self and Others derived from Ethnographic Observations in the Context of School.* Informal observations of mentalising behaviours in the school setting were carried out for the target group only. This ethnographic information was used as complementary evidence to the other types of data.

On the whole, this study has aimed to look at knowledge of self and others in high-functioning autism/Asperger's syndrome from a wider perspective that combines experimental with naturalistic techniques. This methodological synthesis, based on a theoretical perspective that regards cognitive and social development in clinical populations as closely interrelated, may provide a more comprehensive understanding of the issue, if it is indeed the case that autistic children affect and are affected by social interactions. Hence, there is a shift of emphasis: from individualistic approaches that measure autistic children's cognitive abilities in the context of artificial/experimental situations to social perspectives that examine the application of cognitive skills by autistic children in their interactions with others in natural contexts. This research is intended to carry out this task.

The thesis is organised in four parts. Part I will provide the theoretical background of this study. First, the controversy on the distinction or "continuity" between high-functioning autism (HFA) and Asperger's syndrome (AS) will be presented (Chapter 2). Next, cognitive theories and social-affective perspectives on the knowledge of self and others in autism will be discussed in the light of their empirical evidence (Chapter 3). In the

following chapter, theoretical models on the understanding of the self and others in normal children will be reviewed.

In part II, the purpose is to discuss how significant issues arising from the literature review have formulated the theoretical aims and the methodological directions of this study (Chapter 5). Part III will present the analysis of all sets of findings. First, results from experimental testing (Chapter 6) and interviews on self-understanding (Chapter 7) will be discussed (Chapter 8). Then, the use of language on mental states of the self and others at school (Chapter 9) and home (Chapter 10) will be described, and discussed (Chapter 11). Also, observations based on ethnographic observations will be presented (Chapter 12). Finally, conclusions and directions for future research will be covered (Chapter 13).

CHAPTER 2: IDENTIFICATION OF THE DISORDER

Introduction

In the first section of this chapter the aim is to present a detailed clinical description of typical autism and discuss the main diagnostic issues related with this disorder (this term is used to describe the pervasive disturbance of autism, including several deficits; the meaning of the term "deficit" refers only to *one* abnormal aspect of a disorder), arising from existing diagnostic classifications. The next section will compare the clinical picture of high-functioning autism with that of Asperger's syndrome. Finally, there will be a discussion of the existing controversy about the validity of a differential diagnosis between high-level autism and Asperger's syndrome, drawing from research findings.

EARLY INFANTILE AUTISM

The "triad of impairment"

Early infantile autism was originally identified as a syndrome by the American child psychiatrist Leo Kanner in 1943. That year he published an article entitled "Autistic disturbances of affective contact", which was ground-breaking in the sense that it described the case histories of eleven children (all under the age of 11) with a peculiar clinical picture. The main striking features of these individuals were: an "inability to relate themselves in the ordinary way to people and situations from the beginning of life" (p. 242), an "extreme aloneness ..., not responding to anything that comes to them from the outside world." (p. 248) and "an anxiously obsessive desire for the maintenance of sameness" (p. 245). Also, these children showed delayed echolalia, inappropriate use of personal pronouns ("personal pronouns were repeated as heard"), very good rote memory

and stable relationships with objects; yet, most of these children gave the "impression of serious-mindedness" (p. 247) in their facial expression. Overall, Kanner claimed that all the above symptoms established "early infantile autism" as a distinct syndrome, differentiated from childhood schizophrenia.

It was nearly thirty years later that these anecdotal clinical observations comprised the basis for an epidemiological study of the disorder, with the purpose to investigate the incidence of autistic features in the population and their relation to mental retardation. A comprehensive study by Lorna Wing and Judith Gould (1979) in the MRC Social Psychiatry Unit in London represents a major step in that direction. Out of 914 children with mental or physical handicap under the age of 15 years who lived in Camberwell, 132 children had been identified on the basis of the following criteria. They showed at least one of the following behaviours, regardless of level of intelligence and age of onset: impairment in reciprocal social interaction (especially with peers), impairment in verbal and non-verbal communication and impairment in imagination accompanied with repetitive, stereotyped activities. This "triad of impairment" was established as the crux of autism.

Wing & Gould (1979) distinguished between two groups of children: "socially impaired" and "sociable severely retarded". The former group represented 21.2 cases of every 10,000 children in the same area, of whom 4.9 had a history of typical autism. Furthermore, they proposed a classificatory system for the "socially impaired" group. Social impairment was rated as "social aloofness", "passive interaction" and "active but odd interaction". A "socially aloof" child would show indifference and aversion to social contact; s/he would initiate social approaches only with the purpose to satisfy her/his own needs. Also, s/he would like physical contact, such as cuddling and tickling, but with no interest in the social aspects of the contact. A "passive" child would not make social contacts but would not resist if other children asked her/him to engage in their games. Her/his role in these games was simply to act like a baby or a patient. When the game was

finished s/he would just wander off. The "active but odd" child would enjoy being with people, mostly with adults. But s/he would monopolise the topic of the discussion and would not appreciate the feelings and needs of others. S/he would pester other people, because of her/his idiosyncratic behaviour. However, these types of behaviour indicated the predominant style of abnormal social interaction in different children, as well as different styles of social handicap shown in different situations by the same child (Wing & Attwood, 1987).

Moreover, an important finding of this study was the positive association between level of retardation and severity of social impairment (Wing & Gould, 1979). So those children that seemed to be "socially aloof" and "passive" had severe to mild mental retardation; whereas the "active but odd" socially impaired children had milder mental handicap. One might leap to the conclusion that in autism there is a broader neurological damage in the brain areas responsible for social interaction and intelligence. But a group of mentally retarded children with social skills appropriate to their mental age ("sociable severely retarded") was also identified. Finally, this large scale study provided empirical evidence for the reliability of the distinction between "childhood autism", "childhood psychosis" and "childhood schizophrenia".

However, Wing & Gould's research has been criticised on methodological grounds, particularly the selection of its sample. Baron-Cohen (1985) argued that the generalisability of the subtypes of social impairment was dubious, since it was drawn from a sample that represented only the retarded range of autism. Hence, he questioned the validity of the comparison of the social handicap in autistic people with normal intelligence with the social impairment in severely retarded autistic persons. Baron-Cohen's evaluation is fair in the light of recent research on the social handicap in high-level autism. But, Wing and Gould's typology needs to be evaluated as the pioneer work in the prevalence and identification of the core abnormalities in autism.

Diagnostic criteria for autism

There has been a great deal of variation in the conceptualisations of autism over the years, since the focus of clinicians and researchers has shifted from viewing autism as an infantile psychosis to a cognitive developmental disorder that is characterised both by deviance and delay in specific areas of functioning (Rutter & Schopler, 1987). Both the major systems of classification, ICD-10 (World Health Organisation, 1990) and DSM-III-R (American Psychiatric Association, 1987) have tended to concentrate on four sets of diagnostic criteria. First, "autistic disorder" or "childhood autism" is defined as "a qualitative impairment in reciprocal social interaction", that is shown through (a) lack of awareness of the feelings of others, (b) lack of seeking comfort when distressed, (c) rarely imitating others, (d) rarely participating in interactive play with others and (e) lack of ability to make relationships with peers, based on mutual interests, activities and emotions.

The second set of diagnostic criteria includes abnormalities in verbal and non-verbal communication and imagination. These deficits are described as a cluster of features, such as (a) lack of general mode of communication (i.e., facial expression, gesture, mime, spoken language), (b) abnormal use of non-verbal communication means (i.e., does not respond with smile and eye-gaze when making social contact, stares at people, becomes rigid when held), (c) abnormalities in the characteristics of speech (like volume, pitch, rate and rhythm), (d) impairment in the form and the content of language (i.e., reversal of pronouns, echolalia, idiosyncratic use of words), (e) failure to initiate and sustain conversation with others and (f) lack of spontaneous and creative imaginative play, such as pretend play.

The third set of diagnostic criteria is related to stereotyped activities and interests, shown in (a) stereotyped body movements, (b) restricted and narrow interests, (c) preoccupations

with parts of objects, (d) attachment to unusual objects, (e) distress over changes in minor aspects of the environment and (f) insistence on following rituals in precise detail.

Lastly, the age of onset is mentioned as a secondary criterion for the diagnosis of autism. But there is no agreement on the exact age range. DSM-III-R (1987) requires that an onset of the above symptoms during infancy or childhood is specified, whereas according to ICD-10 (1990), these clinical features need to be present in the first three years of life. Gillberg (1990) argued that the age factor should be dismissed, since it is not a behavioural criterion. Also, it is often hard to obtain a full and reliable medical history from parents before the age of three. In addition, Baron-Cohen & Bolton (1993) emphasise that it is very difficult to detect whether abnormalities of the child at an early age are caused by autism or mental retardation. Moreover, functional language and communication do not always develop until the end of the first three years. Finally, they point out that there is a small number of autistic children with an initial period of normal development followed by a regression and decline of their abilities and skills.

It is important to note that "early infantile autism" is defined in DSM-III-R as in DSM-III (1980): as a member of the group "pervasive developmental disorders" (severe, early developmental disorders with delays and distortions in the development of social skills, communication and cognition). As Rutter & Schopler (1987) argue, this classification is useful, since it points to a broad deficit picture in autism, instead of a specific one. Also, it implies that autism is a disorder present from childhood, unlike adult mental conditions. However, this grouping is misleading as "the disorder is pervasive but not all-pervasive" (p. 161). The general level of intelligence maybe high but the ability for social relationships may be very low (i.e., "high-functioning autism").

Nevertheless, DSM-III-R defined the "autistic disorder" as a range of cardinal behaviours including severe and mild autism. Thus, autism was substantially broadened and specified in a concrete and observable way, that would make its diagnosis more operational (Tsai,

1992). Yet, Tsai also criticised the classification of DSM-III-R as a "lumpers" approach (p. 16), since it tends to group all different conditions under the same bundle. Clinicians and researchers may diagnose a mild form of autism and a severe form of autism under "autistic disorder", making it even more difficult to study small groups that are heterogeneous in their functioning. Therefore, Tsai suggested "a "splitters" approach" (p. 17) as more appropriate. He contends that in order to learn more about autism and autism-related disorders we need to differentiate between levels of autism.

The psychogenic theory of autism

This section will only highlight the major proponents of psychogenic explanations for the causes of autism. The first theory on the etiology of autism was introduced by Leo Kanner (1943, 1954, 1979). He commented that the parents of all his cases were highly intellectual, educated people with "a great deal of obsessiveness"; they were strongly preoccupied with abstract aspects of science, art and literature and their interest for people was limited. Overall, they were characterised as cold and formal personalities. Thus, he explained his cases as "pure-culture examples of inborn autistic disturbances of affective contact." (Kanner, 1943; 250) However, he stated that "the children's aloneness from the beginning of life makes it difficult to attribute the whole picture exclusively to the type of the early parental relations with our patients." (p. 250).

Rutter (1983) has pointed out a conflict between Kanner's earlier and later statements on the etiology of the disorder. Six years after his first article (1949), he suggested that autistic children's aloneness "... seems to be an act of turning away from such a situation to seek comfort in solitude" (p. 517). Also in 1951, he explained obsessive behaviours in these children as follows: "The patients find security in sameness, a security that is very tenuous because changes do occur constantly and the children are therefore threatened perpetually and try tensely to ward off this threat to their security." (p. 517, quoted in

Rutter, 1983). Yet, in 1954, he claimed that "... it should not be forgotten that the emotional refrigeration which the children experience from such parents cannot but be a highly pathogenic element in the patient's early personality development." (p. 384). Therefore, Kanner's first position that autism is an innate deficit shifted to the view that the extreme social withdrawal of these children may be a constitutional disposition, but essentially it is a conscious reaction to a hostile family environment.

A psychogenic explanation for autism was also put forward by the child psychoanalyst, Bruno Bettelheim. In his book "The empty fortress: infantile autism and the birth of self" (1967), he explained the whole clinical picture of his patients as the outcome of the mother-child relationship. Therefore, he proposed that these children should be isolated from the cause of their behaviour: their parents. The treatment would be the initial isolation of the child in the clinic, where there would be continual effort to re-build the emotional security that these children lacked, due to an unresponsive mother.

Although the above theoretical accounts were useful in stimulating clinical interest on the enigmatic nature of autism, they have failed to provide any adequate empirical evidence. Despite their incisive observations of the children's disordered behaviour, their claims were founded on interviews with parents and impressionistic information. On these grounds, the psychogenic assumptions have been dismissed as a valid explanation of autism. But they have inspired an explosion of genetic studies, intended to explain the puzzling clinical picture of autism.

Medical research

It is now unanimously accepted that autism is an organically based neuro-developmental disorder (Rutter and Schopler, 1987). There is a considerable body of evidence for the

contribution of genetic factors in the cause of autism. Different types of research findings will be examined.

Twin studies have found that there is an increased possibility of finding autism in the siblings of autistic children. In a nationwide British twin study, 60% of pairs of identical (monozygotic) twins had autism whereas 9% of non-identical (dizygotic) cases of twins showed autism (Folstein & Rutter, 1977a). Also, over 90% of the identical twins showed abnormalities in the cognitive and social domain, whereas only 10% of the non-identical twins showed similar signs of autism. Moreover, family studies claim that the proportion of siblings with some features of autism is about 20% (Baron-Cohen & Bolton, 1993). It seems likely that what is inherited is not nuclear autism but language and social difficulties. Also, siblings did not appear to have a mental handicap, unless they were autistic. Therefore, both the twin and the family research show that what is passed on to relatives is an impairment of a broader nature. Interestingly, the chance of broader abnormalities in relatives is associated with the severity of autism.

Furthermore, two population studies on autistic twins (Folstein & Rutter, 1977b; Steffenburg et al, 1989) reported that perinatal complications play an important role in the cause of autism. However, it was found that inborn abnormalities in the foetus had given rise to obstetric problems, rather than the other way round (as is the case with Down syndrome) (also, Bolton et al, 1994).

The view that the biological component is strong in autism is consistently supported by the high male: female ratio. In typical autism, the excess of boys ranges from 2.0 to 2.9 (Gillberg, 1990). Also, Wing & Gould (1979) argued that the sex ratio is related with the degree of autism. In their study, the ratio of boys to girls was 2:1 at the lowest levels of ability but it raised to 15:1 at the highest ability levels.

In addition, epidemiological studies in Sweden, France, U.S.A. and U.K. have showed that there is no social class effect in the occurrence of autism (Gillberg, 1990). Interestingly, there seems to be a bias in the referral of autistic children. Wing (1980) noted that parents of autistic children from high and middle classes tended to refer their children to psychiatric services for a diagnosis. This conclusion implies a strong referral bias rather than a social class effect. Nuclear autism can be found in any culture and social level (Baron-Cohen & Bolton, 1993).

Finally, the association between mental handicap and autism in 75%-90% of the autistic population provides further evidence that there is a strong organic background in the autistic disorder (Gillberg, 1990). In addition, the prevalence of epilepsy in autistic children (5% to 14%) (Steffenburg & Gillberg, 1986) and adolescents with typical autism (26%) (Gillberg & Steffenburg, 1987) provides another clue for supporting that autism is caused by a neurological fault. Moreover, autism has been found to be related with chromosomal anomalies, such as fragile X (about 2.5% (Bailey et al, 1993)), tuberous sclerosis and neurofibromatosis. Metabolic disorders, such as phenylketonuria as well as viral infections (rubella, cytomegalovirus, herpes encephalitis) have been also associated with autism (Baron-Cohen & Bolton, 1993). However, Rutter et al (1994) in their review of research findings on the link between autism and medical conditions concluded that the degree of this association is strongly determined by the level of intelligence. Thus, it is more common to find medical conditions in the severely retarded autistic children rather than the mildly retarded or those with normal IQ.

In summarising the discussion on the evidence for a biological background in autism, the main point is the considerable genetic heterogeneity in the etiology of autism. Yet, it is possible that what lies behind all these related abnormalities is a "final common pathway" (Darby & Clark, 1992). This model proposes that various genetic factors cause neurological damage in centres of the brain that lead to autism and mental handicap.

Hence, it remains still uncertain which area of the brain has been insulted and which mechanisms have been responsible for the dysfunction of these systems.

HIGH-FUNCTIONING AUTISM

Over the past decade, the need to study different subgroups that fall within the category of "autistic disorder" has been widely acknowledged (Schopler & Mesibov, 1988, 1992). The variety and complexity of the autistic impairment have called for a differentiating approach. The grouping of individuals according to their level of functioning and severity of the handicap has been highly beneficial for the understanding of the syndrome. Recently, there has been a growing attention on the minority (one-fifth to one quarter) of the autistic population that shows a mild form of the core autistic symptoms and is not associated with mental handicap. Able autistic individuals present a special interest, since they represent a purely autistic group, without any abnormal behaviours attributed to mental retardation or other handicaps (Rutter, 1983). However, it is necessary to point out that high-functioning autism is not defined as a separate member of the category "pervasive developmental disorders" in DSM-III-R (1987); the diagnostic criteria for the "autistic disorder" are described with examples for more and less handicapped autistic persons. Next, the profile of an individual with high-functioning autism will be presented- a description drawn from DSM-III-R and research findings.

Cognitive level

Kanner's (1943) first account on the disorder described eleven autistic persons, all of whom had normal intelligence. However, this has not been found to be the case in later studies. Three quarters of the autistic population are also mentally retarded (Rutter &

Lockyer, 1967). Initial investigations in autism focused on the mentally impaired majority of autistic persons. Bartak & Rutter (1976) found that there was a different pattern of behaviours and skills between autistic children with performance IQs above 70 and below 70. Since then, the cut-off point of Performance IQ above 70 or Full Scale IQ above 60-65 has been used for research purposes as the main cognitive criterion for the differentiation of a high-functioning from a low-functioning autistic group (Tsai, 1992). Therefore, high-functioning autism has been defined on the basis of a normal cognitive level, as measured by a standardised test of intelligence. However, the question is whether a cognitive criterion is sufficient or needs to be complemented by additional criteria of social and communication skills (Tsai, 1992).

Social relationships

In the area of social interaction, persons with high-functioning autism appear to be interested in forming relationships with other people, but they do not seem to understand the social conventions and needs of others for privacy. As they grow older, they feel a stronger desire to make friends and have human company, but fail to comprehend the complex social rules of interaction (Wing, 1992). With regard to Wing's classification ("aloof", "passive", "active but odd"), the high-functioning groups would be those with passive and "active but odd" social behaviour. Moreover, they do not avoid eye contact but tend to stare at people and talk to them for a long time about their own particular circumscribed interest. They may approach others persistently so that they can bombard them with their own favourite topic. When they are involved in an activity they tend to act repetitively and stereotypically but they do not seem to be so rigid as severely retarded autistic children in following their patterns. Also, they copy others' actions but out of context. In play, they engage other children only as "mechanical aids". In adolescence and adulthood, these high-level autistic persons may achieve independence and employment in a job with a fixed routine and minimal requirements for social interaction (such as

librarian, accountant, work with computers, assembly work in factories) (Wing, 1988; 1991). However, they need continuous supervision and counselling in coping with the multiple demands of social life. Most of these cases with high-functioning autism may have not been diagnosed in early childhood since they were considered as eccentric and odd rather than disordered. Quite often their bizarre behaviour was not even observed as abnormal by their parents. Many of them may attend mainstream schools and receive special support. However, because of their social naivety they are often bullied by their peers.

Language and communication

In high-level autism aspects of verbal and non-verbal communication seem to be mildly impaired. This impairment covers abnormalities both in the production of speech and the content of talk. They seem to be delayed in acquiring and using grammatical constructs, such as pronouns, negatives, interrogatives (Shea & Mesibov, 1985). Also, Bartak & Rutter (1976) found that all the high-functioning autistic children who could speak were echolalic, and 95% of them showed pronoun reversal. Besides, DSM-III-R (1987) describes the speech of less handicapped autistic persons as monotonous and stereotyped, with idiosyncratic use of words and phrases and lack of normal intonation. Also, their voice sounds mechanical and artificial and they tend to talk about superficial, repetitive and esoteric issues (Wing, 1992). Bright autistic children appear to change subject quite often without taking into account the other's feelings or enthusiasm about the conversation; they also show a lack of interest for imaginary stories (DSM-III-R). Overall, they are very poor listeners.

Ritualistic and compulsive behaviour

Similarly to low-level autism, in high-functioning autism there is a high incidence of stereotyped movements (rotating movements of the hand, arm flapping, shaking of the arms and arms, whole body movements) (DSM-III-R, 1987; Tsai, 1992). In addition, there is a strong tendency for pre-occupation with a single subject (i.e., mathematics, astrology, train timetables, telephone directory) and difficulty to accept a new routine or change in the environment. However, there is a lot of potential for monitoring these behaviours because able autistic persons have better communication skills. The main problems persist but it is easier to explain to them how they could suppress their obsessions and stereotypies in social situations.

ASPERGER'S SYNDROME

A first account

One year after Kanner's insightful account of "early infantile autism" (1943), an Austrian clinician published his thesis on " 'Autistic Psychopathy' in childhood" (Asperger, 1944, translated in Frith, 1991). Hans Asperger's paper described a "personality disorder" characterised by "the shutting-off of relations between self and the outside world." (p. 39). At that time he did not seem to be aware of Kanner's article. However, Asperger later recognised that his four cases of boys (aged 6-11 years) share more similarities than differences in their clinical picture with Kanner's eleven patients (Asperger, 1979; Wing, 1992). He emphasised social isolation, impaired non-verbal communication, stereotypical movements, narrow interests and "originality of thought" as the main features of his syndrome- he later concluded that his syndrome was a mild form of Kanner's autism (Asperger, 1979). But he considered autism as a "psychotic process" and his syndrome as a personality trait (Asperger, 1979). Unlike Kanner, he insisted that "autistic psychopathy" can occur at all levels of intelligence, from "the highly original genius to

the most severe contact-disordered, automaton-like mentally retarded individual." (Asperger, 1944, in Frith, 1991; 74). Also, he noted that his syndrome was not recognised before the third year, whereas Kanner's autism occurs before 30 months. He claimed that his patients were not indifferent to other people, but aware of their existence; yet, their approach to others was inappropriate. Perhaps the most interesting observations made by Asperger are related to highly creative abstract thought and the production of a sophisticated original language in these persons. For example, an eleven year old boy said: "I can't do this orally, only headily." (Asperger, 1944, in Frith, 1991; 17); he probably meant that he found it easier to think about something rather than talk about it. Asperger felt that these children would follow their own esoteric impulses and interests regardless of the outside world. Some of them had pursued this interest as a profession (i.e., mathematics, chemistry, technology). Also, Gillberg (1991) examined six family stories with Asperger's syndrome and noted that "the most striking feature of Asperger cases is their odd all-absorbing interests" (p. 140).

Asperger's syndrome and schizoid personality disorder

Asperger (1979) defined his syndrome as a personality disorder, although he appreciated many similarities with Kanner's infantile autism. Later, Wolff & Barlow (1979) compared autistic (high-functioning), schizoid and normal adolescents on a variety of psychometric tests. They found that their sample with "schizoid personality" showed the same clinical features as those that manifest Asperger's syndrome but they were distinct from the autistic children. Also, in a follow-up study of 25 boys with schizoid personality or Asperger's syndrome, the stability of the clinical picture and the validity of using these two labels interchangeably was further supported (Cull et al, 1984). In contrast, Tantam (1988b, 1988c, 1991) did not find any strong association between Asperger's syndrome and schizotypal personality disorder. He reported that it was common for able autistic persons to develop schizoid features but the occurrence of these problems was not

significantly higher than in the control group of non-autistic subjects. However, Wolff (1991) suggested that "schizoid personality" disorders are likely to be on a continuum with Asperger's syndrome and autism and overlap with schizophrenia spectrum disorders.

Asperger's syndrome and autism

In this section, the existing controversy in the literature over the relationship between Asperger's syndrome and autism will be presented. Namely, is Asperger's syndrome closely related with autism? If so, then which is the group of autistic persons that also shares the label Asperger's syndrome? If not, then what are the criteria for the distinction between "autistic psychopathy" and infantile autism?

Asperger's syndrome was first recognised as a nosological entity in the draft of the tenth edition of the World Health Organisation's International classification of diseases (World Health Organisation, 1987). It was included under the category of "pervasive developmental disorders", that are characterised by "the triad", together with restricted, stereotyped interests and activities. It was stated that "no general delay or retardation in language or in cognitive development" would distinguish Asperger's syndrome from autism; yet, it was mentioned that the majority of people with this disorder have normal intelligence. However, ICD-10 did not make any references to the impairment of verbal and non-verbal communication that has been reported in research (Asperger, 1944, translated in Frith, 1991; Tantam, 1988a, 1991; Wing, 1981a). This highlights the need for diagnosticians to be better informed by researchers and clinicians.

Wing (1981a) examined 34 cases (aged from 5-35 years) that resembled the clinical features for "autistic psychopathy". Despite her agreement with Asperger (1944, 1979) that there is a strong familial loading for the occurrence of the syndrome, she disagreed

with him that speech develops at normal age in these children, since she noted that slightly less than half of her sample were delayed in their speech. Besides, she argued that despite the good use of grammar and the large, rich vocabulary observed by Asperger, "the content of speech was impoverished and much of it copied inappropriately from other people or books." (Wing, 1981a; 117). In addition, she made the point that careful analysis of the thought processes of these persons revealed that they were not original and creative as Asperger (1944, translated in Frith, 1991) had regarded but rather "confined to a narrow, pedantic, literal, but logical, chain of reasoning." (p. 118). Also, she noted that some of the children in her sample showed autistic features in their pre-school years but later appeared to have Asperger's syndrome. Thus, she argued that Asperger's syndrome and Kanner's autism can be classified under the same category ("the autistic continuum"), since they share the core triad of impairment in communication, social interaction and imagination, accompanied by repetitive activities and circumscribed interests. Their differences lie only in the degree of severity of the deficit (Wing, 1988).

Two case studies lend further support to Wing's position for "an autistic continuum". Volkmar, Raul & Cohen (1985) discussed a case study (boy aged 13 years old) that would be very problematic to be diagnosed as Asperger's syndrome or high-functioning autism. They concluded that there was not enough evidence for the claim that Asperger's syndrome and autism are entirely separate disorders. Also, Bowman (1988) presented a case study of a family with four out of six members exhibiting features of the autistic continuum. The youngest boy was diagnosed as Asperger's syndrome and his other two older brothers were autistic; one of them had no speech delay and the other was observed to be retarded before the age of 30 months. The father was described as a "loner" with odd language and narrow interests. All of them had normal verbal and performance IQ, but widely scattered subtest scores: a cognitive profile that is very common in autistic persons. Clearly, there is a strong genetic effect in this family, that supports the view that autism and Asperger's syndrome may have a broad common etiology. Thus, the variations

in the impairment of the triad in this family were explained in terms of the "autistic continuum".

Szatmari (1989) reviewed 20 studies with the aim to evaluate whether the evidence for the distinction between autistic disorder and "autistic spectrum disorders" (ASD) had internal and external validity. The term "autistic spectrum disorders" included those disorders with the triad of impairment (such as Asperger's syndrome, autistic tendencies, atypical autism) but without enough features to qualify for the autistic disorder. He concluded that "certain clinical differences exist between ASD and autism; that is, the ASD children tend to have fewer autistic symptoms, greater fluency in language, and later age of onset." (p. 592). However, Szatmari's review of 17 studies on the comparison of clinical symptoms between autistic spectrum disorders and autism highlighted many critical methodological weaknesses in this area of research. These, including the clinic-based sampling procedure, the lack of justification for the exclusion of autism in the cases with Asperger's syndrome and the non-matching on IQ, cast serious doubts on the validity of the claim for the clinical distinction between the two diagnostic categories. Nevertheless, he identified three subgroups under "autistic spectrum disorders": low-functioning autism, high-functioning autism and Asperger's syndrome. Yet, he noted that there was enough evidence that the two latter groups share common etiology in contrast with the first group. But it remains unresolved whether level of severity or developmental level account for the distinction between Asperger's syndrome and autism (Szatmari, 1989). Thus, research on specific subgroups within the "autistic spectrum" or "autistic continuum" would be highly necessary.

Szatmari, Bartolucci & Bremner (1989) compared a group of adolescents with AS with a group of adults with HFA on early history and outcome. They did not find any substantive qualitative differences between the two samples, although there were clinical differences related with the "triad of impairment" in their early history and outcome. These were explained as milder forms of pervasive developmental disorder, rather than as

symptoms of a distinct syndrome. The question is whether we really need the label "Asperger's syndrome". But Simblett & Wilson (1993) point out that, although the diagnosis of Asperger's syndrome remains controversial, it was useful in designing a management program for the anti-social and violent behaviour of three adults.

A major British study of 46 adults provided good evidence that Asperger's syndrome can be reliably identified in adulthood as well (Tantam, 1988a, 1988b, 1991). The validity of the diagnostic criteria was supported by the high frequency of these behaviours in his sample: 91% showed non-verbal communication handicap, 67% were socially impaired and 95% had special, narrow and private interests; also, clumsiness was observed in 91% of them. Hence, there is a consistency in the presence of the core deficits throughout life. However, Tantam argued for the independence of Asperger's syndrome from high-functioning autism on the basis of a wide IQ distribution in his group of patients. This finding has been also supported by Burgoine and Wing (1983) and Gillberg et al (1986). Therefore, the level of intelligence cannot be accepted uncritically as the significant criterion for the connection between Asperger's syndrome and autism.

In summary, it is clear that diagnostic guidelines are confusing in the identification of high-functioning autism and Asperger's syndrome. It seems that the "triad" of impairment is the common clinical picture for both disorders. Moreover, research has shown that the criterion of absence of language delay in early history is not well established for distinguishing Asperger's syndrome from high-level autism. In the light of these considerations, Happe (1994a) has gone further to suggest that theoretical criteria based on psychological measurements might be more useful. In particular, performance on theory of mind tasks may be an appropriate way to differentiate between autism and Asperger's syndrome. However, Wolff (1994) has criticised this approach on the grounds of tapping only specific skills and drawing inferential results. In this thesis, the position of regarding high-functioning autism and Asperger's syndrome at the upper end of "the autistic continuum" has been adopted. However, diagnosis of HFA and AS is only one

dimension of the identification of the disorder. The next step would be to examine current psychological theories aimed to explain cognitive and affective processes in able autistic individuals. In particular, the intention is to present the main theoretical assumptions of cognitive and social/affective perspectives and the major research findings on the ability of persons at the upper end of the autistic continuum to have knowledge of their own and others' mental states.

CHAPTER 3: PSYCHOLOGICAL THEORIES ON KNOWLEDGE OF SELF AND OTHERS IN AUTISM

Introduction

The principal aim of this chapter is to discuss the main psychological theories of the understanding of self and others in autism. The first section will present the theoretical assumptions and empirical evidence of recent and influential cognitive perspectives; in these, the main argument is that the lack of theory of mind can explain the social deficits in autism. The second section will present the conceptual framework and experimental research of social-affective theories that regard autism as an impairment in the interpersonal relationships between autistic individuals and others. Finally, the quality of awareness of self and others will be examined through first-person accounts and autobiographies of able autistic persons.

COGNITIVE PERSPECTIVES

Theoretical framework

Autism as a cognitive disorder

It is widely accepted that autism is a "behaviourally defined syndrome of neurological impairment" (Gillberg, 1990; 106); however, the special brain lesions remain unknown. One of the main premises of the cognitive theory is that autism is a cognitive disorder (Baron-Cohen, 1988, 1993; Frith, 1989a, 1989b; Leslie, 1987, 1991, 1993). Therefore, the principal theoretical aim of cognitive perspectives is to provide an explanatory hypothesis that will link a biological mechanism with a behavioural manifestation via a cognitive

psychological process (Frith, 1989a, 1989b). Hence, the study of the function of the autistic mind has been considered the key route for the understanding of this syndrome. Frith (1993) proposes three causal models for the explanation of various developmental disorders at three levels: biological, cognitive and behavioural. The suggestion is that, in the case of autism multiple neurological abnormalities may cause a single cognitive deficit, leading in turn to multiple behavioural manifestations. Thus, the objective of cognitive neuropsychology is to identify the underlying cognitive process that gives rise to "surface" behaviours (Frith, 1992).

Philosophy of mind

Philosophy of mind and cognitive science provide the theoretical resources for cognitive perspectives on the etiology of autism. In 1978, Premack & Woodruff published a paper with the title "Does the chimpanzee have a theory of mind?". They carried out a series of experiments with a chimp (Sara); she was shown video recordings of a person facing problems and was asked to choose a solution. Her responses were surprisingly appropriate, revealing that she could understand the actor's desires and intentions. So, if Sara could easily predict human behaviour on the basis of her theory of mind, then this innate cognitive mechanism of attributing independent mental states to self and other could be the background for making sense of the social world in humans as well. In a commentary on this study, the philosopher Dennett (1978) argued that mental states are "instrumental" for every human being to make sense of the social world; beliefs and desires are the most significant, because they determine human action. Thus, the study of one's ability to understand and predict false belief could be a strong test for his/her theory of mind ability. These ideas have inspired many theoretical hypotheses and a rich body of empirical investigation in autism, since one of its primary clinical symptoms is the lack of reciprocal social interaction. Namely, it has been proposed that the social abnormalities in autistic children may stem from a pathological fault in the acquisition and development of

the ability to understand and predict one's own and other's social behaviour by inferring mental states (Baron-Cohen, 1993; Frith, 1989a, 1989b; Leslie, 1993).

Precursors of the theory of mind

The "cognitivist stance" views behaviour as a set of representational schemata of the world (Olson, 1988). For example, if one believes (represents) an object to be in location x, one's action will be determined by this belief, rather than the true location of the object. The characteristic feature of these psychological states is their "intentionality". This property provides a realistic dimension to representational states. In other words, mental states entail a "propositional attitude": they express the relation between a proposition and its holder, i.e., I (subject) think (attitude) that it will rain tomorrow (proposition). That is, their content is always about something, i.e., I think x, I know y. Moreover, these mental states are not directly observable and require the use of inference. This logical property of mental states is their "referential opacity": it is suspended whether they are true or not (Olson, 1988). Hence, it is possible to represent things that are non-existent or false, i.e., in the statement "I believe there is a tree in the yard", it is not clear whether there is a tree or not.

Leslie (1987, 1988, 1991, 1993) proposed that the cognitive system produces "primary" and "secondary" representations (or metarepresentations). The former are beliefs about concepts of the physical world, i.e., there is a tree. The latter are beliefs about own or other's primary representations, i.e., I pretend there is ghost here (first-order metarepresentation), I think that you pretend that there is a ghost (second-order metarepresentation), I believe that you think that he pretends there is a ghost (third-order metarepresentation) and so on. In Leslie's terms, any metarepresentation has the general form: Agent (person/s) - Informational Relation (intentional state, i.e., pretend, think, know, imagine) - "Expression" (decoupled representation). "Decoupling" is the mechanism

of copying a primary representation and suspending its reference to the physical world. In the above example of first-order metarepresentation, it is not certain whether there is a ghost or not, since this is only related to my mental state. Leslie formulated his theory through observations of pretence in young normal children. He assumed that their ability to pretend (or form metarepresentations) is based on their ability to have primary representations of the world. When a child pretends that a banana is a telephone, s/he already knows that bananas are fruit. Otherwise, s/he would not be able to understand and show pretence. However, autistic children have not been observed to engage in spontaneous pretend play (Baron-Cohen, 1985). This impairment has been explained by Leslie as a lack of their capacity for metarepresentation. However, Eisenmajer & Prior (1991) stressed that a serious problem with Leslie's metarepresentational model is that "it is an all-or-none affair" (p. 362), that does not allow for degrees of metarepresentational ability. This point is fair in the light of empirical evidence on some high-functioning autistic individuals that show the ability to hold first- and second-order representations.

There is a great deal of controversy on the nature of the precursors for a theory of mind in infants as well as the exact age of onset of a theory of mind. Wellman (1990) proposes that by the age of three years all children are able to perceive other people's minds and use this knowledge for understanding their actions. Leslie (1987) suggests that the acquisition of theory of mind occurs earlier, between 12 and 18 months of age. Baron-Cohen (1991b; 1993a) claims that this ability emerges in the 9-12 months of age and is associated with the understanding of goal and attention. In particular, he argues that joint-attention deficits are the earlier signs of an impaired theory of mind, since they are also based on metarepresentation.

Baron-Cohen (1989d) tested autistic children on their ability to use protoimperative and protodeclarative pointing. Compared to normal and Down's syndrome children, autistic subjects showed almost no use of pointing for making a comment or remark for objects to others (protodeclarative use). In contrast, they appeared to use their index finger mainly

for requesting objects from adults (protoimperative use). Thus, autistic children appeared to share one's attention only as a strategy for satisfying their own needs. Then, Baron-Cohen (1991b; 1993) argued that the earliest detector of autism could be the lack of understanding attention in others: that others look at objects selectively, because of their own interest. This is the first type of representation formulated in the mind: understanding of the mental state of attention. This argument is useful in explaining clinical observations of autistic children that take an adult by the hand and guide him to the object they want to get. In opposition, normal children use eye-gaze as a way to communicate their needs. But, autistic children do not seem to use eye-gaze for understanding the goal of one's actions; although they do not always avoid eye-contact with others, they do not seem to make the appropriate social use of eye-gaze. Thus, the deficit in goal-detection leads to a general deficit in the ability for "mind-reading" of other mental states (Baron-Cohen, 1991b; 1993).

However, Baron-Cohen's account remains in the cognitive domain. Although, Mundy et al (1993) acknowledge the critical role of joint-attention behaviours for the development of a theory of mind, they draw attention to their affective component. Thus, their model emphasises the integration of affect and cognition in joint-attention. The ability for affect perception is viewed as closely related with the cognitive ability for representation. Also, Meltzoff and Gopnik (1993) agree that infants perceive others as persons rather than as objects (as the affective theories propose) but refute the "affective attunement between infants and others" (p. 360) as the key mechanism; instead they support imitation as the fundamental process for the development of a theory of mind.

The "nativist assumption"

The aim of neurocognitive approaches is to build up a theory, based on the investigation of the internal architecture of the mind, that will explain abnormal and normal behaviours

(Leslie's "black box" model, 1993). The hypothesis is that abnormalities in brain growth may produce impairments in cognitive structures, resulting in behavioural deficits. Metarepresentation (or theory of mind) is considered as an in-built module of the cognitive engine that generates conceptual development (Leslie, 1988, 1991); it is a computational mechanism that changes with maturation. Leslie (1988) claims that normal children at the age of 18 months are "biologically prewired" to acquire the ability for pretend play, a primitive form of metarepresentation. Later, at about 3-4 years, they are able to make attributions about intentional states of their own and others' minds. However, autistic children are not equipped with this cognitive apparatus. As a consequence, they can not make sense of social interaction and are not aware and conscious of their own mental reality (Baron-Cohen, 1989c). Meltzoff & Gopnik (1993) present Leslie's view with an analogy: autistic children " might be seen as more analogous to astronomers who try to develop theories of the stars without telescopes" (p. 359). Proponents of the cognitive perspectives claim that education can only compensate for an ability that nature has impaired (Frith, 1993).

The "primacy assumption"

The relevant argument is that the deficit in theory of mind is the most appropriate tool for predicting the "triad of impairment" in autism (Baron-Cohen, 1985; Frith, 1989a, 1989b, 1989c). Thus, the damage in metarepresentation is considered as the single cognitive domain responsible for the abnormalities in communication, imagination and social interaction in autism. However, Happe (1994a, 1994b) rightly points out that the theory of mind account cannot explain non-triad features of autism, such as restricted repertoire of interests, obsessive desire for sameness, islets of ability, excellent rote memory and pre-occupation with parts of objects. She goes further to suggest that Frith's "central coherence theory" is more successful on this task. Frith (1989a) suggested that autism could be explained as a result of a disturbance in the information-processing ability for

formulating meaning in context out of diverse information. The hypothesis is that autistic children will perform very well on tasks that require attention to local aspects but very poorly on tasks that require knowledge of the global meaning. Happe (1994a, 1994b) embraces Frith's theory, since it may explain why "the talented minority" of autistic children (those that pass advanced theory of mind tests) has persisting problems in real life social encounters. Two-way social interaction is a global situation and as such, it is even more difficult for an autistic person to control and respond to the whole, if s/he is able to process only parts of it.

Another rival neuropsychological theory on the primacy of the metarepresentational deficit in the autistic syndrome is "the executive function hypothesis" (Bishop, 1993; Ozonoff et al 1991a, 1991b). This assumption postulates autism as the outcome of a biological fault in the frontal lobe and the limbic system of the brain, where "the ability to maintain an appropriate problem-solving set for attainment of a future goal" (Bishop, 1993; 284) is located. Executive function is the basis for behaviours, such as organised search, flexibility of thought and action, impulse control. The evidence for this presumption will be discussed in relation with the empirical evidence on theory of mind in autistic individuals.

The "specificity assumption"

It has been noted that one of the strengths of the cognitive account is that it allows for a mixed pattern of abilities and deficits in autism (Frith, 1989a; Baron-Cohen, 1993). The main premise is that areas of functioning that call on mentalising skills and "mindreading" will be heavily damaged. Thus, the "metarepresentational conjecture" (Leslie, 1991) predicts that some social skills will be intact in autistic children: those that do not require metarepresentation. Namely, face recognition, mirror self-recognition, gender recognition, visual perspective-taking, person permanence, relationship recognition, animate-inanimate distinction will be unimpaired, whereas imitation of symbolic gestures, emotion

recognition and conceptual role-taking will be impaired (Baron-Cohen, 1988, 1991b, 1991c). On the whole, it is proposed that the lack of theory of mind in autism presents a mixed pattern of deviance and delay in areas of functioning (Baron-Cohen, 1991c, 1992a). This is illustrated through strong experimental evidence showing a small number of autistic children passing second-order theory of mind tasks. However, they do not appear to follow the same developmental pattern in the developmental acquisition of mental states (i.e., perception, desire, imagination, belief).

Knowledge of self and others in autism

The cognitive model puts forward the argument that awareness of the self and others will be impaired in autism (Frith, 1989a, 1989b, 1993). This claim rests on the assumption that the autistic person's mind cannot impute its own and others' internal states. Self-consciousness is regarded as the product of having a mental self. To illustrate this point, Frith (1989b; 47) paraphrases Descartes' dictum "I think therefore I am" in the following way, "I know that I think, therefore there is myself". However, she claims that without any doubt autistic children do have mental states, such as perceptions, desires, wishes, beliefs, memories, knowledge; but they are not conscious of them, due to the innate lack of theory of mind. In effect, they are "mind-blind" as opposed to others that can "mind-read" (Happé, 1994a). Hence, the autistic person can only make sense of the physical and observable world; s/he can not access any mental dimensions of reality in her/himself. In Frith's terms (1989b), the autistic individual would have a "non-reflective" (p.47) sense of self that might include a concept of self as a bodily object and not as a mental subject, as a result of a deficit in the ability to be aware of mental representations about the self. Moreover, understanding of the self and the other are considered as closely related. Thus, knowledge of others will not go beyond the attribution of physiological states, which do not require mental skills for their conception. Therefore, autism represents a disorder with a primitive concept of the self and others.

Critique of cognitive approaches

Here, my objective is to evaluate the a-priori theoretical assumptions of the cognitive theories that were presented in the preceding sections. Of course, the theory of mind hypothesis constitutes a major advance, because it established specific mechanisms that link cognition and social behaviour (Rutter & Bailey, 1993). It moved from the behavioural level to the cognitive level in research into autism; thus, it threw light on the underlying cognitive mechanisms of the clinical features of autism. Moreover, the cognitive account has been essentially a developmental one; it postulated a series of skills that built up one's theory of mind; it did not claim that "mind-reading" is a novel ability. It attempted to explain early autistic indicators through cognitive deficits at the young age of 9 months. On the whole, it represents an ambitious endeavour, that has stimulated a great deal of theoretical discussion and empirical work at an international level. The task of evaluating the cognitive approach has been impeded by its enthusiastic welcome in the research and professional community, mainly because it offers a new and ground-breaking theory, demonstrating that autism is a cognitive disorder and not a psychogenic syndrome.

Nevertheless, the fact that the theory of mind hypothesis has been primarily focused on the role and the contribution of cognitive processes in the autistic behaviour constitutes one of its critical theoretical limitations. Certainly, the emphasis on innate mentalising abilities is an insightful avenue but it is not sufficient for a more comprehensive understanding of autism, as it is experienced in real-life social situations. The assumption of the primacy of the theory of mind ability as the basis for social interaction could be criticised for its narrow and mechanistic implications. The cognitivist stance views all social contact as a merely computational act, free of contextual influence. It regards human nature as a product of a cognitive engine that constructs and appraises its contents (i.e., mental states) and behaviour. However, the mind is not developed in a vacuum but in the complex social

domain. Individuals manipulate their behaviour with respect to the social-emotional cues they receive from their human surroundings. Thus, it would be interesting to explore how the autistic mind performs in different contexts; to look for variations in the ways autistic persons use or do not use a theory of mind. It seems that there is a need to go beyond the metarepresentational self and examine social interactions.

In normal children the development of a theory of mind occurs through the transactional experience between caregivers and children (Bruner & Feldman, 1993). Such an approach acknowledges the significance of interpersonal relationships in shaping one's theory of mind. Various assumptions have been put forward on the key processes that may hinder the formation of social experience in autism. A failure to recognise and appreciate emotional expressions in other people has been postulated as the primary deficit in autism (Hobson, 1993a). Another alternative hypothesis is that the inability of autistic persons to encode and organise the narrative structures of society as they are scaffolded by others prevents them from developing a conventional theory of mind (Bruner & Feldman, 1993). However, these assumptions have not been tested in natural settings. Finally, the strength of the cognitive theory will be measured in terms of its methodological decisions and empirical findings. These will be considered in the following section of this chapter.

Empirical research

Here, the overall aim is to consider the empirical evidence of cognitive perspectives on the understanding of mental states of self and others in autism. However, the intention is to select and present the most prominent and diverse research paradigms that have served as the basis for the assumption that individuals with autism show a cognitive deficit in their social understanding with implications for their own knowledge of themselves. The emphasis on selection of research paradigms is important, because this chapter is not seeking to present a total coverage of the extensive research on autism. Moreover, the

focus will be on studies that have used persons with high-functioning autism and Asperger's syndrome as their target groups.

Although research conducted by the proponents of cognitive theories is, on the whole, primarily experimental, there is some interesting work carried out in naturalistic settings. First, I will present findings on the performance of autistic persons on a series of experimental tasks, tapping the theory of mind ability. Here, the main paradigm is the comparison of the target group with control groups (mentally handicapped and normal), carefully matched on verbal mental age, so that any effects from mental retardation on the autistic subjects are reduced. However, there has been a fascinating explosion of research with data that are contradictory to those obtained by the initial experimental investigations. Next, I will discuss how naturalistic work on the cognitive deficit in autism, albeit extending the traditional experimental approach, nevertheless remains within the same theoretical framework.

Experimental evidence

Attribution of false belief

At the outset, understanding of false belief was regarded as the baseline for establishing a theory of mind or the lack of it in normal and clinical populations. In 1983, Wimmer & Perner tested normal children at the age of 3-4 on their ability to impute another's false belief. Their test was adopted by Simon Baron-Cohen, Alan Leslie & Uta Frith (1985), who were the first psychologists to test the same ability in autistic children ($n = 20$), compared with a group with Down's syndrome and a group of normal children. The target group had higher mean verbal (5 years and 5 months) and non-verbal (9 years and 3 months) mental age than the control groups; also, these autistic subjects were high-

functioning, with an average performance IQ of 82 (only one subject had IQ lower than 70).

The "marble task" involves two dolls: Sally and Anne. Sally has a basket and Anne has a box. Sally puts a marble into her basket and leaves. While she is away, Anne takes the marble from Sally's basket and places it into her box. Then Sally comes back and wants to play with her marble. The critical question is: "Where will Sally look for her marble?" (the Belief question). Children were also asked comprehension questions: the Naming question ("Which doll is Sally and which is Anne?"), the Reality question ("Where is the marble really?") and the Memory question ("Where was the marble in the beginning?").

Interestingly, the only significant group differences were found in the Belief Question: 80% of autistic children failed the test, in contrast with 85% of normal and 86% of Down's syndrome children who responded correctly about Sally's false belief. The finding that the autistic subjects who passed the test did not have higher MA than those who failed showed that successful attribution of false belief was not related with verbal ability. Thus, this failure in imputing another's false belief was supported as a demonstration of a specific cognitive deficit in the theory of mind in able autistic children.

deGelder (1987) criticised heavily Baron-Cohen et al's study. Firstly, she argued that the autistic group did not pass the test, because it was "embedded in a pretence situation" (p. 287). Autistic children were asked to pretend that the dolls were people with beliefs, and it has been demonstrated that they have difficulty in pretend play. Therefore, it was expected that they would find it hard it to be successful on that task. Instead, deGelder insisted that it would be necessary to study autistic children in natural interactions that require the use of the ability experimentally tested. Secondly, she pointed out that this task was "embedded in language" (p. 287), since autistic children were asked to give verbal responses. Given the empirical evidence for pragmatic deficits in autism, it is not certain that autistic children could understand the meaning of the critical question. Thus, the

"Sally-Anne" task may evidence a language deficit rather than a cognitive deficit. Thirdly, she suggested that if autistic children did not have a theory of mind they would not have been able to participate in an experimental situation, as they need to be able to understand the experimenter's beliefs and intentions. She concluded that autistic children do have a theory of mind, but it is less complex than that of normal children. Finally, deGelder proposed a componential view in the study of autism: this syndrome needs to be considered as a case of a partial biological breakdown in the integration of the biological function of social interaction with the development of linguistic/conversational skills and the conceptual ability of having a theory of mind.

Leslie & Frith (1987) replied to deGelder in the following way. Firstly, they referred to the replication of a similar experiment with real people confirming the theory-of-mind-deficit prediction (Leslie & Frith, 1988). Secondly, autistic children appeared to have rather selective language problems only with the belief question and not with the memory and reality questions. So, if there was a language disability, it was not generalised, but affected only statements on mental states and not true states of affairs. Thirdly, Leslie & Frith (1987) emphasised that it is not certain which areas of social interaction and conversation involve metarepresentational skills and which do not. Therefore, these autistic children may have not employed this cognitive ability for taking part in an experiment.

deGelder's argument (1987) was important in the sense that it highlighted factors associated with the task that may explain autistic children's performance on the task. As Freeman et al (1991) have demonstrated appropriate changes in the task may have a direct effect on normal children's success rate. They modified the "Sally-Anne" task to a hide-and-seek game (the marble was replaced with a doll with whom Sally was playing hide-and-seek), so that the task would have greater "human sense" (Donaldson, 1978) for the children. They tested one group of 3-year-old ($n = 40$) normal children and another of 4 1/2 year-olds ($n = 40$) on three tests of false-belief attribution: the standard Sally-Anne test, the hide-and-seek test and the Debbie's pet test. The results were interesting, because they

showed that the hide-and-seek game was easier (85% success rate) than the standard test (48% success rate). In a second experiment, the children were required to act out the actor's plan. Children were asked to take up the story and act out the actor's mental plan (measure of practical intelligence). This resulted in more successful responses (94%), whereas in the standard modified task the success rate was smaller (64%). However, there has not been any research on whether similar task modifications would also affect *autistic* children's performance on the same test.

In 1986, Baron-Cohen, Leslie and Frith tested false-belief attribution through a different paradigm. Autistic, mentally handicapped and normal 4-year old children were shown pictures representing three different types of events: physical, social-behavioural and intentional. They were asked to make a story by putting each set of pictures in the right order and give a verbal report of it. For example, one intentional story was: a girl is holding her teddy bear and looks at a flower. She leaves her teddy bear behind, picks the flower and smells it. At this point, a boy comes and takes the teddy bear away. The girl turns back and believes (or expects) that her teddy bear is there. The hypothesis was that the autistic group would have a specifically impaired performance on those stories that involved understanding of the protagonist's mental state. Also, their language would be poor in mental terms. These assumptions were confirmed. All autistic children were successful in finding the correct picture-sequence in events with physical and social-behavioural causes, but 80% of them failed in the false-belief stories. Moreover, their descriptions were not rich in mental-state verbs relative to those of controls. Boucher (1989) criticised this study on the ground that the sample might not be representative, since it was also examined in the 1985 study by Baron-Cohen, Leslie & Frith. However, Ozonoff et al (1991a) found exactly the opposite results: high-functioning autistic adolescents were able to pass the intentional condition in the same task, but not the mechanical and behavioural (they failed only on one of these stories) conditions. Also, Oswald & Ollendick (1989) did not find any differences between a low-functioning autistic group and mentally retarded controls. It could be concluded, then, that the utility of this

task as a measure of knowledge of false belief is still questioned. A critique of the theoretical model used was given on pp.33-34 and on pp.59-60 there is further discussion of the empirical evidence derived from them.

The few autistic children that passed the "marble" test (Baron-Cohen, Leslie & Frith, 1985) were further tested on their ability to understand second-order belief attribution (i.e., "I think he believes that ...") (Baron-Cohen, 1989b). It was hypothesised that the capacity for an advanced theory of mind would be also impaired in this successful minority. In the autistic group, the minimum chronological age was 11 years and verbal/non-verbal age higher than 7 years.

The "Ice-Cream man" task, adapted from Perner & Wimmer's study (1985) with normal 5-10 year olds, was also presented with puppets, but the story was more complicated than in the "Sally-Anne" task. John and Mary are in the park. John wants to buy ice-cream but has left his money at home. The ice-cream man tells him that he will be there all afternoon. So John goes home to get his money and will be back in the afternoon. But the ice-cream man changes his mind and tells Mary that he will go to the church in order to sell more ice-cream there. On his way, he meets John and tells him that he will drive to church. Mary goes to John's home and his mother tells her that John has gone to buy some ice-cream. The Belief question was: "Where does Mary think John has gone to buy an ice-cream?". Also children were asked to justify their responses.

The prediction was confirmed. All autistic children failed this task, as opposed to 90% of normal and 60% of Down's syndrome children who passed it. Moreover, autistic children were found to use either first-order (instead of second-order) attributions or attributions to physical states in their justification responses. This finding supported the hypothesis that most of the autistic children are not able to make first-order attributions and those that are able, do not proceed to a more advanced level of a theory of mind. Therefore, autism was seen as a case of a specific developmental delay in theory of mind.

However, Burack (1992) argued that the above findings indicate a developmental deviance rather than delay in the acquisition of a theory of mind. Baron-Cohen (1992a) proposed a mixed model of deviance and delay in autism. His preceding study (1989b) supported a delay in the acquisition of theory of mind. Later, when he studied experimentally the ability for recall of a range of mental states in autistic children, he found a deviant pattern in the sequence of acquisition of a range of mental states (Baron-Cohen, 1991c). Autistic children appeared to have more difficulties with imagination and pretence than perception (in contrast with normal and mentally handicapped who found these mental states the easiest ones), which was the easiest for them followed by desire. Yet, belief was equally difficult for all groups.

Boucher (1989) developed an insightful criticism of the "Ice-Cream Man" task. By drawing attention to "the safety of interpreting failure to use a skill as evidence that the skill is lacking" (p. 191), she suggested that autistic children may fail to appreciate the need to use this knowledge of others' mental states in particular situations. She recalled a similar argument proposed in respect of pretend play: that autistic children lack the ability to pretend in their play (Baron-Cohen, 1985). However, able autistic children showed pretend play under "elicited" play situations, whereas under "spontaneous" conditions they did not (Lewis & Boucher, 1988). Boucher made the point that a more careful research design and a hypothesis that is not deficit-oriented may throw light on the "true" behaviours in autism. Moreover, she stressed the fact that autistic children were assessed on a vocabulary test (the British Picture Vocabulary Scale), whereas the theory of mind tasks assess grammatical competence. Although their vocabulary was superior to that of controls, this did not imply that their comprehension of syntax was also superior. However, Leslie & Frith (1988) did not find any relationship between language ability and performance on theory of mind tests; this might be due to the use of an inappropriate language test. Also, Boucher speculated that motivational factors may determine autistic children's performance on theory of mind tasks. Baron-Cohen (1989a) replied to Boucher,

by posing the critical question: "Why are they not motivated to use a theory of mind?". If it is an intentional act on behalf of autistic children then, he argues, it would require a massive effort from them.

Leslie & Frith (1988) utilised a more refined methodological strategy in another study of false belief and knowledge attribution in autistic children. In this project, autistic children were compared with children with specific language impairment; so any effects from language delay in the performance of autistic subjects would be eliminated. Again, the target group had a higher mean MA (7 years and 2 months) than the control group (6 years and 9 months).

In the knowledge task, experimenter 1 hid a red counter under a yellow box. Both experimenter 2 and the child saw her doing that. Then, experimenter 2 was asked to leave the room; experimenter 1 produced another similar counter which the child hid in another place. The "knowledge" question was: "Does experimenter 2 know that there is a counter (the second) under here?" and the prediction question was: "When experimenter 2 comes back in, where will she look for a counter?". Eight (44%) out of 18 autistic children passed the above task. The authors did not use a control group for this test.

In the false belief task, instead of puppets as in the initial study by Baron-Cohen, Leslie & Frith (1985), real people acted out a scenario. Experimenter 1 hid a coin in a basket in front of experimenter 2 and the child. Experimenter 2 left the room, and then experimenter 1 removed the coin from the basket and hid it in a red purse, making sure that the child was attending. The "knowing" question was: "Does experimenter 2 *know* that the coin is in here?", the prediction question was: "When experimenter 2 comes back, where will she *look* for the coin?" and the "think" question was: "Where does experimenter 2 *think* the coin is?". Significant group differences emerged: only 27% of autistic children made the correct predictions of the experimenter's false belief, as opposed to 92% of the control children. Interestingly, there was no correlation between mental age and performance in

the target group on both tests. Therefore, autistic children found it easier to understand knowledge than belief (44% and 27% of the autistic children were successful respectively); yet, both mental states were difficult for them.

The autistic child's understanding of false belief and knowledge was tested in a different paradigm by Perner, Frith, Leslie and Leekam (1989). Again, autistic children (mean verbal mental age= 6.2) were compared with children with specific language impairment (SLI) (mean verbal mental age= 6.9) on the "deceptive-appearance" or "Smarties box" test. Each child was presented with a box of Smarties and was asked to say what the contents of the tube would be. All children gave the same response: "Smarties". Then the box was opened and children were shown that it contained a pencil. The critical question was: "S/He hasn't seen the box. When she comes in, I'll show her/him this box just like this and ask: [Name] what's in here?", "What will [Name] say?". Only 4 (17.5%) out of 23 autistic children gave the correct response, whereas all but one SLI children passed the test. The pass rate was similar to that of the seminal study on false belief by Baron-Cohen et al (1985). As in Leslie & Frith's study (1988), performance on false belief and knowledge were closely associated. However in the present study, more autistic children failed to attribute knowledge to themselves and others, compared to those in Leslie & Frith (1988), due to "procedural differences" between the two studies (Perner et al, 1989).

Eisenmajer & Prior (1991) were the first to study the link between having a theory of mind and its cognitive-behavioural consequences, such as pragmatic competence, understanding of social/moral rules and interpersonal relations. Their main assumption was that the performance of autistic children in theory of mind tests may result from a cognitive/linguistic delay which is not an autism-specific deficit. In other words, their aim was to examine how the possession of theory of mind is related with language competence. They investigated theory of mind in a sample of Australian high-functioning autistic children with mean MA (7 years and 9 months) higher than that (5 years 5 months) in Baron-Cohen et al's (1985) as well as that (7 years 2 months) in Leslie & Frith's (1988)

British studies. First-order belief attribution was measured in two tasks. First, they presented the "Sally-Anne" task in its original form as it was employed in Baron-Cohen et al's study (1985); in the second trial, they introduced the word "first" in the critical question: "Where will Sally look for her marble *first*?". This procedural change had an interesting effect on the results: 50% of the children who failed the first trial passed when the question was changed to include the word "first". Overall, the percentage of "passers" (69%) was higher than the previous studies. All subjects who passed had verbal mental age above 5 years and chronological age of 8 years. Although verbal MA appeared to be a significant discriminating factor of autistic children on theory of mind tests, it was not sufficient since some children with high verbal MA did fail on those tasks.

At this point it is worth noting a valid argument supported by Siegal & Beattie (1991) and embraced by Leslie (1994). They claim that children may not be aware of the experimenter's intention and switch their response to an incorrect one. For example, children may interpret the critical question: "Where will Sally look for the marble?" as "Where will Sally have to look for the marble?" rather than "Where will Sally look for the marble first?", which is more revealing of the experimenter's questioning. Thus, experimenters should be more careful on the conversational rules of the task and provide conversationally supportive task questions (as in the above study) that may improve autistic children's performance on these tasks. It is crucial that the participants who are tested share the same purpose of the task questions with the experimenter. The general suggestion is that failure on false-belief tasks could be explained in terms of children's conversational environment (at home and school) and their previous experience with adults' usage of language (Siegal & Peterson, 1994). It might be interesting to explore whether high-functioning autistic children who succeed on theory mind tasks are taking part in rich conversations on mental states in their natural settings.

A linguistic modification on the test questions was used by Lewis & Osborne (1990) in a study of belief attribution to self and other in normal 3-year old children. Their hypothesis

was that the syntactic form of the question accords a higher chance that children will understand the experimenter's intentions. They tested a large sample of pre-schoolers (n= 131) on the "Smarties task" under three conditions. In the first trial, the belief question was asked in the standard way; in the other trials, a different time-specification was introduced: "What did you think was in the box?" (standard question), "What did you think was in the box, when the top was still on it?" ("when" question), "What did you think was in the box, before I took the top off?" ("before" question). It was found that 3-year-olds were able to make false belief attributions, when the time was specified in the question. Their responses to the standard question were less successful than to the other two conditions. They had greater difficulty with the "when" question than the "before" question. Also, all children tended to predict equally correctly their own and other's beliefs. This study emphasises the importance of the "children's interpretations of the discourses in which experimenters attempt to assess their knowledge and skill." (p. 1519).

The view that task-related factors may effect autistic children's performance has been also tested by Tager-Flusberg & Sullivan (1994). A group of high-functioning autistic adolescents was tested on a second-order theory of mind task with simple information processing demands (i.e., the length and complexity of the story). Two short stories on deception were read to the children. Surprisingly, there were no significant differences between the autistic group and the mentally retarded control group in the number of correct responses as well as appropriate use of mental explanations. Therefore, it was argued that "the difficulty for both groups with the standard second-order task lies in its information processing demands, rather than subjects' conceptual difficulties in handling recursively embedded mental states." (p. 583).

Bowler (1992) also found a more successful performance on first and second order belief attribution tasks of 15 individuals with Asperger's syndrome. As in Eisenmajer & Prior (1991), this sample had significantly higher age (26.6) and general intelligence (IQ= 87) than the autistic group in Baron-Cohen et al's study (1985). There were no significant

group differences in the first-order belief attribution test ("the marble story") between the target group and a comparison group of schizophrenic patients (in order to test differences in theory of mind in two groups with social impairment) and normal subjects. Interestingly, the percentage of successful persons with Asperger's syndrome (93%) was exactly the same with that of normal subjects and higher than that of the schizophrenic group (73%).

Further, the ability for second-order belief attribution was tested twice. In the first study, the test used was the "Ice-Cream Man" scenario, identical to that in Baron-Cohen (1989b). Contrary to Baron-Cohen's findings (1989b), no significant group differences were found. Besides, all subjects were asked to give justifications of the protagonists' belief and behaviour. Individuals with Asperger's syndrome and schizophrenia did not differ from controls in their use of mental-state language. However, the majority of justifications in all groups was of one type: not referring to the actor's mental state.

A further study of second-order belief attribution tested the hypothesis that the failure of subjects' responses to use mental-state language in the above task could not be explained in terms of representational deficits, but was due to "features of the story that focus subjects' minds on non-mental explanations for people's behaviour" (Bowler, 1992; 884). So, another test ("The Overcoat Story") that followed a pattern similar to the "Ice-Cream Man" story was devised. But this scenario had two important characteristics: the content was more adult and the event leading to a false-belief was a random, non-intentional act, instead of a deliberate mental one. The percentage of "passers" with Asperger's syndrome (73%) was the same as in the first study of second-order belief attribution. However, less normal subjects and schizophrenic patients were successful compared to their own performance in the first study and that of the Asperger's group. Interestingly, the use of mental-state language in all groups tended to be greater than in the first study.

Bowler's study poses a serious challenge for the universality assumption of the cognitive theory: the argument that theory of mind is not found at any level of autism. His sample of

adults with Asperger's syndrome was successful in showing advanced theory of mind. Moreover, his findings undermine the primacy assumption: whether the theory of mind deficit can predict the "triad" of autistic features. Further, he makes the challenging question: does the successful performance on a theory of mind test protect autistic children from their social impairment? Clearly, it does not. Thus, it seems that the theory of mind hypothesis is not sufficient as an explanatory framework for the central social abnormalities in autism.

Moreover, Bowler (1992) raised another substantial point: the failure in performance on a theory of mind task does not necessarily imply that this ability is absent in the repertoire of autistic persons. It could be interpreted as a failure to generalise and apply skills that make them incompetent in their social behaviour. He argued that there is a problem in all the deficit-oriented research on theory of mind in autism. It has failed to reject the null hypothesis (that this ability is present), but this does not mean that the ability is absent. Therefore, a failure to generalise and apply skills may explain why most autistic children are incompetent in their social behaviour. In this study, persons with Asperger's syndrome appeared to show an intact theory of mind *and* social impairment. He proposed that it is likely that individuals with Asperger's syndrome are able to develop compensatory cognitive strategies and use "slow" and "cumbersome" routes in theory of mind tasks that make them appear odd in social interactions. A similar possible cognitive interpretation of the results is what Hermelin & O'Connor (1985) termed as the "logico-affective state": high-functioning autistic persons use logical processes in problems that are in the emotional and affective domain. However, Frith (1991) suggested that the success of Asperger's syndrome individuals in solving complex belief attribution tests may explain their better social adaptation. Yet, she proposed that their success on theory of mind tests may come from a strategy that is not "theory-based". Developing this point, it could be argued that these studies that focus on performance outcomes do not highlight the process and the route that these children employ for solving or failing similar tests.

Happe (1994c) attempted to investigate this critical issue as well as explore Bowler's (1992) question. That is, why able autistic individuals pass advanced theory of mind tasks, but face problems in their everyday social interaction. For this purpose, she devised a set of stories with a more naturalistic content than other theory of mind tasks, responding to the need for contextually embedded and realistic tests. These stories described dialogues with different motivations behind utterances, such as, "pretence", "white lie", "joke", "irony", "double bluff", "persuasion". The autistic adults who took part in that study were grouped according to their performance on traditional theory of mind tasks. There were three groups: those who failed all theory of mind tasks, those who passed first-order theory of mind and those who passed second-order theory of mind tests. All subjects were asked to give a response to the questions: "Was it true, what X said?" and "Why did X say that?". Interestingly, autistic persons were consistent between their performance on the stories and the theory of mind tasks: those who passed the second-order theory of mind tasks scored higher than the other two groups of autistic subjects and gave more mental explanations in their justifications. Also, stories on lying, joking and persuasion were more difficult than stories about appearance/reality and forgetting. Moreover, the adults who passed second-order theory of mind tasks (mean verbal IQ= 95) were not different in their scores from the two comparison groups: normal adults and persons with mental handicap. However, a significant difference emerged in the use of mental explanations; although, the successful autistic group used the same amount of mental state terms as the control groups, they were observed to give fewer correct mental state answers and made more errors in attributing mental states than the normal controls. Thus, the difference was found in the appropriate use of mental state references. These results replicated Bowler's assumption that able autistic persons may find it hard to apply social knowledge in everyday life (implying that the theory of mind deficit is not primary). Happe (1994c) suggested that the lack of "central coherence" as it has been proposed by Frith (1989a) may fit these findings: these able autistic adults are able to understand mental states but fail to use them in a context, due to an innate deficit in processing information as a whole.

The relationship between success on theory of mind tasks and social adaptation in real life was explored by Frith, Happe & Siddons (1994). They studied a group of 24 autistic adolescents (mean verbal IQ= 51.63) on two tasks of first-order false belief attribution; also, the Vineland Adaptive Behaviour Scales were completed for each child by his/her teacher/caregiver. The items of this instrument were classified into those that require "mentalising" skills and those who do not. Three subgroups of autistic individuals were observed: those who fail theory of mind tasks and in everyday life, those who pass the tasks but show no theory of mind ability in real life and those who are able to understand mental states both in the experiment and in real life. These results were confirmed by Fombonne et al (1994) who applied the same methodology on 17 French high-functioning autistic individuals. Thus, the claim that there is "talented minority" in autism gains further support. However, it could be argued that these measures were purely psychometric and indirect: they were not derived from observations of social behaviour of able autistic children in natural settings (i.e., home and school) but based on others' judgements about these skills. It seems that the next direction for research should be to study the behaviour of able autistic persons in their social interactions in everyday life.

However, an Australian study by Sparrevohn & Howie (1995) did not find any relationship between performance on a series of theory of mind tests and social skills (the Social Behaviour Rating Scale by Dawson & Fernald (1987) was completed by teachers). They agreed with Ozonoff et al (1991b) that "it may be necessary to test theory of mind in a more ecologically valid setting, if it is truly to represent the individual's ability to utilise understanding of the beliefs of others during real-world social interactions." (p. 261). This seems an insightful argument.

Nevertheless, a strong association between conceptual role-taking measured on tests in the laboratory and social behaviour (teachers' ratings on the Social Behaviour Rating Scale) was supported by Dawson & Fernald (1987). However, Prior et al (1990) found no relationship between theory of mind performance and social skills (measured by parents'

ratings on the scale referred above). There seems to be a contradiction between parents' and teachers' evaluations of the social skills of autistic children. This problem arises as a result of collecting information on autistic children's social awareness through indirect/psychometric techniques. Another study by Oswald & Ollendick (1989) measured autistic children's role-taking ability with a combination of techniques: task performance, structured observations between children and adults, parents' and teachers' ratings. They found a close relationship between direct measures of social competence and adults' reports.

The "primacy" assumption of the theory of mind deficit (that the deficit in theory of mind is primary) was also investigated by Ozonoff et al (1991a). In particular, emotion perception, theory of mind and executive function were measured in high-functioning autistic adolescents (mean full scale IQ= 89), matched on CA and verbal IQ with non-autistic children with dyslexia, learning difficulties, mild mental retardation and attention deficit hyperactivity disorder. First- and second-order theory of mind were assessed in five different tests: picture-sequence, appearance-reality task, mental-physical distinction task, brain-function task, Smarties task and the "Ice-Cream Man" task.

This study replicated findings of earlier studies: the autistic group was found to perform significantly less well than the controls on the tests of emotion perception, theory of mind and executive function. However, the theory of mind deficit was not found to be universal in the whole autistic group, as opposed to the executive function deficit. The autistic group appeared to find the tasks on the executive function the hardest (96% failed), whereas the emotion perception tests were the easiest (65% failed). Second-order theory of mind tasks were more difficult (87% failed) than first-order theory of mind (52% failed) for the autistic subjects. Therefore, Ozonoff et al (1991a) argued that the primacy assumption needs revision, since the prefrontal hypothesis provides a more successful account; they also suggested that another neurological impairment in the prefrontal cortex may causes both the executive function deficit and the theory of mind deficit.

However, the autistic subjects of the previous study were divided in those with HFA and those with AS and comparisons on the above tests were carried out (Ozonoff et al, 1991b). It was found that the HFA and the AS groups were deficient on the executive function test, whereas the AS group had a better performance on the theory of mind tests than the HFA group. On the basis of these findings, they argued for the primacy of the executive function deficit and the distinction between HFA and AS.

However, the main issue on whether the ability of an advanced theory of mind is lacking from *all* autistic individuals remains still unresolved. Apart from task factors that may influence autistic children's performance, another issue has been also suggested as a possible explanation for the discrepancies in the percentages of autistic persons that pass advanced theory of mind tests: verbal ability. Sparrevohn and Howie (1995) set out to investigate whether autistic individuals with low (mean verbal age= 5.8) and high (mean verbal age= 9.3) verbal ability would have the same performance on five tasks of belief attribution. Also, they examined the development of theory of mind, by selecting tasks that ranged from simple to advanced belief imputations. They found that verbal ability was a significant discriminating factor for success on the tasks: the autistic group with high verbal mental ability scored higher than the comparison group with low verbal mental age. However, they observed that the number of successful autistic persons was decreasing, as the difficulty of the tasks was increasing. In particular, the second-order theory of mind task was passed by 30% of the sample; this rate is consistent with Ozonoff et al (1991a) and Bowler (1992), but in discrepancy from Baron-Cohen's (1989b) study. The main explanation for that may be the higher verbal and non-verbal ability of the autistic group in Baron-Cohen's study. Sparrevohn & Howie (1995) also found that all autistic subjects who passed the tests gave mental explanations in their justifications. However, this may be due to a less stringent criterion on these responses: implicit *and* explicit references to mental states were included.

Experimental testing of self-awareness in autistic children

Autistic children's knowledge of their own mental states has been tested experimentally by Baron-Cohen (1989c). The prediction was that autistic children would not be able to take into account their own mental states, as a consequence of "a dysfunction of the neural structures necessary for a theory of mind in general" (p. 581). This deficit-oriented hypothesis was tested on the basis of the assumption that self-awareness is a precursor of the appearance-reality distinction (the ability to distinguish what something appears to be as opposed to what it really is). The theoretical background of this experimental investigation was the interrelationship between understanding false-belief attribution, representational change and the appearance-reality distinction in normal 3-5 year olds (Gopnik & Astington, 1988). The fundamental cognitive capacity for all these acquisitions is metarepresentation (the construction of representations of one's own and others' representations).

Autistic children were compared with mentally retarded and normal subjects on four different tasks, in which four object properties (colour, size, material, identity) were manipulated (Baron-Cohen, 1989c). These tasks were slightly adapted from relevant developmental research with normal groups (Flavell et al, 1983; Gopnik & Astington, 1988). For example in the identity task, the child was shown a stone looking like an egg and was asked: "What is this?". After replying that it was an egg, the child was given the object to handle and discover that it was really a stone. Then, the probe question: "What is it made of?" was asked. At that time, the appearance question: "What does it look like?" was asked, followed by the reality question: "What is it really?". The tasks on the other properties had an analogous structure.

According to the results in all tests, 11 out of 17 autistic subjects failed to give the correct responses, as opposed to 13 out of 16 mentally retarded and 15 out of 19 normal children

that were successful. Thus, autistic children tended to make phenomenist errors, focusing and reporting only the appearance of the objects. For example, in the above task they appeared to say that it looked like an egg and it was really an egg. Furthermore, autistic children had greater difficulty performing on the tasks on size, material and identity. In contrast, the same number of autistic and mentally retarded children (n= 11) passed the colour task. Therefore, these findings supported the hypothesis that autistic persons would be unable to disentangle their own perception of an object and their own knowledge about it. In cognitive terms, "the perceptual information overrides other representations of an object" (Baron-Cohen, 1989c; 595). It was concluded that they did not seem to be in contact with their own mental states. However, their performance might be better, if they were asked more probe questions (Baron-Cohen, 1989c). Another explanation emphasised that the ability for introspection is only one of the component skills required by these tasks, like "the ability to recognise the occurrence of a 'trick', and then communicate this recognition." (p. 595). Besides, it is important to clarify that not all internal states are beyond their awareness in autistic persons. This inability pertains only to those mental states that depend on metarepresentation.

Nevertheless, the evidence outlined above can be criticised, with respect to the *type* of the objects and the *degree of familiarity* to the autistic children. It could be argued that, if each child was presented with a picture of himself, then the possibility of showing understanding of the appearance and the reality of these objects might be greater. For example in the colour task, a photo of the child could be placed behind an orange filter and then the child would be asked to say what the colour of his physical characteristics *looked like* and what it *really* was. This modification of the task is based on the idea that the responses of autistic children on tests of their awareness might be correct, if the objects were representing directly themselves. Also, in the test of the appearance-reality distinction on the size of the objects, the autistic child could be shown a photo of himself and a family member. Then, a magnifying glass held over his figure in the photo would make him appear bigger than the other figure. The child would be asked to say who *looked*

bigger and who was *really* bigger. It has been reported that autistic children are able to recognise facial characteristics of people (Hobson et al, 1988). So they would not have problems with this sort of material. In that case, it is possible that they could express easily their own mental states. A similar procedure could be applied for the test of material and identity of objects. Another criticism could be that experimental evidence is necessary but not sufficient evidence for a deficit in self-awareness in autism, because of its artificial nature and the lack of qualitative information on the issue. It might be more illuminating to obtain direct and qualitative information on mental states from autistic persons by asking them direct questions on their own mental states.

Development of the understanding of mental states

Baron-Cohen (1991c) studied the ability to recall a variety of mental states- belief, pretence, perception, desire and imagination- in the same group of autistic individuals. He examined autistic children's awareness of their own mental states in 15 subjects (with mental age over 5 years) matched with mentally retarded and 3 to 4 year old normal children. Each mental state was tested once on tasks that followed the same pattern: the child was presented with an original state that was experimentally manipulated and produced a changed state. The critical demand was to report the original state. However, the test question was modified, so that it would be more specific in *time* (this modification was originally used by Lewis & Osborne, 1990). For example, in the belief and pretend tasks the questions had this form: "When I first asked you, before we opened the carton, what did you think was inside?" or "When I first asked you, before we poured anything out, what did you pretend to drink?".

It was striking that autistic children showed a different developmental sequence in the understanding of these mental states from the normal and mentally retarded groups. In particular, recall of their own perceptions was the easiest for them; pretence was more

difficult than imagination; belief was the most difficult, as for the other two control groups. On the contrary, the control groups found the task on desire slightly more difficult than those on perception, imagination and pretence. Therefore, there is some evidence that persons with autism understand belief six years later than normal children and they follow a different pattern in understanding mental states.

Baron-Cohen (1991c) explained these findings as consistent with the cognitive model. First, autistic children were expected not to be able to understand the "representational mind". Second, the metarepresentational deficit predicts that the understanding of mental states that are "driven by thought", like pretence and imagination, will be impaired, whereas perception and desire will be intact. Third, the degree of mental-state comprehension is related with the "truth-suspension" criterion. It is hypothesised that in autism there is a dysfunction in the mechanism that allows "truth suspension". Therefore, autistic children are predicted to have difficulties in grasping mental states, such as imagination, pretence and belief, in which truth is suspended.

Understanding of emotions

Baron-Cohen (1991d) examined the ability to understand three causes of emotions: situations, desires and beliefs. Desire and false belief are regarded as fundamental in folk psychology (Dennett, 1978). Autistic children were compared with mentally retarded and normal children on their ability to describe the feeling state (happy or sad) of a protagonist in a story and explain the cause of these emotions. Significant group differences were only found on the belief task: autistic children showed less understanding of beliefs as causes of emotion than situations and desires. These findings confirmed the specificity assumption of the cognitive account: autistic children appeared to have intact awareness of desire, but impaired understanding of belief. Therefore, they would have difficulty in grasping emotions caused by beliefs, such as boredom, embarrassment, surprise, curiosity. In

contrast, they were able to be aware of their own and others' desires, since these mental states do not require metarepresentation; they do not involve "intentions" but "drives" to certain objects (Baron-Cohen, 1991d).

Understanding of deception

On the one hand, clinical observations have reported that deceptive behaviour is rarely shown by autistic persons. On the other hand, psychologists have conducted experimental research with contradictory findings. This discrepancy is significant, taking into account the underlying assumption that there is a strong relationship between understanding false belief and the ability to understand lies and deception.

Russell et al (1991) presented autistic children with two boxes with windows facing them. Each child was shown which box contained chocolate; then, he was told that someone else wants to get this chocolate as well, but does not know where it really is. The critical question was: "Where will you show (name) that the chocolate is?". Autistic children failed to use their knowledge for deceiving the other person. This performance was explained in terms of "the salience hypothesis": that autistic persons tend to consider as more salient their physical knowledge about objects rather than their mental knowledge, due to an impairment in their executive functioning ability. In other words, the lack of deception in the tasks could be attributed to the inability of autistic subjects to disengage from the objects. The same claim has been also made for the failure on false-belief tasks.

In a different paradigm, Sodian & Frith (1992) found that children with low and high-functioning autism were successful on a sabotage task but failed on a deception task. In the sabotage task, autistic subjects were successful in hindering a competitor from getting a sweet by locking the box where it was hidden, while they left the box open for a cooperative person; the critical question was: "Do you want to lock the box or do you

want to leave it open?". Thus, they were able to apply deception with physical manipulation (locking the box). However, they failed on the deception task that required a belief manipulation; the critical question was: "Do you want to say the box is locked or do you want to say it is open?".

Baron-Cohen (1992b) questioned the validity of the above findings, as they were based on linguistically complex test questions. Also, he suggested that autistic children might not have been motivated to respond correctly on a task that was not studied in a natural context. Thus, he carried out a different investigation of deception in a group of autistic children, compared with mentally handicapped and normal subjects. His method involved a naturalistic situation with minimal linguistic requirements: the penny-hiding game. However, his findings were consistent with those by Sodian & Frith (1992). Thirteen out of fifteen autistic children were only able to keep the penny hidden from the guesser ("object occlusion") but they disclosed cues from the guesser about where the penny might be ("information occlusion"). In other words, they did not seem to understand that seeing leads to knowing.

Another study on the relationship between second-order belief attribution and understanding of lies and jokes in a group of high-functioning subjects showed that 50% of them passed the second-order theory of mind test and made correct social judgements about lies and jokes in the task story (Leekam & Prior, 1994). These findings replicate those of Bowler (1992), Happe (1994c) and Ozonoff et al (1991b) that there seems to be a "talented minority" that, despite an early history of childhood autism, has a successful performance on "mentalising" tests. Leekam & Prior (1994) interviewed the parents of their autistic sample on "lying" and "joking" behaviours by the children. No incidents of lying were reported for almost all children who passed the second-order belief attribution tasks. Also, there was no evidence for intentional jokes and irony. Instead, parents described their autistic children's jokes as repetitions of simple jokes. Therefore, it would be useful to explore whether high-functioning autistic persons do not use their knowledge

of understanding mental states in their everyday social interactions or they apply compensatory strategies for this deficit (Sodian & Frith, 1993).

Naturalistic evidence

Research on the theory of mind in autistic children has been enriched by a different methodological approach: the study of knowledge of one's and other's mental states in spontaneous talk as well as the development of contingent discourse ability and cohesion in spontaneous interactions with others.

Autistic children (mean CA= 3.5 yrs) were found to use correct cohesive strategies (linguistic tools that create connections within and between utterances in a conversation: pragmatic skills) *less frequently* than normal children in their discourse with an experimenter in a semi-structured situation (Baltaxe & D'Angiola, 1992). However, the autistic group made *more errors* than both the normal and the specifically language-impaired group in the use of cohesive ties in discourse.

Furthermore, high-functioning autistic children showed no developmental changes in their discourse abilities, although their language became more sophisticated in structural aspects (i.e., grammar, syntax) over the period of 1 year in their conversations with their mothers (Tager-Flusberg & Anderson, 1991). In contrast with a group of children with Down syndrome (matched on age and language level), the autistic subjects did not seem to use ways to maintain the conversational topic (by adding new information, challenging, expanding or introducing new topics), despite their advanced language ability to contribute in a conversation. Thus, the content of their discourse did not appear to change in parallel with the form of their language.

Moreover, Tager-Flusberg (1992) carried out an empirical investigation of the use of utterances that referred to mental states by six high-functioning autistic children, compared with six children with Down syndrome during home visits over a period of 1-2 years. Both groups were matched on CA (mean= 5.4), language level, family/educational background and socio-economic status, but not on level of intelligence. The main hypothesis was that autistic children would have a language poor in lexical mental terms compared to controls, due to the metarepresentational deficit. Verbal interactions between mother and child were observed for 40-70 minutes bimonthly and recorded. Mothers could choose the toys/activities/games that would suit best their children's needs. Four internal states were coded: perception, desire, emotion and cognition. Also, all utterances were coded according to whether they referred to self or other.

Interestingly, autistic and Down's syndrome children differed significantly only in the cognitive domain. It was confirmed that autistic children were "noticeably deficient" in their ability to talk about cognitive mental states. Another important finding was that all children talked more about their own perceptions, desires and cognitions than those of others. Only emotion terms were used equally for themselves and others.

Therefore, the data of this small-scale observational study are in agreement with the experimental evidence on the delayed/deviant development of understanding mental states in autism (Baron-Cohen, 1991a, 1991c). In particular, there is further support for an uneven developmental pattern: perceptions, desires and emotions are unimpaired early on, whereas cognitions seem to be impaired from the start. One possible explanation could be that autistic children do not have pragmatic skills: they may not know the social use of these terms. This argument could be also put forward for explaining the findings by Bowler (1992) and Happe (1994c).

Overall, Tager-Flusberg's study has a limited observational scope. It could be suggested that recordings of the conversations of able autistic individuals in different social settings

(i.e., home, school) with a variety of others (i.e., father, sibling, teacher, peer) would provide deeper and broader knowledge about their theory of mind, as reflected in language about mental states. Nevertheless, the strength of the methodological strategy applied by Tager-Flusberg lies in its empirical basis: a social situation that minimises experimental effects and encourages naturalistic interaction. But, it has to be noted that, despite its contextual focus, the interpretation of the results by Tager-Flusberg remains primarily *cognitive*. The following study illustrates clearly the point that we wish to make.

Brown and Dunn (1991) studied the spontaneous talk of six second-born normal children with their mothers and older siblings during the whole of their third year. They found that there were *reciprocal changes* in mothers' and children's talk about feelings, desires and thoughts of others. Also, both mothers and children were "delayed" in the use of references to cognitive states as compared with their references to desires and feeling states. Here, the main argument is that *the role of social interaction* in the developing cognitive ability of normal children to understand their own and other people's psychological states is substantial. Dunn (1994) has argued that "the ability to 'understand other minds' is not a capability that, once achieved, will be evident across contexts; rather, it will be subtly and not-so-subtly affected by what the child is trying to do in the social encounter, and how the child interprets what the other is trying to do." (p. 307). Curiously, though, there is a very limited amount of research with normal children on this issue. In the area of autism, too, the paucity of research on whether autistic children apply (or fail to do so) their social understanding in different contexts is notable. This line of inquiry may illuminate the contradictory research findings on the able autistic children's performance on theory of mind tasks.

Critique of the empirical research

Because both the theoretical and practical implications of cognitive theories are substantial and important, it is necessary to consider the evidence carefully and critically. Without any doubt, the whole body of experimental evidence is based on carefully designed experiments and sound methodological strategies. The original tests on false belief attribution, such as the "Sally-Anne" and the "Ice-Cream" tests have introduced useful paradigms for exploring the cognitive ability for a theory of mind. There has been an explosion of studies with refined experimental methods. Persons with autism have also been exposed to a variety of materials with a scenario that is supposed to represent naturalistic circumstances. A range of task modifications have been critical in the improvement of autistic person's performance. Currently, it is a matter of agreement that there is a minority of individuals with high-functioning autism or Asperger's syndrome who perform successfully on advanced theory of mind tests. Thus, the assumption for the universality of a single metarepresentational deficit across all levels of autism has been seriously undermined. Alternative cognitive deficits have been proposed as more appropriate candidates for explaining autism in the "talented minority": weak central coherence and executive function.

However, it is this amount and quality of work that illuminates theoretical weaknesses of the cognitive model. Therefore, the question that poses a challenge for cognitive psychologists, who support a cognitive impairment as the sole fundamental cause of the syndrome, comes from their own experimental findings: why do high-functioning autistic persons with theory of mind still have persisting problems in real life situations? Thus, their conclusions do not have a full explanatory power, since they cannot justify the social abnormalities of the bright autistic persons that pass theory of mind tasks. Therefore, in my view, an urgent need, which emerges from the existing experimental studies, is for a new direction in the study of the social behaviour in autism: real-world social settings. The major focus of the empirical research on the performance of autistic individuals in an artificial situation indicates its most important limitation. It fails to take into account the

context of social interaction, in which the use of the theory of mind ability will take place and develop. This is the key area for a comprehensive understanding of the autistic mind.

SOCIAL-AFFECTIVE PERSPECTIVES

In this part I will present another set of psychological theories on the etiology of autism. My purpose is to evaluate the main assumptions of social-affective arguments as measured against the cognitive hypotheses. I begin with the theoretical premises on social perception and the understanding of self and other in normal and abnormal development. Then, I will consider the main directions of empirical research on autistic children, that provide support for these explanatory models.

Theoretical background

The "relatedness triangle"

A rigorous alternative theory for explaining autism at the psychological level has been proposed by Peter Hobson (1989, 1991, 1992, 1993a, 1994). Its theoretical origins draw from Kanner's (1943) first description of the syndrome as "a pure culture example of inborn autistic disturbance of affective contact" (p. 250). Hence, Hobson's account emphasises the affective aspects of autistic behaviour, as the key routes for understanding the disorder. Also, philosophical ideas by Wittengestein, Strawson and Hamlyn are used as the theoretical grounds for developing a social-affective theory of autism.

The first premise of this theory is that social behaviour is determined by the innate propensity for "personal relatedness", which is anchored on perception of others'

psychological orientations through their bodily movements (Hobson, 1993a). Infants are "hard-wired" with the capacity to perceive the affective expressions of people and respond to them in appropriate ways from the middle of their first year of life; they do not simply respond to the behaviour of others, but they are also emotionally engaged. Thus, "perception is relational" (Hobson, 1993a; 187). The concept of "relatedness" has been chosen as the cornerstone of this theory, because it is perceptually based, it has cognitive dimensions and entails motivational and emotional qualities (Hobson, 1993a). Therefore, the role of others in social development is strongly acknowledged.

The notion of the "relatedness triangle" reflects the triangulation between infant, other and referent. It means that infants are able to perceive their own attitude towards a referent, as well as somebody else's different evaluative attitude towards the same referent (Hobson, 1994). This ability starts to develop through face-to-face interactions between the infant and the caregiver in the early months of life. Examples of this type of relatedness and understanding are requesting actions, initiating games, communicating refusal, making greetings. It is argued that the interpersonal dimension of the infant's engagement with the world will provide the essential background for the growth of social perception in childhood (Hobson, 1993a). Namely, self-reflection, creative symbolisation and language depend fundamentally on the "relatedness triangle".

Understanding of attitudes

The second premise of Hobson's perspective is that understanding of minds is essentially understanding of persons with minds (Hobson, 1990b, 1993a, 1994). In his own words, "the existence of beliefs presupposes the existence of persons" (Hobson, 1993a; 111). He defines a "person" as a thing that has a body and a mind. He postulates that from the beginning of life newborn babies relate to people and experience their emotional expressions. Thus, by the age of nine months infants begin to apprehend others as persons

with beliefs, intentions and feelings through their affective inter-subjective relations. They can represent others' mental states, because they can directly perceive their attitudes in their bodily movements.

Apart from the ability for interpersonal engagement, self-reflective awareness is considered as another precursor for the development of a theory of mind. The argument is that of the analogy. Once the infant is involved in social interaction, s/he begins to introspect and ascribe mental attitudes to her/him self; then, s/he starts to infer others' mental states (Hobson, 1990a, 1993a). This account is similar to that of George Herbert Mead (1934) on role-taking: the child can reflect others' attitudes within her/himself, if s/he has appropriate attitudes towards others.

The focus on the development of self is one of the major differences between the cognitive approaches and the affective theories. The "computational metaphor" regards "metarepresentation" as an innate module of the cognitive apparatus in the child (Leslie, 1994). However, in Hobson's terms the "decoupling" or distancing of thoughts from objects will not occur out of context, but in the affective engagement of the infant with the caregiver that will facilitate awareness of the self (Hobson, 1994). This claim is drawn from Vygotsky's (1978) thesis that "An interpersonal process is transformed into an intrapersonal one" (p. 78). Hence, Hobson's position places emphasis on the social-developmental paths for the acquisition of a theory of mind. In this process, self-knowledge is a critical prerequisite for the grasp of mental states of others (Hobson, 1990a). Thus, the innate dimension in the affective theory does not go beyond the biological ability for interpersonal relatedness. In normal development, the inborn capacity for engagement in emotional relationships with others will lead to the understanding of the psychological states of others (Hobson, 1990b).

Autism as an affective disorder

In the case of autism, the argument is that there is a lack of the inborn ability for affective relationships with others, due to a deficient perceptual equipment grounded on neurological fault. In short, "autism is best viewed as an interpersonal impairment" (Hobson, 1992; 164). Hobson's claim regards autism as a condition resulting from the lack or slow development of the innate ability to relate and experience other people as persons. Therefore, the knowledge of self and others as persons with psychological attitudes will be seriously impaired. Moreover, Hobson's theory has the ambitious aim to explain the "triad of impairment": creative imaginative play, symbolic language and comprehension of verbal and non-verbal communication will be deficient.

The main thesis is that autistic persons behave in an abnormal way, as a result of their inability to direct their attention to others around them and share emotional experiences with them. Although they are not visually impaired, they are not motivated or equipped with the natural tendency to engage in relationships with caregivers; as a consequence, their concept of themselves and others as persons with bodies and minds is restrained. They are not able to make the important distinction between things ("I-It" relations) and people ("I-Thou" relations); so they appear to treat people as objects, without any emotional value. Thus, they can not have a concept of belief, since they do not have a concept of persons holding beliefs. As Hobson, in agreement with Neisser (1988), states "they have an impairment in the development of the interpersonal self" (1990a; 173). This lack of personhood leads to a lack of understanding attitudes or mental states of the self and others.

An integrative model

Peter Mundy and Marian Sigman (1989) propose an alternative model that combines affective and cognitive factors. In particular, they agree with Hobson on the critical role of affective mechanisms in the development of autism. But they do not consider the

disturbance in early emotional perceptions and exchanges to be the primary deficit that gives rise to the cognitive metarepresentational deficit. Instead, their theoretical position emphasises the interaction between impaired early affective responses to social stimuli with developmental delays in the cognitive system of the child. Another aspect of their model differentiated from Hobson's hypothesis is the focus on a deficit in the expression of emotion (i.e., self-regulation of arousal) rather than the perception of emotion in autistic persons.

Critique of social-affective perspectives

One of the strengths of Hobson's argument is its emphasis on interpersonal relationships for the development of social perception. The basic assumption is that the understanding of mental states is a process that occurs in the social domain. The emotionally-laden contacts between infants and caregivers are considered as fundamental for cognitive growth. This approach comprises a valuable contribution in the understanding of the syndrome, illuminating another area of autistic behaviour. The social-affective aspects of autistic behaviour have been neglected and overlooked by the cognitive schools of thought. In essence, the main difference between Hobson's theory and the cognitive hypotheses lies in the primary role they attribute to psychological processes: affective or cognitive. I consider that a balanced view is more appropriate in the investigation of the complex autistic disorder; both cognitive and affective processes may be disturbed in the individual with autism. Human interaction is a complex phenomenon that requires cognitive and affective skills. In fact, Hobson (1993a, 1993b) regards his perspective as complementary rather than antithetical to cognitive explanations of the autistic syndrome. Also, Baron-Cohen (1988) elaborated the prospect of a synthesis of cognitive and affective accounts for the acquisition of social knowledge in autism.

Nevertheless, both Hobson's explanation and the cognitive accounts share a common feature: the deficit-oriented perspective. Although they draw attention to different psychological processes as primary causes of autism, both aim to prove that a single deficit creates a core disturbance in autistic persons' social interaction. Despite the focus on social relationships, the affective approach remains in the same theoretical tradition as the cognitive theories: postulating an impairment in the autistic individual as the only cause of abnormality. Curiously, the effect of the autistic child's disturbance, either cognitive or affective, on the behaviour of others has not been conceptualised as another possible line of understanding autism. It seems possible that a shift of theoretical focus on the relationships of autistic persons with their social environment could be a fruitful avenue for the investigation of this complex disorder.

Another important aspect of Hobson's affective theory is the central role of awareness of self and other for the development of a theory of mind. A sense of the self as a person with psychological attitudes is essential in forming social relations with people and predicting their behaviour. Knowledge of the self and the other are closely linked, both arising from the perceptually anchored affective interaction between infants and caregivers. Hence, the initial ability of perceiving others as persons with bodies and minds, distinct from self and objects is the basis for developing social perception. In contrast, the cognitive account views this ability as a consequence of the metarepresentational skill. But humans do not simply function as cognitive subjects in social encounters; they do not only pay attention to others' mental states. They also perceive others' emotions, as reflected through their bodily expressions. Emotion perception is the ground for self-reflection and social understanding. Hobson's emphasis on self-development as a precursor of a theory of mind is a significant contribution in the study of autism.

Another strong factor in the social-affective theory is its sound theoretical basis. Its conceptual "loans" from philosophy are elegantly interwoven with psychological theories on normal development (i.e., the notion of "persons" and the key role of perception in

cognitive development). Hobson (1990a, 1993a) unfolds his argument with confidence in its philosophical underpinnings. Thus, he succeeds in building a heuristically useful theoretical framework. Nevertheless, his perspective needs to be evaluated in terms of its empirical evidence. This is the centre of the discussion in the following section.

Empirical evidence

In this section, my objective is to present the body of empirical research that has been carried out to investigate the social-affective domain of autistic person's behaviour. First, I will present the major findings of experimental research on emotion perception in autism. Next, I will consider studies on affective sharing, joint-attention, social attachments and interactions with caregivers that also deal with the assumption of a social-affective deficit in autism.

Emotion perception

Hobson's early studies on emotion-perception are important advances in the research on affective processes in autism, because of their refined methodological paradigm using a cross-modal technique: the study of emotion recognition through different modes (visual, auditory, gestural), so that the possibility of using a perceptual matching strategy is eliminated.

Hobson (1986a, 1986b) in his first study on emotion recognition applied an interesting matching strategy: he compared the same group of autistic children (mean chronological age= 14.7; mean verbal mental age= 7.1) with one group of mentally retarded subjects matched on performance IQ, a second group of normal children matched on verbal mental age and a third group of normal children matched on non-verbal mental age. In the

principal task, the children were asked to match basic emotions (sadness, happiness, fear and anger) expressed by a person in a videotape with gestures, vocalisations and context. In the first condition, the child was presented with two tape-recorded vocalisations for each emotion. In the second condition, the experimenter acted out two examples of each emotion, wearing a cardboard mask to conceal facial expression cues. In the third situation, two large drawings representing situations likely to elicit each of the four emotions were shown. A control task with "things", instead of emotions, was also used.

Autistic children failed to choose the appropriate drawings of facial expressions of emotion to match with videotaped gestures, vocalisations and contexts, as compared with normal children with the same non-verbal mental age. Similar results were obtained when the autistic group was tested again on the same tests about one year later (Hobson, 1986b). Interestingly, there were no group differences between the autistic group and the group of normal children matched on verbal MA. Yet, Hobson argued for an affective deficit on the basis of autistic children's performance on these experimental tasks. However, he questioned the validity of his claim; he admitted that these facial expressions could be regarded as artificial, since "they were not only stylised in form and content, but were also presented singly and out of context." (Hobson, 1986a; 338).

In a later study, Hobson, Ouston & Lee (1988) repeated the same paradigm with two methodological refinements: they used a control non-emotion task (objects/events recognition) that was the same with the emotions task in terms of form and level of difficulty; also, they used as control groups, mentally handicapped children matched on verbal mental age and verbal IQ, and normal children. Again, there was a significant group difference on the recognition of emotions, rather than the recognition of objects. Thus, the hypothesis for an autism-specific impairment in the recognition of affect was confirmed.

Ozonoff et al (1990) conducted a study, paying special attention to the selection of control groups and the equal level of difficulty in the "emotions" and the control tasks. In their

first study, they examined emotion perception in a group of autistic children (mean chronological age= 6.40, mean verbal age= 3 years or greater) matched on verbal mental age with a control group of normal children. In their second study, the same target group was matched with a different control group of normal children on non-verbal mental age. In both studies, emotion perception was measured with four techniques, each with an affective and a non-affective component (within-subjects design): (1) identity/emotion task, which involved sorting a set of cards on the basis of identity and emotion (happiness and sadness), (2) crossmodal processing task, which included matching colour photographs of emotions (happiness, sadness and anger) with sounds; in the non-emotional task, photographs of objects had to be matched with sounds, (3) matching task, which required children to match pictures of objects, faces, emotional expressions and situations with a photograph. Also, parents of the children were asked to complete a questionnaire on the emotion-related vocabulary used by their children. Interestingly, in the first study there were no group differences between autistic and normal children matched on verbal mental age. Thus, the hypothesis for an affective deficit in autistic persons was not supported. However, there were group differences on the identity/emotion sorting and matching tasks, when autistic children were compared with normal children of the same non-verbal mental age. Therefore, there was not sufficient evidence for the primacy of the emotion perception deficit in autism.

Another important study threw doubt on the specificity of the affective impairment in autism. Hobson, Ouston & Lee (1989) applied a slightly different methodology in the study of emotion perception: participants were asked to give spontaneous verbal judgements of the photographs and the sounds expressing emotions, instead of a forced-choice technique, used in the above studies. A group of autistic adolescents was matched on verbal mental age with a group of mentally handicapped subjects and a group of normal children. Emotion perception was tested through photographs and audio tapes. Also, a control task with non-emotion materials (objects) was included. The prediction that

autistic children's performance would be worse than the controls' on the emotion tasks rather than the objects tasks was confirmed.

However, Prior et al (1990) carried out an experimental investigation of emotion perception with an Australian group of autistic children (mean verbal mental age: 7.2) that also failed to replicate the hypothesis for a deficit in autistic children's recognition of emotions. They used "the emotions task" by Hobson (1986a): each child was shown a set of pictures, with faces expressing happiness, sadness, fear, anger and a neutral expression. Also, emotion recognition was tested through three modes: sounds, gestures and contexts. Prior et al (1990) did not find any group differences on the emotion recognition task: 11 out of 20 autistic children and 10 out of 20 controls passed. This success rate was higher than that in Hobson's study, although the average mental age in both studies was the same.

A study on empathy in high-functioning autistic persons provided empirical evidence for the claim that autism may be a "logico-affective" impairment (Hermelin & O'Connor, 1985). Yirmiya, Sigman, Kasari & Mundy (1992) selected "empathy" as an appropriate affective state, as it combines the use of cognitive and affective skills. They adopted Feshbach's model on empathy, as the feeling state that requires three components: "a cognitive ability to discriminate among affective states of others; a second, more advanced cognitive ability to assume the perspective and role of another person; and an emotional response." (Yirmiya et al, 1992; 151). High-functioning autistic children, matched on full-scale IQ with normal children, watched a set of ten videotaped segments about children displaying happiness, anger, pride, sadness and fear; they were asked to provide an account of how the person they had just watched would feel as well as their own feelings to the story. In agreement with previous research findings, the autistic group failed to perform as well as the normal group on the empathy task. They did not appear to be able to label the feelings of the protagonists in the video stories and take the role and perspective of others.

Another study adds an extra dimension to these observations. Capps, Yirmiya & Sigman (1992) studied understanding of emotions in a group of high-functioning adolescents through verbal report and recognition of affect in pictures. A list of simple (such as happiness, sadness) and complex (such as pride and embarrassment) feelings was read aloud to each child and they were asked to describe when they had experienced them. The autistic children's responses were compared with those of normal children only, since the average full scale IQ of the target group was 101.9. Autistic children appeared to make greater cognitive effort to talk about their emotions. Also, they had greatest difficulty with reporting an incident of "embarrassment"; 40% of them reported embarrassing experiences that were external and uncontrollable and they made less explicit and frequent references to an audience than the normal group. This finding was explained as a consequence of a lack of a theory of mind, as well as a deficit in affective sharing and joint attention skills. In particular, Capps et al (1992) suggested that "the sense of a critical audience pervades autistic person's experiences such that they are compelled to avoid, rather than solicit, the appraisal of others." (p. 1178). In contrast, autistic children did not differ from the controls on talking about simple emotions and pride. Pride requires "personal responsibility", whereas embarrassment requires a social audience. Finally, there were no significant group differences on the ability to label affects in photographs. However, in another study by Kasari et al (1993) autistic children showed the same "mastery" behaviour (smiling after completing the task) as mentally retarded children, but did not show evidence for "pride": they avoided contact with the adult who praised their work. This indicates that praise was aversive to them; or they were not interested in it.

Kasari et al (1993) did not argue that persons with autism do not experience emotions, such as pride, but rather that they seem to face difficulties with socially-mediated emotions.

Joint-attention

Apart from emotion perception, joint-attention skills have been also considered as another line of empirical investigation of social-affective disturbances in autism. The majority of the research on joint-attention in autistic children has been conducted by a team of psychologists at UCLA. Marian Sigman, Peter Mundy, and their colleagues (1986) video-recorded young autistic children with average age four and a half years old with matched mentally retarded and normal children in 12-minute play situations with their caregivers in the laboratory. They found that the autistic group did not appear to share attention and make eye contact with both familiar and unfamiliar adults. Thus, they supported the hypothesis for an autism specific deficit in joint-attention skills.

Moreover, Mundy, Sigman & Kasari (1990) studied the relationship between joint-attention and language development in autistic children. They examined a group of autistic children with mean age of four years (mean mental age= 19 months) matched with two groups of mentally retarded children on language and mental age respectively, over a period of one year. In this paradigm, non-verbal communication skills were observed in a 25-minute session between the experimenter and the child. Each child sat at a table, facing the experimenter, who presented a set of toys, that were within the reach of the child. Also, the experimenter engaged the child in physical social games (such as tickling) and in turn-taking activities (such as, rolling a car back and forth, taking turns in using a comb). Verbal interactions were kept to a minimum. The child's non-verbal behaviour was rated in three categories: (1) "social behaviour", which described the ability of the child to make physical contact with the experimenter and engage in turn-taking with him, (2) "joint attention", which referred to directing attention to an object and (3) "requesting", which involved attempts to ask for help in obtaining objects. Lastly, expressive and receptive language skills were measured through psychometric scales.

The hypothesis for a deficit in the non-verbal joint-attention skills in the autistic group was confirmed, thus replicating results from an earlier study (Mundy et al, 1986). Moreover, this impairment seemed to be specific in the target group only; hence, it could not be

attributed to factors, such as language ability and mental age. Also, it was found to be stable over the period of 13 months. In addition, this study provided evidence for a strong association between gestural joint attention and language abilities. Thus, this work suggests that autistic children's disturbance in the acquisition of joint-attention skills (such as, pointing and showing) may constrain their subsequent language development.

. Expression and sharing of affect

Kasari, Sigman, Mundy & Yirmiya (1990) looked at affective expression and sharing in autistic children in relation with their joint-attention and requesting behaviour. It was hypothesised that joint-attention, rather than requesting behaviours, would elicit greater sharing of positive affect with adults. Also, the aim was to investigate whether autistic children were different in the type of affect they displayed in joint-attention situations from mentally handicapped children. The procedure was identical to that in Mundy et al's study (1990) reported above. The coding variables were: "attention" to the adult and the toys, "facial affect expressions" (positive, negative and neutral/interest expressions) and "communicative context", which included requesting and joint-attention behaviours.

The results revealed significant group differences in the expression of positive affect according to the communicative context. In particular, autistic children were found to share less positive affect with the experimenter in their joint-attention behaviours, rather than their requesting acts. On the contrary, there were no group differences in the display of positive affect in the context of requesting objects. Therefore, there may be a strong developmental link between joint-attention deficits and expression/sharing of positive affect in autistic children.

Further to this study, Sigman et al (1992) investigated autistic children's responses to the negative emotions expressed by familiar and unfamiliar adults. In one situation, parents

would show distress on hitting accidentally a finger with a hammer; in another situation, both the experimenter and the parent would show fear, when a robot was moving to them; in a third situation, the parent would pretend that s/he is in discomfort, feeling ill, and would lay in a couch. Strikingly, autistic children did not pay much attention to the adults in all situations, in contrast to mentally retarded and normal control groups who were very attentive to adults. Autistic children seemed to be more interested in playing with their toys, rather than noticing the adults. These findings were interpreted as a lack of the ability for emotion comprehension. Yet, it has been found that autistic children are not emotionally detached, as Kanner (1943) first described. They do show positive affect, and they form social attachments with caregivers (Sigman & Mundy, 1989). However, there seems to be an impairment in their cognitive/affective underpinnings to make sense of the emotional cues from others. Sigman et al (1992) suggested that if these children do not have a theory of mind (recognising that other people have emotions), then they are not motivated to look at people's faces. But this raises the question: how is it possible that autistic children are able to display appropriate affect in some social situations but they are unable to recognise emotional expressions in other people.

Overall, the evidence shows that autistic children are inattentive to others' negative emotions. But, what are their reactions to expressions of positive affect? This question was explored by Kasari et al (1993) in a study on pride and mastery in autistic children, with average age three and a half years. Each child was given by the experimenter a developmentally appropriate puzzle to complete. When the child had finished, the experimenter waited five seconds and made a neutral comment and gave a second puzzle to the child. After the completion of the second puzzle, both the experimenter and the parent praised the child. Preschool autistic children were compared with mentally retarded and normal children, on their overall emotional responses on pride and mastery in each stage of the session. The prediction of no group differences upon completion of the puzzle was confirmed. Similarly to control groups, autistic children showed pleasure when they had completed the task. Thus, they displayed a positive feeling, showing mastery

motivation. However, the autistic group did not seem to seek the adult's attention to their task. The lack of this behaviour has been explained as inability of the self to experience a socially mediated emotion such as pride and reflect on it in normal ways. This does not mean that autistic children do not feel pride, but rather that the nature and the situations of this emotion (independent of social audience) may be different in them. Moreover, autistic children avoided contact with the adult who praised them; perhaps, praise was not only uninteresting for them but also aversive. Finally, Kasari et al (1993) make the interesting point that the affective deficit in autism may extend only to emotions and situations that make demands on social-interactive skills.

Social attachments and interactions

Sigman & Mundy (1989) studied the social attachments of preschool autistic children with their caregivers (in all but one autistic cases, caregivers were parents) in the laboratory. In this procedure, the child was left to play alone with some toys in the room, where the parent and the experimenter were present. Then, the caregiver would leave the room for two minutes and he would come back in the room, sit in the chair and allow the child to do whatever s/he liked. Next, a stranger would approach the child for two minutes, making physical contact before returning to her seat. Subsequently, the stranger would leave the room for two minutes and would enter the room in the same way that the caregiver did. There were no critical differences in the social behaviour towards the caregivers between the autistic and the control groups. The only difference was evident in the behaviour towards the stranger. In contrast to the normal group and the mentally handicapped groups who looked at their caregivers' faces for reassurance when they saw the stranger, the autistic group did not retreat nor did they look at the stranger's or the caregiver's face. This finding was explained as an indication of lack of skills in the autistic children in using other people's facial expression to derive information about their mental states.

Sigman & Mundy (1989) carried out a second controlled study with a slightly different methodology and a different sample of autistic children; the chronological and mental age of the autistic group were the same as in the above study. They included a second separation and reunion session and omitted the stranger episode. Curiously, they found that autistic children showed more distress when separated from their caregivers for the second time, than mentally retarded children. Thus, autistic children do form social attachments but their deficit seems to be in the area of social comprehension, which could be due to lack of affective awareness and responsiveness.

In another study by Kasari, Sigman, Mundy & Yirmiya (1988), autistic children's interactions with their caregivers were observed from a different perspective. The aim was to look into the ways that adults responded to the autistic children's deficient social behaviour. Thus, the focus was on the influence of the autistic child on the caregiver, rather than the other way round. In particular, caregivers (in most cases, mothers) of preschool autistic, mentally-retarded and normal children were observed in free-play episodes with a doll, a puzzle, a social game and putting all the toys away. These 12-minute sessions were videotaped and caregivers' behaviour was rated for the following categories: (1) "attention regulation", which referred to the ways the caregivers attempted to elicit the child's attention to objects or events without the use of physical contact, (2) "behaviour regulation", which involved requesting a specific action of the child or control/management of the child and (3) "responsiveness", that is, verbal and non-verbal actions used to maintain the child's engagement with an activity. These behaviours were studied in relation to the child's non-verbal communication language skills, assessed through different psychometric scales.

Interestingly, there were few group differences in the interactive behaviours of the caregivers across the three groups. However, significant differences emerged within the autistic group. Specifically, there was a significant association between caregivers' regulatory behaviour/responsiveness and the autistic child's joint-attention and language

skills. In particular, there was a difference in parents' responses to more communicatively able children; parents showed more mutual play, less behaviour regulation and more positive feedback to the autistic children with less joint-attention deficit; this pattern was not found in the comparison groups. A possible interpretation of the results reported by Kasari et al is that the relationship between the autistic child's characteristics and caregivers' behaviour to them is important. Although the direction of this influence awaits further investigation, this evidence is valuable in the understanding of the abnormal autistic repertoire; it highlights the critical role of others' responses in shaping autistic children's behaviour.

Another study that throws further light on the effect of autistic children's behaviour on the behaviour of others was conducted by Dawson et al (1990). These investigators examined social behaviour, affect and eye gaze in a group of preschool autistic children, matched on receptive language age with a group of normal children. They videotaped the interactions between children and their mothers during three situations: a 10-minute free play session, which involved low communicative demands, a "put-toys-away" session, where mothers asked the children to help them to tidy up the toys and a 10-minute "snack" session, where mothers were sitting face-to-face with their children and provided them a snack. Interestingly, there were no group differences in the frequency and the duration of children's gaze at their mothers' face, as well as emotional expression. However, there was a critical qualitative difference between the two groups: autistic children did not seem to combine emotion and eye contact in an act with communicative intent. Also, most of the autistic children did not smile in response to their mothers' smiles. This abnormality was interpreted as a result of overstimulation of the autistic children by the complexity of the social situation; it may be that the emotional expressions and the language are overstimulating, so that children with autism tend to withdraw from the situation.

It has to be also noted, that there was a significant difference in the affective changes between mothers of the autistic and the normal children. In particular, mothers of the

autistic children were less likely to display smiles and respond to their children's smiles, than mothers of the normal children. This is an important finding, since it implies that "the autistic child is affected not only by an inability to easily assimilate and respond to social stimulation but also by the negative impact that his or her behaviour may have on the social environment" (Dawson et al, 1990; 345). Sadly, a serious limitation for the specificity of the abnormalities that were found in the autistic group is that the majority of the autistic participants were also mentally retarded.

Critique of the empirical evidence

Although the research reviewed in the preceding section is not by any means exhaustive, it presents the main directions of empirical work on affective deficits in autism. In summary, the major findings suggest that the empirical evidence on the primacy and the specificity of emotion perception as the underlying impairment in autism is not convincing. First, there is conflicting evidence on whether autistic children have a deficit in recognising emotions on tasks. It seems that task-related factors and methodological issues, such as the matching strategy, can throw doubt on the findings. Therefore, the nature of the tests needs to be refined and the criteria for the comparison groups to be more fully identified. In contrast, a specific deficit in joint-attention skills seems to be universal in autism and to explain language and emotion development.

However, in my view, research both on "emotion-perception" and "joint-attention" has a common underlying objective: to look for an affective deficit in the autistic child. Despite the emphasis on the importance of affective relationships between autistic individuals and their social environment, the relevant studies do not examine the lack or the presence of an affective skill *in the context of social interaction*. Hence, they examine affective behaviour through an individualistic perspective, which determines their methodological choices and interpretations of their results. However, in one study by Kasari et al (1988) there was

critical evidence on the affect of the autistic children's abnormal behaviour on the behaviour of caregivers towards them. Curiously, researchers have neglected to investigate how autistic children's deficits may affect and be affected by others' responses to them.

The paucity of research with a "social-interactionist" approach could be explained as a consequence of a specific methodology. On the whole, research on autism from social-affective perspectives has been almost exclusively experimental and quasi-naturalistic. Observational studies of affective exchanges between parents and autistic children have been largely carried out in the laboratory. Thus, it seems that systematic naturalistic data might shed further light on the nature and course of social perception in autism.

FIRST-PERSON ACCOUNTS ON AUTISM

In the previous sections of this chapter, I have discussed awareness of the self and others in autism, as it has been conceptualised by current psychological theories. At this stage, I will present another strand in the literature. First-person accounts on the experience of autism provide an insightful perspective on the syndrome, rather than test an explanatory hypothesis. They offer valuable qualitative information on how able people with autism think and feel about themselves and the social world. There are a few very bright persons with autism who have published an account of their lifelong experience of being autistic and their journey in the discovery of themselves and others around them (Grandin & Scariano, 1986; Miedzianik, 1986; Williams, 1992).

Cesaroni & Garber (1991) applied a qualitative strategy to study the experience of autism through the accounts of a 25-year old man (Jim) and a 13-year old boy (Albert) and his parents. As their main techniques, they used participant observation, formal and informal interviewing, correspondence and collection of poems, art work and essays. Content analysis

of their data revealed five areas of functioning as the most significant: sensory processing, memory, stereotypical behaviours, social interaction and empathy.

In particular, both autistic individuals described auditory, visual and tactile stimuli as intense and as coming from multiple sources; they reported that they very often feel overloaded by information. Both Albert and Jim stressed the degree of trust they need to have with another person to allow him/her to touch them. Moreover, they had extraordinarily detailed memory for past events. Regarding their stereotypes, they were able to bring them under conscious control. Interestingly, they showed increasing self awareness with respect to their social behaviour together with the need to develop interpersonal relationships with friends.

"I look like Frankenstein, that's what people tell me. My voice sounds strange, I'm telling you people say I look like Frankenstein, I know he might look like me."
(Cesaroni & Garber, 1991; 310)

This quote illustrates how Albert's self-perception has been heavily influenced by how he perceives others as perceiving him. Curiously, there is no reference to behavioural characteristics; he is only concerned with his image, rather than with his psychological self. Jim also described his continuous victimisation by people, because "he lacked the ability to judge the depth or sincerity of friendship" (Cesaroni & Garber, 1991; 310). However, in both cases there are signs of introspective ability, although it is noted that both made great effort to achieve this level of reflection. Moreover, both emphasised the difficulty in becoming involved with other people and showing empathy. However, they explained this problem as a result of lack of expressive and receptive communication skills, rather than a lack of empathy itself. As Jim states:

"It is therefore much easier to empathise with someone whose ways of experiencing the world are similar to one's own than to understand someone whose perceptions are very different." (Cesaroni & Garber, 1991; 311)

Another study by Hurlburt, Happe & Frith (1994) offers an additional dimension to the study of a reflective self in persons with Asperger's syndrome. These researchers hypothesised that the ability for introspection would be impaired even in bright autistic individuals. The contribution of this study lies in the methodology applied. Namely, they adopted the "descriptive experience sampling method" that has been used with a sample of normal subjects compared with a group of patients with anxiety, depression, eating disorders and schizophrenia. This technique involves the subject wearing a device that produces a beep at random intervals, which he can hear through an earphone; when he hears the beep, the individual needs to stop and write down details of his experience at that moment. Three adults with Asperger's syndrome were systematically interviewed by the research team on the same day as the collection of samples. Each person produced between twelve and sixteen samples. All three adults had passed first-order theory of mind tests, and two had passed second-order theory of mind tasks. Thus, this method combined the privacy of the autistic person when sampling his experience and the establishment of a relationship with the researchers for analysing these samples.

The striking finding was that the sole aspect of the reported inner experiences of the three adults consisted of visual images. Their thoughts were described in the form of images only; processing of mental events appeared to be carried out mainly by visual thinking. Thus, there was an absence of other categories that were found in the samples of forty normal individuals: verbal inner experience, unsymbolized thinking and feelings. Moreover, they found a relationship between successful performance on theory of minds tasks and the ability to report inner experience. The two adults who passed the advanced theory of mind task easily understood the introspection technique, whereas the adult who failed on that, was the least able to report his inner experience. Therefore, their hypothesis for a paucity of an introspective psychological self in high-functioning autistic persons was supported.

Another piece of information on self-awareness comes from a large-scale study on identifying autistic persons with near-normal intelligence. Dawson (1983) interviewed extensively parents of 93 high-functioning individuals on their behaviour and functioning. With respect to self-awareness, in 35 out of 93 cases there was a sense of being different from other people, but without feelings of worry; whereas only 11 out of 93 young persons were reported to feel different and worry about that. These results are important, because of the large size of the sample; however, these data are based on indirect knowledge of the autistic person's self-awareness, i.e., parental observations and inferences.

A detailed presentation of the life history of a 31-year old man with Asperger's syndrome established further the tendency of able autistic persons to become aware of their difference from others in the period of adolescence (Bemporad, 1979). However, it has to be noted that, despite awareness of the loneliness, there was "an appalling poverty of inner life" (p. 191), that is, daydreams and fantasies.

Fransesca Happe (1991) made some useful comments on autobiographical writings of three adults with Asperger's syndrome. She analysed the content and style of two autobiographies (Temple Grandin's (1986) and David Miedzianik's (1986)) and letters of an adult man through theoretical models for communication and social understanding in autism. Regarding knowledge of the self and others, a common feature of this material was that all individuals showed limited insight into their own feelings and thought processes. The evidence suggests that, although these bright individuals were able to reflect on their own and others' behaviour, still they lacked a deep awareness of mental states. Social naivety together with strong desire to make friendships appeared to be the main concerns of the two male writers.

However, there is an important methodological problem with this textual material: the lack of control group (Happe, 1991). That is, these accounts have not been systematically compared with those of normal children for the study of content and stylistic aspects, such as description of psychological states, the choice of subject matter, how frequently the topic changes, the

keeping with conventional literary rules. It could be possible, then, to find deviance or delay in communication *and* theory of mind in Asperger's syndrome.

Finally, I wish to draw attention to an important methodological issue. Although first-person accounts, case histories and autobiographies provide a substantial body of information on the understanding of self and other in autism, the paucity of systematic, controlled and qualitative studies of children and adults with high-functioning autism has to be noted. Hence, it might be illuminating to explore how a group of able autistic children or adults think about themselves in comparison with a group of children/adults with mental handicap.

Conclusion

In summary, both the cognitive and the social-affective perspectives support a deficit in the ability of knowledge of the self and others. It seems that only a minority of bright autistic individuals is successful on theory of mind tasks; but research has shown that they do not report a rich mental life and their problems in social interactions are persistent. However, the understanding of the self and the other has not been studied directly in a controlled study, that will compare first-person accounts of able autistic persons on their own conceptions of themselves with those of persons with mental handicap. Another important issue is the lack of naturalistic studies that will evaluate the performance of the "talented minority" of autistic individuals on experiments with evidence on their "mentalising" skills in everyday life. In my view, this is one promising avenue in the study of autism. Research on understanding of the self and others in normal development may provide useful methods for investigating these unexplored issues. The following chapter will touch on these areas.

CHAPTER 4: PSYCHOLOGICAL THEORIES ON KNOWLEDGE OF SELF AND OTHERS IN NORMAL DEVELOPMENT

Introduction

The broad aim in this chapter is not to present a comprehensive review of psychological theories of the self. Instead, the discussion is primarily intended to select and present specific empirical investigations on knowledge of the self and other in normal populations that will resolve the *methodological* problems that have been addressed in the preceding sections of the thesis: the lack of systematic qualitative information on the self as it is viewed by individuals themselves and the paucity of techniques that look into the ways that the self is constructed through social experience between children and adults.

In the first section, I will present a contemporary social-cognitive model, formulated by Damon & Hart (1982, 1988). It has been selected as appropriate for conceptual purposes of this study for the following reasons:

1. As a social-cognitive model on the self, it focuses on cognitions rather than affective attitudes about the self: how the individual perceives him/her self, rather than a person's positive/negative evaluation of his/her personality. This emphasis is in line with the cognitive perspectives on autism (see Chapter 3) that consider as fundamental the ability for a conceptual understanding of the mental aspects of self.
2. Also, it identifies specific developmental conceptual changes in the understanding of the self at different ages.
3. Moreover, it is committed to the assumption that the knowledge about the self is shaped both by the features of the environment *and* by features of the cognizing subject. This dimension is in agreement with the theoretical aim of this thesis: to explore social understanding as a cognitive ability applied in social interactions.

4. Lastly, its empirical technique (the self-understanding interview) has been used with clinical populations; thus, it may provide useful insights in the study of persons with high-functioning autism/Asperger's syndrome. Methodological limitations of this model will be also highlighted.

In the second section of this chapter, I will deal with naturalistic perspectives which examine how the construction of knowledge of self and others is achieved through everyday social interaction. First, their theoretical background in symbolic interactionism and contemporary developmental psychology will be explained. Next, empirical research on the representation of self through discourse will be reported. Finally, there will be a critical evaluation of this strand in the literature. Here, the purpose is to identify methodological strategies that will assist the research design of this study (the need to examine the understanding of mental states of self and others as it revealed through natural discourse in social contexts).

Damon & Hart's developmental model of self-understanding

A primary assumption of Damon & Hart's (1982, 1988) perspective is the dual nature of the self. William James' (1890) classical distinction between the "I" and the "Me" in one's self provides one of its theoretical bases. In particular, Damon & Hart (1988) adopted James' definition of the "I" as the "self-as-knower": the part of the self that initiates, organises and interprets experience. Awareness of the "I" is achieved through four types of subjective experience: agency ("how I became this person"), distinctness ("how I am different from others"), continuity ("how do I change or remain the same over time?") and reflection. A sense of an autonomous self derives from its ability to process and structure experiences ("agency"). Individuality of the self emerges from distinctness from others; James wrote "Other men's experiences, no matter how much I may know them, never bear this vivid, this peculiar brand." (James, 1890; 71). Stability of the self comes from

continuity; in James's words - "... each of us spontaneously considers that by 'I' he means something always the same." (p. 63). Lastly, self-consciousness derives from reflection ("awareness of one's own awareness"), the ability to know oneself. Damon & Hart (1988) note that the strength of James' account lies in "the systematic integration of these four components into a single psychological theory of the self-as-subject." (p. 6).

Damon & Hart (1988) also drew upon James' conceptualisation of the other aspect of the self, the "Me", as "the sum total of all a person can call his." (James, 1890; 44). Namely, "the self-as-known" includes material features (i.e., body, possessions), social characteristics (i.e., relations, roles, personality) and "spiritual" characteristics (i.e., consciousness, thoughts, psychological mechanisms). In Damon & Hart's model, the "Me" includes four "self-schemes": physical, active, social and psychological. James also proposed that each individual organises these primary "constituents" in a hierarchy with "the bodily me at the bottom, the spiritual me at the top, and the extra-corporeal material selves and the various social selves between." (James, 1890; 57). Although James suggested that persons would vary in the ways they formulate these aspects of themselves, he did not imply a developmental dimension in his self-concept (Damon & Hart, 1982, 1988). Thus, he did not hypothesise variations in the hierarchical organisations of the three constituents over time.

Further, James (1890) suggested that psychological investigation should focus on the "Me", as the most concrete and objective aspect of self. Inquiry into the experiential "I" should be left to philosophers. However, Damon & Hart (1982, 1988) purported to explore both the self-as-subject and the self-as-object. They drew on George Herbert Mead's (1934) proposal for a study of one's knowledge of the "I" through the "Me"; thus, their emphasis is on a conceptual approach to the self. For this purpose, Damon & Hart adopted the term "self-understanding" instead of "self-concept", as it reflects more appropriately their intellectual focus.

A relevant fundamental assumption in Damon & Hart's (1988) theoretical approach is that "self-understanding" is a cognitive construct. It is defined as "one's cognitive representation of self, self-interest, and personal identity." (p. 14). It is distinguished from "self-esteem", the affective evaluation of the self, that has been measured quantitatively. Damon & Hart's model concentrates on the study of the cognitive constructs that persons hold for themselves, the conceptual framework of their self-concept. Thus, it aims to provide a qualitative analysis of the meanings of self across individuals. This shift of interest from "affective" to "cognitive" aspects of self has been dictated by the failure of empirical research on self-concept to establish relationships between self-esteem and variables on adaptation to life, as noted in an extensive and detailed review of a large number of studies on the self-concept (Wylie, 1979). Another conclusion in the same review was that the majority of studies measure self-esteem rather than self-concept. Damon & Hart (1988) make the additional comment on the same literature that there is "a lack of attention in such scales to the changing conceptual bases of self for the growing child." (p.18).

Another important dimension of Damon & Hart's approach on self-understanding is its developmental orientation. The assumption is that knowledge of the self as a whole undergoes critical age-related cognitive changes. The emergence and formulation of self has been conceptualised as a maturational process. In particular, self-knowledge in childhood and adolescence is suggested to evolve in four periods: (a) infancy/early childhood, (b) middle/late childhood, (c) early adolescence, and (d) late adolescence. At each age, the development of self occurs in two parallel dimensions: the "I" and the "Me" (Figure 4.1 in the next page). The "I" has three distinct features: continuity, distinctness and agency. The "Me" has four aspects: physical, active, social and psychological self. At each stage the "I" and the "Me" develop in mutual influence. This notion of developmental change, regarded as "a conceptual reorganisation" is opposed to the traditional view of change in terms of a shift or empirical tendency. Hence, Damon & Hart (1982, 1988) argue that each individual is able to describe all aspects of "Me" and qualities of "I" from

early life; what changes is the focus of the self-understanding over time, rather than the content of self-knowledge. In essence, transformations apply to the knowledge of each self-scheme and process of the self following a qualitative developmental sequence from "categorical identifications", "comparative assessments", "inter-personal implications" to "systematic beliefs and plans". Thus, each of these hierarchical levels signifies a different level of self-understanding.

Damon & Hart (1988) examined the empirical validation of their assumptions through cross-sectional and longitudinal studies. They administered the "self-understanding clinical interview" to 82 boys and girls (aged from 6 to 16) on three occasions over a period of three years. Content analysis of their subjects' statements about themselves on the items of the interview revealed that the four aspects of the self-as-object were evident across all age levels. These findings were explained in terms of their methodology: they used a probing clinical interview, so that a fuller account of self-perceptions could be obtained. Interestingly, these results contradict those from previous studies that young children are only able to conceive themselves in terms of their physical characteristics and favourite activities. Their evidence suggests that an early concept of a psychological self exists even in early childhood. Thus, there is a need for more "sensitive" techniques that will capture these levels of self-knowledge.

Damon & Hart's (1988) hypothesis that knowledge of the self-as-object develops in a orderly sequence of levels, defined by the front face of their model (Figure 1) was also confirmed by the evidence from their longitudinal studies. However, little stability and regularity was found in the aspects of themselves on which individuals focused. Only the "psychological" self-scheme was found to be increasingly used across the three testing occasions. But this was attributed to the nature of the testing: the interview technique

repeated three times with the same individuals may have affected their tendency to become reflective and to focus on themselves.

Data from the above cross-sectional and longitudinal studies also support the relationship between age and developmental change in the three dimensions of the "I" of the self. In particular, children's understanding of "continuity" and "distinctness" is transformed from early childhood to late adolescence. There is a transition in the perception of stability of the self from categorical identifications (body, possessions, behaviour), cognitive and active capabilities, to the recognition of self by the social network and a sense of continuity between the past and the present self. Similarly, distinctness is first defined in relation to the physical self; next, the self is compared with others on behavioural and cognitive criteria, followed by a sense of self as a unique whole of physical and psychological characteristics; in adolescence, the self is perceived as distinct from others in terms of one's own philosophy and life plans. The third dimension of the self-as-subject (agency) develops from an understanding of the self as non-volitional and controlled from external biological, social or supernatural forces. In middle childhood, there is a dramatic shift to an awareness of the self as a subject with control over his/her formation; later, the self is perceived as part of a wider social matrix; in the adolescent period, the self control is considered to derive from personal values and philosophies.

An issue connected with the validation of this model of self-understanding is its usefulness in the study of abnormal populations. Damon & Hart (1988) used their self-understanding interview as a method for exploring mental health problems in a group of anorexic girls. They assumed that the sense of "agency" and "distinctness" might have a central role in the disturbance. Their general argument was that there is a close association between problems of self-understanding and mental health difficulties: pathological conditions generate a distorted self-understanding, which in turn exacerbate mental health problems.

Nevertheless, their findings supported their assumptions for "agency" but not for "distinctness". In contrast to normal teenagers, anorexic girls were found to have a sense of lack of control over their condition; they seemed to perceive themselves as passive to external forces, not being responsible for their condition. However, their sense of distinctness was conceptualised at the same developmental level as in the normal group.

In another study (Damon & Hart, 1988), self-understanding was examined in a group of adolescent boys with conduct disorder. Preliminary findings showed that there was developmental delay in the way these individuals perceived themselves. They seemed to make immature judgements on themselves, based on categorical aspects of the "me". Thus, their sense of "me" was less connected with the social context (family, friends, society). Also, their sense of "agency" seemed to be distorted. It was also important that they did not seem to have a concept of themselves in the future and a sense of personal continuity; these contribute to the formation of personal identity. Damon & Hart (1988) suggested that these characteristics of self-understanding in boys with conduct disorder may explain the behaviour of these individuals. They did not claim that these aspects are the primary cause of their condition but they may influence their actions.

Critique of Damon & Hart's model

Damon & Hart's position represents a comprehensive and multifaceted approach to the knowledge of the self. It is successful in operationalising the integration of the "I" and the "Me", and the self-understanding interview encompasses aspects of the subjective and the objective self. Thus, a holistic view of the self is obtained. Another strength of this model is the emphasis on the knowledge of the self rather than its affective evaluation. However, this specific focus could be regarded as a weakness as well, because it undermines the comprehensiveness of this model (self-evaluation is measured only with one question). Of course, the centrality of conception of the self is a major step in the empirical investigation

of the self, but it is strongly associated with positive or negative appraisal of the self. Thus, Damon & Hart adopt a similar set of preconceptions to the theorists they criticise. It might be more illuminating to formulate a clinical interview that would tap both conceptual and evaluative dimensions of the self (in a balanced proportion of questions on the interview), so that a global sense of the individual towards him/her self would be obtained.

However, Damon & Hart's argument that all aspects of the self are present from early childhood is a significant contribution in developmental thinking on the self-concept; the critical age-related change is on the conceptual modes of understanding the self. Empirical evidence suggests that there is a qualitative shift in the ways that persons think about different aspects of themselves, such as physical, active, social and psychological characteristics. This position is radically different to the traditional developmental view that self-understanding is characterised by a move from a conception of the physical self, to the active, to the social and later to the psychological self.

Nevertheless, Damon & Hart's model presents a static view of the self: it describes the spontaneous self. Although, it is put forward as a social-cognitive perspective that acknowledges the role of social interaction in the construction of self, it fails to operationalise this assumption. It does not highlight the processes involved in the formation of this self-knowledge. Given that the clinical interview technique entails methodological limitations, since it relies heavily on the individual's memory and language abilities as well as on the relationship with the interviewer for the disclosure of private aspects of one's personality, its reliability as a method for gaining access to one's knowledge of him/her self is under dispute. Thus, the self-understanding interview, albeit focused on mental attitudes towards the self, is not a sufficient method for exploring the social mechanisms associated with the formation and maintenance of cognitions about the self. This limitation is crucial and must be recognised in a thorough study of the development of the self-system. Interestingly, there has been a considerable amount of evidence that children have abilities that are not evident in interviews and experimental

situations (Dunn, 1992). Therefore, it would be interesting to look at social-cognitive approaches, directed towards a naturalistic enquiry into knowledge about the self. This will be the theme of the following section of this chapter.

Naturalistic perspectives

A pertinent supposition of naturalistic approaches is that the genesis and maintenance of self is heavily dependent on social processes. Interpersonal experience is considered fundamental for the emergence and development of self. Social relationships are regarded as the cornerstone for the cognitive construction of knowledge about the self and the other. The theoretical basis of this presumption is symbolic interactionism with its emphasis on language as a medium for socialisation into a cultural system (Mead, 1934). Any type of socially embedded discourse provides the powerful tool for self reflection and construction of identity. Children's cognitive abilities to think and talk about themselves are affected by the emotional context of the interaction, their self-interest and the salience of the topic of the conversation (Dunn, 1988, 1991a, 1991b).

At an empirical level, social-cognitive models have focused on discourse, on the co-narrated self that is shaped through everyday social interaction. The observation of language in naturalistic and laboratory settings between children and their mothers in a variety of tasks has been their major methodological strategy. The fundamental assumption is that language is "a window into self" (Miller et al, 1992; 46). Language represents the self and the social contributions to the construction and alteration of ideas about the self.

Language research on the self has taken two directions. First, it has employed the measurement of lexical terms referring to the self or others in the spontaneous talk of children with their mothers at home (Bretherton & Beeghly, 1982; Shatz et al, 1983). Part of this literature has been presented in chapter 3, as the main type of naturalistic evidence

for cognitive perspectives on the development of social understanding in autism (Tager-Flusberg, 1992). Another substantive corpus of studies has shifted the focus of analysis from the utterance-level to the discourse-level, as more appropriate for looking at the social construction of understanding of self and others. The following studies illustrate this theoretical and methodological turn.

Miller et al (1992) carried out a study on the "narrated" self through observations of co-narrated personal experiences occurring in the spontaneous talk of children with others in the family context. The purpose of their study was to examine empirically the social character of self-construction through examination of interactive rather than monologic discourse. They videotaped 12 children with average age two and a half years and 12 children with average age five years in their conversations with family members and friends at home; for each child ten naturally occurring stories of personal experience were collected. These young children came from diverse cultural backgrounds. It was found that both young and older children portrayed themselves through *interpersonal* experiences; this tendency was increased by 85% at the age of 5. Thus, their stories increasingly described the self in relation to the other, situated within a social context. However, young children referred more to themselves in relation to family members, whereas older children extended their references to peers and others (i.e., teacher, doctor). Also, the majority of children described themselves in relation to others in terms of an activity (joint activity, social comparison). This finding is consistent with the evidence from interviews on the self that supports an activity orientation in the categorisations of the self in early childhood. In the above study, children compared themselves with others along three dimensions: actions, emotions and possessions.

Another line of empirical investigation into the social processes on the development of the self-concept in young children is the study of attributions about the self. Wylie (1987) analysed the attributions made by three mothers in their talk to their children during 2 1/2 hour sessions for each case in an apartment within the laboratory. The average age of the

children was 2 years and 10 months. Maternal attribution was defined as "any statement made by a mother in the hearing of her child which makes some comment expressing and/or implying some behavioural and/or inner characteristic(s) of the child, whether current or more enduring." (p. 79). It was found that mothers tended to refer more frequently to their children's cognitions (perceiving, knowing, understanding, remembering), powers/abilities to make acceptable, appropriate choices and competencies (building, table setting, climbing). Also, the most common type of lexical terms that mothers used referred to children's desires/needs/emotions; the next most common categories were "cognitions", "name address" and "abilities/competencies". Moreover, most of maternal attributions to the children were implicit rather than explicit and few were directed towards the total child rather than aspects of his/her behaviour.

Mothers' natural discourse has been the focus in another study by Radke-Yarrow et al (1990). Eighteen middle class mothers with their toddlers (average age: 30.5) compared with seventeen mothers with depression and their infants were observed on two occasions, each time for 2 1/2 hours in a research apartment. There was a high frequency of labelling of the child's behaviour by mothers. This indicates the importance of mother-child conversations as a source of information about the self. Surprisingly, there were no significant differences between the severity of a mother's depression and the frequency of implicit/explicit attributions to the child. Interestingly, the implicit comments of mothers in both groups were most frequently directed towards children's ongoing activities and cognitions, rather than feelings and social qualities. In both groups, most of mothers' comments for their children were positive in evaluative tone; also, mothers made more explicit rather than implicit attributions to their children. Yarrow et al (1990) acknowledge the risk of overgeneralising these findings, because they were produced under semi-naturalistic circumstances; real-life social interaction is embedded in different contexts that influence the quality and the content of discourse.

Regarding children's comments about themselves, it was found that there was a significant positive relationship between the number of self-references made by the children and (a) implicit and explicit attributions of mothers in both groups, (b) the variety in mothers' attributions, and (c) the quality of dialogue. Interestingly, there were no differences between the children of depressed and normal mothers in their frequency and variety of self-references. Like their mothers, children tended to refer more often to their immediate activities and less to their social and emotional qualities. Unlike them, they described their own physiological feeling states more than their mothers did. It is interesting that mothers made more frequent references to their children's cognitions and competencies rather than to social-emotional domains; they seemed to affect social-affective development through non-verbal behaviour, such as the moods they expressed and the feelings they created to their children. The most evident difference between the two groups of mothers was in the evaluative nature of their comments. Depressed mothers tended to make more negative comments about their children. Their affective tone was different from mothers without depression.

Research on the linguistic representations of the self in atypical populations has been also fruitful. Beeghly, Bretherton and Mervis (1986) found that mothers of prelinguistic children with Down syndrome employed proportionately fewer internal state utterances than did mothers of children in the comparison group (matched on mean length of utterance, mental and chronological age). Also, they did not refer to their children's cognitive states as frequently as mothers in the control group. The above results have significance when they are considered together with those of Cichetti et al (1990), who found that children with Down syndrome were delayed in their ability to talk about actions and internal states of self. Beeghly et al (1986) also found that mothers of children with Down syndrome used significantly more internal state words referring to their children's physiological states (i.e., "You're not very alert today") than mothers of the control children. A possible explanation would be that children with Down syndrome have arousal difficulties.

Critique of social-developmental perspectives

On the whole, naturalistic perspectives have provided a valuable insight in the study of development of the knowledge about the self and others. Their theoretical framework takes into account developmental assumptions and cognitive hypotheses on the ability for a conception of the self. But the research design and methodology in these empirical studies are dictated by the argument that understanding of the self is a social process mediated through language. This has special interest, as the dearth of research on the investigation of the role of socialising agents, whose labelling of the child's behaviour becomes a significant source of self-descriptions, has been noted in the literature (Harter, 1983).

Although contemporary developmental approaches in social cognition recognise the importance of social interaction in the construction of self understanding, they do not provide empirical methodological strategies that could examine systematically this issue. The observation of spontaneous talk between children and their caregivers represents a direct and meaningful way of looking at the ways that others influence children's concepts about themselves. Further, these observations could be analysed together with transcripts of clinical interviews on the self for a fuller understanding of the underlying mechanisms of self development. Therefore, a combination of methodologies (interview and language observation) could offer a more insightful perspective in the descriptive self and its formation. However, the data from naturalistic perspectives come from only from toddlers and preschool children. Thus, there is a need for additional information on the social construction of self in middle and late childhood in normal and atypical children.

CHAPTER 5: RESEARCH QUESTIONS AND METHODOLOGY

Introduction

The goal of this chapter will be to describe the aims of this study, as well as explain its research design and methodology in broad terms. First, the purpose will be to bring together questions arising from the literature review highlighting those issues that the present work has set out to investigate. Next, it will outline and justify methodological decisions that have been taken for answering these research questions. The final part will focus on the selection of participants, in terms of their clinical picture and psychometric characteristics.

Research aims

The main theoretical issues arising from the discussion in the preceding chapters seem to point to the same direction: the need to carry out research on the understanding of self and others in autism in real-world social settings. This expansion of the theoretical and empirical basis of current investigations may provide useful insights into current assumptions under dispute. Further work is needed on the ways that "the talented minority" of the autistic continuum uses or fails to use theory of mind competence in social relationships. In addition, given that an increasing body of experimental evidence against the hypothesis for a theory of mind deficit in autism shows the critical influence of task factors on autistic persons' performance, the next step could be to compare experimental findings with naturalistic information. Also, the study of social behaviour in real life might be fruitful in the debate on the "cognitive" or "affective" deficit in autism. Although, both the cognitive and social-affective approaches depend on carefully designed experiments, the social domain of autistic behaviour has been surprisingly overlooked. An important reason for this neglect is the attraction of the hypothesis for a single cognitive/affective

handicap that will explain the complexity of autism. As a result, there is plenty of research on both sides. However, what remains unexplored is how autistic individuals cope with real-life social circumstances that require the application of mental understanding of themselves and others. Moreover, qualitative information on the self comes mainly from accounts of exceptionally bright autistic persons; there has not been any controlled study on descriptions of the self by able autistic individuals (with an appropriate comparison group). Finally, the naturalistic data on how high-functioning autistic children talk about their own and others' mental states with their mothers at home have been analysed only as utterances used by the autistic children, without paying attention to the parents' input in these conversational exchanges.

These unexplored issues have formulated the following primary aims of this study.

1. A qualitative investigation of self-understanding

On the whole, the principal theoretical aim has been to explore the notion of awareness of the self and others in individuals with high-functioning autism/Asperger's syndrome. The first general aim was to gain a qualitative understanding of how persons with mild autistic disability think about their own self. I thought it important to collect direct information on the attributes that they ascribe to themselves; also, to examine which aspects of their personality they are aware of and choose to describe. At present, there is a great deal of controversy on whether able autistic persons can have knowledge of their own internal psychological states, as has been supported through a series of experimental tests (see Chapter 3). However, it remains unknown how *they* perceive *themselves* as human beings. Therefore, an important goal has been to gather direct and descriptive information on knowledge of the self from able autistic individuals, rather than measure the use of this ability on an experimental test.

2. The study of the effect of context on the understanding of self and others

A further significant line of this research has been to study whether cognitive development of awareness of the internal states of the self and others affects and is affected by social processes in able autistic individuals. This objective goes beyond the current state of affairs in the field: the focus solely on the cognitive achievements or limitations of the autistic mind. My theoretical interest has been to look at the ways that this cognitive ability or the lack of it are related with social relationships in the life of an autistic person.

Consequently, this study has been concerned with extending existing research knowledge on able autistic persons' awareness of themselves and others (derived from experimental situations) by looking further at naturalistic contexts. The aim, therefore, was to combine information on behaviour in different settings. Since relevant research in autism has been primarily carried out in artificial situations, it would be interesting to examine whether the study of autistic children's real-life relationships provides conflicting evidence on the same issue. Research on normal pre-school children's ability for social understanding has demonstrated that children's intimate relationships with others (i.e., mothers, siblings, peers) are closely related with their ability to understand their own and others' inner states (Dunn, 1993, 1994). Thus, interactions within the family and the classroom may play an important part in the development of these cognitive skills. An examination of different contexts in which autistic children talk about their own and others' internal states and the feedback they receive from familiar others may illuminate the processes that facilitate or inhibit their own use of social knowledge.

3. An evaluation of different methodological approaches to the study of knowledge of self and others in autism

This project has set out to explore the ability to understand the self and others through a variety of methods in the *same* group of autistic individuals. This objective is consistent



with the theoretical assumption that the performance of a cognitive ability is a complicated phenomenon, related both to social and to cognitive processes. This framework of ideas has guided the choice of different methodological strategies, so that a comprehensive systematic understanding of the issue will be achieved. In essence, the underlying principle of this study has been to explore the "ecological validity" of dominant experimental research: to examine whether findings from experimental tasks are replicated or discredited by naturalistic techniques.

To recapitulate, the specific research questions are:

1. Do persons with high-functioning autism/Asperger's syndrome pass or fail a traditional experimental test on the ability for a theory of mind?
2. Which aspects of themselves do the same individuals describe in a semi-structured interview?
3. How do these persons talk about their own and others' internal states in the naturalistic contexts of school and home?
4. Is there evidence that familiar others (i.e., teachers, parents) at home and in school encourage or inhibit able autistic children's talk about their own and others' mental states?
5. Do these individuals with high-functioning autism/Asperger's syndrome show mental understanding of others in their behaviour in real life situations?

Methodology

The intention here is to outline the methodology adopted for each stage of the study. Also, this presentation seeks to demonstrate that the research design has been closely linked with the preceding research questions. However, in this section the discussion is confined to mapping out the broad methodological directions. More detailed description of the techniques used to investigate each research question will be provided in the following chapters.

The core characteristic of our methodology has been its *mixed* nature. The concept of "methodological triangulation" (Cohen & Manion, 1994) is descriptive of the general research design of this study. It is defined as the combination of different methods on the same object of inquiry. The need for a mixed methodology has been dictated by the essence of our principal aim: to acquire a *global understanding* of knowledge of the self and others in high-level autism drawing on people's performance in different contexts. Up to now, research in the same area has mainly utilised a single strategy, namely hypothesis testing; it has neglected to explore the interaction between individuals with autism and their environment. Thus, the theoretical background of the present study, permeated by the aim to embrace cognitive and social perspectives, has led to the application of methods that will illuminate existing knowledge of awareness of the self and others in mild autism. Moreover, this project represents a combination of research strategies that have been applied to the *same* target group: children with high-functioning autism/Asperger's syndrome.

In essence, my methodology is characterised by a move from structured to semi-structured and naturalistic techniques. The assumption here is that such a comprehensive strategy may throw light on the subject at issue. Therefore, the need to obtain information from several different contexts necessitated the inclusion of a variety of settings. My aim has to been to investigate whether differences in the nature of the situation (formal and structured

versus spontaneous and naturalistic) would have an impact on the ways that able autistic children talk about their own and others' mental states.

Another aspect of my methodology has been its *qualitative* dimension. My aim has been to go beyond current approaches focused on proving whether a cognitive ability is absent or lacking, so that a deeper analysis of self-understanding can be achieved by looking at the content of this ability (how able autistic individuals think and talk about themselves and others). For this purpose, *language* has been selected as the main unit of systematic observation. There is general consensus in the literature that language analysis can successfully inform theoretical interest on the development of understanding of the self and others (Dunn, 1992). The study of the spontaneous narrated self has been used as a fruitful method for the investigation of the development of self in normal populations (see Chapter 4). Given that the participants of this study do not have language retardation, the study of their talk provides a useful tool for gaining access into their mental world. However, it needs to be acknowledged that some high-functioning autistic persons have the ability to get involved in conversations (interviews with researchers) and tasks (retelling stories) about mental states, but they seem to *describe* rather than *narrate* their experiences (Bruner & Feldman, 1993); this communicative problem has been explained as a result of a weak or absent impulse to rework life experiences through transactional processes (caregiver-child interactions) from the early years.

However, one of the limitations of analysing language as a rich source of information for the contents of the "mind" and "awareness" is that it concentrates only on what is expressed verbally. For this purpose, the study of natural verbal behaviour was extended to include spontaneous behaviours and dialogues, occurring either during the period of recorded sessions (for language analysis) or in less structured sessions with teachers. This technique of *opportunistic event sampling* based on observations of interactions, could be used as a complementary source of looking at the person's abilities as a whole, thereby throwing further light on the findings from the other sets of data.

Specifically, the techniques applied for exploring each of the research questions are the following:

- I. An experimental methodology has been used to test whether persons with HFA/AS show the ability for first- and second-order theory of mind. The measurement of attributing another's false belief has been chosen, as this is the traditional technique for the study of theory of mind in all levels of autism (see chapter 3). It is *a structured test situation* that provides an "all-or-none" reply to the question whether these children are able to demonstrate the ability to understand somebody else's mental state in the context of a carefully designed experiment.
- II. For looking at the aspects of themselves that persons with HFA/AS describe, *a semi-structured interview* has been employed. Since my aim is to obtain descriptions of the self from the autistic group, a set of questions tapping different aspects of knowledge of the self has been administered. These free-response questions provide a semi-structured framework for all talk related to the self between the researcher and the autistic individual. Also, the interview situation provides a secure setting for confidential, private information to be gathered.
- III. Concerning the talk about mental states of the self and others in naturalistic contexts, a semi-structured but systematic technique has been chosen as appropriate: *the observation of spontaneous verbal interactions of the autistic group in two different social contexts (home and school)*. The intention, at this stage, was to examine the ways that able autistic persons express understanding of themselves and others in a formal (classroom) and informal (home) environment. It may be useful to look at the effects of structure and human factors (the adult taking part in the conversation) on language about mental states that autistic children use for referring to themselves and others. The focus, here, is on the able autistic child and the contribution of the adult (teacher or parent) in the spontaneous conversation on psychological states of the

self and others. Hence, both questions 3 and 4 have been explored through recordings of spontaneous talk between autistic children and their teachers and parents. With these techniques, information on the self and others is collected through a procedure that minimises effects from the researcher's presence.

- IV. Finally, in order to overcome the limitations of systematic language data collection as well as to enrich the other information obtained, an additional method has been used: *the use of ethnographic observation*. This technique aimed to capture any type of incidents showing mental understanding of the self and others, arising out of the structured recorded periods at school.

Description of participants

The target group

Our theoretical interest in persons with high-functioning autism/Asperger's syndrome was inspired by research findings on this subgroup. Although, they seem to perform successfully on first- and second-order theory of mind tests, they still show autistic deficiencies in their social life. Also, their advanced verbal ability provides an interesting way of investigating their knowledge of themselves and others; since they are able to talk, it might be fruitful to gain access to their social understanding as expressed in a variety of contexts. Therefore, this "talented minority" (Happe, 1994a, 1994b) presents a challenging case for understanding the complexity of autism.

Our first step in selecting the participants of this study was to clarify the diagnostic criteria for the target group. This task became difficult in the face of the amount of controversy (discussed in Chapter 2) on whether Asperger's syndrome and high-functioning autism represent the same form of autistic abnormality. On the one hand, high-level autism is

defined in DSM-III-R (1987) in terms of a mild qualitative impairment in Wing's triad (social interaction, communication, imagination) together with restricted, stereotyped patterns of behaviour and interests. Also, the cut-off point of 70 in a standardised intelligence scale has been used by researchers as the differentiating criterion between mild and severe autism. On the other hand, Asperger's syndrome was first defined in ICD-10 (1992) as similar to autism in terms of the qualitative impairment in reciprocal social interaction and repetitive behavioural patterns. But, the lack of delay in general language and cognitive development has been identified as the single diagnostic criterion differentiating typical autism from Asperger's syndrome. However, there is some debate on the validity of lack of language delay in early history. Recent studies have made a diagnosis of AS only on the basis of normal language functioning at the time of the study rather than past history (Ozonoff et al, 1991a; Manjiviona & Prior, 1995).

A further issue that needs to be addressed is the developmental dimension of research design in this study. The age of the target group (adolescents) imposes some limitations on the interpretation of findings from the application of techniques. It has to be acknowledged that all data are regarded as a reflection of an original disability as well as efforts at compensation, resulting from education and learning.

Seven pupils from a special school for autistic children/adolescents were selected for this study on the grounds that they had been identified by educational psychologists as having "autism", "autistic tendencies", "Asperger's syndrome" and "communication problems". In general, the criteria for mild autism could be applied to their behaviour. All of them met the criteria for autistic disorder defined in DSM-III-R (1987), including at least eight symptoms from the three categories of abnormalities: impairment in reciprocal social interaction, verbal/non-verbal communication and restricted repertoire of activities/interests (see Appendix 1). Also, they had an extensively documented history of classic autism. Subjects' current social ability was not assessed separately but it was assumed with the diagnosis, as it was not the focus of the study. Moreover, a

measurement of their performance IQ was taken. However, only two children (the youngest in the group) showed more autistic symptoms (one met eleven criteria and the other met thirteen criteria of DSM-III-R) than the other five children and could have been diagnosed as low-functioning. But, one of the two children with low-functioning autism had the highest performance IQ (114.5) in the whole group. Thus, five individuals could be diagnosed as high-functioning. Regarding the ICD-10 criteria for Asperger's syndrome, four children had a history of language delay. However, two children (described above) showed impaired use of language (echolalia) at the time of the study. Hence, five children could be also diagnosed as having Asperger's syndrome. Because five children had received a diagnosis of the same level of autistic handicap and cognitive functioning, they were placed in the same classroom, together with the other two children that showed echolalia. The main reason for this was that they did not have severe language delay. Although the focus of this study is on individuals at the "upper end of the autistic continuum", two children with more typical autism have been also included in the target group. This decision was based on the following reason: as a large amount of our data would be collected in the classroom during group sessions, it was practical to include these two children in our observations. All children came from different areas of an English County in the northern part of the country. The social status of their families ranged from working to middle class.

The decision to study a target group of this size ($n=7$) was related to my research questions and methodological principles. Since the aim is to examine the application of knowledge of self and others by using multiple techniques, it was considered more appropriate to pay attention to the quality of the data rather than the number of participants. In addition, it would have been impractical for one researcher to collect and analyse the same type of information for a larger number of children within the allocated time for fieldwork.

The comparison groups

The inclusion of a comparison group has been largely used as a methodological strategy in psychological research in autism (Baron-Cohen, Leslie & Frith, 1985; Baron-Cohen, 1989b; Tager-Flusberg, 1992). In most cases, the control group consists of individuals with mental retardation, so that any effects from mild retardation in the performance of the autistic group can be eliminated. Thus, it was necessary to select a group of children with moderate learning difficulties (MLD) for our research purposes.

The children in the comparison group had been identified as having "moderate learning difficulties" and were all (except one) attending the same special school in the northern part of England. In contrast with the autistic children, they all came from different classes within the same school. The two groups of children were compared on chronological age (CA) and verbal mental age (VMA). Verbal ability was assessed with the Short Form of the British Picture Vocabulary Scale (BPVS) (Dunn, Dunn, Whetton & Pintillie, 1982). Non-verbal ability was measured with Raven's Coloured Progressive Matrices (1956). The gender distribution in the comparison group (male:female ratio= 5:3) was almost the same as in the autistic group (5:2). Details of the participants are summarised below.

Table 5.1 *Descriptive Characteristics of the Two Groups of Children.*

| | HFA/AS (n = 7) | MLD (n = 8) | T-test |
|----------------|-------------------|----------------|--------------------|
| \bar{X} CA | 11.95 | 12.43 | t = 0.47, p = 0.99 |
| SD | 3.54 | 3.31 | |
| \bar{X} VMA | 7.88 | 7.2 | t = 0.68, p = 0.57 |
| SD | 2.76 | 2.11 | |
| \bar{X} NVMA | 8.78 | 6.50 | t = 1.96, p = 0.10 |
| SD | 2.98 | 1.33 | |

A group of adults with AS (male:female ratio= 5:1) was also included as a comparison group, so that it could be possible to examine whether the findings from the experimental testing and the semi-structured interviews would be different by age. These individuals were selected from a residential College catering especially for autistic persons and all had received a diagnosis of Asperger's syndrome. They met the criteria of ICD-10 for this disorder: they showed abnormalities in "the triad" and had normal intelligence and no language abnormalities at the time of the study (see Appendix 1). Verbal, non-verbal and general intelligence (VSIQ, PSIQ and FSIQ respectively) in the adult AS group was measured with the WAIS-R (1955). Only one adult had a history of language retardation and full scale IQ of 60.5. The other five subjects had general intelligence above 70. Further details of this group are given in Table 5.2 below.

Table 5.2 *Descriptive Characteristics of the Adults with Asperger's Syndrome (n = 6).*

| | CA | VIQ | PIQ | FSIQ |
|--------------------|---------|--------|----------|--------|
| Mean | 24.32 | 90.33 | 90.67 | 91.17 |
| Standard deviation | 5.11 | 17.73 | 25.45 | 37.91 |
| Range | 18-33.1 | 70-118 | 60.5-130 | 51-140 |

CHAPTER 6: EXPERIMENTAL TESTING ON THEORY OF MIND

Introduction

This chapter intends to describe the first stage of data collection in this study: experimental testing. The first section will provide detailed justifications for the methodological design and procedure that have been applied for exploring the following research question: Do children with HFA/AS differ in performance on first- and second-order theory of mind tests compared to children with MLD and adults with AS? In particular, the selection of tests, procedures and materials will be presented. Then, results will be reported and explained in the light of current experimental evidence in the field.

Methodology

In this phase of the study, the main aim was to seek experimental evidence on the ability for a theory of mind in a group of children with high-functioning autism/Asperger's syndrome. However, we decided to focus only on "false belief attribution". This decision was based on four reasons.

1. The theoretical assumption supported by cognitive psychologists that "belief" is a fundamental internal state for the interpretation of human behaviour; thus, testing "false belief" would be a strict test for the theory of mind hypothesis (Baron-Cohen et al, 1985).
2. The performance of high-functioning autistic children on tests of false belief attribution has been used as the main evidence for assumptions about their ability for self-reflection: since they fail to take into account another's false belief, they may not be able to be aware of their own beliefs as well. Hence, the focus on "false belief attribution" would be more relevant than performance on tests of attributing other mental states to the central theme in this thesis: the investigation of understanding of

the self and others in able autistic persons in a variety of contexts. The information obtained through experimental testing will be compared with evidence of their spontaneous talk on mental states (of themselves and others) in naturalistic settings.

3. Our focus on "false belief" would make it possible for a comparison between our findings and existing evidence derived from the same procedures.
4. It seems that understanding of false belief presents problems for "the talented minority" of autistic individuals (Sparrevohn & Howie, 1995).

At this stage of the study, my hypotheses are the following:

1. Children with HFA/AS are expected to be as successful on a first-order theory of mind test as children with MLD. This prediction is based on two reasons. First, I used a modified version of the traditional task, that has been found to improve autistic children's performance (Eisenmajer & Prior, 1991; Prior et al, 1990). Also, verbal mental ability (greater than 6 years) has been shown to be a necessary but not sufficient criterion for success on first-order belief attribution (Prior et al, 1990; Sparrevohn & Howie, 1995). Since the verbal mental age of our target group is over 6 years, it is expected that they would not fail this task. Moreover, the adult group with AS is predicted to pass the same task, because other studies using subjects with AS in the same range of chronological age and level of intelligence as our participants have shown that they pass first-order theory of mind tasks (Bowler, 1992; Happe, 1994c).
2. Children with HFA/AS will be less likely to pass the second-order false belief-attribution task than children with MLD. The main reason for this is related to the verbal ability of the group. It has been found that a chronological age of no less than 11 years and a minimum verbal mental age of 9 years is necessary for passing the advanced test of theory of mind (Ozonoff et al, 1991; Sparrevohn & Howie, 1995).

Since, the children with HFA/AS had an average age of 11.95 and verbal age of 7.88, it is predicted that very few of them will be successful on this task.

3. Adults with AS will be more likely to pass the second-order theory of mind test than children with HFA/AS. This expectation is grounded on empirical evidence, showing that adults with similar chronological and verbal mental age are successful on this task (Bowler, 1992; Happe, 1994c).

Procedure

Both tasks were administered individually to all participants in a quiet room in their school/college. First, each subject was tested on the first-order theory of mind test, to investigate first-order belief attribution. Those who passed this task were further tested at another time on second-order belief attribution. All sessions were tape-recorded and subjects' responses to each question were transcribed.

First-order belief attribution

A modified version of the traditional "Sally-Anne" test was used, which included the word "*first*" in the test question, introduced by Prior et al (1990). The test employed two dolls, a basket, a box and a marble. The experimenter and the subject were sitting around a table facing each other. Each participant was presented with two dolls, Sally and Anne. Explanations were given: "This is Sally. This is Anne. Sally has a basket. Anne has a box.". Two *naming* questions were asked for checking whether the subject could identify which doll was Sally and which was Anne:

"Which is Anne?" and "Which is Sally?".

Next, the experimenter moved the doll Sally in a way that she put a marble in her basket and then went away. Then, the experimenter moved the doll Anne in a way that took the

marble from Sally's basket and hid it into her box. At this point, two *prompt* questions were asked:

(1) "Where did Anne hide the marble?" and (2) "Did Sally see that?".

After a while, Sally came back and looked for her marble. At this point, the experimenter asked the *test* question:

"Where will Sally look for her marble *first*?".

The subject could either say or point to the location where s/he thought that Sally would look for her marble. Also, s/he was asked to justify her/his response (*justification* question). Lastly, two control questions were asked: the *reality* question:

"Where is the marble *really*?", and the *memory* question:

"Where was the marble in the *beginning*?".

The test was repeated (trial 2) in the same session, this time reversing the locations.

Second-order belief attribution

The traditional test for second-order belief attribution developed by Baron-Cohen (1989a) was used in this study (Bowler's tasks (1992) have not been chosen, as they were designed and administered to an *adult* group of Asperger's syndrome). In this story the subject is asked to predict one person's false belief about another's false belief. Each subject was presented with a toy village (two houses, a church, a fence, an ice-cream van and four dolls) and was asked to name all the toys. Then the experimenter said the following story twice; the second time (trial 2) the locations were reversed. Explanations and questions are given in the box below.

This is John. This is Mary. They live in this village.

Naming Question: Which is John/Mary?

Here they are in the park. Along comes the ice-cream man. John would like to buy an ice-cream but he has left his money at home. He is very sad. "Don't worry" says the ice-cream man, "you can go home and get your money and buy some ice-cream later. I'll be here in the park all afternoon ...". "Oh, good" says John, "I'll be back in the afternoon to buy an ice-cream."

Prompt question (1): Where did the ice-cream man say to John that he would be all afternoon?

So John goes home. He lives in this house. Now, the ice-cream man says "I am going to drive my van to the church to see if I can sell my ice-cream outside there."

Prompt Question (2): Where did the ice-cream man say he was going?

Prompt Question (3): Did John hear that?

The ice-cream man drives over to the church. On his way he passes John's house. John sees him and says "Where are you going?" The ice-cream man says "I'm going to sell ice-cream outside the church.". So off he drives to the church.

Prompt Question (4): Where did the ice-cream man tell John he was going?

Prompt Question (5): Does Mary know that the ice-cream man has talked to John?

Now Mary goes home. She lives in this house. Then she goes to John's house. She knocks on the door and says "Is John in?". "No", says his mother, "he's gone to buy an ice-cream."

Belief Question: Where does Mary think John has gone to buy his ice-cream?

Justification: Why?

Reality Question: Where did John really go to buy his ice-cream?

Memory Question: Where was the ice-cream man in the beginning?

From Baron-Cohen (1989b).

Results

A strict scoring criterion was applied in both tests. The child would pass the test if s/he pointed to or gave correct responses to the test as well as the control questions (the reality and the memory questions). For example, a subject would pass the first-order belief attribution test if s/he pointed to/said the previous location (Sally's basket), the real location (Anne's box) and the initial location (Sally's basket), thereby predicting correctly the protagonist's false belief. If the subject pointed to/said the current location of the marble (Anne's box), then s/he would fail the test.

First-order belief attribution

All groups passed the naming questions. Interestingly, group differences on the belief question were strikingly small: six out of seven children with high-functioning autism/Asperger's syndrome passed the test on both trials and seven out of eight children in the MLD group also passed the critical question (Table 6.1, below). All children in the HFA/AS group who passed the belief question had also given correct responses on both control questions; curiously, the only autistic child who failed the test question was correct on the control questions. The same pattern of performance was observed in the MLD group: all children, including the one who failed the test, gave correct replies to the control questions. In the group of adults with Asperger's syndrome, all passed the belief and the control questions. Therefore, no significant differences were found between the target group and the comparison groups.

Table 6.1 *Group Performance on the First-Order Belief Attribution Task.*

| | Children with HFA/AS (n = 7) | Children MLD (n = 8) | Adults with AS (n = 6) | Fisher's exact probability test |
|--------|------------------------------------|----------------------------|------------------------------|---------------------------------------|
| Passed | 6 | 7 | | p = 0.53, n.s. |
| Passed | 6 | | 6 | p = 0.53, n.s. |

However, responses to the justification question ("Why Sally will look for her marble in her basket?") appeared to be interesting. A detailed description of the justification data for each group is included in appendix 2. In the HFA group, three out of six subjects who passed the test, used correct mental explanations (such as "know" and "think") to justify the doll's action. Yet, replies of the remaining three children who also passed the test referred to physical states (behavioural actions, i.e., "she put it in there", "she left it last"). The child who failed the test gave an irrelevant reason for the protagonist's action, showing that he did not understand the belief question. Responses of the adults with AS were exactly the same as those of the target group: three subjects referred to mental states and three described physical states.

Similar results were obtained from the comparison group of children. Out of seven children with MLD who passed, only two described mental states in their justifications and the other six used the same physical state (i.e., "she put it in there"). Surprisingly, the only child with MLD who failed the task gave a mental explanation.

Second-order belief attribution

The task of second-order belief attribution was given only to those individuals who had been successful on the first-order belief attribution test. There were small changes in the size, the chronological and verbal mental age of the target group and the group of children with MLD. Details are given in Table 6.2 below. The group of adults was exactly the same as in the other test, as all had succeeded on that task.

Table 6.2 *Descriptive Characteristics of Children with HFA/AS and Children with MLD on the Second-Order Belief Attribution Task.*

| | HFA/AS (n = 6) | MLD (n= 7) | T-test |
|---------------|-------------------|---------------|------------------------|
| \bar{X} CA | 12.35 | 12.72 | t= 0.37, p= 0.9, n.s. |
| SD | 3.71 | 3.47 | |
| \bar{X} VMA | 8.53 | 7.64 | t= 0.88, p= 0.43, n.s. |
| SD | 2.37 | 1.84 | |

All subjects who passed the test answered correctly on the belief and the control questions. There were no significant differences between the target and the comparison groups (Table 6.3 below). Two out of three children with HFA/AS who failed the test, gave incorrect responses on the reality question and correct replies on the memory question on both trials, whereas the other child who also failed, replied correctly on the control questions on both trials. A similar pattern was observed in the MLD group: three out of the four children who failed the test, replied correctly on the control questions. In the group of adults with AS, out of the two who failed, only one of them replied correctly on the control questions. These findings show that the belief question was especially difficult for them.

Table 6.3 *Group Performance on the Second-Order Belief Attribution Task.*

| | Children with HFA/AS (n = 6) | Children with MLD (n = 7) | Adults with AS (n = 6) | Fisher's exact probability test |
|---|------------------------------------|---------------------------------|------------------------------|---------------------------------------|
| Passed (HFA/AS Children and MLD Children) | 3 | 3 | | p = 0.40 |
| Passed (HFA/AS Children and AS Adults) | 3 | | 4 | p = 0.43 |

A non-stringent criterion was applied for correct justifications: explicit and implicit references to mental states were scored as correct. For example, the statement: "Because he thought the van was gonna stay in there" makes a clear description of a mental state; but, in the statement: "Because that's where the ice-cream man said he would be all day" a mental state (knowledge) is implied. Interestingly, all children with HFA who passed used appropriate mental explanations (first-order theory of mind) in their responses to the justification question. The same pattern was observed in three out of four adults with AS who passed the test: they made appropriate references to internal states (first-order theory of mind). Also, one adult who failed the test used an inappropriate mental explanation. In the MLD group, two out of three children who passed the test, gave mental explanations (first-order theory of mind) for explaining their reply; the other person who passed the test described a physical state.

Discussion

First-order belief attribution

The findings from the experimental testing do *not* provide evidence for the hypothesis that high-functioning autistic children fail to employ a first-order theory of mind. Moreover, the fact that all children in the target group who passed the test gave correct responses on the control questions as well allows us to conclude that their knowledge about the protagonist's false belief was genuine and not the result of guessing. Yet, that was not the case for the only child who failed: although he answered the control questions correctly, he failed the belief question. It is clear, then, that the question on the other's mental state was difficult for him, as opposed to the control questions that are both focused on facts (i.e., "where is the marble really?", "where was the marble in the beginning?").

The high success rate of the target group can be explained in terms of their verbal mental age. The "passing" group of children with HFA/AS in my study had a higher mental age (7.88) than the "failing" group of autistic children (5.5) in Baron et al's study (1985), which used the "Sally-Anne" test without the word "first" in the belief question and found that only 20% of the group passed the task. Our results are consistent with those by Prior et al (1990) and Eisenmajer & Prior (1991) who used the same version of the task; also, our target group had similar chronological and verbal age as the groups of high-functioning subjects in both studies. Therefore, task factors as well as verbal ability (over 6 years) of the autistic individuals appear to improve their performance on the first-order theory of mind task. However, the current view suggests that verbal ability is not sufficient for success on the task. Our findings seem to support this position: out of two children with HFA/AS with verbal mental age below 6 years, one child (verbal age= 5.4) passed the test and he also gave a mental explanation. The only child who failed had the lowest verbal ability in the group (4.0). Regarding the results from the adults with Asperger's syndrome, they are consistent with those in Bowler's study (1992). That was expected as the subjects with AS in both studies had similar chronological age and verbal IQ.

Another interesting aspect of my findings is related to the responses on the justification question. This question is useful in revealing the process of thinking around the belief question. It was found that not all children (and adults) with HFA/AS who passed the test referred to the protagonist's mental state for explaining her action. Children with HFA/AS and adults with AS who were successful explained their prediction for the doll's behaviour in terms of observed facts (e.g., "Because she put it in there", "The fact that she left it last", "Because that was the first place she had it", " 'Cause that's where it was."). This picture becomes even more confusing, since some children in the MLD group used the same type of reply (common reply: " 'Cause she put it there before"). This implies that the lack of appropriate mental state language in some autistic individuals who are able to attribute beliefs to another person is not autism-specific. However, this finding may be explained in two different ways: either that these persons are using mentalising skills but they do not articulate them in an appropriate way, or that they rely on different cognitive strategies that are not based on theory of mind. These intriguing results may be illuminated through the study of the use of these abilities in natural social contexts by the same autistic individuals. Then it might be possible to provide an "ecologically valid explanation".

Second-order belief attribution

My hypothesis that some children with HFA/AS would pass on the second-order belief attribution test was supported. In contrast with Baron-Cohen's (1989b) evidence (none of the ten high-functioning autistic children he tested passed the test), three (out of six children tested) were successful in this study. This is interesting, as in both studies the target groups had similar chronological and verbal mental ages. The rates of pass and failure in our target group can be partially explained as a result of a verbal mental age over 9 years (Ozonoff et al, 1991a; Sparrevohn & Howie, 1995). Yet, one child with lower verbal mental age (7.2) passed the task. All the other children with HFA/AS who failed had verbal mental age lower than 9 years. Thus, it seems that there is an indication that verbal ability improves task performance but this is not conclusive. It appears that the

ability to understand the instructions and the nature of the task (dependant on verbal ability) are not strongly related with the ability for second-order belief attribution (an advanced conceptual skill).

The success rate in the group of adults with AS is consistent with Ozonoff et al's study (1991a) and Bowler's (1992) study. It could be explained in terms of general level of intelligence. The full scale IQ (95.18) of the adults with AS in our group who passed the test was close to the full IQ of the subjects with AS who were also successful in the above studies (89.52 and 86.8, respectively); the full scale IQ of the adults with AS who failed in our testing was 81.75.

My results are also consistent with those by Sparrevohn & Howie (1995) who found that all children with HFA who passed the test gave correct mental explanations, without specifying if they were first- or second-order theory of mind responses. Also, the use of mental justifications from adults with AS who were successful is in agreement with Bowler (1992). However, successful performance on this task seems to be more associated with first- than second-order explanations. All the children with HFA/AS and nearly all the children with MLD and adults with AS who passed the test used a first-order theory of mind strategy in their justifications. Could this mean that they do not have an advanced theory of mind? But it is notable that the use of mental states was appropriate in the above cases. Nevertheless, the focus here is on the expression of the thinking process, not the underlying cognitive ability. Thus, it is not certain whether the language ability truly represents conceptual ability. This shows the limitations of the experimental technique and highlights the need to explore application of theory of mind in real-world settings.

CHAPTER 7: INTERVIEWS ON SELF-UNDERSTANDING

Introduction

The focus of this chapter will be on the second stage of fieldwork of this study: administration of a semi-structured interview. In the first section, the main research aims will be outlined in connection with the methodology for their empirical investigation. The principal research question was: Do children with HFA/AS show different understanding of themselves compared with children with MLD and adults with AS? Next, the procedure for the data collection, as well as the specific instrument that has been used, will be described. Then, results will be analysed and presented; finally, a discussion of the findings will be developed.

Research aims

In this phase of the study the primary aim was to obtain qualitative evidence on knowledge of the self in the same single group of children with high-functioning autism/Asperger's syndrome that had been tested for their cognitive ability to attribute mental states to another person. The underlying assumption in the testing procedure was that children's performance on tasks of attributing mental states to another person would be associated with their cognitive ability to be aware of their own mental states. However, the nature of experimental measurement did not throw further light on the contents of their ability to have knowledge of themselves as persons. In particular, it might be interesting to explore the ways that the same group of children with high-level autism conceptualise themselves and which aspects of their own personality they report in a semi-structured situation. Thus, the intention here was to acquire information on knowledge of the self that would be descriptive and qualitative. Therefore, the major concern was to choose an approach that would tap on cognitions about the self, that could then be evaluated in connection with

assumptions about the ability to attribute mental states to the self, based on laboratory tasks.

The different nature of the research aims at this stage required the selection of a different methodology. For the purposes described above, the technique of the clinical interview was chosen as most appropriate. It is a tool that has been extensively applied in developmental studies that tap social-cognitive dimensions of self-understanding (Broughton, 1980; Johnson & Wellman, 1982; Montemayor & Eisen, 1977; Selman, 1980). The interview offers mainly the opportunity of gaining access to *the spontaneous self*, as it emerges in a semi-structured situation. The individual is given the freedom to express his/her own concepts/views about him/her self with respect to a set of questions. However, the lack of instruments for measuring knowledge rather than evaluation of the self (self-esteem) in normal children is notable (see Chapter 4). To my current knowledge, there has been no published study to date that has examined systematically descriptions of the self derived by individuals with high-functioning autism/Asperger's syndrome. Hence, the area of their self-understanding remains unexplored.

At this stage of the study the research aims were the following:

1. To determine whether the quality and the level of self-understanding in autism is related to the presence or lack of a complex developmental disability by comparing children with high-level autism/Asperger's syndrome and children with moderate learning difficulties.
- 2 To investigate developmental differences in the quality and the level of self-understanding by comparing children with HFA/AS and adults with AS.

3. To examine the relationship between performance on theory of mind tasks and understanding of the self within a single autistic group of children with HFA/AS compared with adults with AS and children with MLD.

Methodology

The interview was selected as an appropriate technique for two main theoretical purposes. First, as a qualitative method it would provide a deeper insight in self-understanding, that would go beyond the limitations of the experimental testing. Individuals would be asked to describe themselves in a free-response mode, without the constraints of test questions. However, it has to be noted that the use of an interview was not based on the aim to contradict, but rather to complement experimental findings. Both techniques concentrate on cognitive abilities: the false-belief attribution tasks measure the cognitive ability to use knowledge of another's mental states; the interview reveals the cognitions (views/thoughts) about the self. Therefore, the experimental testing and the interview have been employed as suitable for answering different questions. In this thesis, the combined application of two (or multiple) techniques is considered as more fruitful than the use of a single research strategy for the study of understanding of self and others in autistic individuals.

The clinical interview

Although a variety of interview techniques have focused on young children's conceptions about the self (Broughton, 1980; Johnson & Wellman, 1982; Selman, 1980), they concentrate only on general aspects of self-understanding. These studies used open-ended questions, such as "What is the self?", "What is the brain?" or presented children with story-dilemmas, tapping self-reflection. But these questions are broad and do not examine the two basic aspects of a person: the "I" (i.e., sense of the self being different from others,

stable over time) and the "me" (i.e., physical characteristics, activities, social abilities, psychological experience). This lack of a comprehensive instrument determined the use of the self-understanding interview by Damon and Hart (1988).

This clinical tool is based on a multidimensional model of self-understanding (described in Chapter 4). It consists of seven core items; four of them focus on aspects of the self-as-object (the "I") and three items explore dimensions of the self-as-subject (the "Me") (see Appendix 3). The first four questions are defined as "self-definition", "self-evaluation", "self in past and future" and "self-interest". Responses on each item are examined in terms of the child's description of four self-schemes (physical, active, social and psychological) and use of four levels of self-understanding. The "physical" scheme refers to physical and material attributes of the self, such as size, age, nationality, gender, body, voice, name, possessions, clothes, health and physical environment. The "active" self includes typical activities that are allowed, forbidden or demanded from the self (e.g., "I play Nintendo.", "I'll fight the place."). The "social" self reflects membership of family relations, friendships and social groups (e.g., "I have a family.", "I am proud of my friends."). The "psychological" self comprises of feelings, moods and thoughts about cognitive/social abilities of the self (e.g., "I like going on a ride.", "I get on with people quite well.").

In addition, Damon & Hart propose a conceptual hierarchy of four developmental levels of increasing complexity in self-understanding (see Figure 4.1 in page 88). In early childhood, the self is understood in terms of "categorical identifications" (level 1); characteristics of the self are important in and of themselves without any underlying significance (e.g., "Why do you say that this is important for you?", "Because I just do."). In middle childhood, the self is described through explicit or implicit "comparative assessments" with others (level 2) (e.g., "Why is it important for you to work at school?", "Because I work better than others in the class."). In early adolescence, the self is construed on the basis of its capabilities to form and sustain interpersonal relationships (level 3) (e.g., "Why does that make you feel proud?", "Because other kids want to play with me."). In late adolescence,

the self is organised according to personal moral and belief systems, life plans and goals (level 4) (e.g., "Why is that good for you?", "Because I think it's good to help the handicapped kids.").

A further dimension of the self-understanding interview focuses on the cognitions for the self-as-subject, which are operationalised as "agency", "continuity" and "distinctness" of the self. "Agency" describes the individual's conception of the formation and existence of the self. At level 1, the self is considered to be the result of supernatural, biological or social forces. At level 2, the self is regarded as the product of talents, abilities and efforts of the self. At level 3, the self is conceived as influenced by communication with others. At level 4, the self is viewed as the outcome of personal or moral evaluations. "Continuity" is defined as the sense of having the same self and the same personal identity. "Distinctness" covers one's statements about the sense of him/her self as a distinct, separate human being from others. For these two components, the levels of understanding the self as a continuous or distinct human being correspond to those of the understanding of the self-as-object that were described above. For example, "continuity" at level 1 would describe one's view of him/herself being the same or different over time, as derived from "categorical identifications", whereas at level 3 "self-continuity" would be established on the recognition of the self by others.

At this stage of the study, the hypotheses are the following:

1. It is likely that there will be differences in the aspects of self-understanding described by children with HFA/AS and children with MLD, associated with the type of handicap in each group.
2. Similar differences are expected to appear between the target group and adults with Asperger's syndrome, related to maturational factors (i.e., the age) and the amount of social experiences.

3. It is predicted that there will be differences in the level of reasoning between the children with HFA/AS and the children with MLD, compared with literature findings with normal children on the same interview.

Participants

The same groups that were tested on false-belief attribution tests participated in this phase of the research. In particular, the semi-structured interview was administered to seven children with high-functioning autism/Asperger's syndrome, nine children with moderate learning difficulties and six adults with Asperger's syndrome.

Administration procedure

The self-understanding interview was administered individually to all subjects in a quiet room in their school/college. All sessions were tape-recorded and transcribed shortly after the interview. To avoid the problem of participants being reluctant to talk to an unknown interviewer, the researcher had spent some time with the children and was well known to them, before the interviews were carried out. The autistic children were interviewed after three months of informal contacts between the researcher and the children in their classroom (all were in the same class) and the playground. The researcher attended classroom sessions and occasionally helped as an assistant, so that the autistic children would be familiar with her. A similar approach was followed with the adults with AS. The researcher visited them in their college and went with those students that had been selected as co-operative and able to respond to an interview in their activities. Lastly, the researcher spent a few days in the school with MLD with the purpose to meet the children in advance, so that she was not a stranger to them.

When a relationship had been established, each autistic child was given the interview twice, approximately one week apart. That was regarded as necessary to confirm the reliability of the data. In the first session, each child was initially presented with a photograph of him/her self only, to make sure that they were able to recognise themselves. Then, the interviewer would ask the child to say something about him/her self. If the child persisted in reporting information that was closely related to the photograph only, then the photograph was placed out of his/her sight. However, the children with MLD and the adults with AS were interviewed only once, since they appeared to be more able to understand the nature of the interview.

The interview session lasted between twenty to forty minutes. Yet, it would be interrupted if the child seemed to be uninterested or unwilling to talk at that time. It was presented to them as an opportunity to have "a little chat" or a break from the classroom work; in fact, this proved to be motivating for them to come along. Also, the use of the tape-recorder was very helpful in making the experience desirable and appealing to them. Most of them enjoyed listening to their own voices afterwards or during the session as a reward for their participation.

Scoring procedure

Each transcript was divided into scorable units ("chunks") of responses to each item. A chunk included characteristic(s) of the self described by the individual and all statements explaining the meaning/importance of that characteristic(s). Then, each chunk was coded according to the self scheme and the developmental level of reasoning. This process followed the instructions set in the scoring manual developed by Damon et al. It has to be emphasised that each response is scorable only if the subject is given the opportunity to explicate his/her statement about him/her self. Some chunks can be scorable in two levels within the same scheme. In this case, only the highest level is recorded. For instance,

Interviewer : "What kind of person are you?"
 Subject : "I don't know. Tall, I guess."
 Interviewer : Why is that important for you?"
 Subject : "If I wasn't tall I couldn't play basketball as well as my friends and they wouldn't play me any more. "

This response is coded both in level 2 ("comparative assessments") and level 3 ("interpersonal implications") of the physical self. However, it is scored only on level 3, as this is higher than level 2. Also, if some chunks are scorable in the same level of different self-schemes, all self-schemes are recorded. For example,

Interviewer : "What kind of person are you?"
 Subject : I go for rides."
 Interviewer : "Why is that important?"
 Subject : "Because I'm in the Biker's Club."
 Interviewer : Is it important for you to be in the Biker's Club?"
 Subject : "Yes, it is."
 Interviewer : "Why?"
 Subject : "Because I go for rides."

This statement is scorable in both level 1 of the active self and level 1 of the social self. If a chunk is scorable at different levels in two or more schemes, only the score for the scheme with the highest level is recorded. For example:

Interviewer : "What kind of person are you?"
 Subject : "I'm a Christian."
 Interviewer : "Why is that important for you?"
 Subject : "Because I believe in God."

This chunk could be coded at level 1, social scheme ("I'm a Christian.") as well as level 4, psychological scheme ("I believe in God."). But it is scored only at level 4, psychological scheme, since it is clear that this is the personal meaning of "I'm a Christian.". The assumption, here, is that the higher level incorporates the lower level of reasoning.

Results

This section will report findings from the interviews on self-understanding from the three groups of participants. The broad aim of the analysis was to examine differences in the understanding of the self between children with high-functioning autism/Asperger's syndrome, adults with Asperger's syndrome and children with moderate learning difficulties. Individual differences within each group were also noted. However, the analysis of group differences has concentrated on two specific dimensions: the use of self scheme and the use of modal level of reasoning for self-understanding. The first part of the results will describe group differences on knowledge of the self-as-object, as it is represented in the first four items of the interview schedule. The second part of findings focuses on the conceptions of the self-as-subject, derived from responses to the last three items of the interview.

Self-as-object

Item: Self - definition

The first item of the interview explored general definitions of the self ("How would you describe yourself?"). All children with HFA/AS described their "physical" self at level 1. They made references mainly to their gender (e.g., "I'm a boy.", "I'm a female.": four children), bodily features (e.g., "I've got blonde hair.": four children) and age (e.g., "I'm eighteen years old.": three children). There were also references to clothes (e.g., "I've got new trousers today.": two children), physical environment (e.g., "I live in Darlington.": two children), possessions (e.g., "I've got two pets.": two children), name (e.g., "My name

is ...": two children), nationality (e.g., "I am a British person.": one child) and health (e.g., "I had seven teeth out.": one child).

Four children in the same group also described their "active" self at level 1 through their daily activities (e.g., play, watching TV, eating). Only one person (the oldest in the group) referred to her "active" self at level 4; that is, she seemed to have associated her activity with personal feelings.

| | |
|-------------|--------------------------------------|
| Interviewer | :"Can you tell me about yourself?" |
| Subject | :"Yea. I'd like to leave school." |
| Interviewer | :"Yes." |
| Subject | :"Help me mum in the house." |
| Interviewer | :"Is this important for you?" |
| Subject | :"Yes, it is." |
| Interviewer | :"Why?" |
| Subject | :"... 'Cause I'll feel better then." |

Interestingly, one child spontaneously gave an example of using theory of mind ability. She described her pretend play with her doll (e.g., "I play fips.", "It's where you have a daughter.", "And she speaks to you sometimes and you look at her, you know..."). The same child was the only one who made statements related to the "social" self at level 1 (e.g., "I like my cousins.", "I don't know really what cousins are.") and level 3 (e.g., "I like babies.", "They are small, they are patient, they learn to sit beside to me."). Also, she showed understanding of mental states in the following incident she described: "Sometimes in my dream I say 'Look up there, look up there'. When he (the dog) tries to climb up the tree. He climbs right at the top of the tree. The dog is confused and he goes up. And I say to him 'I'm up here, try and catch me.' He tries to come up but he gives up in the end." When she was asked to explain why she said that the dog was confused she replied: "Because he doesn't know where I am. So he never bites me.".

Further, two children referred to their "psychological" self: one child talked about his preferences (e.g., "I like listening to tapes.", level 1) and another child mentioned his abilities (e.g., "I've been good to take up things like interviews" because "importance means to go ahead. When I was born in 1983 I had to do it.", level 2). Finally, three children used three self-schemes in their responses, two children used two self-schemes and two children used one self-scheme only. Also, three children used two levels in their statements and the other three used only one level of reasoning.

However, adults with Asperger's syndrome seemed to describe mainly their "social" self, together with "physical" and "active" characteristics. Five adults made statements on the "social" self: two used level 1 (e.g., "I'm a student here in Ashleigh College.") and three used level 3. In particular, "being friendly" and "getting on with people" seemed to be the most common responses (e.g., "I get on with most people but there's a few who I don't. I try quite hard to make friends but I can be a bit shy at first and I can talk a lot."). Under the "physical" self at level 1 (described by three adults) references were made to possessions (e.g., "I have a log book.": one person), physical environment (e.g., "I have been to many schools outside of Newcastle.": one person), gender (e.g., "I'm a male.": one person) and name (e.g. "I'm": one person). The "active" self scheme was expressed at level 1 by two adults with AS (typical activities, e.g., "I'm doing independence.") and at level 3 by one adult (e.g., "Unsettled.", "Like not coping with the place of it at all.", "I'll fight the place, I'll do anything stupid.", "Like if I got thrown out of, of an important shop by somebody of a pub or club, then people think I was a troublemaker or a thief, I was suspect. And they've just picked the wrong person, because they realise that, that this person wasn't at all the trouble maker."). Lastly, occurrences on the "psychological" scheme were coded at levels 1 and 2: one adult stated his interest in music and one referred to his cognitive ability (knowledge of maps).

Similarly, in the group of children with moderate learning difficulties the most commonly elicited self schemes were the "physical" and "social". Seven children referred to their

"social" self at level 3; they described characteristics associated with social interaction, such as "helping people", "caring for people", "sharing with people", "being kind". Also, eight out of nine children described physical attributes of themselves at level 1: clothes (five children), bodily features (four children), gender (three children), health (e.g., "medical problems. Like fits", "I have leukaemia.": three children), age (one child) and possessions (one child).

Fewer references were made to the "active" and "psychological" schemes by children with MLD. The "active" self (four children) mainly covered activities in the classroom (level 1); one child used level 3 (e.g., "I'm a good person.", "When people fall over I have to help them."). Three children made statements for their "psychological" self at level 1 (e.g., "I'll miss that, me friends.") and two children at level 2 (e.g., "I'm a person and I've come to this school 'cause I was slow at writing.").

Item 2: Self-evaluation

In the second item the focus is on making an evaluation of the self and explaining the aspects of the self that the individual feels or does not feel proud of ("Is there something that you really like a lot about yourself?", "Do you feel proud about yourself?"). Only two adolescents with HFA/AS (one male, one female; both were the oldest in the group) made general negative self-evaluations. The "active", "physical" and "psychological" self schemes were observed. Five children described their activities at level 1. Also, the "physical" self scheme at level 1 was elicited by four children. Three children talked about their "psychological" self at level 1 (preferences, e.g., "I like dinner, meals.").

In the adult group with Asperger's syndrome, only two persons (one male and one female, both with the highest intellectual ability in the group) expressed negative feelings about themselves. Four individuals referred to their activities: three of them explained their typical activities either in the classroom or in their leisure time (level 1) and another one

said that the inappropriate behaviour (level 3) he described in the previous item was his response on this question as well. Two adults made statements related with their "psychological" self at level 1; they referred to their interests. Only one individual made a statement in the "social" scheme at level 3, e.g., "whether I look stupid in front of other people and stuff like, if, if I don't listen it right first time."); this person (female) also made the only statement on "physical" self at level 1 (aesthetic appearance and bodily features).

In the group of children with moderate learning difficulties, three children (two girls, one boy) made a low evaluation of themselves. The most common elicited scheme was the "psychological" self; six children described their preferences and another child referred to his feelings at level 1; only one used level 2 (ability in swimming). Two children described the "social" scheme in terms of social response of other people to their behaviour (level 2) (e.g., "How lucky I am that I have a mother and father love me. They support me in other ways."), two children at level 3 (e.g., "Wicked kids. 'Cause they get wicked and always pick on and things like that.", "People call you names, you do call them.") and one child at level 1 (e.g., "I've got family."). Four children described their typical activities ("active" scheme) at level 1. The "physical" self at level 1 was elicited only in two children.

Item 3: Self in future and past

This item asks for statements about aspects of the self that will remain the same in the future or have changed over time ("What do you think will stay the same about you in five years", "What was the same about you five years ago?"). Five children with HFA/AS described changes in their future "physical" self at level 1 ("age": three children, "body size": two children). Another two children had difficulty in answering this question: one said that he did not know what to say and the other said that he would change and he would be different but did not explain what he meant in each case. Two children made references to their "psychological" self in terms of their behaviour (level 1) (e.g., "I was cheekier.", "I'll still be good.").

Regarding the self in the past, five children with HFA/AS focused on the "physical" self at level 1 (size: three children, body: two children, age: two children, physical environment: two children). Three children referred to their activities in the past, at level 1; one child used level 2 comparing his abilities in the past with those in the present (e.g., "I couldn't talk as I talk now."). The "psychological" self at level 1 was elicited in only one child (e.g., "Sometimes I think I'm funny, sometimes I don't think I'm funny."). Notably, none of the children talked about the "social" aspect of the self in the past. Also, four children insisted that there had been no change in them as persons.

In their responses on the self in the future, adults with AS reported all self schemes. Two subjects described changes in their "physical" self at level 1 (body and age). Another two adults referred to changes in their activities at level 1: one talked about a job and the other about bad habits (e.g., drinking). One adult expressed the wish to develop her social self at level 3 (e.g., "I think I'll probably be a bit more confident probably.", so that "I might have, like, a few friends at College."). Only one adult referred to the "psychological" scheme at level 1, stating that there would not be any change in his interests (e.g., "I go around with me metals.") and emotional behaviour (e.g., "If I don't have my own way I moan.").

Regarding statements on the self in the past, four adults with AS referred to changes in the dimensions of their "physical" self ("physical environment": two adults, "possessions": one adult and "age": one adult). One subject emphasised changes in her social behaviour at level 3 (e.g., "I wouldn't say anything nice to anyone, I'd just be rebellious all the time.", "I turn saying nasty.", "I used to wind people a lot."). Another mentioned the reactions of other people to his social behaviour at level 2 (e.g., "But apart from that it gave me a bad time including so many people who think I am stupid.", "When I was and they thought I was a suspect."). Another referred to his friends at level 1 (e.g., "I didn't know anybody in Ashleigh."). The "psychological" self at level 2 was elicited only in one adult (e.g., "I have no idea how to dress.").

In the group of children with MLD, the "physical" scheme at level 1 was elicited by seven out of nine children. Their concept of themselves in the future was based on changes in their bodies (five children), voice (two children), size (two children), age (one child), physical environment (one child) and clothes (one child). Two children referred to their social self at level 3 (e.g., "still stick up for people.") and three children referred to friendships, family and clubs at level 1. In the "psychological" scheme, three children perceived change in themselves in terms of interests (level 1); in the "active" self, two children described their activities at level 1.

Seven children with MLD described changes in themselves compared to how they used to be in the past in terms of "physical" characteristics (health: three children, body: three children, physical environment: two children, age: two children, possessions: one child and voice: one child). Two children mentioned changes in their social behaviour at level 3 (e.g., "Fight all the time. I would be cheeky."), three children talked about their friends (level 1) and one child referred to others' reactions (level 2) (e.g., "And I was good, everyone says good, very good man, going like that."). Also, another child used the "social" self at level 4 (e.g., "I used to kick people in wheelchairs and now I don't. ... 'Cause I know it's wrong."). Also, the active self at level 1 was elicited by three children.

Item 4: Self-interest

This item involved the question: "What do you want to be when you grow up?". Four children with HFA/AS talked about the sort of job they wished to have when they grow up ("active" self, level 1). However, the oldest person in the group again referred to her desire to leave school, so that she could help her parents at home, because she liked them ("active" self, level 4). Three children described changes in their "physical" self, level 1 (size: two children and physical environment: one child). One child said that he did not know how to answer this question.

In the responses given by the adults with AS, the "active" scheme emerged in the statements made by five of them. Four referred mainly to their future occupation; another described activities that are not allowed (e.g., "and without doing anything stupid, like smashing or doing anything else. Or tipping the whole room upside down."). Two students talked about their concern for improving their skills for social interaction ("social" self, level 3) (e.g., "I would like to have a personality like Angela. She's, she's nice to people, she's, em, oh, she's sort of, she's nice, she's dead confident and she's chatty.", "Good at in, like attempt of looking for a new, like, to a new future. Including ... coping well with others, and without doing anything stupid, like smashing or doing anything else. Or tipping the whole room upside down. Or causing frustration to other people."). One adult gave a reply that was not scored as valid.

Likewise, seven children with MLD described their self interest in terms of future occupation ("active" scheme, level 1). Yet, two children made the same type of statement but at a higher level (level 4); their preference to become "a sign language teacher"/teacher was related with their desire to help the handicapped children, "people in wheelchairs", "little children in the nursery". Two children made statements on the "social" self; one at level 2 (e.g., "If my father doesn't mind, I want to be in show business.", "I want to prove them what, what I can do.") and one at level 3 (e.g., "I want to be like Jesus. 'Cause he's always kind.").

Self-as-subject

Item 5: Continuity

This item explored the basis of perceptions about the self's continuity ("Do you change at all from year to year?"). Five children with HFA/AS scored at level 1: they identified stable

physical properties (age: three children), behaviours (two children). Also, four children insisted that they remain the same over the years. In a similar way, three adults with AS used observable behavioural characteristics (three adults), possessions (one adult) and preferences (one adult) as references for their concept of "continuity" (level 1). Only one person used statements of level 2: he referred to improvement in his cognitive capabilities as the basis for perceiving himself as the same person. In addition, two adults refused the idea of change in themselves and did not make any statements on this item. All children with MLD, described their sense of "continuity" only at a physicalistic level (level 1). However, there was greater variety in their responses compared to the other comparison groups; elements, such as body (five children), behaviour (four children), social membership group (three children), name (one child), possessions (one child), preferences (one child) were described.

Item 6: Agency

The question of this item was: "How did you become the person that you are?" Four children with HFA/AS reported that biological forces influence the formation and existence of the self (level 1). In other words, they perceived themselves being the way they were as a result of a biological process ("growing"). Only two children considered their own abilities and effort as the motivational drive for becoming persons (level 2) (e.g., "I drink fast. I eat fast.", "If you buy, eh, ... eat things that are good for you."). One child said that he didn't know; in this case, my impression was that he really expressed ignorance rather than inability to understand the question.

There was greater variance of perceptions in the adults with AS. Two stated that they became as they are as persons through communication with others (level 3). Namely, guidance and help from others affected their development and progress in their personality. (e.g., "All the staff may think I'm special. And because I was more than important they know that I was more than important, they know I was more ...

understandable and dependable, at the same time.", "People have a lot of patience with me."). Two adults used explanations at the first level (e.g., "cause I'm growing up.") and two persons used reasoning at the second level (e.g., "Just through experience. Learning how people behave, like all I did was "wrong", shout to people for no reason at all. And it was nice to sit and talk to people, instead of sit and shout at them.").

The picture was different in the group of children with MLD. Five of them referred to biological forces as responsible for their existence (level 1) and two of them claimed that social interaction has been the main source of personal development (level 3) (e.g., Mum had to teach when I, when I was four."). Two children replied that they didn't know how to reply in this question.

Item 7: Distinctness

Here, the question was: "Do you think that there is anyone who is exactly like you?". Three children with HFA/AS explained that their sense of being different from other people was based on physical features (level 1), such as bodily characteristics (two children) and their name (two children). Only one child referred to common activities of the self and another person as the basis for sameness (level 2). Three other children were not able to give any sort of reply to this question. One of them explained her lack of response: "I don't know what other people are like." The pattern was different in the adults with AS. Five of them talked about "distinctness" on the basis of different activities (four adults), personality characteristics (two adults) and cognitive capabilities (one adult) (level 2). One subject did not know what to say to this question. In the group of children with MLD, six used explanations at the second level. They compared themselves with others on abilities (one child), activities (three children) and aspects of personality (three children). Another three children used reasoning at level 1. They described their own physical properties (three children) and social membership (one child) as the bases for their sense of distinctness.

Discussion

This section will only summarise the main findings for each group of participants. These results will be discussed in the light of the evidence from the experimental testing (Chapter 6) in the following chapter.

Self - as - Object

Self-definition

It is notable that only one child with HFA/AS referred to the "social" self in her definition of herself, compared with seven children with MLD. It seems that the target group was more focused than the MLD on the "physical" and "active" self rather than the "social" and "psychological" schemes. That is, the aspects of themselves that were mainly elicited were those that are observable. This finding could be explained in terms of the social handicap in autism: the self's association with friends/family/groups. Reactions of other people to the individual's behaviour and social-personality characteristics did not appear in the definition of the self, since the fundamental deficit area in autism lies in the social domain. In contrast, it appeared that for the children with MLD "helping other people" was a strong component of their concept of self. Six out of nine children used definitions referring to the "social" self at level 3. This type of response could be interpreted as a result of experience and practice within the school. It is very common for special schools catering for persons with moderate learning difficulties to admit children with physical handicaps. Thus, it seems to be considered essential to teach children with MLD to behave in a respectful and helpful way towards other children with multiple physical problems. However, five out of six adults with AS referred to friendships (level 1) and social characteristics (level 3): whether they could get on with people and were friendly towards

others. It seems that as individuals with AS get older, the "social" aspect of themselves is a greater focus for them. There appears to be a stronger need to have friends, and this makes them think about the skills required for forming relationships with others.

Self-evaluation

It seemed that the "active" (level 1, five children) and the "physical" (level 1, six children) self schemes were the most important aspects of self-evaluation in children with HFA/AS, whereas in the group of children with MLD, the "psychological" (six children at level 1 and one child at level 2), "social" (two children at level 2, two children at level 3) and "active" (four children at level 1) self-schemes were frequently elicited. Again, the emphasis in the HFA/AS group was on external and personal features of the self. Interestingly, children with MLD used higher levels of reasoning for the "social" self rather than the "psychological" self. This finding is consistent with their responses on the previous item; it shows a stable focus on social aspects of the personality in children with MLD. Similarly to the children with HFA/AS, the "active" self at level 1 emerged as the main component in the responses from adults with AS, even though, "social" dimensions had been central in their self-definitions.

Self in future and past

There were no differences between children with HFA/AS and children with MLD in the use of level of reasoning for the "physical" scheme. However, children with MLD also emphasised change in their "social" self (level 3: two children; level 1: three children), whereas the HFA/AS group did not refer to this aspect at all. Thus, there is a greater concentration on observable characteristics of the self in the autistic group on this item as well. Yet, there was a greater variability in the responses made by adults with AS: "physical", "active", "social" and "psychological" schemes were equally represented.

None of the children with HFA/AS referred to the past "social" self; they insisted on having been the same persons and they described changes mainly in their "physical" (level 1: five children) and "active" (level 1: three children; level 2: one child) self. In the children with MLD, the "physical" (level 1, seven children) as well as the "social" (seven children) self at all levels were elicited. Similarly, in the group of adults with AS, the "physical" (level 1) and the "social" (levels 1,2 and 3) schemes were the most common.

Self-interest

On this item, there were more similarities than differences across the three groups. Here, the main focus was on the "active" self at level 1. Only two adults with AS used level 3 and two children with MLD used level 4 in their statements. The "social" scheme was not elicited at all in the group of children with HFA/AS; only two adults with AS referred to their social behaviour (at level 3) and two children with MLD (one at level 2 and one level 3).

Self-as -subject

Regarding "continuity" of the self, all groups perceived themselves as the same persons on the basis of "physicalistic" features (level 1). Again, the children with HFA/AS insisted on sameness. Concerning "agency", there was greater variability. In children with HFA/AS, responses were coded at level 1 (biological forces were taken as the bases for becoming a person in four children). However, two children identified personal ability and effort as responsible for the formation of the self (level 2). Interestingly here, there was an absence of reasoning that emphasised the role of social interaction (level 3); that was elicited only by two children with MLD. Also, five children with MLD seemed to attribute their sense of agency to biological forces (level 1). Responses from adults with AS were more variable. Level 1, level 2 and level 3 were elicited (each by two persons).

About perceptions on "distinctness" of the self, differences between the children with HFA/AS and the comparison groups emerged. In the target group, three children based their views on being distinct from others on their own physicalistic features (level 1) and one child made comparisons between himself and others (level 2); three children did not reply. They seemed to find it difficult to think how they were different from other people. However, six children with MLD used statements at level 2; also, three children used level 1. In the group of adults with AS, five of them used level 2. One did not reply.

The general finding on the perceptions of the "self-as-object" elicited from the children with HFA/AS is that they persisted on describing physical and active aspects of themselves and not making references to their social and psychological characteristics. This tendency was maintained in the cognitions on the "self-as-subject"; physicalistic views were mainly described for the formation of self, its continuity and distinctness.

CHAPTER 8: DISCUSSION OF FINDINGS FROM EXPERIMENTAL TESTING AND INTERVIEWS

This chapter will attempt to discuss findings from the experimental testing in the light of qualitative evidence from the interviews. As each technique examines a different type of cognitive ability, a direct comparison between these two sources of data is not feasible. However, there are some aspects of the findings on the tasks that may illuminate the quality of responses to the interviews.

It seems that the children with HFA/AS found it easier to pass the test on first-order (all, except one, passed) than on second-order theory of mind (three out of six were successful). That was predicted on the basis of task factors (change in the belief question in the "Sally-Anne" test) and the verbal ability of the group. However, the interesting finding is related to the type of responses on the justification question in the first-order belief attribution task. There were more similarities than differences between the children with HFA and the children with MLD. Half of the children with HFA who passed the test gave "mental" explanations, whereas the other half described "physical" events as causes of the doll's behaviour. The same results were obtained from the adults with AS. Five children with MLD who passed the test referred to "physical" states and another two used "mental" explanations.

Interestingly, the three children with HFA/AS who were successful on second-order belief attribution gave appropriate "mental" (first-order) explanations. However, both implicit and explicit references to mental states were accepted. Thus, there was no case in which they passed the test either via another cognitive route or accidentally. The same pattern was observed in the adults with AS who passed the same test. This is not consistent with another study by Bowler (1992), who found that no subject with AS (and in the control groups) made an explicit reference to psychological states. This difference may be explained as a result of applying stringent criteria, or not, on the justification responses. If

we accept Bowler's strict criterion, then two children with HFA and one adult with AS made "all-mental" statements in our study.

On the whole, children with HFA/AS and adults with AS appeared to have an understanding of beliefs, despite the mixed pattern of physical and mental explanations in their justifications. These findings may suggest that these individuals have knowledge of their own mental states but their cognitions may be focused on *both* physical and mental characteristics of persons. This speculative view seems to be useful in the interpretation of part of the findings from the interviews on self-understanding, as the main purpose of the interview technique has been to provide an insight in the cognitions that these individuals hold about themselves and how they describe them.

In particular, the tendency of all participants to describe physical characteristics as well as actions/abilities of themselves as important in and of themselves (level 1) could be related with their "physical" justifications on the tasks. A possible explanation could be that these aspects of the self are observable and behavioural; therefore, they are easier to describe. But children with HFA/AS and children with MLD also referred to their psychological attributes (moods, preferences, feelings) at level 1 (21.4% and 34.7% of all the statements on the first four items in each group respectively). Curiously, the "psychological" self (11.9%) was the less described aspect by adults with AS.

Surprisingly, significant group differences were not observed in the experimental testing but were found in the responses to the interview. It seems that the questions of the interview proved useful in discriminating between the target group and the adults with AS as well as the children with MLD. This is in agreement with findings from other clinical samples (conduct disorder and anorexia nervosa) using the same tool (Damon & Hart, 1988).

In essence, there are interesting findings on the centrality of certain aspects of the self, suggesting that there is a relation between a mental health problem (such as autism) and a mode of understanding the self. The almost complete lack of statements on the social self in children with HFA/AS was notable (1.78% of their statements referred to the "social" self). Conversely, children in the comparison group and the adult group with AS not only made more references to their social traits (26.6%) but also these perceptions were at a high developmental level (level 3); that is, their conceptions of themselves were based on social-personality characteristics that affect interpersonal relationships. Thus, it seems that their social behaviour was an important concern for them. This tendency of the target children could be explained in terms of the social handicap in autism. Children with HFA/AS did not appear to regard social attributes as important for their self-understanding. It may be that their interest on the social self increases with age, as implied by findings from the older AS group. It appeared that the "social" self (28.6%) was the second most frequent type of statements on the self made by the adults with AS. Perhaps as they grow older, they feel a stronger need to have friends and develop the necessary skills. However, this association should not be taken as causal, but only as another perspective on the understanding of the autistic disorder.

A further aspect of the findings is related to the level of reasoning of conceptions on the self. Notably, the majority of statements in all four self-schemes in the three groups were coded at the level of "categorical identifications" (level 1). According to Damon & Hart (1988), this level of reasoning is characteristic of early childhood (until 6 years of age). This may imply a developmental delay in comparison with normal subjects; however, this delay did not seem to be group-specific but universal. The highest level (level 4) that represents views on the self as part of systematic beliefs and plans was observed in a few expressions on the "active" (two statements in the HFA/AS group and two statements in the MLD group) and the "social" (one statement by a child with MLD) self-schemes.

Concerning perceptions on the self-as-subject, a similar persistence on level 1 was observed for the children with HFA/AS and the children with MLD. In particular, these groups based their sense of being the same person over time on "categorical identifications", such as physical/material/behavioural characteristics. In addition, three children with MLD perceived themselves as stable over time because of their membership of social groups; that was not referred to at all by the target group. Also, only one adult with AS explained his knowledge of remaining the same person through reference to his cognitive abilities.

Similarly, perceptions on the existence and formation of self ("agency") were concentrated primarily on supernatural and biological forces (level 1). Only two children with MLD and two adults with AS referred to social interaction as an important source of personal development (level 3). Finally, the item on "distinctness" seemed to appear more difficult for the children with HFA/AS; nearly half of them could not give a reply and for those who responded physical features (at level 1) appeared to be the main aspects of themselves that would make them different from other people. However, six children with MLD felt that they were different from others as a result of comparisons on abilities, activities and personality traits (level 2). Adults with AS also used the same level of reasoning.

In summary, findings from the experimental testing showed most of the children with HFA/AS could predict another's mental state and their responses to the interview on self-understanding revealed a tendency to describe physical, active and psychological characteristics of themselves. However, these results derived from artificial and semi-structured techniques illuminate to some extent the use of knowledge of the self and others in the target group. Therefore, the next step could be to explore whether these children with HFA/AS apply awareness of mental states of themselves and others in their spontaneous social interactions.

CHAPTER 9: MENTAL STATE LANGUAGE: SELF AND OTHERS AT SCHOOL

Introduction

This chapter will present and discuss the third set of information that has been collected for the same group of children with HFA/AS for the study of their understanding of themselves and others. In this section, the intention is to describe data generated from the application of a naturalistic methodology that may throw further light on the findings derived from the experimental testing (Chapter 6) and the administration of a semi-structured interview to the same target group (Chapter 7). Here, the main research questions are: (1) What type of mental state utterances do children with HFA/AS use in their conversations about psychological states of themselves and others in the natural context of school compared with children with MLD? and (2) How do teachers use mental state terms and how do they respond to language about internal states used by children with HFA/AS compared with children with MLD?

Research aims

At this stage of the research the broad aim was to investigate the theoretical assumption that social interaction plays a part in the development of the cognitive abilities for a theory of mind. The fundamental premise is that cognitive processes are closely interwoven with social relationships; they do not develop in a vacuum but through communication with others. This perspective becomes especially significant for the study of autism, where the core deficit lies in the social domain. Therefore, it is theoretically interesting to explore the link between social and cognitive dimensions in the development of knowledge about inner states.

This theoretical shift in the research focus from cognitive processes to social relationships required a similar methodological movement from experimental to naturalistic methods of data collection. Current evidence on the theory of mind in autism is heavily based on the hypothesis that awareness of the mental world can be assessed through performance on a variety of simple and complex tests. Hence, the issue that remains unexplored and which might extend existing empirical work is the association between children's interactions with others and the demonstration of a theory of mind. Therefore, it would be illuminating to examine the uses that individuals with high-level autism/Asperger's syndrome make of mental state terms in social settings. Specifically, a secondary objective of this study was to examine systematically spontaneous talk about mental states between children with HFA/AS and teachers at school.

In this phase the research aims were the following:

1. To investigate the role of social interaction in the demonstration of understanding of inner states about the self and others, by comparing able autistic children's verbal interactions with others in the context of school with those of children with MLD.
2. To explore the relationship between children's and teachers' talk about mental states, by analysing teacher-child conversations in a group of children with HFA/AS compared with a group of children with MLD.
3. To assist in the interpretation of findings on the understanding of the self derived from experimental testing and semi-structured interviews with results from observations in a natural context.

Methodology

Extending the theoretical basis of this research required the application of an additional methodology. In particular, the next step in the fieldwork was to study how children with

HFA/AS express their ability for mental understanding of themselves and others in a natural context. This methodological shift from artificial to natural settings was inspired by research on the spontaneous use of mental understanding by high-functioning autistic children (Tager-Flusberg, 1992) and normal children (Brown & Dunn, 1991) through their family interactions. These studies utilised "language" as the medium for assessing children's ability for a theory of mind. This technique of systematic observation of conversations between children and their mothers was applied in the context of school. The quality of mental state language between children with HFA/AS and familiar others, such as teachers, appears to have remained unexplored. The context of school was selected on the basis of its salience as a setting for the development of cognitive abilities in children. Also, as a natural setting it might offer useful information on demonstrations of a theory of mind in everyday life. Yet, the organisation and the type of activities at school follow a set structure; so, it needs to be born in mind that children and teachers express their knowledge about themselves and others within the constraints of the school schedule.

Further, the focus on spontaneous verbal interaction has been established as an important methodological tool for the study of the social construction of the understanding of self and others (see Chapter 4). The analysis of talk has a significant qualitative dimension that provides an insight about how children's perceptions of themselves and others are shaped through social relationships. Also, conversations can be examined through quantitative methods, thereby substantiating theoretical arguments based on other qualitative data sets.

In addition, verbal interaction comprises an important aspect of social communication; this is highly relevant in the study of autism, where the crux of the disorder is a handicap in areas of communication and social interaction. Thus, it might provide an interesting way of investigating autistic children's self-understanding in non-natural situations, such as experimental tests.

Research in theory of mind in autism has mainly followed the same tradition as in normal development. It has primarily examined performance on multiple tests of mental understanding that have been used with normal children. However, there is some research on the influence of the social context on children's theory of mind. Judy Dunn (1988, 1991a, 1993, 1994) has studied intensively family interactions in normal children as another line of inquiry into the same issue. However, there is only one study that has applied a similar method in the area of autism (Tager-Flusberg, 1992). Notably, there appears to have been no attempt to combine experimental and observational methods within the same single group of children with HFA/AS for the evaluation of theory of mind. It is this combination that could provide a useful perspective on the topic and comprises the main aim of this research.

At this stage of the study the predictions are the following:

1. There will be differences between children with HFA/AS and children with MLD in *the frequency* of use of mental state language on the self and other: the target group will make fewer references to inner states of self and other compared to the comparison group.
2. There will be group differences in *the quality* of mental state language: the target group is expected to make fewer references to cognitions rather than emotions, perceptions and desires compared to the comparison group.
3. There will be *a relationship* between autistic children's talk and their teachers' talk about mental states.

Participants

Data were collected only for two groups. The same group of seven children with HFA/AS that took part in the previous stages of this study was observed in the classroom in

comparison with seven children with MLD. The exclusion of the adult group with AS was based on practical considerations. On the one hand, there is a gap of knowledge in the spontaneous use about mental state language by adolescents and adults with HFA/AS. On the other hand, the collection of qualitative data as well as their transcription and analysis for all three groups would go beyond the time scale for this project. Thus, it was considered more important to focus only on the group of children with HFA/AS.

Procedure

Systematic observations of the target group in their school were carried out over a period of three months, following experimental testing and administration of interviews. Thus, the researcher had been already established as a familiar person with all children and the teaching staff in the class. These relationships were enhanced by the fact that the researcher would also see these children at home for carrying out further observations over the same period.

The aim of the fieldwork at school was to audio-tape naturally occurring conversations between children and their teachers without disturbing the typical schedule. The purpose was to collect samples of teacher-child verbal interactions that were part of the common routine of the children's school life. However, observations covered only those activities that would occur in the classroom. The main reason was that, during break time children would either play in the garden or have a drink in the class (all sitting around a table). At that time, the interaction between the children and their teachers was kept to a minimum, so that the children could relax. Thus, the sessions that were recorded were: (a) *group sessions* in the classroom including all seven children with HFA/AS and their teachers; these sessions focused on encouraging the interaction between the children offered opportunities for discussions (e.g., "describe what you did in the weekend", "describe what you enjoyed doing this week at school") and activities (e.g., "write a sentence about

the book that you got from the library", role playing: "how to make a conversation") given by the teacher. (b) *curriculum sessions*, involving a teacher working with two/three children on English or Maths; one session with the speech therapist and four children was also included in these sessions. The length of sessions ranged from 30 to 45 minutes. The researcher would sit at a short distance to the persons that were observed, so that notes related to the context of the interaction could also be taken. The tape-recorder was often visible; but it was not considered obtrusive to the conversation, since the children and the teachers were already used to it.

The group of children with MLD was observed for a period of one month. Six of the children who took part in the other two sets of data were in the same class. Three observations were carried out for that class (45 to 60 minutes each): group sessions with conversational activity (e.g., role play, "describe another person in the class"). It was not possible to collect information on curriculum sessions, because the class with the children with MLD was not organised in the same way as the class with the autistic children. Another child with MLD was observed in his class in a different school, working in a group of four children with the teacher.

Method of analysis

The underlying principle of the analysis of spontaneous conversations in the natural setting of school was to explore the use (or lack of use) of utterances for mental states of self and others as well as the context of their expression. Thus, the approach intended to provide a wider understanding of the mental language used by children and their teachers in the HFA and the MLD groups. This task was difficult, since no other study using the same type of data with autistic children has been traced. My method of analysis has followed two main lines of research. It has drawn upon existing research on mental state language in autism that has been carried out solely *at home* (Tager-Flusberg, 1992). Also, it has been guided

by influential studies on the mental state language used by *normal* children in their interactions with their mothers at home (Bretherton & Beeghly, 1982; Brown & Dunn, 1991; Dunn et al, 1987; Shatz et al, 1983).

Although the above researchers have collected the same type of evidence, they have applied a different method for analysing the use of mental state terms. On the one hand, Tager-Flusberg's study (1992) has focused on the frequencies and the use of mental state references by autistic children, excluding utterances made by their mothers. This approach is useful in providing quantitative information on their language; yet, a limitation is that it does not take into account the context and the sequence of a natural conversation. On the other hand, Judy Dunn's work has offered a different perspective that illuminates interactions/associations between children's and mothers' use of mental state language: here, the focus is on conversational turns and the pragmatic context of the utterance.

My analysis is a combination of these two methods. All transcripts were analysed at two levels. At the first level, all transcripts were searched for *lexical terms* that referred explicitly to four psychological states: perception, desire, emotion and cognition. At the second level, the aim has been to look for *conversational turns* in which references to psychological states were made. A conversational turn was defined as one speaker's utterance followed by another speaker's utterance.

Level 1: Explicit utterances

The mental state terms that have been identified fall into the following categories.

PERCEPTION

Vision look, see, watch, notice, observe, pay attention

Hearing hear, listen, loud, noise

Touch cold, dry, feel, hard, hot, hurt, touch, wet, warm, freezing

Smell smell

Taste taste, sour

DESIRE care, want, wish, need

EMOTION angry, bad, better, calm, fun, good, happy, hate, like, love, sad, scare,
surprised, upset, worry, glad, funny, enjoy, bored, fright, tired, cry,
proud, embarrassed, make cross, enthusiastic, unhappy, hug, kiss,
scream, smile, laugh

COGNITION ... believe, dream, forget, guess, idea, know, mean, pretend, remember,
think, trick, understand, wonder, ignore, be aware of, understand,
understanding, realise, suppose, hope

Following Shatz et al (1983) and Tager-Flusberg (1992), each utterance was coded in terms of its "functional use". That is, "true mental state references" were distinguished from those that did not denote mental states ("conversational" or "idiomatic" uses). Different categories of functional use were defined for each category of psychological state. The analysis excluded all terms included in incomplete sentences and imitative/echolalic utterances made by autistic children. There is a legitimate argument that terms showing emotional behaviour (such as hug, smile, laugh) should not be included in the analysis as they show display of emotion rather than understanding of emotion. They have, however, been used in other research with clinical (Tager-Flusberg, 1992) and non-

clinical (Bretherton & Beeghly, 1982; Brown & Dunn, 1991) and the critical question is whether references to hugging, smiling, etc, are used in appropriate situations. In practice, observational data indicated consistently that these terms were used appropriately, and it was therefore decided to retain them in the analyses.

Perception

- ♦ True Mental State Reference: the utterance clearly represents actual perception related to one of the five senses (e.g., "I did not hear that.").
- ♦ Conversational Use: the term is used to draw *attention* to one's needs (e.g., "Watch that.", "Listen to Paul.").
- ♦ Idiom: e.g., "See you later.", "you see".

Desire

- ♦ True Mental State Reference: the utterance clearly expresses a wish (e.g., "I want to play outside.").
- ♦ Conversational Use: the term is used either for making a request (e.g., "I want a tissue." meaning "Give me a tissue.") or for introducing an activity (e.g., "Do you want to write it down, please?" which could be paraphrased as "Write it down please.").

Emotion

- ♦ True Mental State Reference : the utterance is used to describe feelings/emotions (e.g., "I was scared."). Also, terms showing emotional behaviour (such as "hug", "smile", "cry", "laugh", "scream") are included in the analysis.

Cognition

- ♦ True Mental State Reference: utterances describe cognitive states (such as belief, knowledge, understanding, thought, dream, imagination) (e.g., "I don't think that's true.").

♦ Conversational Use

- Modulation of Assertion : cognitive terms used to show the degree of certainty about something (e.g., "Do you know where they are?", "I think they are at that drawer.").
 - Directing social interaction (e.g., "Know what?").
 - Introducing an activity (e.g., "Do you think you can tell us a few sentences?").
 - Clarification (e.g., "It's a person, I mean, a man.").
 - Reminders for action-memory (e.g., "Don't forget to take your book with you.").
- ♦ Idiom: (e.g., "You know.").
- ♦ Special Code: "I don't know".

Level 2: Conversational turns

Following Dunn et al (1987) and Brown & Dunn (1991), each conversational turn was coded in terms of (a) which participant explicitly referred to the internal state (teacher or child), (b) the person to whom the statement was addressed (teacher, child/children) and (c) whose psychological state was referred to (referent: self, other, self and other). Teacher's talk directed to another teacher in the class during the lesson was also included in the analysis. In addition, following Shatz et al (1983), I examined the use of mental verbs through three categories: (a) initial use of a term in a sequence of conversation, (b) repetition of the teacher's word in the previous two turns, and (c) repetition of the child's word in the previous two turns. Further, each conversational turn was coded in terms of the pragmatic context of the utterance. Pragmatic context referred to the explicit or inferred intention of the speaker who made the utterance. Different categories of pragmatic context, adopted from Brown & Dunn (1991), were defined for teachers' and children's utterances. Teachers' references were classified in four categories:

1. Didactic/Controlling: efforts to control the behaviour of the child, teach moral lessons, impose discipline (e.g., "If you were listening, you would know.").
2. Commentary: identification of one's mental state, discussion, simple comments, narratives (e.g., "I know what's happening.", "What I want to do is ...").
3. Questioning/Clarifying: making a question about a mental state, clarifying a mental state (e.g., "What have you liked to do in school this week?").
4. Directing/Guiding Behaviour: the teacher is giving instructions for a task (e.g., "Try to think of something.").

Children's utterances were coded under five categories of pragmatic context.

1. Self-interest: drawing attention to one's own needs, soliciting comfort/ assistance (e.g., "I need a tissue.").
2. Sophisticated: comforting another, teasing, deception, explaining one's actions, attempts to avoid blame (e.g., "He's dreaming all day.").
3. Commentary: simple comments without giving explanation (e.g., "I feel like you, Gail. I don't like the cold.").
4. Describing a Mental State: giving information to the teacher as a response to her request (e.g., "I haven't heard about that.").
5. Questioning/Clarifying: asking a question about a mental state (e.g., "How do you think ...?", "What do you mean?").

Two types of verbal interactions between teachers and children were observed for both groups in their classroom: group sessions and curriculum sessions. The total amount of recorded "group sessions" was 137 min. for the HFA group and 118 min. for the MLD group. There was a larger difference in the length of observations of "curriculum"

sessions: 197 min. for the HFA group and 33 min. for the MLD group. The main reasons for our decision to obtain this amount of data from the comparison group were both methodological and practical. My primary theoretical focus has been to explore understanding of self and others in a single group of individuals with HFA in different contexts. Also, this task has been demanding within time constraints for a full-time research degree. Thus, given that the collection of data on the comparison group has the purpose to complement the main corpus of information on the target group and the limited time for fieldwork, it was not feasible to gather and analyse the same amount of evidence for the MLD group.

As the sets of observations for group sessions and curriculum sessions for each group were not of the same time length, it was necessary to define a means of standardisation for the application of statistical analyses on the data. Thus, the standardisation of the longest to the shortest sessions was determined as the technique for resolving this problem. For example, the comparison of all utterances between teachers in each group on group sessions could be carried out, if the longest observations (the group sessions of the HFA class) were standardised to the shortest observations (the group sessions of the MLD class). The same process was followed for comparisons between teachers and children in each group on all features of mental state utterances that were coded. The formula that has been applied was:

$$N = \frac{a \times b}{c}, \text{ where}$$

a= the number of mental state utterances by children with HFA,

b= the total amount of recorded time of group sessions for the MLD group, and

c= the total number of recorded time of group sessions for the HFA group.

Then, the number of utterances by children with HFA would be standardised to the 118 min. of the observations of the MLD group. For example, if children with HFA made 187 mental state utterances in group sessions lasted 137 min. and the comparable sessions for the children with MLD lasted 118 min., the formula applied would be:

$$N = \frac{187 \times 118}{137}$$

Differences were examined *within* (Tables 1-8) and *across* (Tables 9-16) the two groups. Comparisons were made between: (a) teachers and children with HFA, (b) teachers and children with MLD, (c) teachers of children with HFA and teachers of children with MLD and (d) children with HFA and children with MLD. Also, all utterances were analysed at proportion level (Tables 17-19). For example, a comparison between children with HFA and children with MLD on references to others' psychological states does not provide information on whether the two samples are significantly different in the use of the referent "other" in proportion to their overall use of referents. All group comparisons were performed using chi-square, as this test is appropriate for the study of differences between categorical data from two independent samples (Siegel, 1956).

Reliability of Observations and Codings

Ideally, a second observer would have been present for some of the observations to establish inter-observer reliability. Unfortunately this was considered too intrusive, both in the classroom and in the home setting (Chapter 10). An alternative would have been to use a video camera, but, this, too, was considered too intrusive. The procedure adopted by Brown & Dunn (1991) and Tager-Flusberg (1992) was followed strictly, and extensive *discussions were held with the candidate's supervisor* to establish consistent treatment of *observations on the borderline between two categories* (e.g., cognitive terms used to represent a true mental state differentiated from cognitive terms with a conversational use). It could be argued that ideally a second rater should have coded a sample of observations in order to establish the reliability of the coding system. In practice, the

second rater would have had to be trained by the candidate and this would largely have defeated the purpose of the exercise. It was felt that the procedure adopted was more appropriate: namely to establish consistent treatment through informal discussion with an experienced person.

Results

In presenting the results, Tables with results of particular educational and clinical importance have been placed in the text and other Tables have been placed in Appendix 4.

Comparisons within groups

Overall use of mental state language

As Tables 9.1 and 9.2 show, significant differences emerged between teachers and children in the general use of mental state language. That is, teachers used significantly *more* utterances referring to psychological states than children in group and curriculum sessions. Also, these significant results were not group-specific: they were observed in the HFA and in the MLD group.

Table 9.1 *Overall Frequencies of Mental State Utterances in Group Sessions: Teachers and Children in Both Groups.*

| Groups | Teacher | Child | χ^2 |
|--------|---------|-------|----------------------------|
| HFA | 414 | 187 | 85.7, df = 1, $p < 0.001$ |
| MLD | 781 | 138 | 449.9, df = 1, $p < 0.001$ |

Table 9.2 Overall Frequencies of Mental State Utterances in Curriculum Sessions: Teachers and Children in Both Groups.

| Groups | Teacher | Child | χ^2 |
|--------|---------|-------|----------------------------|
| HFA | 473 | 140 | 180.9, df = 1, $p < 0.001$ |
| MLD | 62 | 12 | 33.8, df = 1, $p < 0.001$ |

Categories of mental state utterances

In group sessions, teachers in each group used significantly more utterances referring to perceptions and cognitions than children (Tables 9.3 and 9.4). Also, children with HFA used significantly fewer terms referring to desires than their teachers. Another interesting finding is that no significant differences were found between children with HFA and their teachers in the use of terms about emotions, whereas children with MLD made significantly less use of the same type of utterances than their teachers.

Table 9.3 Frequencies of Each Category of Mental State Utterances in Group Sessions: Teachers and Children with HFA.

| Mental States | Teacher | Child | χ^2 |
|---------------|---------|-------|---------------------------|
| Perception | 115 | 44 | 31.7, df = 1, $p < 0.001$ |
| Desire | 43 | 12 | 17.5, df = 1, $p < 0.001$ |
| Emotion | 64 | 56 | 0.5, n.s. |
| Cognition | 192 | 75 | 51.2, df = 1, $p < 0.001$ |

Note: n.s. = non-significant.

Table 9.4 *Frequencies of Each Category of Mental State Utterances in Group Sessions: Teachers and Children with MLD.*

| Mental States | Teacher | Child | χ^2 |
|---------------|---------|-------|----------------------------|
| Perception | 86 | 11 | 57.9, df = 1, $p < 0.001$ |
| Desire | 26 | 3 | n/a |
| Emotion | 342 | 103 | 128.4, df = 1, $p < 0.001$ |
| Cognition | 327 | 21 | 269.1, df = 1, $p < 0.001$ |

Note: n/a= not applicable.

In curriculum sessions, significant "within-group" differences were found only in the HFA group and observed across all categories of psychological state: teachers used significantly more terms referring to perceptions, desires, feelings and cognitions (Table 9.5). In proportion terms, the largest teacher-child difference was observed in the use of "desire" terms. No significant differences were found between teachers and children with MLD (Table 1 in Appendix 4).

Table 9.5 *Frequencies of Each Category of Mental State Utterances in Curriculum Sessions: Teachers and Children with HFA.*

| Mental States | Teacher | Child | χ^2 |
|---------------|---------|-------|---------------------------|
| Perception | 132 | 31 | 62.6, df = 1, $p < 0.001$ |
| Desire | 77 | 9 | 53.8, df = 1, $p < 0.001$ |
| Emotion | 51 | 26 | 8.1, df = 1, $p < 0.01$ |
| Cognition | 213 | 74 | 67.3, df = 1, $p < 0.001$ |

Referents of mental state utterances

Interestingly, different results were obtained for the HFA group between group and curriculum sessions. In group sessions, children with HFA referred significantly more to

their own internal states than their teachers (Table 9.6); but the reverse was found in curriculum sessions (Table 9.7). Also, no significant differences emerged between teachers and children in their references to others' mental states in group sessions, although in curriculum sessions, teachers referred significantly more to others' mental states than their pupils. Yet, children with MLD described others' mental states significantly less than their teachers in group sessions (Table 2 in Appendix 4).

Table 9.6 *Referents of Mental State Utterances in Group Sessions: Teachers and Children with HFA.*

| Referent | Teacher | Child | χ^2 |
|---------------|---------|-------|----------------------------|
| Self | 105 | 141 | 5.3, df = 1, $p < 0.05$ |
| Child/Teacher | 218 | 8 | 195.1, df = 1, $p < 0.001$ |
| Other | 31 | 28 | 0.1, n.s. |

Table 9.7 *Referents of Mental State Utterances in Curriculum Sessions: Teachers and Children with HFA.*

| Referent | Teacher | Child | χ^2 |
|---------------|---------|-------|----------------------------|
| Self | 144 | 91 | 11.9, df = 1, $p < 0.001$ |
| Child/Teacher | 174 | 20 | 122.2, df = 1, $p < 0.001$ |
| Other | 36 | 15 | 8.6, df = 1, $p < 0.01$ |

Functional use of mental state utterances

Children in each group used significantly fewer utterances to represent "true" internal states than their teachers in group sessions (Table 9.8 below, Table 5 in Appendix 4) and curriculum sessions (Tables 7 and 9 in Appendix 4). In particular, children with HFA

appeared to make significantly less "mental" use of utterances describing perceptions, desires and cognitions (Table 4 in Appendix 4). Children with MLD were found to use significantly fewer terms representing "true" perceptions, emotions and cognitions than their teachers (Table 6 in Appendix 4). Lastly, teachers made significantly higher "conversational" and "idiomatic" use of mental state terms than children with HFA in group sessions (Table 9.8 below).

Table 9.8 *Functional Use of Mental State Utterances in Group Sessions: Teachers and Children with HFA.*

| Functional Use | Teacher | Child | χ^2 |
|-------------------|---------|-------|---------------------------|
| True Mental State | 349 | 163 | 67.6, df = 1, $p < 0.001$ |
| Conversational | 40 | 7 | 23.1, df = 1, $p < 0.001$ |
| Idiomatic | 25 | 6 | 11.6, df = 1, $p < 0.001$ |

Use of mental state utterances

Teachers in each group initiated significantly more mental state utterances than children in group sessions (Tables 11 and 13 in Appendix 4) and curriculum sessions (Tables 15 and 17 in Appendix 4). In the HFA group, teachers made significantly higher initial use of terms referring to all psychological states than children across all sessions (Tables 12 and 16 in Appendix 4). Also, they used significantly more terms describing "cognitions" that they had repeated than children. In the MLD group, teachers initiated significantly more utterances referring to perceptions, emotions and cognitions than children in group sessions (Table 14 in Appendix 4). Also, they used significantly more terms describing emotions that had been repeated by them and by the children.

Comparisons across groups

Overall use of mental state language

Interestingly, teachers of children with HFA were found to make significantly less use of mental state language in group sessions than teachers of children with MLD (Table 9.9 below). However, no significant differences were observed between children with HFA and children in the comparison group on the general use of terms of psychological states in group sessions (Table 9.10) not in curriculum sessions (Table 19 in Appendix 4). Finally, there were no significant differences between teachers in the general use of mental state language in curriculum sessions (Table 9.11 below).

Table 9.9 *Overall Frequencies of Mental State Utterances in Group Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Groups | HFA | MLD | χ^2 |
|---------|-----|-----|----------------------------|
| Teacher | 356 | 781 | 158.9, df = 1, $p < 0.001$ |

Table 9.10 *Overall Frequencies of Mental State Utterances in Group Sessions: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Groups | HFA | MLD | χ^2 |
|--------|-----|-----|-----------|
| Child | 161 | 138 | 1.8, n.s. |

Table 9.11 *Overall Frequencies of Mental State Utterances in Curriculum Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Groups | HFA | MLD | χ^2 |
|---------|-----|-----|-----------|
| Teacher | 79 | 62 | 2.0, n.s. |

Categories of mental state utterances

In group sessions, teachers of children with HFA used significantly fewer terms referring to emotions and cognitions than teachers in the comparison group (Table 9.12). In curriculum sessions, teachers of children with MLD were only found to use significantly fewer terms representing "perception" than teachers in the HFA group (Table 20 in Appendix 4). Children with HFA used significantly more terms describing perceptions and cognitions and fewer referring to emotions than children with MLD in group sessions (Table 9.13), whereas no significant differences were observed in curriculum sessions (Table 21 in Appendix 4).

Table 9.12 *Frequencies of Each Category of Psychological State Utterances in Group Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Mental States | HFA | MLD | χ^2 |
|---------------|-----|-----|----------------------------|
| Perception | 99 | 86 | 0.9, n.s. |
| Desire | 37 | 26 | 1.9, n.s. |
| Emotion | 55 | 342 | 207.4, df = 1, $p < 0.001$ |
| Cognition | 165 | 327 | 53.3, df = 1, $p < 0.001$ |

Table 9.13 *Frequencies of Each Category of Psychological State Utterances in Group Sessions: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Mental States | HFA | MLD | χ^2 |
|---------------|-----|-----|---------------------------|
| Perception | 38 | 11 | 14.8, df = 1, $p < 0.01$ |
| Desire | 10 | 3 | n/a |
| Emotion | 48 | 103 | 20.0, df = 1, $p < 0.001$ |
| Cognition | 64 | 21 | 21.7, df = 1, $p < 0.001$ |

Referents of mental state utterances

Teachers of children with HFA referred significantly less to their own, to children's and to others' internal states than teachers of children with MLD in group sessions (Table 22 in Appendix 4). However, there were no group differences in curriculum sessions (Table 24 in Appendix 4). Interestingly, there were no significant differences in the use of referents between children in the two groups in group sessions (Table 23 in Appendix 4).

Functional use of mental state utterances

In group sessions, teachers of children with HFA were found to use significantly fewer psychological state utterances to represent "true" internal states and significantly more utterances as idioms than teachers of children with MLD (Table 9.14). However, teachers of the target children appeared to make significantly more frequent "mental" and "conversational" use of terms than teachers of the comparison group in curriculum sessions (Table 9.15). Finally, no significant differences were observed between children with HFA and children with MLD in the categories of functional use of all terms across all sessions (Tables 27 and 30 in Appendix 4).

Table 9.14 *Functional Use of Mental State Utterances in Group Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Functional Use | HFA | MLD | χ^2 |
|-------------------|-----|-----|----------------------------|
| True Mental State | 300 | 734 | 182.2, df = 1, $p < 0.001$ |
| Conversational | 34 | 38 | 0.2, n.s. |
| Idiomatic | 21 | 9 | 4.8, df = 1, $p < 0.05$ |

Table 9.15 *Functional Use of Mental State Utterances in Curriculum Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Functional Use | HFA | MLD | χ^2 |
|-------------------|-----|-----|----------------------------|
| True Mental State | 331 | 51 | 205.2, df = 1, $p < 0.001$ |
| Conversational | 58 | 9 | 35.8, df = 1, $p < 0.001$ |
| Idiomatic | 18 | 2 | n/a |

Use of mental state utterances

In group sessions, teachers of children with MLD initiated significantly more mental state terms (this was also true in the curriculum sessions, Table 35 in Appendix 4) and repeated significantly more utterances that had been used by them and the children than teachers of children with HFA (Table 31 in Appendix 4). Interestingly, children with HFA initiated significantly more mental state utterances (as was also found in curriculum sessions, Table 37 in Appendix 4) and repeated significantly fewer terms that had been used by the teacher than children with MLD in group sessions (Table 33 in Appendix 4).

Pragmatic context of mental state utterances

In group sessions, teachers of children with HFA used significantly fewer mental state terms for making comments, asking questions and giving guidance than teachers with MLD (Table 9.16). In curriculum sessions, teachers in the HFA group made significantly higher use of mental state utterances for questioning than teachers in the MLD group (Table 39 in Appendix 4). Also, children with HFA used significantly fewer terms for providing information than children with MLD in group sessions (Table 38 in Appendix 4).

Table 9.16 *Categories of Pragmatic Context of Mental State Utterances in Group Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Categories | HFA | MLD | χ^2 |
|-------------|-----|-----|----------------------------|
| Didactic | 11 | 3 | n/a |
| Commentary | 172 | 375 | 98.5, df = 1, $p < 0.001$ |
| Questioning | 87 | 286 | 106.1, df = 1, $p < 0.001$ |
| Guiding | 71 | 113 | 9.6, df = 1, $p < 0.01$ |

Comparisons across groups

Categories of mental state utterances

In group sessions, teachers of children with HFA appeared to refer significantly more to perceptions and desires and significantly less to emotions in proportion to their total amount of mental state language compared with teachers of children with MLD (Table 9.17). No significant group differences emerged in the curriculum sessions (Table 40 in Appendix 4). In group sessions, children of the target group were found to talk significantly more about perceptions and cognitions and significantly less about emotions

(similarly to their teachers) in proportion to their overall use of utterances on psychological states than children with MLD (Table 9.18).

Table 9.17 *Comparison of Frequencies of Utterances for Each Category of Mental State as a Proportion of All Psychological State Utterances in Group Sessions: Teachers of Children with HFA and Teachers of Children with MLD.*

| Mental States | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|---------------|----------------------------|----------------------------|-------------------------|
| Perception | 115 (27.7) | (86) 10.9 | 45.2, df = 1, p < 0.001 |
| Desire | 43 (10.4) | (26) 3.3 | 23.3, df = 1, p < 0.001 |
| Emotion | 64 (15.4) | 342 (43.7) | 63.9, df = 1, p < 0.001 |
| Cognition | 192 (46.3) | 327 (41.8) | 1.3, n.s. |
| Total | 414 | 781 | |

Table 9.18 *Comparison of Frequencies of Utterances for Each Category of Mental State as a Proportion of All Psychological State Utterances in Group Sessions: Children with HFA and Children with MLD.*

| Mental States | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|---------------|----------------------------|----------------------------|-------------------------|
| Perception | 44 (23.5) | 11 (8) | 11.3, df = 1, p < 0.001 |
| Desire | 12 (6.4) | 3 (2.1) | n/a |
| Emotion | 56 (29.9) | 103 (74.6) | 32.4, df = 1, p < 0.001 |
| Cognition | 75 (40.1) | 21 (15.2) | 16.6, df = 1, p < 0.001 |
| Total | 187 | 138 | |

Referents of mental state utterances

In group sessions, teachers of children with HFA seemed to make significantly more use of references to their own psychological states and significantly less to others' mental states in proportion to all their referents, compared with teachers of children with MLD (Table 42 in Appendix 4). No significant differences were found between teachers in curriculum sessions (Table 44 in Appendix 4). Interestingly, there were no significant differences in the use of referents between children in group sessions (Table 43 in Appendix 4).

Functional use of mental state utterances

In group sessions, no significant differences were observed in "true mental" use of utterances between teachers and between children (Table 46 and 47 in Appendix 4, respectively). Also, teachers of children with HFA appeared to make significantly more "conversational" and "idiomatic" use of terms in proportion to their overall functional uses compared with teachers of children with MLD. No significant differences were found between teachers and between children in curriculum sessions (Tables 48 and 49 in Appendix 4).

Use of mental state utterances

In group sessions, teachers of children with HFA initiated significantly more terms and used significantly fewer terms which they had repeated in proportion to their general use of utterances, compared with teachers of children with MLD (Table 50 in Appendix 4). Children of the target group were found to initiate significantly more utterances and repeat their teachers' terms significantly less in proportion to their total use, compared with children with MLD in group sessions (Table 51 in Appendix 4). No significant differences between teachers and between children emerged in curriculum sessions (Tables 52 and 53 in Appendix 4).

Pragmatic context of mental state utterances

In group sessions, teachers of children with HFA appeared to use significantly more utterances for didactic purposes and providing guidance to the children and significantly less for making questions in proportion to their overall use of categories of pragmatic context, compared with teachers of children with MLD (Table 9.19). Yet, no significant differences were observed in curriculum sessions (Table 54 in Appendix 4). Also, there were no differences between children in their use of mental state terms for giving information across all sessions (Tables 55 and 56 in Appendix 4).

Table 9.19 *Comparison of Categories of Pragmatic Context of Mental State Utterances as a Proportion of the Overall Use of Pragmatic Categories in Group Sessions: Teachers of Children with HFA and Teachers of Children with MLD.*

| Categories | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|-------------|----------------------------|----------------------------|---------------------------|
| Didactic | 11 (3) | 3 (0.3) | 13.9, df = 1, $p < 0.001$ |
| Commentary | 172 (46.9) | 375 (48.2) | 0.1, n.s. |
| Questioning | 101 (27.5) | 286 (36.8) | 6.2, df = 1, $p < 0.05$ |
| Guiding | 82 (22.4) | 113 (14.5) | 9.0, df = 1, $p < 0.01$ |
| Total | 366 | 777 | |

Discussion

This part of the fieldwork aimed to explore the quantity and the quality of mental state language on the self and the other used by teachers and children with HFA, compared with teachers and children with MLD. This section will only summarise the main findings; the principal discussion of the most significant results will be developed in Chapter 11.

Comparisons within groups

First, it is necessary to evaluate whether observations of two different types of classroom sessions (group sessions and curriculum sessions) were useful in bringing out differences in the type and use of utterances on psychological states made by teachers and children. In fact, the use of categories of internal states as well as the referents of terms were not consistent across all sessions (for the HFA group only). In particular, no significant differences were found between children with HFA and their teachers in the use of terms of "emotions" in group sessions as a proportion of their overall use of categories of mental states; yet, the same children referred significantly less to feelings than their teachers in the curriculum sessions. This finding was not surprising, taking into account that group sessions are intended to encourage group discussion, whereas curriculum sessions are rather target-oriented: to teach English and Maths. In addition, the lack of significant differences in the use of terms describing emotions between teachers and children with HFA in group sessions is an interesting finding compared with the results from the MLD group who used significantly fewer utterances on feelings than their teachers.

Another interesting finding was that teachers in each group referred significantly more to perceptions and cognitions than the children across all sessions. It seems that these mental states are more relevant to teaching/learning processes than emotions and desires. It also shows a greater emphasis on the use of skills of perception and cognition in these classrooms.

Another difference between group sessions and curriculum sessions emerged in the use of referents in the HFA group. In group sessions, children with HFA talked more about their own mental states, whereas in curriculum sessions they made significantly fewer references to themselves. Also, there were no significant differences between teachers and children in describing others' psychological states in group sessions (yet, children with MLD were observed to make significantly fewer references to others than teachers); in curriculum

sessions, children with HFA referred significantly less to others' internal states than teachers. These results could be also explained in relation to the nature of the sessions: group sessions are aimed to encourage talk about the self and others, whereas curriculum sessions are rather target-oriented.

Results were consistent across all sessions on the general amount of mental state language: teachers in each group used significantly more mental state utterances than children. It is surprising that teacher-child differences were found even in group sessions, although these have the purpose to encourage children to participate in conversation; it seems that these sessions tend to be directed mainly by the teacher.

In addition, findings were consistent on the functional use of mental state utterances made by children in each group. They used significantly fewer utterances representing "true" psychological states than their teachers. Finally, children in each group initiated fewer mental state terms than their teachers across all sessions.

Comparisons across groups

The overall picture of findings suggests that significant differences were more often found between teachers and not between children as had been expected.

Firstly, there were no significant differences in the general use of mental state language between children across all sessions. It is important that these results are consistent in group sessions and curriculum sessions; it suggests that the nature of the session does not have an effect on the amount of utterances on psychological states used by children with HFA. However, differences were observed between teachers in each group in group sessions: teachers of children with HFA used significantly fewer mental state terms than teachers of MLD (there were no significant differences in curriculum sessions).

Interesting results were obtained on the type of categories of psychological states that were described by the speakers. In group sessions, children and teachers in the HFA group used significantly fewer terms on emotions than children and teachers in the MLD group. Also, teachers of children with HFA referred significantly less to cognitions than teachers in the comparison group. However, children with HFA talked significantly more about cognitions and perceptions than children with MLD.

Secondly, it was surprising not to find any significant differences between children in references to their own and others' mental states in group sessions. Instead, teachers of children with HFA referred significantly less to their own, to the children's and others' mental states than teachers of children with MLD in group sessions.

Significant differences between teachers in each group were also observed on the functional use of mental state utterances: teachers of the target children appeared to use significantly fewer terms for representing "true" psychological states in group sessions and made significantly higher "mental" use of utterances in curriculum sessions than teachers of children with MLD. Yet, no significant differences were found between children in each group in functional uses in group sessions.

Interestingly, children with HFA initiated more mental state terms than children with MLD across all sessions. However, teachers of the target group initiated more psychological state utterances in group sessions and significantly more in curriculum sessions than teachers of the comparison group.

Another significant difference between group sessions and curriculum sessions emerged between teachers in each group. In the former sessions, teachers of children with HFA used mental state terms significantly less for making comments, asking questions and giving guidance as a proportion of their general use of categories of pragmatic context compared with teachers of children with MLD. In the latter sessions, teachers of the target

group used significantly more mental state utterances for asking questions than teachers of the comparison group. In group sessions, children with HFA used significantly fewer mental state utterances for giving information than children with MLD.

In summary, the comparison of verbal interactions between children with HFA and their teachers revealed similarities on the use of terms describing emotions and differences in the use of utterances about perceptions and cognitions across all sessions. However, this does not imply that these children were not able to talk about these mental states, because their comparison with children with MLD revealed that they used more terms on perception and cognition. It is also interesting that significant differences were found in the use of categories of mental state and their pragmatic context across teachers than children in each group. Given these surprising results, it should be illuminating to examine whether these tendencies are consistently observed in conversations with parents at home.

CHAPTER 10: MENTAL STATE LANGUAGE: SELF AND OTHERS AT HOME

Introduction

This chapter will describe and discuss the fourth set of data that has been obtained from the same group of individuals with HFA/AS for the study of their understanding of themselves and others. This part of the thesis will present evidence from another application of a naturalistic methodology that may complement and illuminate the findings from the experimental testing (Chapter 6), the semi-structured interview on knowledge of the self (Chapter 7) as well as the observations of conversations between autistic children and their teachers (Chapter 9). At this stage of the study, the main research questions are: (1) How do children with HFA/AS talk about psychological states of themselves and others in the natural context of home compared with children with MLD? and (2) How do parents of children with HFA/AS use mental state language and how do they respond to their children's talk about internal states compared with parents of children with MLD?

Research aims

In this phase of the research, the general aim was to explore further knowledge of the self and the other as it is used by individuals with HFA/AS in a *different* natural context. The theoretical assumption is that the social context may play a critical role in the application of social understanding by the target group. Therefore, looking at another area of autistic children's social interaction in their everyday life might provide a greater insight in the ways that their ability to show a theory of mind is employed, or not. The main premise is that the use of mental abilities in practice is based on cognitive processes as well as social relationships; it is not a phenomenon that can be

explained only through cognitive skills or deficits. Besides, this perspective on research into theory of mind could be particularly significant for the study of autism, since the essence of the disorder is "a triad of impairments" in the social domain.

As in Chapter 9, the broad theoretical focus on the social context required an appropriate methodology that would provide naturalistic information. It was regarded as useful to extend empirical evidence derived from the classroom setting with similar information collected from the natural context of home. Although existing research on social understanding in HFA/AS remains primarily within the experimental tradition, some naturalistic work has been also carried out (Tager-Flusberg, 1992). However, its purpose has been to examine exclusively the autistic child's mental state language, without paying attention to issues related to the interaction between the child and others.

At this stage the research aims were the following:

1. To explore the role of social context in the application of understanding of mental states about the self and the other, by comparing able autistic children's verbal interactions with their parents at home with those of children with MLD.
2. To examine the relationships between children's and parents' language about psychological states, by analysing parent-child conversations in a group of children with HFA/AS compared with a group of children with MLD.
3. To extend findings derived from experimental testing, semi-structured interviews and observations of mental state language in the classroom in the same target and comparison group of children.

Methodology

In this part of the fieldwork, the theoretical interest has been to investigate further how autistic children use understanding of the self and the other in a *different* real-life setting. For this purpose, the family context was regarded as appropriate, because of its informal and familiar nature. Autistic children may show different aspects of social understanding in their interactions with their parents/siblings or relatives. In contrast to the classroom, the family environment is a more private social area, providing more opportunities to the children to behave and talk in more natural ways.

Since the theoretical objective has been to collect *similar* information from another natural setting, the technique applied here was on the same lines as that in the previous part of the fieldwork. Thus, the main focus was on systematic observation of mental state language used by children with HFA/AS and family members at home.

As noted in Chapter 9, the amount of relevant research on high-functioning autism is minimal. The main piece of work that has been carried out compared the spontaneous talk of able autistic children at pre-school age with that of children with Down Syndrome matched on chronological age, mental age and language ability (Tager-Flusberg, 1992). However, the analysis of language on inner states concentrated on the utterances used by children in both groups, without taking into account dimensions of natural verbal interactions, such as the complexity and sequence of conversations. This neglected aspect might have thrown further light on the findings that autistic children tended to use fewer mental state terms than mentally retarded children. Thus, my research aimed to expand existing knowledge on spontaneous mental language of children with HFA/AS by looking at an older target group and applying a different analysis that combines single utterances with interactional aspects of the conversation. As in chapter 9, this direction of analysis has been based on work carried out Brown & Dunn (1991) on conversations between pre-school children and their mothers at home.

At this stage of the study the predictions were the following:

1. There will be differences between children with HFA/AS and children with MLD in the *amount* of mental state language on the self and the other: the target group is expected to use fewer utterances on inner states of self and other compared to the comparison group.
2. There will be group differences in the *quality* of mental state language: the target group is expected to make fewer references to cognitions rather than emotions, perceptions and desires compared to the comparison group.
3. There will be a *relationship* between autistic children's talk and their parents' talk on mental states.

Participants

Two groups of children were observed at home: six children with HFA/AS and three children with MLD. All families with autistic children, except one, were willing to take part at this stage of the research. However, it was more difficult to obtain the co-operation of families with children with MLD; four families refused to give their consent for home visits, because they had been involved with other relevant research in the past. Therefore, the amount of data collected from the comparison group was not the same as the target group.

Procedure

All children were observed at home during three home visits, each one week apart. These observations were carried out at the same period as the observations of the

same children in the classroom. In most cases, the researcher went with the children on their return to their homes. This arrangement facilitated the establishment of the researcher as a familiar person for all children. Some of the parents of autistic children had been approached through an annual meeting with the administrative staff of all units of the school.

Similarly to the technique applied in the classroom, spontaneous conversations between children and others at home were audio taped with a portable tape-recorder. The length of the home visits varied from 30 to 50 minutes, depending on whether the parent and the child would feel at ease with the recording. Three home visits were carried out for each child. It has to be noted that, some of these conversations involved siblings and relatives who happened to be at home at that time, since the aim was to obtain naturalistic evidence, without disturbing the family routine. The researcher was present in the room where the conversation was taking place, keeping notes on the ongoing activities and avoiding taking part in the interaction.

Method of analysis

All conversations were transcribed and analysed following the same principles that have been described in Chapter 9. However, some modifications have been applied to the coding system.

Level 1: Explicit Utterances

First, additions have been made to the list of terms that were identified as mental state utterances, representing "perception", "emotion" and "cognition". These are included in the following table.

PERCEPTION

Touch cool, stroking

EMOTION..... mood, relieve, fancy, sick of, aggravate, aggression, adore, satisfaction

COGNITION..... joking, misunderstand, reckon, doubt

In addition, the functional use of utterances describing emotions was expanded to include "conversational use" of these utterances, e.g., "I'd like that little bowl." meaning "I need that bowl", "I'm afraid you were struggling a lot" meaning "I think you were struggling a lot."

Level 2: Conversational Turns

All utterances made by another person other than the parent were also included in the analysis. All other codings followed the same system as the analysis of transcripts from school (Chapter 9).

Eighteen home visits were transcribed for the children with HFA and nine home visits for the children with MLD. The total amount of recorded time was 684 min. for the target group and 325 min. for the comparison group. All transcripts from home observations were analysed at two levels: (1) within each group (Tables 1-5) and (2) across groups (Tables 6-10). Comparisons were made between: (a) parents and children with HFA, (b) parents and children with MLD, (c) parents of children with HFA and parents of children with MLD and (d) children with HFA and children with MLD. In addition, all observations at home were compared with those from school

(Tables 11-15); they were compared separately for group sessions and curriculum sessions. Thus, the following groups were examined: (a) parents of children with HFA and teachers of children with HFA, (b) parents of children with MLD and teachers of children with MLD, (c) children with HFA at home and school, and (d) children with MLD at home and school. Finally, all home transcripts were analysed at proportion level (Table 16). For example, it is possible to compare the number of "perception" utterances by parents of children with MLD with the number of "perception" terms by parents of children with HFA within the period (i.e., an across-groups comparison). However, that does not tell me whether the two samples made the same use of "perception" utterances as a proportion of all psychological state terms. To investigate that, separate analyses were needed. As in Chapter 9, all comparisons were carried out using the chi-square, as the most appropriate statistical test.

As the sets of home observations for the two groups were not of the same length, it was necessary to devise a means of standardisation for the application of statistical analyses on the data. Thus, all transcripts collected from the HFA group were standardised to the transcripts obtained from the MLD group (since the latter were shorter than the former). The same technique was used for the comparison between home and school observations: all home visits were standardised to group sessions and curriculum sessions for both groups. For example, the comparison of children with HFA at home (684 min) and in group sessions (137 min) is possible, if the longest observations (i.e., the home visits) are standardised to the shortest recorded time (i.e., the group sessions). The formula that has been applied was the same as in Chapter 9.

Results

With regard to reliability of codings, special reference has been made to the section on reliability of observations and codings in Chapter 9. As in Chapter 9, Tables with

results of particular educational and clinical importance have been placed in the text and other Tables have been placed in Appendix 5.

Comparisons within groups

Overall use of mental state language

As Table 10.1 shows below, parents in each group used significantly more mental state utterances than children with HFA and children with MLD. The largest difference in absolute terms emerged in the target group.

Table 10.1 *Overall Frequencies of Mental State Utterances in All Home Visits: Parents and Children in Both Groups.*

| Groups | Parent | Child | χ^2 |
|--------|--------|-------|---------------------------|
| HFA | 1249 | 850 | 75.8, df = 1, $p < 0.001$ |
| MLD | 706 | 392 | 89.8, df = 1, $p < 0.001$ |

Categories of mental state utterances

Parents were found to use significantly more terms referring to "perception", "emotion" and "cognition" than children with HFA; but this was not true of "desire" (Table 10.2). The largest difference was observed in the use of utterances about feelings. Parents in the MLD group made significantly higher use of all four categories of psychological states than children (Table 10.3). The largest difference appeared in the use of terms on perceptions.

Table 10.2 *Frequencies of Each Category of Mental State Utterances in All Home Visits: Parents and Children with HFA.*

| Mental States | Parent | Child | χ^2 |
|---------------|--------|-------|---------------------------|
| Perception | 265 | 171 | 20.3, df = 1, $p < 0.001$ |
| Desire | 156 | 126 | 3.2, n.s. |
| Emotion | 350 | 216 | 31.7, df = 1, $p < 0.001$ |
| Cognition | 478 | 337 | 24.4, df = 1, $p < 0.001$ |

Table 10.3 *Frequencies of Each Category of Mental State Utterances in All Home Visits: Parents and Children with MLD.*

| Mental States | Parent | Child | χ^2 |
|---------------|--------|-------|---------------------------|
| Perception | 183 | 58 | 64.8, df = 1, $p < 0.001$ |
| Desire | 64 | 42 | 4.6, df = 1, $p < 0.05$ |
| Emotion | 91 | 42 | 18.0, df = 1, $p < 0.001$ |
| Cognition | 368 | 250 | 22.5, df = 1, $p < 0.001$ |

Referents of mental state utterances

As Table 10.4 shows, children with HFA used significantly more mental state utterances referring to themselves than their parents. Also, children in each group referred significantly less to another person's psychological state than their parents (Tables 10.4 and 10.5).

Table 10.4 *Referents of Mental State Utterances in All Home Visits: Parents and Children with HFA.*

| Referent | Parent | Child | χ^2 |
|----------|--------|-------|---------------------------|
| Self | 445 | 590 | 20.3, df = 1, $p < 0.001$ |
| Other | 123 | 65 | 17.9, df = 1, $p < 0.001$ |

Table 10.5 *Referents of Mental State Utterances in All Home Visits: Parents and Children with MLD.*

| Referent | Parent | Child | χ^2 |
|----------|--------|-------|---------------------------|
| Self | 284 | 250 | 2.2, n.s. |
| Other | 95 | 41 | 21.4, df = 1, $p < 0.001$ |

Functional use of mental state utterances

Parents were found to make significantly more use of mental state utterances to represent "true" mental states in all categories of psychological states and for conversational purposes than children with HFA (Tables 1 and 2 in Appendix 5). A similar pattern was observed in the MLD group (Tables 3 and 4 in Appendix 5). In addition, parents of children with MLD made significantly more conversational and idiomatic use of "perception" terms than children.

Use of mental state utterances

Parents initiated significantly more mental state utterances than children with HFA (Table 5 in Appendix 5). Also, they used significantly more internal state terms as a repetition of their own use of these terms than children with HFA. Similar results were obtained from the MLD group (Table 6 in Appendix 5). In addition, parents of children with MLD repeated terms used by children significantly more than children.

Comparisons across groups

Overall use of mental state language

As Table 10.6 shows, parents of children with HFA used significantly fewer utterances referring to mental states than parents of children with MLD in all home visits. Interestingly, there were no significant differences between children with HFA and children with MLD in their overall use of mental state language (Table 10.7).

Table 10.6 *Overall Frequencies of Mental State Utterances in All Home Visits: Parents of Children with HFA and Parents of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Groups | HFA | MLD | χ^2 |
|--------|-----|-----|-------------------------|
| Parent | 593 | 706 | 9.8, df = 1, $p < 0.01$ |

Table 10.7 *Overall Frequencies of Mental State Utterances in All Home Visits: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Groups | HFA | MLD | χ^2 |
|--------|-----|-----|-----------|
| Child | 404 | 392 | 0.2, n.s. |

Categories of mental state utterances

Parents of children with MLD used significantly more terms describing "perception" and "cognition" and significantly fewer terms referring to "emotion" than parents of children with HFA (Table 10.8). On the other hand, children with HFA made significantly more use of terms representing "perception" and "emotion" and less use of terms describing "cognition" than children with MLD (Table 10.9).

Table 10.8 *Frequencies of Each Category of Psychological State Utterances in All Home Visits: Parents of Children with HFA and Parents of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Mental States | HFA | MLD | χ^2 |
|---------------|-----|-----|---------------------------|
| Perception | 126 | 183 | 10.5, df = 1, $p < 0.01$ |
| Desire | 74 | 64 | 0.7, n.s. |
| Emotion | 166 | 91 | 21.9, df = 1, $p < 0.001$ |
| Cognition | 227 | 368 | 33.4, df = 1, $p < 0.001$ |

Table 10.9 *Frequencies of Each Category of Psychological State Utterances in All Home Visits: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Mental States | HFA | MLD | χ^2 |
|---------------|-----|-----|-------------------------|
| Perception | 81 | 58 | 3.8, df = 1, p = 0.05 |
| Desire | 60 | 42 | 3.2, n.s. |
| Emotion | 103 | 42 | 25.6, df = 1, p < 0.001 |
| Cognition | 160 | 250 | 19.7, df = 1, p < 0.001 |

Referents of mental state utterances

Parents of children with MLD referred significantly more to their own and others' mental states than parents of children with HFA (Table 10.10). Also, no significant differences were found in references to children's psychological states between parents in both groups. However, there were no significant differences between children in each group in the use of referents (Table 7 in Appendix 5).

Table 10.10. *Referents of Mental State Utterances in All Home Visits: Parents of Children with HFA and Parents of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Referent | HFA | MLD | χ^2 |
|--------------|-----|-----|-------------------------|
| Self | 211 | 284 | 10.8, df = 1, p < 0.001 |
| Child | 292 | 285 | 0.1, n.s. |
| Self + Child | 10 | 13 | 0.4, n.s. |
| Other | 58 | 95 | 8.9, df = 1, p < 0.01 |

Functional use of mental state utterances

Parents of the target group were observed to make significantly less "mental", "conversational" and "idiomatic" use of all psychological state utterances than parents of children with MLD (Table 8 in Appendix 5). In particular, they used significantly fewer terms describing perceptions and cognitions to denote true mental states than parents of the comparison group; also, they were found to use significantly more terms referring to "true" feelings (Table 9 in Appendix 5).

In general, children with HFA appeared to make significantly less idiomatic use of mental state utterances than children with MLD (Table 10 in Appendix 5). Yet, when they were compared on each psychological state, they were found to use significantly more terms indicating "desire" and "emotion" to represent true internal states and significantly fewer terms describing "cognition" to represent true psychological states than children with MLD (Table 11 in Appendix 5).

Use of mental state utterances

Parents of children with MLD initiated significantly more mental state terms than parents in the comparison group (Table 12 in Appendix 5). No significant differences were found between children with HFA and children with MLD in the use of utterances (Table 13 in Appendix 5).

Pragmatic context of mental state utterances

In general, parents of children with HFA were found to use mental state utterances significantly more for asking questions and significantly less for commentaries and giving guidance to the children, compared to parents of children with MLD (Table 14

in Appendix 5). In particular, parents of children with MLD used significantly more terms indicating "perception" for didactic/controlling purposes and guiding children's behaviour than parents of children with HFA (Table 15 in Appendix 5). Parents of children with HFA used significantly more terms showing "desire" to address questions to the children than parents of children with MLD. Also, they used significantly more terms describing "emotion" for making comments and asking questions in their conversations with their children than parents in the comparison group. Finally, parents of children with MLD used more cognitive terms to make comments than parents in the target group.

Overall, children with HFA were observed to use mental state utterances significantly more for giving information and significantly less for comments and questions (Table 16 in Appendix 5). In particular, significant group differences emerged only in the use of cognitive terms. Children with MLD used significantly more cognitive terms to make comments and significantly fewer for giving information to others than children with HFA (Table 17 in Appendix 5).

Across groups comparisons: parents and teachers of children with HFA

Overall use of mental state language

As Table 10.11 shows, teachers of children with HFA used significantly more psychological state utterances in group sessions and curriculum sessions than parents of the same group of children at home.

Table 10.11 *Overall Frequencies of Mental State Utterances: Parents and Teachers of Children with HFA in All Sessions (observations of home standardised to observations of school).*

| Sessions | Teachers | Parents | χ^2 |
|------------|----------|---------|-------------------------|
| Group | 414 | 250 | 40.5, df = 1, p < 0.001 |
| Curriculum | 473 | 358 | 15.9, df = 1, p < 0.001 |

Categories of mental state utterances

Teachers of children with HFA used more terms referring to "perception" and "cognition" in group sessions (Table 18 in Appendix 5) and curriculum sessions (Table 19 in Appendix 5) than parents of the same children at home. There were no significant group differences in the use of utterances indicating "desire" and "emotion" between home and group sessions. Yet, teachers of the target children used significantly fewer terms indicating "desire" and "emotion" in curriculum sessions than parents of the target group (Table 19 in Appendix 5).

Referents of mental state utterances

Teachers of children with HFA used significantly more mental state terms to describe children's internal states in group sessions than parents of the same children (Table 20 in Appendix 5). There were no significant group differences in the use of all referents between parents at home and teachers in the curriculum sessions (Table 21 in Appendix 5).

Functional use of mental state utterances

In total, parents of children with HFA used significantly fewer mental state utterances for describing "true" mental states and in conversational ways than teachers in group sessions and curriculum sessions (Tables 22 and 24 in Appendix 5, respectively). In particular, teachers of children with HFA used significantly more utterances referring to "perception" and "cognition" to represent true mental states across all sessions than parents at home (Tables 23 and 25 in Appendix 5). Also, teachers used significantly more cognitive terms in idiomatic ways than parents of the children with HFA. However, parents made significantly higher use of terms indicating "desire" and "emotion" to represent true mental states than teachers in curriculum sessions.

Use of mental state utterances

Overall, parents of children with HFA were found to make significant less "initial" and "repetitive" use of mental state utterances than teachers in group sessions (Table 26 in Appendix 5). Parents of children with HFA made significantly less initial use of terms referring to "perception" and "cognition" than teachers of the same children in group sessions (Table 27 in Appendix 5). Also, they used significantly fewer terms indicating "desire" and cognition" as a repetition of their own initial use than teachers.

Parents of the target group were observed to make significantly less "initial" use of utterances than teachers in curriculum sessions (Table 28 in Appendix 5). Teachers of children with HFA made significantly higher initial use of utterances on "perception", "desire" and "cognition" in curriculum sessions than parents at home (Table 29 in Appendix 5). In addition, parents of the same group of children used significantly fewer "desire" terms as a repetition of their own use than teachers in curriculum sessions.

Pragmatic context of mental state utterances

In general, teachers of children with HFA used significantly more mental state terms to guide children's behaviour in all sessions than parents at home (Tables 30 and 31 in Appendix 5). Also, parents of children with HFA used significantly fewer psychological state utterances for making comments than teachers of the same children in group sessions.

Across groups comparisons: parents and teachers of children with MLD

Overall use of mental state language

As Table 10.12 shows, teachers of children with MLD used significantly more terms in group sessions than parents at home, but that was not true in curriculum sessions.

Table 10.12 *Overall Frequencies of Mental State Utterances in All Home Visits and in All Sessions: Parents at Home and Teachers of Children with MLD (observations of home standardised to observations of school).*

| Sessions | Parent | Teacher | χ^2 |
|------------|--------|---------|-------------------------------|
| Group | 256 | 781 | 265.8, $df = 1$, $p < 0.001$ |
| Curriculum | 72 | 62 | 0.74, n.s. |

Categories of mental state utterances

Teachers of children with MLD used significantly more terms describing emotions and cognitions in group sessions (Table 32 in Appendix 5) and significantly more

utterances referring to desires in curriculum sessions (Table 33 in Appendix 5) than parents at home.

Referents of mental state utterances

As Table 10.13 shows, teachers of children with MLD used significantly more mental state utterances in group sessions to refer to their own, to the children's as well as to another person's internal states than parents at home. However, there were no significant differences in the use of referents between parents at home and teachers in curriculum sessions (Table 34 in Appendix 5).

Table 10.13. *Referents of Mental State Utterances in All Home Visits and in Group Sessions: Parents and Teachers of Children with MLD (observations of home standardised to observations of group sessions).*

| Referent | Parent | Teacher | χ^2 |
|----------------|--------|---------|--------------------------|
| Self | 103 | 133 | 3.8, df = 1, p = 0.05 |
| Child | 103 | 466 | 231.6, df = 1, p < 0.001 |
| Self and Child | 5 | 21 | 9.8, df = 1, p < 0.01 |
| Other | 34 | 89 | 24.6, df = 1, p < 0.001 |

Functional use of mental state utterances

Teachers of children with MLD were observed to use significantly more mental state utterances to represent "true" internal states and in conversational ways in group sessions than parents at home (Table 35 in Appendix 5). Parents of children with MLD used significantly more "desire" and significantly fewer "emotion" and "cognition" terms to represent true mental states than teachers of the same children in group

sessions (Table 36 in Appendix 5). In general, there were no significant differences in functional use between home and curriculum sessions (Tables 37 and 38 in Appendix 5).

Use of mental state utterances

In general, parents of children with MLD were found to use significantly less all types of use than teachers in group sessions (Table 39 in Appendix 5). Teachers of children with MLD made significantly greater initial use of "perception", "emotion" and "cognition" terms than parents at home (Table 40 in Appendix 5). Also, they used significantly more "emotion" and "cognition" utterances as a repetition of their own initial use and significantly more "emotion" terms as a repetition of the child's initial use of the terms than parents at home. No significant differences were found between home and curriculum sessions (Tables 41 and 42 in Appendix 5).

Pragmatic context of mental state utterances

Parents of children with MLD made significantly less use of mental state utterances for making comments and guiding children's behaviour and significantly higher use of terms for questions about internal states than teachers in group sessions (Table 43 in Appendix 5). Also, parents used significantly more psychological state utterances for making comments than teachers in curriculum sessions (Table 44 in Appendix 5).

Across groups comparisons: children with HFA at home and school

Overall use of mental state language

As Table 10.14 shows, no significant differences were found between home and group sessions in children with HFA. Yet, they used significantly fewer mental state utterances in curriculum sessions than at home.

Table 10.14 *Overall Frequencies of Mental State Utterances in Children with HFA Between Home and School (observations of home standardised to observations of all sessions).*

| | Home | Group Sessions | χ^2 |
|--------------|------|----------------|-----------|
| HFA Children | 170 | 187 | 0.9, n.s. |

| | Home | Curriculum Sessions | χ^2 |
|--------------|------|---------------------|---------------------------|
| HFA Children | 245 | 138 | 29.9, df = 1, $p < 0.001$ |

Categories of mental state utterances

Children with HFA used significantly more mental state utterances referring to "desire" at home than in group sessions at school (Table 45 in Appendix 5). However, they used significantly more "perception", "desire" and "emotion" terms at home than in the curriculum sessions at school (Table 46 in Appendix 5). There were no significant differences in the use of "cognition" terms between home and school.

Referents of mental state utterances

Children with HFA referred significantly more to their parents' mental states at home than to their teachers' in school (Tables 47 and 48 in Appendix 5). Also, they described significantly more others' psychological states in group sessions than at home. Finally, they talked significantly more about their own mental states in curriculum sessions than at home.

Functional use of mental state utterances

In general, there were no significant differences on all types of functional use between home and group sessions (Table 49 in Appendix 5). In particular, children with HFA made significantly less use of "perception" terms to represent true mental states and significantly more use of "desire" utterances to describe true mental states at home than in group sessions at school (Table 50 in Appendix 5). Also, they used significantly more "desire" and "emotion" terms to represent "true" mental states at home than in curriculum sessions at school (Table 52 in Appendix 5).

Use of mental state utterances

Overall, children with HFA were found to repeat their teachers' cognition terms (but not other terms) in group sessions significantly more than their parents' utterances at home (Tables 53 and 54 in Appendix 5). Also, they appeared to initiate significantly more terms indicating "desire" at home than in group sessions. Also, they initiated terms describing desires, emotions and cognitions significantly more at home than in curriculum sessions at school (Table 56 in Appendix 5).

Pragmatic context of mental state utterances

Children with HFA used significantly more mental state utterances for making comments and questioning at home than in all sessions at school (Tables 57 and 58 in

Appendix 5). Also, they were observed to use significantly more terms for giving information at school than at home.

Across groups comparisons: children with MLD at home and school

Overall use of mental state language

As Table 10.15 shows, children with MLD used significantly more mental state utterances at home than in curriculum sessions. No difference was found in the overall use of mental state language between home and group sessions at school.

Table 10.15. *Overall Frequencies of Mental State Utterances in Children with MLD Between Home and School (observations of home standardised to observations of all sessions).*

| | Home | Group Sessions | χ^2 |
|--------------|------|---------------------|-------------------------|
| MLD Children | 142 | 138 | 0.05, n.s. |
| | Home | Curriculum Sessions | χ^2 |
| MLD Children | 40 | 12 | 15.1, df = 1, p = 0.001 |

Categories of mental state utterances

Children with MLD used significantly more terms describing feelings and significantly fewer utterances referring to cognitions in group sessions than at home (Table 59 in Appendix 5).

Referents of mental state utterances

No significant differences were found in references to the self and other between home and school in children with MLD (Tables 60 and 61 in Appendix 5).

Functional use of mental state utterances

Children with MLD used significantly more terms describing "emotion" and significantly fewer utterances indicating "cognition" to represent true mental states in group sessions than at home (Table 63 in Appendix 5).

Use of mental state utterances

Children with MLD initiated significantly more utterances at home than in group sessions (Table 64 in Appendix 5); also, they repeated terms that had been used by the teacher significantly more than terms repeated by their parents at home. In particular, they initiated significantly more utterances referring to "emotion" and significantly fewer describing cognitions in group sessions than at home (Table 65 in Appendix 5).

Pragmatic context of mental state utterances

Children with MLD used significantly more mental state utterances for providing information in group sessions than at home; no other significant differences were found (Table 66 in Appendix 5).

Across group comparisons

Overall use of mental state utterances

As Table 10.16 shows, children with MLD used significantly fewer mental state utterances than children with HFA in home observations as a proportion of the total amount of utterances on mental states. Notably, there were no significant differences between parents in each group.

Table 10.16 *Comparison of Overall Frequencies Mental State Utterances as a Proportion of Overall Utterances in All Home Visits: Parents and Children in Both Groups.*

| Groups | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|--------|---------------------------|---------------------------|----------------------|
| Parent | 1249 (59.5) | 706 (64.2) | 2.70, n.s. |
| Child | 850 (40.5) | 392 (35.7) | 4.26, df = 1, p<0.05 |
| Total | 2099 | 1098 | |

Categories of mental state utterances

Parents of children with HFA used significantly fewer mental state utterances referring to "perception" and "cognition" and significantly more terms describing "desire" and "emotion" in proportion to the overall use of mental state language than parents of children with MLD (Table 67 in Appendix 5). Children with HFA made significantly more use of utterances describing perceptions and feelings and significantly fewer references to cognitions as a proportion of their overall use of mental state language than children with MLD (Table 68 in Appendix 5).

Referents of mental state utterances

Parents of children with HFA referred significantly more to children's mental states and significantly less to others' internal states as a proportion of their overall use of referents than parents of children with MLD (Table 69 in Appendix 5). No significant differences were found in the use of different referents as a proportion of the overall use of referents in both groups of children (Table 70 in Appendix 5).

Functional use of mental state utterances

Parents of children with HFA used significantly more terms indicating "true" desires and emotions and significantly fewer utterances to represent "true" cognitions than parents of children with MLD (Table 72 in Appendix 5). Also, they used significantly fewer utterances on "perception" in idiomatic ways than parents of the comparison group. Children with HFA used significantly fewer utterances on desires, emotions and cognitions to represent true mental states than children with MLD (Table 74 in Appendix 5).

Use of mental state utterances

Parents of children with HFA used significantly more utterances as a repetition of their own initial use of these terms as a proportion of their overall use of utterances than parents of children with MLD (Table 75 in Appendix 5).

Pragmatic context of mental state utterances

Parents of children with HFA used significantly more utterances referring to perceptions, desires, emotions and cognitions for asking questions than parents of

children with MLD (Table 78 in Appendix 5). Parents of children with MLD used significantly more utterances describing perceptions for making comments and guiding behaviour; also, they used significantly more terms referring to cognitions for commentaries.

In general, children with HFA used significantly fewer utterances for making comments and asking questions and significantly more for giving information than children with MLD (Table 79 in Appendix 5). In particular, children with MLD used significantly fewer utterances referring to emotions for making comments and to cognitions for asking questions and significantly more to cognitions for commentaries (Table 80 in Appendix 5).

Discussion

As in chapter 9, in this section the intention is to identify the most interesting findings of the analysis of use of language on mental states between children in each group and their parents. These results will be discussed in connection with those from the interaction analysis at school in the next chapter.

Comparisons within groups

Interestingly, parents in each group made significantly more use of mental states in their talk than children. This tendency might be explained as a result of parents' effort to engage children in the ongoing conversation. In addition, parents of the target and the comparison group described the same type of psychological states (perceptions, emotions and cognitions) at a significantly higher level than children.

Another notable difference between parents and children was observed in the use of references to the self and the other: children with HFA were found to talk significantly

more about their own mental states and significantly less about others' mental states than their parents. Also, children with MLD appeared to refer to another person's internal states significantly less than their parents. In contrast, there were no significant differences on references to the self between children and parents in the MLD group.

Comparisons across groups

Here, the expected significant differences between children with HFA and children with MLD in the general use of mental state language were not found. Instead, significant differences between parents were observed: parents of the target group appeared to use significantly fewer mental state utterances than parents of the comparison group at home. This could not be explained as a result of socio-economic status differences, as one third of families in each group had a parent in a "professional" occupation and the remaining two thirds in manual occupation.

Another interesting finding was that parents of children with HFA made significantly more references to emotions than parents of children with MLD. Also, they described significantly fewer perceptions and cognitions. The picture was somewhat similar between children: children with HFA were found to refer significantly more to perceptions and emotions and significantly less to cognitions.

Also, significant differences between parents rather than between children were also observed in the use of referents: parents of children with HFA seemed to talk significantly less about their own and others' mental states than parents of children with MLD. Yet, *no such differences were found between children in each group*. This is inconsistent with Tager-Flusberg's (1992) results, and is discussed further in chapter 11.

In addition, parents of the target group used significantly fewer terms for representing "true" mental states and initiated fewer psychological state utterances than parents of the comparison group. However, there were no significant differences between children on the "mental" nor on "initial" use of terms.

Finally, parents of children with HFA were found to use mental state utterances significantly less for making comments and giving guidance and significantly more for asking questions than parents of children with MLD. Children with HFA were also observed to make significantly less use of psychological state terms for comments and significantly higher use for giving information.

Comparisons between parents and teachers in each group

Overall, parents of children with HFA used significantly fewer mental state utterances than teachers in all sessions. In particular, they were observed to refer significantly less to perceptions and cognitions than teachers in all sessions. However, there were no significant differences between parents and teachers in the use of terms describing desires and emotions in group sessions. In the MLD group, parents were found to use significantly fewer mental state terms than teachers in group sessions only. Specifically, they used significantly fewer terms on emotions and cognitions than teachers in group sessions.

In addition, parents of the target group seemed to describe significantly less children's psychological states than teachers in group sessions only. Also, parents in each group were found to use significantly fewer mental states for representing "true" mental states than teachers in group sessions. Notably, parents in each group seemed to use significantly fewer psychological state utterances for making comments and guiding children's behaviour than teachers in group sessions and curriculum sessions.

Comparisons of children in each group between home and school

However, children in each group were found to use significantly fewer mental state utterances in curriculum sessions than at home. Interestingly, there were no significant difference for children in each group between home and group sessions in the amount of talk on psychological states. In addition, there was no significant difference in the use of cognitive terms between home and school in children with HFA. Also, they seemed to describe all the same mental states (except desire) at home and in group sessions; that was not true for curriculum sessions.

Regarding the use of referents, children with HFA were observed to talk significantly less about others at home than in group sessions at school; yet, they appeared to refer to themselves at home at the same level as in group sessions. Also, no significant differences were found in the use of mental states for representing "true" internal states between home and group sessions in children in each group.

Notably, children with HFA and children with MLD used mental state utterances significantly more for giving information in group sessions than at home. Also, children in the target group seemed to use significantly more terms for making comments and asking questions at home than in group sessions.

CHAPTER 11: DISCUSSION OF FINDINGS FROM OBSERVATIONS OF MENTAL STATE LANGUAGE ON SELF AND OTHERS AT SCHOOL AND HOME

This chapter will examine the findings from the two sets of naturalistic evidence in relation to the principal aim of this study: to explore the use of knowledge of the self's and others' mental states in children with HFA/AS in different contexts. Thus, it is essential to consider critical issues, such as: (a) whether there are similar tendencies or differences in the use of mental state language on the self and others by children with HFA between home and school compared with children with MLD, and (b) whether the use of mental language by teachers and parents could explain children's talk on internal states.

In general, it was found that children in each group were exposed to language on mental states significantly more at school (across all sessions for the HFA group; only in group sessions for the MLD group) than home. But, teachers and parents were found to talk more about mental states than children. These findings may indicate that the structure of the group sessions at school was mainly teacher-guided; also, parents may have made a greater effort to engage the children in the ongoing conversation.

On the other hand, there were no consistencies between the total amount of mental state language used by teachers/parents and children with HFA/AS between home and school. Although teachers talked about internal states across all sessions more than parents, children with HFA were found to describe mental states at the same level in group sessions and at home, but not in curriculum sessions. This shows that the type of context where the conversation took place was critical for the children with HFA; they may have been more encouraged to talk about psychological states in group sessions as well as at home and they have done so.

However, the quality of language used in school and at home also needs to be considered. First, parents in each group were similar in the type of mental states they described: perceptions, emotions and cognitions. In both groups, desires seemed not to feature in their conversations at home. But parents of children with HFA talked significantly more about feelings than parents of the MLD group. That seemed to be an interesting finding in the light of old psychodynamic theories that parents of autistic children are "emotionally refrigerated" persons. On the other hand, parents of the target group described fewer perceptions and cognitions than parents of the comparison group. Interestingly, a similar picture emerged between the children: children with HFA talked more about emotions and less about cognitions than children with MLD at home. It is clear that there is a consistency between parents and children in each group. This may indicate that the type of psychological states that are used by children (irrespective of their handicap) is closely related with that used by their parents. At school, a similar picture emerged only in the use of emotion terms by teachers and children with HFA. Children with HFA and their teachers were found to make fewer references to feelings than teachers and children with MLD in group sessions. My findings are not in agreement with those by Tager-Flusberg's (1992) study. She did not find any significant differences between young children with HFA and children with Down's syndrome in the use of terms on emotions in their conversations at home.

Another interesting finding was that, although parents of children with HFA talked less about cognitions than teachers, children with HFA made similar use of cognitive utterances at home and school. Also, the target children described cognitions more than children with MLD at school, although their teachers talked less about cognitions than teachers of the children with MLD. This consistency in the use of terms describing thoughts and beliefs by the HFA group is particularly interesting, taking into account the hypothesis that even high-functioning autistic children find it extremely difficult to understand and talk about cognitive states. This argument has gained support from

experimental testing (Baron-Cohen et al, 1985; Baron-Cohen, 1989b) and naturalistic observations at home (Tager-Flusberg, 1992). Tager-Flusberg found that young children with HFA were observed to make no use of cognitive terms at all compared with children with Down's syndrome. Yet, I found that autistic children described cognitions at home, although at a significantly lower level than children with MLD. It could be argued, then, that as able autistic children become older they seem to talk more about cognitive states. However, it is not possible to evaluate the results of the American study, since they do not include an analysis of the mothers' use of mental state terms. It has to be noted that when the children with HFA in our study were compared with children with MLD in their use of cognitive terms at school, they were shown to make a significantly higher use than the comparison group. This shows that the context of the conversation, as well as the participants in the conversation, may have an effect on the type of language used by children. Also, the developmental aspect of the research design could offer an explanation for the above result: the chronological age of the autistic children in this study needs to be considered in connection with their educational/social experiences at school and home.

It was notable to find that teachers and parents in both groups described significantly more perceptions and cognitions than children. In addition, the use of terms on "emotions" appeared to be interesting: children with HFA talked about feelings at the same level as their teachers in group sessions, but significantly less than their parents. Yet, children with MLD talked about emotions less than their teachers.

Another interesting finding was the difference in the type of mental states used by children in each group between home and school: children with HFA talked about perceptions, emotions and cognitions at the same level at home and in group sessions, whereas children with MLD talked less about cognitions and more about feelings at home than in group sessions. Also, teachers of children with MLD talked more about emotions than teachers of HFA.

Although children in each group appeared to use significantly more terms to represent their own mental states than those of others in proportion to their overall use of referents (in line with Tager-Flusberg's findings), there were no significant differences between children with HFA and children with MLD in their references to their own and others' internal states at school as well as home. Also, children with HFA referred to others' mental states significantly more in group sessions than at home, although their teachers (and their parents) referred significantly less to others' psychological states than teachers (as well as parents) of children with MLD. Also, children with HFA were not observed to differ in references to others' mental states from their teachers in group sessions, whereas children with MLD referred to others' psychological states less than their teachers in the same sessions. It seems that children with HFA had a stable tendency to describe others' internal states, irrespective of the persons they were having a conversation with.

In general, all children talked more about their own (in curriculum sessions) and others' (in group sessions) mental states at school than at home. In addition, children with HFA talked about their own internal states at the same level at home and in group sessions. Also, children in each group described others' mental states less than their parents.

Results on the pragmatic context of mental state utterances present an illuminating picture. Children in each group appeared to use more mental state terms to express questions and make comments at home than in group sessions at school. Also, all children described internal states for informational purposes more to their teachers in group sessions than to their parents at home. Yet, children with HFA made fewer comments and gave more information at home than children with MLD. This could be explained in relation with another finding: parents of the target group seemed to ask more questions and make fewer comments and directions to the children than parents of the comparison group. In addition, teachers in each group used more mental state

utterances for making comments and directing children's behaviour than parents. Finally, parents in each group used fewer mental state utterances for giving guidance than teachers at school. This was expected, because of the nature of the context.

Although the analysis of language on mental states of the self and others in natural contexts has been fruitful in expanding the empirical evidence obtained from the data of the experimental testing (Chapter 6) and the interviews on self-understanding (Chapter 7), a major limitation is notable. Its quantitative analysis, as the dominant tradition in the relevant area (Brown & Dunn, 1991; Tager-Flusberg, 1992; Shatz et al, 1983) does not cover qualitative aspects of social interactions. A crucial weakness of this technique is that, it does not fully reveal the use (or the lack) of theory of mind ability, which may not be expressed through mental state terms. Therefore, ethnography of such behavioural incidents of spontaneous social interactions may provide a valuable qualitative insight into mental understanding of self and others in children with high-functioning autism.

CHAPTER 12: ETHNOGRAPHIC OBSERVATIONS

Introduction

This part of the thesis will present and discuss the fifth set of information that has been collected for the same single group of persons with high-functioning autism/Asperger's syndrome. Specifically, this chapter will focus on findings based on another qualitative methodology (ethnographic observation) that was applied with the purpose to extend results from the experimental testing (Chapter 6), the semi-structured interviews on self-understanding (Chapter 7), the analysis of mental state language on the self and others between teachers and children across different sessions (Chapter 9) and between parents and children at home (Chapter 10). At this stage of the project, the primary research question is: How do individuals with HFA/AS behave in circumstances, arising spontaneously in their daily routine at school, that require the use of mental understanding?

Research aims

In this phase of the study, the broad aim was to investigate spontaneous behaviours of children with HFA/AS that would either demonstrate or would fail to apply mental skills in their social interactions in natural contexts. The underlying theoretical assumption is that the role of the social context in the use of theory of mind by persons with autism may be significant. Thus, the exploration of different aspects of the social environment may provide a further insight in the everyday social behaviour of the target group, with a special interest on occasions that ask for the use of "mind-reading" abilities.

At this stage the research aims were the following:

1. To investigate the use/non-use of mental understanding of the self and others in a group of children with HFA/AS on events occurring spontaneously in the social context of school.
2. To extend findings on the same target group derived from experimental testing of theory of mind, semi-structured interviews on self-knowledge and systematic observations of talk on psychological states of the self and others in school and at home.

Methodology

At this stage of fieldwork, the theoretical interest has been to look into spontaneous behaviour of children with HFA/AS on incidents that require knowledge of mental states of the self and others, taking place in a social context. For this purpose, the classroom setting was selected as appropriate, since it was accessible for longer periods in the day (six hours) than home. Also, there were more frequent opportunities to observe informal interactions. During the home visits the researcher was concentrating mainly on obtaining information for the language analysis (Chapter 10). At school there were times when the researcher was present, without being directly involved in collecting the data presented in chapters 6-9.

The above theoretical aim required the application of a qualitative methodology that would provide a full account of incidents on first- and second-order theory of mind. Thus, notes based on informal observations were selected as a suitable technique. However, it was difficult to observe explicit expressions of second-order theory of mind. For this

reason, this ability (or the lack of it) was examined through behaviours of advanced mental understanding (e.g., deception, manipulating of another's feelings). The focus was to record behavioural acts that would arise in periods without a specified learning target (i.e., break time, lunch time). The hypothesis was that the loose structure of these time-period would encourage children to interact (verbally or behaviourally) with other children and adults in ways that more tightly structured teaching sessions would not allow. In addition, free observations of more structured sessions (i.e., group sessions and curriculum sessions) that were not recorded for analysis were carried out.

Another set of the data was derived from the transcripts of verbal interactions between the target children and their teachers and parents. Although the benefits of applying quantitative analysis on that data are substantial, there are also important limitations. On the one hand, it has been important to evaluate in statistical terms the amount of mental state language produced by children and adults: this method has been traditionally used in the analysis of language in normal and atypical populations. On the other hand, there is other qualitative information that might be complementary or contradictory to the quantitative evidence. For this purpose, all conversations at school and home were examined in search of behavioural incidents or exchanges that show the use/non-use of mentalising skills. For example, mental understanding of the self and others could be evident in children's expressions *without* mental state utterances and, thus, would not have been included in the quantitative analysis.

Overall, the technique applied in this study shares common features with the ethnographic method which has been widely used in educational settings (Hammersley & Atkinson, 1983; Delamont, 1992). It has been appraised as providing rich qualitative information, describing a phenomenon in a context of interactions, rather than as a single unit of observation. For this reason, the recording of notes is not guided by pre-selected categories of behaviours. Above all, the general objective of ethnographic observations is

an understanding of events/relationships rather than testing hypotheses. Yet, it has to be made clear that the informal observations collected in the present investigation did not follow the principles of "cyclical hypothesizing" and participant observation involved in some ethnographic techniques. The actual method used here was intended to record behavioural incidents (opportunistic event sampling) as evidence for the application (or the lack of it) of skills of mental understanding of oneself and others in social contexts. Finally, this technique is flexible in technical terms; so, it could be employed alongside systematic observations at school (Chapter 9).

Participants

Ethnographic notes were collected for all seven children with HFA/AS in a single class in the special unit. It was not possible to collect similar data on the comparison group of children with MLD. For practical reasons, the time available for the overall fieldwork of this project was limited.

Procedure

All children were observed during their activities at school in sessions that had not been recorded for the analysis of the use of mental state language (i.e., lunch time, break time, group sessions, curriculum sessions). The researcher would keep ethnographic notes sitting at a distance that would be close enough to hear and see the children, but not disturb their activities. Also, she would not respond to any questions addressed to her by the children, being pre-occupied with writing notes on a notepad. However, most children were already familiar with the researcher being around them and they did not seem to take much notice of her.

Results

This section will describe behavioural incidents that show the use/non-use of skills for mental understanding of the self and others in the same group of children with HFA/AS, drawn from the following sources: (a) free observations of children's behaviour during sessions with a loose structure (i.e., break time, lunch time), (b) observations during structured sessions (i.e., group sessions and curriculum sessions) that had not been recorded for the analysis of language, (c) behavioural incidents arising in structured sessions at school and conversations with parents at home that had been analysed for the use of mental state language, and (d) incidents about past events described spontaneously by parents and teachers about the children. All ethnographic data have been grouped by the type of theory of mind ability demonstrated.

Recognition of another's desire

Understanding of desire is regarded as fundamental in the mental understanding of human behaviour (Dennett, 1978). It is an essential mental state in explaining one's actions. Experimental research has shown that autistic children are able to understand desires, as they do not involve metarepresentation but represent "drives" to objects (Baron-Cohen, 1991d). This seemed to be consistent with our ethnographic observations.

Knowledge of another's desire was evident to be a target child's underlying reasoning for his own behaviour, as illuminated by the researcher's questioning. For example, Matthew described his actions on the basis of his teacher's desire. The teacher, Michelle, praised Matthew: "Oh, that's a clean cup!" and he replied: "I know it's cleaned, 'cause I cleaned it

especially for you.". Then I asked him: "Why did you do it especially for Michelle?" and he said: *"Because I thought Michelle would like it cleaned."*

In addition, identification with another's desires was observed in conversations in the class and at home. Diana identified with her teacher's desire, by saying: *"Claire, I feel like you, you know. I don't like them (the windows) closed."* Awareness of another's wishes and the reasons for them was also evident in a conversation between Matthew and his mother. He said that Claire (another teacher in the same class) did not like it when his teacher, Michelle, went to meetings every Thursday. When his mother asked him to explain this, Matthew replied: *"I can see she doesn't like it.", "It, because she has to work with all the children at the same time. So I have to move to Rachel, if I have to, and I don't like it."*

In another incident, a conversational exchange on desires was initiated by the teacher and the target child also recalled another familiar person's desire. Four children were sitting around a table in the classroom having their break; a senior teacher (Claire) and two assistants (Juliet and Rachel) were supervising them. Bill had made sandwiches in the morning; he had placed them on the table so that everybody could have one as a snack. Claire asked Bill whether he would like to take two of them for his parents at home. He replied: "Yes, I will take one for my dad and one for my mum." and added: *"Actually, I'll have three 'cause my nana likes them"*.

The same child took into account another child's desire, when that child had made his preference clear. At lunch time, I asked Bill what he was going to have for pudding and he said: "I think I might have some grapes or a banana.". Then, Robert said: "I'll have a banana.". Bill picked some grapes only adding: "There's only one banana.". I asked him why he did that and he replied that *he did it because Robert wanted the banana.*

The ability to attribute desires and perceptions to others was also evident in a target child's interaction with a pet. Karen was watching a little mouse pushing hard at a door to get out of his toilet and explained his behaviour: *"He say 'I think I would like to get out please'."* Then she started singing: *"Can I get to see outside?"* and talking, as if she was the mouse: *"The best chain I've ever seen in the whole world."*, *"When will I get a wife? I want to marry me."* When her sister wanted to frighten the mouse, Karen said: *"He says 'I don't care, I'm a mouse'."* Then she pretended that *the mouse was crying*.

Attribution of physical state to another person was evident in a comment by a high-functioning adolescent. During dinner time, Matthew went to take his pudding from another table and his teacher Juliet said to him: *"You could do with less talking, Matthew."* Then Patrick, who was sitting on the same table, said to Juliet: *"If he was less talkative it would be nice for us. Maybe he's got a sore throat because he's talking a lot."*

Awareness of own feelings

There was some evidence that the oldest person with HFA/AS in the group was aware of her true feelings. When the teacher Michelle said that Diana liked doing the writing, Diana laughed and said: *"Not really. I don't really enjoy it."* Michelle said: *"You get a good result when you're doing your writing right."* and Diana laughed saying: *"I just do it because I have to."*

A description of links of events with emotional states was evident in the same person's short story. Diana wrote about her visit to the "Spastics Society" shop: *"When we had finished we had a cup of tea. We went downstairs and we all went outside the shop. I got my ///, 'cause I was cutting the rhythm across the door to open that "Spastics" shop. After that, we went outside, I got a bouquet of flowers and they took my photo again. When I went upstairs, I got a glass of wine. So I enjoyed that day."*

Also, Diana was able to articulate her emotional attitude towards a teacher. The following dialogue illustrates awareness of her problem at school and its emotional effects on her .

- Mother : "You got no worries when you go to school."
Diana : "I have."
Mother : "What?"
Diana : "*Michelle getting on us.*"
Mother : "She cannot be that bad." (laughs)
Diana : "She is!" (smiling)
Father : "It's because you are the leader of the bad ones."
Diana : "Ah! (sighs) She is (that bad)! No, I've been nice to her."

Embarrassment

The cognitive theory on theory of mind predicts that awareness of embarrassment will be impaired in autistic individuals, as it requires the use of an audience (it is a socially mediated feeling) and is based on complex mental states, such as beliefs. However, there was some evidence of embarrassment in our target group.

On one occasion, embarrassment was expressed through physical signs (blushing). For example, Matthew asked Karen: "Why did you say all those things for Robert? That he is dreaming and is switched off?". She did not reply, although it was clear that she had heard that question. Then I asked Matthew why he did not like Karen saying these things to Robert. When he said that he did not like her saying these things to people, *Karen blushed showing her embarrassment and awareness of Matthew's criticism of her behaviour.*

Embarrassment appeared to be related to praise as well. The following event illustrates this point. In the afternoon break, Diana said that Patrick never gets punished and a teacher

explained: "It's because he always keeps quiet; he has good manners.". Then Michelle, another teacher turned to Patrick saying: "Being praised again!"; *Patrick blushed* and she asked him: "*You're embarrassed, aren't you?*". Patrick just gave a smile and did not say anything.

Embarrassment was also expressed verbally by the same high-functioning adolescent. His teacher, Michelle asked Patrick whether he liked watching himself on the video and he said: "no". When she asked him: "what he didn't like about it", he said that he felt "*embarrassed*".

Recognition of another's feeling state

Here, the existing evidence has shown that autistic children did not have difficulty in understanding simple emotions (i.e., happiness, sadness, anger), but they were not able to recognise complex emotions, arising from beliefs (i.e., surprise) (Baron-Cohen, 1991d). All the incidents reported below support autistic children's ability to predict another person's simple emotions, such as happiness, frustration and dislike.

The following incident shows that a person with HFA/AS can make an apposite prediction of others' feelings (first-order theory of mind), although its verbal expression does not include an explicit reference to emotional states. For example, when Patrick was sitting next to his teacher, Michelle, during dinner time, he gave her a pat on the back and said with a little smile: "*You are lucky to be here for lunch.*". Michelle nodded and smiled to him. Then, the teacher explained to me that the normal arrangement was not to have lunch with the children (as was happening on that day) but to be on her break at that time, so that she would be with them when they would be playing in the garden. However, she did not like being outside, "unless it's a really warm day" (as Patrick added a few minutes later). Patrick knew that. Michelle had been lucky to be with the children at dinner time,

because she had to replace a classroom assistant, who had not been in the class on that day. Yet, as Michelle told me it was quite a surprise for her to hear Patrick initiating this topic and making a valid comment about her feelings.

In the next dialogue, although the same target individual used the same words and gestures as in the above incident, his questioning showed social interest in his teacher and he made an appropriate prediction of her emotions. At lunch time Patrick was sitting next to his teacher Juliet and offered to take her plate away, when she had finished her lunch. He asked Juliet whether she was covering lunch every Monday and Wednesday and she said: "It depends on the rota. It could be Tuesday and Friday next week.". He commented: "*lucky you*" and gave her a pat on the shoulder. Juliet explained to me she might be "lucky" next week as Patrick had said, because it is not better to cover on lunch on those days than on Mondays and Wednesdays when the dinner is rather slow and awkward.

In another conversation between the same high-functioning autistic individual and the same teacher, he described his teacher's feelings with accuracy, using an explicit reference to them. At dinner time, Patrick was sitting next to Juliet. He asked her: "*Did you enjoy yourself today?*" (as that day was the last of term) and she replied: "Yes". Then Patrick added: "*You'll enjoy yourself even more tomorrow.*". She gave the same reply ("Yes") as before.

Patrick seemed to understand not only his teacher's but his mother's feelings as well (after his mother's repetition of her feeling). In one home visit, he was playing a computer game with his mother. He is very good at it; he was winning yet again. His mother was finding it hard to keep on playing with him. The following dialogue took place (words that are not clear in the recordings are indicated by this symbol: "/////").

Mother : "Should have called "frustration" this game. Shouldn't it? Eh?"

Patrick : "Do know."

Mother : " 'Frustration'."

Patrick : "*For you?*"

Mother : "Aha. And your dad get the same /////. (Patrick laughs) His dad gets the same /////. 'Frustration'." (laughs).

Additional evidence on prediction of another's feeling state comes from the other oldest (CA= 18.7) and mildly autistic (see Appendix 1) adolescent (Diana) -in the group. Although her verbal (VIQ= 38.5) and non-verbal (NVIQ= 58.8) abilities were low, her performance on both theory of mind tasks was successful. She gave an appropriate mental explanation only on the second-order belief attribution test, whereas her justification on the "Sally-Anne" test included an appropriate description of a physical state.

In one occasion, Diana initiated a conversation with her teacher, referring to her teacher's feelings about an anticipated event (school holidays). Diana and Matthew were doing crafts on the same table. They were cutting pictures from magazines and sticking them on cards. Two teachers were sitting next to them, but only one was really supervising them; the other was browsing a magazine. Suddenly Diana smiled to her teacher saying: "*You glad, Annette?*". The teacher did not hear that (being absorbed in the magazine) and asked: "What?". Diana repeated the question (with the same happy face expression) and added: "Because it's last week, next week.". Annette also smiled, showing that she was really glad for that. Although it is possible that Diana started this talk, because she felt happy herself for the same reason, she guessed her teacher's feelings accurately.

However, the teacher's questioning strategy may illuminate the basis of the target child's prediction of another's emotions. In the next dialogue, Robert was able to take part in a conversation about feelings and relate physical states (i.e., getting up early) with emotions

(i.e., feeling tired), although his teacher explained his responses as pure attributions of his own emotional states. Robert's answers can be evaluated better by taking account of the context: this conversation took place at the end of a session (Michelle having a "little chat" with Robert and Matthew) and there was no obvious sequence of events that might have led to this discussion about feelings.

Michelle : "Robert? Rob?"

Robert : "What?"

Michelle : "How d'you think? How do I feel? How do I feel?"

Robert : "Feel tired."

Michelle : "Why d'you think I feel tired?"

Robert : "Because you've got up, out of bed so early."

Matthew : "So am I."

Michelle : "How d'you know I got up early?"

Robert : "Because you're so tired." (laughs)

Michelle : "Did you get up early?"

Robert : "I think I've nearly got up, eh, about a quarter past seven."

The teacher wanted to test further the child's understanding of emotions and asked him to give names of feelings to her facial expressions. Robert seemed to be able to recognise emotions on his teacher's face; this was expected, on the basis of experimental evidence (see Chapter 3) that autistic children are able to recognise simple/basic emotions (i.e., sadness, happiness). However, he could not give an explanation for them. This could be interpreted in terms of the interaction between the teacher and the pupil with autism. The teacher used a method that seemed mechanistic rather than naturalistic. In other words, the teacher's emotional expressions were not presented as a result of events (for example, in the context of a story), making it more natural and easier for the child to justify his correct predictions of her expressions. The following conversation took place:

Michelle : "I would, I try to change my face expression. How d'you think I feel Robert now?"

Robert : "You feel happy."
 Michelle : "Why d'you think I feel happy?"
 Robert : "'Cause I don't know."
 Michelle : "What makes you say I'm happy?"
 Robert : "I don't know."

Next, the teacher applied the same technique with Matthew, asking him to recognise and explain the researcher's emotions. Although Matthew has higher verbal intelligence (VIQ= 78) than Robert (VIQ= 41) and milder autistic handicap (see Appendix 1), his responses were similar to those of Robert: result of guessing. The reason for that could be the lack of information about my own preferences; so he was just guessing that I might be happy because that day the class would go for swimming and I might like that. But, when Matthew had information about his teacher's preferences (that she likes swimming), then he used this knowledge for *teasing her*. In this case, the child's lack of familiarity with another's preferences may explain his inability to relate his predictions of another's feeling state to causes; but, when this information was available, he used it for teasing purposes, as the following dialogue shows.

Michelle : "How d'you think Sophia feels?"
 Matthew : "Happy."
 Sophia : "Why?"
 Matthew : "Eh, because she, feel happy."
 Sophia : "Yea, but why I feel happy?"
 Matthew : "I don't know. Haven't a clue."
 Michelle : "So why say happy? Why not say sad, miserable or angry? Why say happy?"
 Matthew : "Because she's look, she's happy today."
 Michelle : "Why? Why do you think that?"
 Matthew : "Because she's happy it's not swimming."
 Michelle : "But Sophia doesn't come swimming with us."
 Sophia : "Do you know whether I like swimming or not?"

Matthew : "No."

Sophia : "So how do you say that, eh, I am happy because I don't go swimming?"

Matthew : "I don't know. I don't know what."

Michelle : "I'm happy because we're not going swimming. I don't like going swimming. I don't like getting wet."

Matthew : "You're going next week."

Michelle : "Yea."

Matthew : "You'll have to." (laughs)

In a home observation, the same target child referred to his classmate's feeling state, who was crying at school, because *"he didn't like the grill."* Also, Matthew thought that his friend's reactions were reasonable: "I think, I think he's right. It's (using the grill) really dangerous."

Another incident illustrates the ability to predict others' feelings and their causes, although this was revealed through the researcher's questioning. In particular, Bill described accurately his teachers' emotions (on the basis of their behaviour towards him) as a result of his own behaviour. Two teachers, Claire and Rachel, had reprimanded him for his swearing. Then, I asked him: "How do you think that Claire and Rachel feel when you use bad language for them?" and he said: *"Upset"*. When I asked him "why?" he explained: *"Because of the bad language."* implying his accurate understanding of the effect of his language on his teachers' feelings.

It could perhaps be argued that Bill's responses were illustrative of verbal behaviour rather than evidence of understanding feelings as mental states. That argument, however, is hard to sustain in view of this explicit link between the teacher being upset and his own bad language. To argue that Bill was not showing awareness of mental states in this situation would be uncomfortably close to arguing that he could not have been showing such awareness on account of his autism.

However, another child was able to explain another's desire with reference to physical sensations. In a home observation, the whole family was standing around a table, watching a mouse. The following dialogue took place:

Father : "Why do you think he goes into that, Karen?"

Karen : " 'Cause he likes it."

Father : "Why does he like it?"

Karen : "It's ooh! *It's nice and soft. I'll go in..... Soft and neat.*"

Another child in the target group *seemed to avoid talking about his own feelings*. While Anthony was talking about playing with his computer, the teacher asked him: "how d'you feel when the computer wins?". However, he kept on saying what he does when the computer wins: "you press "escape"".

Understanding that some comments may be hurtful for others

The "theory of mind" deficit hypothesis predicts that autistic children will not be able to appreciate the emotional reactions that their comments may have on other people. However, there was conflicting evidence for some children with HFA/AS between their inability to understand that their comments might be offensive for others in their past history, and their present awareness of others' feelings.

Interestingly, some persons with HFA/AS appeared to be aware that their comments may be hurtful to other people. Diana seemed to predict how her teacher might think and feel, hearing her comment. This event was described to me by the teacher Juliet. During break time she was with other children in the garden. Diana approached her saying: "Oh, I like you. You love cuddling.". Juliet thought that Diana was teasing her and responded: "You mean cuddling like a teddy bear?". Diana replied: "*Oh, no. Cuddling like mum.*". Juliet's

interpretation of Diana's response was that Diana seemed to think that she may have offended Juliet with her comment; so, she tried to explain what she really meant.

However, understanding of others' emotional reactions to hurtful comments may be the result of training. For example, Patrick heard his teacher saying something rude for another person and told her: "*Oh, that wasn't a good thing to say.*". But Rachel explained to me that he has been trained to understand that certain things may be offensive and impolite to others. She referred to a behaviour of the past, when *he was using the word "fat" for Juliet* and he did not seem to realise that it could be hurtful for her. At that time, he had been taught the words "fat" and "thin" as used for pens, but he used them for people as well (literally). His teacher pointed out that he seemed to be very confused when they explained to him that it was not appropriate to make such comments for her.

Another similar event of past history was described to me by another child's mother. She said that Karen used to make comments on people like: "How fat you are!". But after explaining to her how the other person may feel, this behaviour was gradually eliminated.

Manipulating another's feelings

An interesting event between a target child and his teacher showed his ability to manipulate her feelings. Matthew was working with Michelle writing some sentences and Annette told him: "Last chance. Game is over, ok? Watching everybody else.". Matthew replied: "*Michelle is the teacher.*". When Annette asked: "Pardon?", he repeated: "Michelle is the teacher.". Annette looking annoyed replied: "I'm your teacher as well, Matthew.". Then Michelle interfered: "Yea. I've just asked Annette to watch you. Because I was over here. We're both trying to help you." and Matthew replied to her: "What do you mean? What about, what about it?". In this case, Matthew did not want to comply with what his teacher had asked him to do. It is clear that he wanted to make her upset and he succeeded.

The same child showed similar behaviour in a session with another teacher. He wanted Michelle's attention while she was working with Anthony. He kept saying to her: *"You make me cross."* He was using his emotional reaction to manipulate her behaviour.

Understanding that "seeing leads to knowing"

Here, two incidents with contradictory behaviour will be reported. The first event took place in the session with the speech therapist (Jane). She presented Bill with three sets of stories that have been used in an experiment carried out by Baron-Cohen et al (1986). Bill was asked to explain what happened in each sequence of pictures. In the third story, he described the scenario: a boy had placed a box of chocolates in a place and left; then his mother came and put the same box somewhere else; when the boy came back, he did not know where to look for the chocolates, because he had not seen where his mother had put them. It was a surprise that Bill suggested to Jane to *"play the story" together*: he went out of the room and Jane hid a chocolate; when he came back, he was looking for them and said that Jane had hidden them. Jane asked him whether he knew where they were and he said "no". In this case, Bill demonstrated his understanding of the whole story, which involved "putting himself in another person's mental state"; also, he was confident that he did not know where the hidden object was, because he had not seen where Jane had put it. Thus, he seemed to understand that "seeing leads to knowing".

It has to be noted that Bill is high-functioning (see Appendix 1) although his non-verbal ability (NVIQ= 62) was not over the normal level and meets the criteria by ICD-10 for Asperger's syndrome. Yet, his verbal (VIQ= 97) ability is high. He passed both tests on belief attribution (Chapter 6); he gave a mental explanation for his response to the second-order belief attribution task and used a reference to a physical state in his reply to the first-order theory of mind task.

In the second incident, the target child did not appear to grasp that "seeing leads to knowing". Anthony was making "squeaking noises" and his teacher, Michelle said: "You shouldn't make these noises. We don't like them." Anthony asked her: "Can we do them outside?" Another teacher said: "Oh, no. It drives me nuts." Anthony asked again: "*Can we do them away from you?*" and the teacher replied: "We won't know, will we?". He gave no reply to that. The different conceptual understanding of these two children may be explained in terms of their general level of intelligence and autistic handicap. Anthony is lower-functioning (NVIQ= 38) and he met eleven criteria for autistic disorder in DSM-III-R (see Appendix 1); also, he failed on the second task. Bill had a non-verbal IQ of 62, milder autism and was successful on both tests.

Recognition of another's thoughts

Awareness of advanced mental states, such as thought and knowledge, is supported to be impaired in autistic children (Baron-Cohen, 1993). However, there was evidence that some individuals with HFA/AS were able to demonstrate understanding of another's thoughts and knowledge. For example, during a curriculum session Patrick was saying to his teacher, Rachel: "*You don't understand the questions sometimes.*"; he was referring to a book full of questions that were described by Rachel as a real "tease for the brain", a book with "tricky language".

In another conversation of the same target person with the same teacher, he seemed to be aware of his teacher's initial lack of knowledge and the change in her mental state after their conversation. Patrick was talking to his teacher, Rachel, about dinosaurs and seemed to know a lot of things about them. Rachel also seemed to be interested in them and they spent some time talking. At the end of the session, Patrick said to her: "*You didn't know about them. I've taught you something though.*".

Also, Patrick appeared to be able to "put himself in his teacher's place" and guess her thoughts. He said to Juliet: *"You've been saved today, because Robert is not sitting on the same table."* His teacher smiled at him. Just before, another teacher sitting close to Robert had asked him to hurry up eating his dinner. Patrick might have heard that before making his comment to Juliet, meaning that she did not have to look after Robert while he was having his dinner.

It has to be noted that each of these incidents illustrate the use of understanding others' feelings by Patrick, who was one of the oldest persons in the group (CA= 15), with high verbal and non-verbal IQs (81.3 and 80, respectively), and mild impairment in "social interaction" and "verbal/non-verbal communication" (see Appendix 1). Also, he passed both theory of mind tests, but he used a mental explanation only on the first-order belief attribution task; he justified his successful response to the task on second-order belief attribution with a reference to physical states. It could be inferred then, that his mild autism and near-normal intelligence have enabled him to understand others' emotional states and apply this knowledge in his social interactions.

On another occasion, an adolescent with HFA/AS was able to uncover her teacher's knowledge and thoughts with exceptional accuracy. The following dialogue illustrates this point:

Helen : "I can't think who might have hidden it."
Diana : "I think you can. *You might know who has hidden it.*"
Helen : "Who?"
Diana : "Me."
Helen : "Why?"
Diana : *"You know I don't like wearing it."*

On another occasion, the same target individual also made an exact prediction of another's thoughts about her. Although she did not articulate a mental state, she was able to "read"

her teacher's mind correctly. For example, the teacher said to Diana: "I know what your best things are, I bet. I'll put my money on your best thing this week.". Diana laughed and said: "*Spastics Society*", meaning her visits to the shop run by the Spastics Society, where she was helping as an assistant. The teacher confirmed that with excitement: "Yes! I won, yes. That's what, I was thinking of.". In theory, this phrase could be said only to show first-order understanding of reality. However, the fact that the phrase did not include a term describing a mental behaviour does not mean that it does not refer to mental states (i.e., her teacher's thoughts).

In a curriculum session, the interaction between the teacher and two children offered one child the opportunity to describe the other child's mental state. For example, Michelle was working with Matthew and Robert. She asked Robert whether he knew the meaning of the word "damage" and used an example to help him give an answer: "How was it (the pencil) damaged?". Robert replied: "Because it's little. ... It was damaged.". Then Matthew spontaneously made the comment: "*I don't think he knows what you mean. I don't think he knows what you mean there.*". Matthew's second-order theory of mind statement is especially interesting, as he failed the second-order task (but passed the first-order theory of mind test). This is a clear example of contradiction between the child's performance on the experiment and his spontaneous use of the same cognitive ability in a natural social situation. However, the critical question is which situation is reliable for Matthew's mentalising skills.

In addition, the same target child showed the ability for self-reflection (awareness of his cognitive difficulties) through the researcher's probing. In a curriculum session ("domestic science"), Matthew had finished the task and was saying that when he was making tea, he found "the beginning harder than the end"; in other words, he found it more difficult to look for everything he needed to start making tea. When I asked him why he said that, he replied: "*It's because thinking is too hard for me.*".

Intentionality

Theory of mind suggests that children with HFA will not be aware of their own intentions. However, one target child described his own intentions openly, after his teacher's questioning. During a break in the class, all children were sitting around a table having a drink. When they had finished their snack, Bill was collecting their glasses. He passed the jug to Karen instead of Patrick (who was on his other side), so that he would collect Robert's glass last. Claire, the teacher noticed that and asked Bill why he did it, but he did not reply. After a while, another teacher (Michelle) came in the class and Matthew told her what Bill had done: "Bill forgot ...". Michelle asked him: "Do you think that he forgot or do you think he did it deliberately?". He did not have the chance to reply, because Bill was saying: *"I did it deliberately, because I wanted Robert to be served last."* .

Also, the child's awareness of others' intentions was evident in the following conversational exchange. When Michelle asked Matthew to tell her what he had done last night, he asked her: *"Why do you want to know?"*. His question clearly showed that he was aware that Michelle *might be intending* to ask her question.

But the same ability was not observed in the following dialogue, where it is clear that the target child did not think of any reason behind his teacher's request.

Michelle : "Why did I tell you to get the chair?"

Robert : *"Because I don't know."*

Moreover, prediction of another's intentions seemed to be difficult for the two oldest and high-functioning adolescents in the group. After the teacher's repeated questioning, their responses showed lack of awareness of another person's intentions and were focused on observable characteristics of behaviour. For example, when Helen (teacher) asked Diana and Patrick whether they knew why I was keeping notes, Patrick said: *"I don't know."* and

Diana replied: *"To keep a record."*. Then Helen asked: "Of what?"; Diana replied: "I don't know." and Patrick said: *"She's recording things."*

However, Diana seemed to be aware of her father's intentions, when he was questioning her about her new habit of waking up at half past six in the morning and sitting in the lounge. They wanted to know why she had started doing that referring to his belief that she had been drinking wine from an open bottle in the cupboard. They suggested the new gas fire as one attraction. Then her father asked: "Do you know what the other is?" and Diana replied: "What's the other one? I don't have any other one. *What are you on about?*".

Mental explanation of behaviour

Attribution of mental states for the interpretation of others' behaviour has been shown to be impaired in children with autism (Baron-Cohen, 1993). However, three children of the target group seemed to describe another's behaviour with appropriate mental explanations.

The use of feeling states as an explanation for change of another's behaviour was used by an adolescent with HFA/AS. In this case, Patrick observed a change of Karen's behaviour and gave a mental explanation for that, by linking her behavioural action with her emotional state. In particular, he was sitting in the same table with his teacher Michelle and the following group of children: Diana, Karen, Bill and Robert. It had been a while, since all had started having their lunch. Karen accidentally spilled some water over her teacher and Diana. She cleared up all the mess and got on with the rest of her food. Soon after that, Michelle asked Robert to speed up eating his food (he was usually slower than the others) and Robert said: "Karen, don't knock it over.". At that moment, Karen started eating faster and her movements seemed rather nervous. Patrick commented: *"I think that's upsetting."*, referring to Karen's change in her behaviour, as a response to what Robert had said to her.

On another occasion, the same target individual explained another's behaviour with a mental state. All children were in the dining room playing the "Tuck Shop". Robert went to buy some sweets from "The Shop". Patrick was at the counter. Robert made an error when he was calculating how much he would have to pay. He didn't ask for help from Patrick and he didn't know what to do next. When the teacher taking notice of that asked what happened, Patrick explained: *"He gets confused."*

However, reference to physical states (facts) was also applied by the same target child for explaining another's behaviour. Here, Patrick was aware of the reason's behind his friend's behaviour, but did not use a mental explanation for that. At the end of a curriculum session, Helen (the teacher) said to Patrick: "Diana has been very kind to you. She did the washing for you.". Diana added: "I washed your bowl." Patrick asked: *"Was it because I did the washing up last week?"* and the teacher agreed: "That's it!". Patrick's explanations in the above incidents seem to share the same characteristics with his responses to the justification questions of the experimental tasks (Chapter 6). He passed both tests of false attribution but used explicit and implicit mental explanations for his justifications: he made an explicit reference to a belief for his justification on the first-order belief attribution task ("because she thinks it's in there"), but he described implicitly another's knowledge ("because that's what the ice-cream said he would be all day").

A mental description of another's behaviour was also given by another adolescent with HFA/AS. In an group session, it was Robert's turn to say what he liked doing that week, when Karen said: *"He's dreaming every day."* and explained: "He wasn't listening. He was like this, covering his ears with his hands.". Karen also used an appropriate explicit reference to a mental state in her response to the justification question of the first-order theory of mind task (which she passed) ("Because she thinks it's in there.").

In another occasion, a target child did not give any explanation for his opinion on another child's behaviour (interest in a conversation). Matthew was observing a conversation between Karen and Diana about clothes. Diana seemed to be very well "in tune" with Karen, whereas Karen did not ask any questions to Diana. When the teacher asked Matthew to explain how he knew that Diana was interested in what Karen was saying, he replied: *"Haven't a clue."*

Moreover, an adolescent with HFA/AS seemed to understand that her teacher's request was a reaction to her own grimace. At lunch time, Diana finished her food and took her plate away; then, she came back to take the bowl with the fruit, making a facial expression that showed that she did not like doing that at all! Her teacher saw her grimace and asked her to go back and take again her bowl with the pudding. When the teacher asked Diana whether she realised why she had asked her do it again, she replied: "Yes" and was nervous (she bumped her bowl), showing she understood the reason for her teacher's irritation.

In addition, there was evidence that two target children considered that knowledge of another's mental states may be difficult, as these mental states are private. The following dialogue was initiated by Karen, while I was sitting next to her at the end of a curriculum session. She made an observation of my behaviour and gave a mental explanation; yet, she appreciated that my thoughts might not be accessible to her.

Karen : "Sophia, you are quiet."

Sophia : "Yes, I am."

Karen : "I am usually like that when I think something in my brain. What are you thinking?"

Sophia : "Can you guess?"

Karen : "I don't know." (laughing) "I don't know what you are thinking."

Also, another individual with HFA/AS explained her lack of knowledge about her teacher's thoughts, because they were not expressed publicly. For example, when Diana was asked by her mother whether she knew if her teacher wanted a family photograph of her, she replied that she didn't know, because *"she (the teacher) doesn't explain things to me, you see", "she doesn't tell us everything"*.

Inappropriate social behaviour

In some case, the target children's understanding of another's emotion seemed to be related to inappropriate social behaviour. Karen's mother described an incident to me that was quite impressive for her daughter's ability to understand how people feel, but was followed by "strange" social behaviour. Once they were in gift shop in a castle and suddenly *Karen went and kissed another lady*. Karen's parents were embarrassed and apologised. But the lady remarked: "This is the only time since the death of my husband that someone has made me feel so happy!". In this case, Karen had observed the sad face expression of this lady and being sensitive to that, she rushed to give her a kiss. This positive behaviour may throw light in the mind of a high-level autistic person: being able to recognise emotions in others but without the ability to think whether some behavioural reactions to these feelings are socially appropriate or not.

However, in other cases negative thoughts about another person may be expressed with honesty. Matthew's mother described an incident with his grandmother. They went to his nana's house to have their dinner. When they were leaving, Matthew told her: *"And I hope you're not coming to our house, 'cause I don't want you to come."* His mother asked him why he had said that and he replied: *"I just felt like it."*

Yet, it is not clear whether Matthew intended to hurt the other person's feelings; in that case, his behaviour seems reasonable. However, when his mother kept on talking about this, he seemed to be upset about it, as expressed in the next dialogue:

Matthew : "Don't talk about it, ok?"

Mother : "Why?"

Matthew : "It's distracting me. On this."

Mother : "You don't want to talk about it 'cause you don't like what you hear."

Matthew : "I don't like what you say. Talk about it, talk about, talk about it. I don't want to hear that. I don't hear, 'cause it's rubbish what you say. I want to talk about things I like."

Apart from the above incidents that were described to me by parents, I observed another similar spontaneous but socially inappropriate behaviour towards me. After a short period of observation of the conversation between Robert and his parents, he asked in a loud voice: "*Can Sophia go home now?*" (I was in the same room as him). However, when his father asked him: "Why do you want her to go home?", he replied: "I don't know.". Then his mother asked him: "It's because you want to go upstairs and read your book, isn't it?" but he didn't respond to her. After a while, Robert asked: "Can I watch "Crystal Maze" now?". But the observation was continued. Later, he repeated the same questions: "*Have I finished with Sophia?*", "*Will Sophia go home?*". It was obvious that he did not want the conversation to be continued, so that he could watch his favourite program; but he expressed this in a rather tactless way.

Another incident of inappropriate social behaviour was mentioned in a conversation between an adolescent with HFA/AS and his parents. Diana's mother said that when her daughter was twelve years old, the teacher had sent a note to them, saying that Diana was showing her underclothes at school and they would have to "put her in trousers".

Teasing

There was some evidence of teasing in children's interactions at school. For example, Robert said that he would not have any kidney beans for his dinner, as he did not like

them. Bill heard him and said: "*Kidney beans for Robert.*", laughing at the same time. He repeated this sentence four times with the same smile on his face, until Michelle asked him to stop it. He was obviously teasing Robert, who showed no reaction.

Also, the target child's ability to understand that another person might be trying to tease him/her was evident in a home observation. The following dialogue illustrates that:

Diana : "Somebody's in a bad mood." (laughs)

Father : "Neil." (laughs) —

Diana : "Aye." (laughs) "He had a bad day at school."

Father : "Did you talk to him?"

Diana : "Aye. I talked to him this morning."

Father : "Aye! You go outside for?" (Diana laughs) "Diana's got a boyfriend!"
(laughs)

Diana : "No! I haven't!" (laughing)

Sense of humour

In one occasion a target child replied in a way that showed his intention of making a joke. When Bill said that he did his homework in the weekend, his teacher, Michelle, asked him who helped him with it. He replied that his mother did. Then she asked him: "Did she tell you the answers?" and when he replied "*She did!*", everybody laughed. Michelle argued: "She didn't! She didn't tell you the answers", and Bill said "I guessed them all". Michelle replied: "You know them all, you didn't guess them". Here, Bill claimed that his mother gave him the answers for his homework *with the purpose to make a joke*. However, it is not certain whether his mother really helped him or not.

Another spontaneous incident of making a joke occurred in the interaction between two children. Patrick was talking about his picture of a dinosaur and Karen asked him how he had made it; he replied laughing: *"I used a pencil"*. Karen also laughed, showing that she had understood the joke.

In a curriculum session, an adolescent with HFA was teasing her teacher. Rachel was using two pens as an example in her explanation of the concepts of "similarity" and "variation". Diana commented that they were "chewed in". Rachel agreed saying: "Yea, that's all. Thanks to me. Can I just chew my pens away?" and Diana *made a joke*: *"You have them for tea at night time."* Patrick and the teacher laughed.

Interestingly, the same individual with HFA used a metaphor for making a joke, showing a sophisticated use of thought and language. When Diana's mother asked her to explain why she didn't like her teacher, she laughed saying: "it's a long story.". Her mother insisted: "Right. Cut the story short. Tell us why you don't like her." and Diana replied laughing: *"There's a pair of scissors there."*

Inability to understand the rules of a game on deception

There was naturalistic evidence that taking part in a game on deception may be difficult for a target child. Robert is 9 yrs old, with a very low verbal IQ (38) but high non-verbal IQ (114). However, his level of autistic handicap is severe; he met a large number of symptoms in DSM-III-R than the other children in the class (see Appendix 1). In the following situation, he seemed not to be able to understand the strategy of hiding a ball, so that the person looking for it would not know where it was. This game is very similar to a

naturalistic experimental test on deception (the penny-hiding game) used by Baron-Cohen (1992).

All children were playing a game with a rope and a ball in it. Everybody, except one standing in the middle, was sitting in a circle. The purpose of the game was to hold the rope and pass the ball to the next person in such a way, that the child who was in the middle of the circle would not see it; this child would have to guess which one was hiding the ball in his/her hands. Robert was the only child who had great difficulty understanding this game: *he was not hiding the ball, but holding it in a way, that was very easy to see whether he had the ball or not*. The teacher had to explain to him what he was supposed to do.

Hiding (disclosing facts)

There were some interesting but puzzling observations on intentional disclosure of facts by some individuals with HFA. In the following dialogues, Anthony appeared to be aware of his own and others' intentions but did not make the link that if they knew his intentions they might change their plans. For example, while he was playing a board game with his mother, he kept revealing his thoughts to her: *"I'm waiting for you to move your back ones, you know."*, *"I'd move there, that pawn over there. Getting your castle. I'm waiting for it."*. But he appeared to have knowledge of his mother's intentions in the game: *"You're waiting for my knight ////////// out of the way, mum."*. Later, when Anthony was playing with his father, he was revealing to his father the type of movements of pawns he did not want him to make; then, his mother said: *"Ssh! You don't tell, you haven't got to tell'im what you wanted to do... 'Cause if you tell'im to, he won't do it."*.

In another occasion, the same child was *hiding from his mother that he was cheating*.

When she discovered that she said: "You're not supposed to change back. You cheat.". He admitted that: "I like cheating. I like changing them back." His mother repeated: "Ei! You're a cheat, you are." Anthony explained his reasons and *was teasing her*: "I'm changing them back, so, so it makes you, I win this time. Am I allowed?".

In the next example, a target adolescent seemed to be able to predict another's disclosing behaviour and the motives behind it. While Patrick and Diana were having a curriculum lesson, their teacher Helen wondered: "Somebody must have borrowed this hair band." and Patrick suggested to her: *"I can think of someone who might have hidden it."* When his teacher asked: "Why do you think Diana might have hidden it?", Patrick explained: *"Because then she wouldn't have to wear it."* Here, Patrick knew that Diana did not like to wear her hair band and used this knowledge to explain why she may have hidden it.

The same teacher described Diana's past habit of hiding objects she didn't like with the intention to avoid working on them. When Helen used to teach Diana in the class, she had noticed that her folders for English and Maths were often missing.

Observations of conversations at home also supported Diana's ability to conceal information that could be used against her. Her parents were concerned to know whether she had damaged her video. Yet, as the next dialogue shows, it had been difficult for them to find the truth from her; Diana was hiding the truth, so that she could avoid being blamed for it.

Mother : "I want to ask you something and I want you to tell us the truth, right?"

Diana : "Oh!"

Mother : "Promise?"

Diana : "Yea."

Mother : "Did you do anything to the video, to your video?"

Diana : "No."

Mother : "You sure?"

Diana : "Sure."

Mother : "Honest?"

Diana : "Yea." (laughs)

Mother : "Stop laughing."

Later her mother added: "But she won't tell us what she did."

The ability to understand "hiding" was also evident in a child's description of a game. When it was Matthew's turn to say how he had spent the weekend, he described *a game of hide-and-seek*: "I mean, and they and they didn't find me. I went in a hard place. *I was behind the back wall and they didn't know*. They looked around there and /// he wasn't there then. I went in the garden."

In a curriculum session with the speech therapist, involving the activity of one child hiding an object and the other children trying to find out what it might be, Bill and Matthew were sitting on the same table and Karen was hiding something from them. While they were questioning her for clues about the hidden object, Bill said: "*It's a secret*" and laughed. His comment showed that he understood the meaning of the activity.

The teacher's questioning strategy could throw interesting light on the target child's perceptions and on the other children's. On one occasion, the teacher asked Robert what he liked doing in the weekend. He said that he went to Newcastle for shopping with his parents and his mother took some money from the Bank. Michelle asked him how much money his mother had taken out. When he replied: "Fifty pounds cash.", everybody (except him) laughed. It was clear that the other six children realised that telling the class

how much money his mother had taken out was socially inappropriate. It was also clear that they understood that Michelle had asked the question to see whether he would disclose this "secret", but he *naively replied with honesty* to his teacher's question.

However, in another occasion the same target child interrupted his narration, because he seemed to be anxious that his teacher might be hiding something from him. Robert had just come back from his session with the speech therapist and sat at his table to do some work. He asked: "When I was at Jane, *have you got something hidden, Jan?*".

In addition, another time Robert was hiding his own movements from his teacher, knowing that they were not allowed. Juliet asked Robert whether he was twiddling his fingers under the table. He refused to admit *that he was doing that*.

Lying

A target child was observed to be lying in a conversation with his father, as a way of avoiding reprimand. In particular, Matthew's father was asking him about an incident that had occurred that morning at school and Matthew said that his teacher was "force feeding" him at dinner time. When his father asked him whether he was telling the truth, *Matthew admitted that his teacher was not really doing that*.

Another child with HFA/AS was able to uncover his mother's lies. Anthony and his mother were playing a game and his mother suggested: "And you can jump on that one there." Anthony replied: *"You're telling me lies, I saw that mum."*

Pretending

Experimental research has shown that understanding of pretence will be as difficult as understanding belief in autistic children (Baron-Cohen, 1991c). However, a natural incident of pretending was reported to me by a teacher. It involved an authentic metaphor; in other words, it was a metarepresentation of an object. In a curriculum session (on cookery), Karen was eating an apple with the red skin on it and said: *"It's like a snow-man when he bites a poisoned apple"*.

Another event of pretence was particularly interesting, as it involved a target child's planning and acting out of a behaviour, so that it would be convincing for her teacher: *Diana pretended that she needed to be taken home with the intention of avoiding staying at school for another day*. In one of the conversations between Diana and her parents, her mother recalled this story of the past. One day the school rang her asking her to take Diana home because she was very ill ("she was very hot"). So her parents went to pick her up. To her mother's surprise, Diana said on the way back: *"I'm alright now, mum. Can we go to the beach?"*. However, when her father commented that this behaviour "doesn't work now though, does it?", Diana agreed with him: *"It's not worth it though, 'cause I knew ///// nobody believe."*. Thus, she was able to evaluate her teacher's mental attitudes (i.e., beliefs) to another similar pretending behaviour.

Nevertheless, not all the children with HFA shared the same ability to understand pretence. The following example illustrates how the same pretending behaviour may cause different reactions in the same group of children. For example, Anthony *thought that his teacher was really crying, when she was pretending to do so*. In contrast to him, three other children (Bill, Matthew and Patrick) were laughing, *as they clearly understood that Juliet was only pretending*. Then the same teacher pretended that she was upset and Patrick was laughing very loudly, showing that he understood that she was teasing Anthony again.

Later, another teacher confirmed Anthony's difficulty in distinguishing between "true" and "pretending" behaviour, by giving an example: if she pretended that she was brushing her teeth, he would believe that was true.

However, one high-functioning child described her pretending play as "copying-out". In a curriculum session, Karen was writing about a game she plays with her sister: "it's when you play mums and children's.". When I asked her to tell me more about it, she replied: *"Well, she'll play as mum with the dolls and Sara (her sister) would make as big aunt. And whatever. So they're just, they're just //, you know, copying what a mum will do."*

The same target child showed a spontaneous ability to pretend in a game she was playing with her father. However, it is possible that her familiarity with the whole set-up made it easier for her to understand the rules of the game and participate actively. Karen and her father were playing a game of tying one another and trying to escape. Her father asked her to "play the little girl who tries to tie him up.". Karen *asked him to pretend to go to sleep*. Her father found it very difficult to escape from the knots that she made and asked her whether she had the key for the padlock, but *she denied that*.

Behavioural signs of interest

There was evidence from the group sessions that some of the HFA children were able to relate eye-contact to a mental state. For example, Matthew and Karen were having a conversation about pets in front of the other children in the class. The teacher (Michelle) asked Diana whether Karen was listening to what Matthew was saying. She replied: "I think she was." and the teacher added: "She looked like she was, didn't she? She was looking at him. And, eh, she didn't but in.". Later, the teacher emphasised how eye contact can be *a behavioural sign of interest* in what the other person is saying.

In another group session, two other children were able to make a correct judgement of another's interest in a conversation. Patrick was having a conversation with Robert about their visit to a museum of dinosaurs and he asked him whether he enjoyed looking at the dinosaurs. Robert replied: "I have looked at the dinosaurs.", but he did not seem to understand the question. When Patrick repeated his question, he said: "Yes, I have.". Patrick made no other attempt to pursue the matter with Robert. Matthew made the comment that Robert was not interested. Michelle asked him to explain that and he said: "*Robert was looking all over the place.*" Michelle asked Karen whether Robert was listening carefully to Patrick's questions. and she replied that he was not paying attention "*'cause he was looking at Diana. And I know that.*". Thus, both Matthew and Karen were *able to relate the eye-contact with a mental state* (being interested).

Awareness of other's criticism

The target child's awareness of pressure by others was shown through behavioural signs. For example, Robert was very slow eating his meal and everybody on the table was waiting for him to finish, so that they could have their pudding. Diana was moaning and Bill said: "Come on, Robert. He's always so slow!". Karen was looking at Robert and Patrick was talking to him. Robert looked as if he was under a lot of pressure: *he put his hands over his ears and seemed to make a real struggle to eat his meal.*

But on another similar occasion, Robert's reactions were not the same as above. At lunch time, Bill said to Robert: "Could you please hurry up?", "Hurry up, Robert."; but, Robert was looking at his plate. He did not give any signs of awareness of Bill's pressure on him.

Discussion

The general picture from the evidence derived from the ethnographic observations of the group of children with HFA/AS supports the consistency in the use of mentalising skills

both in experimental situations and in real-world social interactions. Specifically, all (except one) children who were successful on the first-order belief attribution task, appeared to apply their understanding of others' mental states in social situations as well. For example, they showed the ability to recognise another's desires, feelings, thoughts, knowledge and intentions. But the behaviour of one child has been very difficult to explain. Although he passed the first-order theory of mind test (and that was not expected on the basis of his low verbal mental age: 5.4), he revealed to his parents his strategy in a game, without realising that they could use this knowledge to win the game. Yet, he appeared to be aware of his mother's intentions in the game and thought that she might be telling him lies. Also, he hid his own cheating from her; but, he behaved also naively in thinking that his teacher could know about his activity, without seeing him. In this case, it is really difficult to evaluate which context (the experimental or the natural) demonstrates with greater reliability this child's real mentalising skills. However, there is greater consistency between his behaviours and his failure on the more advanced test of theory of mind. Another explanation of this child's behaviours could be that he was "groping" towards a theory of mind.

Another case of agreement between task performance and social behaviour refers to the child with HFA/AS who failed the "Sally-Anne" task and showed to a great extent lack of mental understanding of others (e.g., inability to take part in a deceptive game, tactless behaviour, naive honesty to questioning). This individual was severely autistic (see Appendix 1), although his performance IQ was very high (114). His failure on the task was expected on the basis of his low verbal ability (VMA= 4 yrs). Therefore, it seems that low verbal skills as well as severe autism may help to account for his general lack of theory of mind.

A similarly puzzling but more complicated picture emerges from the comparison between children's successful performance on the second-order belief attribution task and their spontaneous social understanding. As it was difficult to observe statements of second-

order theory of mind, this ability has been evaluated in terms of the application of advanced social understanding. The children who were successful on this task appeared not only to recognise a range of mental states but also to apply them in mental explanation of others' behaviour. In other words, they seemed to make sophisticated uses of their theory of mind: using pretence to convince others, making jokes, teasing, feeling embarrassed, describing others' actions with mental attitudes. However, one of the oldest individuals with HFA/AS was reported to show socially inappropriate behaviour in the past (e.g., hurtful comments to others); it seems that his long social training improved his behaviour, as well as his general near-normal intelligence and mild autism.

Two other children who failed on the "ice-cream man" task also showed a range of abilities. However, one of them made a second-order theory of mind statement: "I don't think he knows what you mean.". That was the only striking example of inconsistency in a strict comparison between passing the second-order belief attribution task and use of this skill in everyday social interaction in the target group. Moreover, the same individual used appropriately many advanced mentalising behaviours, such as, teasing, recognising other's intentions, manipulating other's feelings, self-reflection, understanding pretending, deception and lying. But he also made a socially inappropriate statement (he asked his grandmother not to visit his house again); when he was asked to explain his behaviour, he simply said: "I just felt like it". Therefore, his behaviour appeared to be more advanced than his test performance; his competence in real-life situations seemed higher than his task performance. He was high-functioning (see Appendix 1) with verbal IQ (78) and non-verbal IQ (89).

The other child who did not pass the second-order theory of mind task showed behaviours, such as embarrassment, awareness of thoughts as private states, understanding of pretending, mental explanation of other's behaviour. But she also showed inappropriate social behaviour in the past (gave a kiss to a lady that had a sad expression).

CHAPTER 13: CONCLUSIONS AND FUTURE DIRECTIONS

This chapter will summarise the main findings of this study and discuss their implications for theoretical work on autism as well as for professional practice. Also, it will identify some future areas of research arising from this project. It needs to be mentioned that the review of the literature in Part I had identified the need for a combined methodology, and the questions arising from the empirical work had already been discussed in chapters 8, 11 and 12.

The study set out to examine how children with HFA/AS use knowledge about self and others in different contexts. In addition, the research aimed to evaluate the application of a mixed methodology as fruitful in throwing light on multiple aspects of the subject of our inquiry. Specifically, the intention was to examine how individuals with HFA/AS who have succeeded or failed on theory of mind tests, would describe themselves in an interview as well as the type of mental states they would refer to in their natural conversations with familiar adults. This information was further complemented by informal observations of their spontaneous mental understanding in everyday social life.

The principal findings of this study were the following:

First, the group of children/adolescents with HFA/AS was more successful on the first-order than the second-order belief attribution task, but there were no significant differences between the target group and the comparison groups on both tests. These results, in line with those from other studies, can be explained in terms of task factors and the verbal ability of the HFA/AS group. However, responses to the justification questions in each task were different. On the "Sally-Anne" test all groups used references to physical and mental states (explicit expressions), whereas on the "Ice-Cream-Man" test, justifications of the children with HFA/AS and the adults with AS who were successful included appropriate explicit and implicit references to mental states only. Thus, nearly

all children with HFA/AS showed an understanding of another's mental state, but only three of them were able to predict another's internal states at an advanced level.

Second, this tendency to describe physical/observable facts together with mental state language also emerged in the interview responses to questions about cognitions of the self by the children with HFA/AS. However, the striking group difference was found on the description of the social self. In contrast to adults with AS and children with MLD, children with HFA/AS did not refer to their social skills and social relationships as an important component of their self-understanding. This was explained in terms of the social handicap in autism and it could be inferred that this area of their personality becomes more important for them as they grow older. However, all groups tended to use a low level of reasoning for their perceptions of themselves: they described their characteristics/skills/activities as important in and of themselves. That was explained as a delay in reasoning ability, which was not found to be autism-specific but present also in children with MLD and adults with AS. Overall, Damon & Hart's (1988) self-understanding interview proved useful in differentiating qualitative aspects of the self between the groups, showing that autism is associated with a different conception of the self.

Third, the analysis of use of mental state language related to the self and others at school and home was fruitful in showing differences in the frequency of mental state utterances used by children in each context. It was also useful to look at the teaching context within the school, as children with HFA/AS referred to mental states more often in their conversations with teachers in group sessions than with their parents at home. Moreover, the analysis of language used by teachers and by parents proved useful in explaining the above results. That is, the finding that teachers used more mental state language than parents, may help to explain the differences in children's use of terms of psychological states.

The findings show the value of an interactive analysis of language used by children and adults. For example, there was a similar tendency between children with HFA *and* their parents to describe more feelings and fewer cognitive states than children with MLD and their parents. Moreover, children with HFA *and* their teachers used fewer terms about emotions than children with MLD and their teachers in group sessions. Hence, the type of mental states used by children in each group was associated with the context of the interaction and the participants in it. But this aspect of that data would have remained unrecognised if the more conventional individualistic approach (focused solely on the child's utterances) had been followed.

However, the picture was not the same for the use of cognitive terms by the target group: they talked about cognitions at a similar level at school and home. Also, this comparison revealed group differences: compared with children with MLD, children with HFA/AS made fewer references to cognitive states at home, but more references in group sessions at school. However, their own use of these terms appeared to be stable across contexts, although the input by adults was not the same: parents talked less about cognitive states than teachers. But, this consistent use of cognitive references does not support the hypothesis that children with HFA/AS are deficient in their ability to perceive cognitive states, because children with HFA/AS described significantly more cognitions than children with MLD at school, but significantly fewer at home. The observation of use of mental state language in two different natural contexts illuminated group differences between children with HFA and children with MLD, that have been supported in the literature (Tager-Flusberg, 1992). Also, this finding throws further light on the experimental results: children with HFA/AS showed knowledge of mental states while responding to the task and they also described cognitive states in naturalistic contexts.

Nevertheless, another finding shows inconsistency in the use of references to others' mental states by children with HFA/AS, thereby indicating a context effect. The target group seemed to talk about others' internal states more in group sessions than at home,

although there were no differences between teachers and parents in their references to others. However, children with HFA/AS seemed to talk about their own and others' mental states at home and school at the same level as children with MLD. Moreover, the study of mental state language in different contexts was illuminating with regard to the pragmatic context of utterances used by children. In particular, all children used more mental state utterances to ask questions and make comments at home than in group sessions at school, although parents made fewer comments than teachers and they used the same number of questions about mental states.

Overall, the results demonstrate the importance of examining differences across contexts, in order to identify consistencies and discrepancies in the use of mental state language. The educational significance of the findings lies in identifying the verbal interactions between children with HFA/AS and different adults which may encourage or inhibit knowledge of the self and others.

Finally, the picture from the ethnographic data is consistent with the performance of children with HFA/AS on experimental tasks. However, there was one case of an individual who did not pass the second-order belief attribution test, but expressed second-order comments and showed advanced mental understanding in his real-world social interactions. Overall, the ethnographic technique offered complementary qualitative evidence to the experimental data.

To summarise, this study represents an extension to current theoretical traditions focused on the measurement of autistic children's performance in an artificial task situation. Although the use of naturalistic experiments on theory of mind is growing, a critical area has not been much explored: autistic children's mental understanding in real-world social settings. The evidence that autistic children who were successful on theory of mind tasks have persisting problems in everyday life poses a challenge for current psychological theories of autism. Hence, future work needs to explore systematically autistic children's

behaviour in their natural social environment. However, it is critical to adopt an interactive perspective that will consider the child's use (or lack) of skills in relation to the adults' responses in the context of interaction.

On the whole, the present study has observed consistencies and inconsistencies in the use of utterances between children with HFA/AS and familiar adults. The next step could be to explore *qualitative* aspects of these interactions, by looking at the *processes* involved in applying skills related to mental state language, so that a deeper understanding can be achieved. For example, this study has suggested that the use of emotion terms varies between conversations with parents and with teachers. The following stage could be to examine the ways (i.e., qualitative dimensions of conversations about mental states) teachers/parents talk about feelings in their interactions with autistic children. Also, the intentions in using mental state language appear not to be the same in each context, although autistic children seem to respond to what is asked of them in a verbal interaction. However, we need qualitative information on specific processes used in each context for the development of knowledge of the self and others. The present research is only one step in this avenue for illuminating the puzzling picture of autism.

Overall, hypotheses based on experimental testing of cognitive abilities need to be measured against evidence from observations of children's behaviour in the real-world. However, new techniques need to be developed that provide qualitative information on these issues. An appropriate methodology will explore a range of natural social settings. Different relationships may have different effect on autistic children's use of social understanding.

The present study has shown significant context effects in the use of mental state language on the self and others by children with HFA/AS. This finding has implications for the design of intervention strategies. It seems that parents need to become aware of their contribution to their children's use of utterances on mental states. Although there

have been studies of teachers teaching high-functioning autistic children mental skills (Ozonoff & Miller, 1995), the use of parents in similar programs remains largely unexplored. Their role as socialising agents in the life of the autistic individual is crucial. But there is not much information about the quality of their verbal interactions with their children: how they describe and explain mental states to them.

In general, this study has explored some of the dimensions of autistic children's use of knowledge of themselves and others in experimental and natural situations. Further research on the qualitative processes involved in autistic children's use of cognitive abilities in their relationships in everyday social contexts may provide valuable insight in our understanding of persons with autism.

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APPENDIX 1: DIAGNOSTIC DATA

DSM-III-R CRITERIA FOR AUTISTIC DISORDER

| | CHILDREN | | | | | | |
|---|----------|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| RECIPROCAL SOCIAL INTERACTION | | | | | | | |
| 1. Impaired awareness of others | x | | | x | x | | x |
| 2. Abnormal comfort seeking | | | | | | | |
| 3. Impaired imitation | | | | | | | x |
| 4. Abnormal social play | x | x | x | | x | x | x |
| 5. Impaired ability to make friends | x | x | x | x | x | x | x |
| VERBAL/NON VERBAL COMMUNICATION AND IMAGINATION | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. No mode of communication | | | | | | | |
| 2. Abnormal non-verbal communication | x | x | x | x | x | x | x |
| 3. Impaired imaginative activity | x | | x | | x | x | x |
| 4. Abnormal speech production | x | x | | x | | | |
| 5. Abnormal speech content | x | x | | x | x | | x |
| 6. Impaired conversational ability | x | x | x | x | x | x | x |
| RESTRICTED REPERTOIRE OF ACTIVITIES AND INTERESTS | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. Stereotyped body movements | | x | | x | | | x |
| 2. Unusual attachments to objects | x | | x | | | x | x |
| 3. Distress over changes | | | x | | | | x |
| 4. Insistence on routines | x | | x | | | x | x |
| 5. Restricted interests | x | x | x | x | x | x | x |

DRAFT ICD-10 CRITERIA FOR ASPERGER'S SYNDROME

| | CHILDREN | | | | | | |
|------------------------------------|----------|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. Impaired social interaction | x | x | x | x | x | x | x |
| 2. Restricted interests/activities | x | x | x | x | x | x | x |
| 3. No language retardation - past | | x | | x | x | x | |
| -present | | x | x | x | x | x | |

Key for reference to Chapter 12:

1. Anthony
2. Bill
3. Diana
4. Karen
5. Matthew
6. Patrick
7. Robert

APPENDIX 2: RESULTS ON THE JUSTIFICATION QUESTIONS

First-order belief attribution task

HFA/AS group

1. "Because she put it in." (physical state)
2. "Because she thinks it's in there." (mental state)
3. "The fact that she left it last." (physical state)
4. " 'Cause she thinks it's still in there." (mental state)
5. "Because she might, she might not, she might say, it might be in there. And it might be, and it's in the box. To see if it's in there. And if it's not in there, she'll look in the box." (physical state)
6. After the prompt questions he spontaneously said "She didn't see that one. She doesn't know it's in there." When the "Why" question was asked, he replied : " 'Cause she might know it's in there (pointed to the basket). She might not know it's in there (pointed to the box). 'Cause she might know it's in the basket." (mental state)
7. " 'Cause she better look for it." (physical state)

MLD group

1. "She don't know if it was in there or not " (mental state)
2. " 'Cause she put it in there." (physical state)
3. "Because she put in there before." (physical state)
4. " 'Cause she's put it there." (physical state)
5. "She knows it's in there." (mental state)
6. "Put the marble in there." (physical state)
7. "Because she thinks it's in." (mental state)
8. " 'Cause she put it in there." (physical state)

Adults with AS

1. " 'Cause she thinks it might be in there." (mental state)
2. "Because that was the first place she had it." (physical state)
3. " 'Cause that's where it was." (physical state)
4. " 'Cause Ann took the marble from there." (physical state)
5. "Because that's where she thinks she left it." (mental state)
6. " 'Cause she's put it there. She doesn't know Anne's taken it." (mental state)

Second-order belief attribution test

HFA/AS group

1. "Because he thought the van was gonna stay in there." (mental state)
2. "Because that's where the ice-cream man said he would be all day." (mental state)
3. "Because, em, his mum said he could buy an ice-cream." (physical state)
4. " 'Cause he (John) thinks the ice cream man is still there. " (mental state)
5. "Because the ice-cream man wants to sell the ice-cream outside the church."
(mental state)
6. " 'Cause there's no ice-cream in there (park)." (physical state)

MLD group

1. "They didn't go ///////////////. They were just talking to the ///////////////." (physical state)
2. " 'Cause that's where the ice-cream man was." (physical state)
3. "Because that's where he said he'd been, when he said that, where he'd been selling the ice-cream." (mental state)
4. " 'Cause the ice-cream wasn't there when she got home." (physical state)
5. "The ice-cream man at the church." (physical state)
6. "Because she might have thought he (the ice cream man) was still at the park." (mental state)
7. "This is down there. The ice cream van." (physical state)

Adults with AS

1. "Just to buy an ice-cream I think". (physical state)
2. "That's where the ice-cream man said he was staying all afternoon." (mental state)
3. "'Cause the ice-cream man said he would be in the park all afternoon." (mental state)
4. " 'Cause he didn't have his money on him." (physical state)
5. "He wants ice-cream". (mental state)
6. "Because she neven heard the ice-cream man saying he was going to the church."
(mental state)

APPENDIX 3: THE SELF-UNDERSTANDING INTERVIEW BY DAMON & HART

Item 1: Self-Definition

Could you tell me what kind of person you are?
What's the most important thing to say about you?
Tell me about yourself.
How would you describe yourself?
What's the most important thing to know about you?
What can you say about the kind of person that you are?
Tell me about ... (name of the child).

Probe Question: Why is that important?

Item 2: Self-Evaluation

What are you especially proud of about yourself?
What do you like about yourself?
What are you not proud of?
Is there something that you don't like about yourself?

Probe Question: Why is that important?

Item 3: Self in Past and Future

Do you think you will be the same or different five years from now?
What do you think will stay the same about you in five years?
What was the same about you five years ago?
How about when you are an adult?
How about when you were a baby?
How have you changed in the past five years?
What will be the same about you in five years?
Do you think you will be the same when you get older?
How about when you were younger?

Probe Questions: What will be the same? What will be different? Why is that important?

Item 4: Self-Interest

What do you want to be when you grow up?

What kind of person do you want to be?

Who would you really like to be like?

Probe Questions? Why is that good for you? Why do you want to be like that?

Item 5: Continuity

Do you change at all from year to year?

If you change from year to year, how do you know it's still you?

What would you like to change about yourself?

Probe Questions: In what ways do you stay the same? Why is this important? What stays the same?

Item 6: Agency

How did you become the kind of person that you are?

How did you get the way that you are?

How could you become different?

Probe Questions: What difference did that make? How did that make you the person that you are?

Item 7: Distinctness

Do you think there is anyone who is exactly like you?

What makes you different from anyone you know?

What makes you different from all the children in your class?

Probe Questions: Why is that important? How do you know?

APPENDIX 4: ADDITIONAL RESULTS ON MENTAL STATE LANGUAGE: SELF AND OTHERS AT SCHOOL

All Tables in this Appendix are referred to in the text.

Table 1. *Frequencies of Each Category of Mental State Utterances in Curriculum Sessions: Teachers and Children with MLD.*

| Mental States | Teacher | Child | χ^2 |
|---------------|---------|-------|-----------|
| Perception | 11 | 7 | 0.9, n.s. |
| Desire | 15 | 0 | n/a |
| Emotion | 6 | 2 | n/a |
| Cognition | 30 | 3 | n/a |

Table 2. *Referents of Mental State Utterances in Group Sessions: Teachers and Children with MLD.*

| Referent | Teacher | Child | χ^2 |
|---------------|---------|-------|----------------------------|
| Self | 133 | 107 | 2.8, n.s. |
| Child/Teacher | 466 | 5 | 451.2, df = 1, $p < 0.001$ |
| Other | 89 | 22 | 40.4, df = 1, $p < 0.001$ |

Table 3. *Referents of Mental State Utterances in Curriculum Sessions: Teachers and Children with MLD.*

| Referent | Teacher | Child | χ^2 |
|---------------|---------|-------|---------------------------|
| Self | 19 | 4 | n/a |
| Child/Teacher | 33 | 5 | 20.6, df = 1, $p < 0.001$ |
| Other | 8 | 3 | n/a |

Table 4. *Functional Use of Mental State Utterances in Group Sessions: Teachers and Children with HFA (in each mental state).*

| Functional Use | Teacher | Child | χ^2 |
|-------------------|---------|-------|---------------------------|
| <i>Perception</i> | | | |
| True mental state | 93 | 44 | 17.5, df = 1, $p < 0.001$ |
| Conversational | 14 | 0 | n/a |
| Idiomatic | 8 | 0 | n/a |
| <i>Desire</i> | | | |
| True mental state | 25 | 11 | 5.4, df = 1, $p < 0.05$ |
| Conversational | 18 | 1 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 64 | 56 | 0.5, n.s. |
| <i>Cognition</i> | | | |
| True mental state | 167 | 52 | 60.4, df = 1, $p < 0.001$ |
| Conversational | 8 | 6 | 0.3, n.s. |
| Idiomatic | 17 | 6 | 5.3, df = 1, $p < 0.05$ |

Table 5. *Functional Use of Mental State Utterances in Group Sessions: Teachers and Children with MLD.*

| Functional Use | Teacher | Child | χ^2 |
|-------------------|---------|-------|----------------------------|
| True mental state | 734 | 130 | 422.2, df = 1, $p < 0.001$ |
| Conversational | 38 | 0 | n/a |
| Idiomatic | 9 | 0 | n/a |

Table 6. *Functional Use of Mental State Utterances in Group Sessions: Teachers and Children with MLD (in each mental state).*

| Functional Use | Teacher | Child | χ^2 |
|-------------------|---------|-------|--------------------------|
| <i>Perception</i> | | | |
| True mental state | 65 | 11 | 38.4, df = 1, p < 0.001 |
| Conversational | 14 | 0 | n/a |
| Idiomatic | 7 | 0 | n/a |
| <i>Desire</i> | | | |
| True mental state | 9 | 3 | n/a |
| Conversational | 17 | 0 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 342 | 103 | 128.4, df = 1, p < 0.001 |
| <i>Cognition</i> | | | |
| True mental state | 318 | 13 | 281.0, df = 1, p < 0.001 |
| Conversational | 7 | 0 | n/a |
| Idiomatic | 2 | 0 | n/a |

Table 7. *Functional Use of Mental State Utterances in Curriculum Sessions: Teachers and Children with HFA.*

| Functional Use | Teacher | Child | χ^2 |
|-------------------|---------|-------|--------------------------|
| True mental state | 384 | 118 | 140.9, df = 1, p < 0.001 |
| Conversational | 68 | 4 | n/a |
| Idiomatic | 21 | 2 | n/a |

Table 8. Functional Use of Mental State Utterances in Curriculum Sessions: Teachers and Children with HFA (in each mental state).

| Functional Use | Teacher | Child | χ^2 |
|-------------------|---------|-------|-------------------------|
| <i>Perception</i> | | | |
| True mental state | 102 | 30 | 39.3, df = 1, p < 0.001 |
| Conversational | 15 | 1 | n/a |
| Idiomatic | 15 | 0 | n/a |
| <i>Desire</i> | | | |
| True mental state | 27 | 8 | 10.3, df = 1, p < 0.01 |
| Conversational | 50 | 1 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 51 | 26 | 8.1, df = 1, p < 0.01 |
| <i>Cognition</i> | | | |
| True mental state | 204 | 54 | 87.2, df = 1, p < 0.001 |
| Conversational | 3 | 2 | n/a |
| Idiomatic | 6 | 2 | n/a |

Table 9. Functional Use of Mental State Utterances in Curriculum Sessions: Teachers and Children with MLD.

| Functional Use | Teacher | Child | χ^2 |
|-------------------|---------|-------|-------------------------|
| True Mental State | 51 | 11 | 28.8, df = 1, p < 0.001 |
| Conversational | 9 | 0 | n/a |
| Idiomatic | 2 | 0 | n/a |

Table 10. *Functional Use of Mental State Utterances in Curriculum Sessions: Teachers and Children with MLD (in each mental state).*

| Functional Use | Teacher | Child | χ^2 |
|-------------------|---------|-------|-----------|
| <i>Perception</i> | | | |
| True mental state | 11 | 7 | 0.9, n.s. |
| Conversational | 0 | 0 | n/a |
| Idiomatic | 0 | 0 | n/a |
| <i>Desire</i> | | | |
| True mental state | 6 | 0 | n/a |
| Conversational | 9 | 0 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 6 | 2 | n/a |
| <i>Cognition</i> | | | |
| Mental | 28 | 2 | n/a |
| Conversational | 2 | 0 | n/a |
| Idiomatic | 2 | 0 | n/a |

Table 11. *Use of Mental State Utterances in Group Sessions: Teachers and Children with HFA.*

| Use | Teacher | Child | χ^2 |
|-----|---------|-------|---------------------------|
| (1) | 289 | 116 | 73.9, df = 1, $p < 0.001$ |
| (2) | 96 | 39 | 24.1, df = 1, $p < 0.001$ |
| (3) | 29 | 32 | 0.1, n.s. |

Note: (1) Initial use, (2) Repetition of the teacher's use of mental term, (3) Repetition of the child's use of mental term.

Table 12. *Use of Mental State Utterances in Group Sessions: Teachers and Children with HFA (in each mental state).*

| Use | Teacher | Child | χ^2 |
|-------------------|---------|-------|---------------------------|
| <i>Perception</i> | | | |
| (1) | 92 | 29 | 32.8, df = 1, $p < 0.001$ |
| (2) | 15 | 10 | 1.0, n.s. |
| (3) | 8 | 5 | 0.7, n.s. |
| <i>Desire</i> | | | |
| (1) | 27 | 9 | 9.0, df = 1, $p < 0.01$ |
| (2) | 16 | 3 | n/a |
| (3) | 0 | 0 | n/a |
| <i>Emotion</i> | | | |
| (1) | 47 | 28 | 4.8, df = 1, $p < 0.05$ |
| (2) | 13 | 9 | 0.7, n.s. |
| (3) | 4 | 19 | n/a |
| <i>Cognition</i> | | | |
| (1) | 123 | 50 | 30.8, df = 1, $p < 0.001$ |
| (2) | 52 | 17 | 17.7, df = 1, $p < 0.001$ |
| (3) | 17 | 8 | 3.2, n.s. |

Table 13. *Use of Mental State Utterances in Group Sessions: Teachers and Children with MLD.*

| Use | Teacher | Child | χ^2 |
|-----|---------|-------|----------------------------|
| (1) | 330 | 60 | 186.9, df = 1, $p < 0.001$ |
| (2) | 383 | 56 | 243.6, df = 1, $p < 0.001$ |
| (3) | 68 | 22 | 23.5, df = 1, $p < 0.001$ |

Table 14. *Use of Mental State Utterances in Group Sessions: Teachers and Children with MLD (in each mental state).*

| Use | Teacher | Child | χ^2 |
|-------------------|---------|-------|---------------------------|
| <i>Perception</i> | | | |
| (1) | 68 | 9 | 45.2, df = 1, $p < 0.001$ |
| (2) | 13 | 2 | n/a |
| (3) | 5 | 0 | n/a |
| <i>Desire</i> | | | |
| (1) | 22 | 3 | n/a |
| (2) | 4 | 0 | n/a |
| (3) | 0 | 0 | n/a |
| <i>Emotion</i> | | | |
| (1) | 104 | 32 | 38.1, df = 1, $p < 0.001$ |
| (2) | 183 | 50 | 75.9, df = 1, $p < 0.001$ |
| (3) | 55 | 21 | 15.2, df = 1, $p = 0.001$ |
| <i>Cognition</i> | | | |
| (1) | 136 | 16 | 94.7, df = 1, $p < 0.001$ |
| (2) | 183 | 4 | n/a |
| (3) | 8 | 1 | n/a |

Table 15. *Use of Mental State Utterances in Curriculum Sessions: Teachers and Children with HFA.*

| Use | Teacher | Child | χ^2 |
|-----|---------|-------|----------------------------|
| (1) | 375 | 100 | 159.2, df = 1, $p < 0.001$ |
| (2) | 74 | 26 | 23.0, df = 1, $p < 0.001$ |
| (3) | 24 | 12 | 4.0, df = 1, $p < 0.05$ |

Table 16. *Use of Mental State Utterances in Curriculum Sessions: Teachers and Children with HFA (in each mental state).*

| Use | Teacher | Child | χ^2 |
|-------------------|---------|-------|---------------------------|
| <i>Perception</i> | | | |
| (1) | 110 | 23 | 56.9, df = 1, $p < 0.001$ |
| (2) | 18 | 6 | 6.0, df = 1, $p < 0.05$ |
| (3) | 4 | 2 | n/a |
| <i>Desire</i> | | | |
| (1) | 58 | 7 | 40.0, df = 1, $p < 0.001$ |
| (2) | 18 | 2 | n/a |
| (3) | 1 | 0 | n/a |
| <i>Emotion</i> | | | |
| (1) | 37 | 20 | 5.1, df = 1, $p < 0.05$ |
| (2) | 6 | 5 | 0.09, n.s. |
| (3) | 8 | 1 | n/a |
| <i>Cognition</i> | | | |
| (1) | 170 | 52 | 62.7, df = 1, $p < 0.001$ |
| (2) | 32 | 13 | 8.0, df = 1, $p < 0.01$ |
| (3) | 11 | 9 | 0.2, n.s. |

Table 17. *Use of Mental State Utterances in Curriculum Sessions: Teachers and Children with MLD.*

| Use | Teacher | Child | χ^2 |
|-----|---------|-------|---------------------------|
| (1) | 37 | 5 | 24.4, df = 1, $p < 0.001$ |
| (2) | 23 | 5 | 11.6, df = 1, $p < 0.001$ |
| (3) | 2 | 2 | n/a |

Table 18. *Use of Mental State Utterances in Curriculum Sessions: Teachers and Children with MLD (in each mental state).*

| Use | Teacher | Child | χ^2 |
|-------------------|---------|-------|----------|
| <i>Perception</i> | | | |
| (1) | 6 | 2 | n/a |
| (2) | 4 | 3 | n/a |
| (3) | 1 | 2 | n/a |
| <i>Desire</i> | | | |
| (1) | 9 | 0 | n/a |
| (2) | 6 | 0 | n/a |
| (3) | 0 | 0 | n/a |
| <i>Emotion</i> | | | |
| (1) | 4 | 2 | n/a |
| (2) | 1 | 0 | n/a |
| (3) | 1 | 0 | n/a |
| <i>Cognition</i> | | | |
| (1) | 18 | 1 | n/a |
| (2) | 12 | 2 | n/a |
| (3) | 0 | 0 | n/a |

Table 19. *Overall Frequencies of Mental State Utterances in Curriculum Sessions: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Groups | HFA | MLD | χ^2 |
|--------|-----|-----|-----------|
| Child | 23 | 12 | 3.4, n.s. |

Table 20. *Frequencies of Each Category of Psychological State Utterances in Curriculum Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Mental States | HFA | MLD | χ^2 |
|---------------|-----|-----|----------------------|
| Perception | 22 | 11 | 3.6, df = 1, p= 0.05 |
| Desire | 13 | 15 | 0.1, n.s. |
| Emotion | 8 | 6 | 0.2, n.s. |
| Cognition | 36 | 30 | 0.5, n.s. |

Table 21. *Frequencies of Each Category of Psychological State Utterances in Curriculum Sessions: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Mental States | HFA | MLD | χ^2 |
|---------------|-----|-----|-----------|
| Perception | 5 | 7 | 0.3, n.s. |
| Desire | 1 | 0 | n/a |
| Emotion | 4 | 2 | n/a |
| Cognition | 12 | 3 | n/a |

Table 22. *Referents of Mental State Utterances in Group Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Referent | HFA | MLD | χ^2 |
|----------|-----|-----|-------------------------|
| Self | 90 | 133 | 8.3, df = 1, p< 0.01 |
| Child | 188 | 466 | 118.2, df = 1, p< 0.001 |
| Other | 27 | 89 | 33.1, df = 1, p< 0.001 |

Table 23. *Referents of Mental State Utterances in Group Sessions: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Referent | HFA | MLD | χ^2 |
|----------|-----|-----|-----------|
| Self | 121 | 107 | 0.8, n.s. |
| Teacher | 7 | 5 | 0.3, n.s. |
| Other | 24 | 22 | 0.1, n.s. |

Table 24. *Referents of Mental State Utterances in Curriculum Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Referent | HFA | MLD | χ^2 |
|----------|-----|-----|-----------|
| Self | 24 | 19 | 0.6, n.s. |
| Child | 29 | 33 | 0.2, n.s. |
| Other | 6 | 8 | 0.3, n.s. |

Table 25. *Referents of Mental State Utterances in Curriculum Sessions: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Referent | HFA | MLD | χ^2 |
|----------|-----|-----|----------|
| Self | 3 | 4 | n/a |
| Teacher | 5 | 5 | n/a |
| Other | 1 | 3 | n/a |

Table 26. *Functional Use of Mental State Utterances in Group Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Functional Use | HFA | MLD | χ^2 |
|-------------------|-----|-----|----------------------------|
| <i>Perception</i> | | | |
| True mental state | 80 | 65 | 1.5, n.s. |
| Conversational | 12 | 14 | 0.1, n.s. |
| Idiomatic | 7 | 7 | n/a |
| <i>Desire</i> | | | |
| True mental state | 21 | 9 | 4.8, df = 1, $p < 0.05$ |
| Conversational | 15 | 17 | 0.1, n.s. |
| <i>Emotion</i> | | | |
| True mental state | 55 | 342 | 207.5, df = 1, $p < 0.001$ |
| <i>Cognition</i> | | | |
| Mental | 144 | 318 | 65.5, df = 1, $p < 0.001$ |
| Conversational | 7 | 7 | n/a |
| Idiomatic | 15 | 2 | n/a |

Table 27. *Functional Use of Mental State Utterances in Group Sessions: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Functional Use | HFA | MLD | χ^2 |
|-------------------|-----|-----|------------|
| True mental state | 140 | 128 | 0.5, n.s. |
| Conversational | 6 | 0 | n/a |
| Idiomatic | 9 | 8 | 0.05, n.s. |

Table 28. *Functional Use of Mental State Utterances in Group Sessions: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Functional Use | HFA | MLD | χ^2 |
|-------------------|-----|-----|------------------------|
| <i>Perception</i> | | | |
| True mental state | 38 | 11 | 14.9, df = 1, p= 0.001 |
| Conversational | 0 | 0 | n/a |
| Idiomatic | 0 | 0 | n/a |
| <i>Desire</i> | | | |
| True mental state | 9 | 3 | n/a |
| Conversational | 1 | 0 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 48 | 101 | 18.8, df = 1, p< 0.001 |
| <i>Cognition</i> | | | |
| True mental state | 45 | 13 | 17.6, df = 1, p< 0.001 |
| Conversational | 5 | 0 | n/a |
| Idiomatic | 5 | 0 | n/a |
| Special code | 9 | 8 | 0.6, n.s. |

Table 29. *Functional Use of Mental State Utterances in Curriculum Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Functional Use | HFA | MLD | χ^2 |
|-------------------|-----|-----|------------|
| <i>Perception</i> | | | |
| Mental | 17 | 11 | 1.3, n.s. |
| Conversational | 2 | 0 | n/a |
| Idiomatic | 2 | 0 | n/a |
| <i>Desire</i> | | | |
| Mental | 4 | 6 | n/a |
| Conversational | 8 | 9 | 0.06, n.s. |
| <i>Emotion</i> | | | |
| Mental | 8 | 6 | 0.3, n.s. |
| <i>Cognition</i> | | | |
| Mental | 34 | 28 | 0.6, n.s. |
| Conversational | 1 | 0 | n/a |
| Idiomatic | 1 | 2 | n/a |

Table 30. *Functional Use of Mental State Utterances in Curriculum Sessions: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Functional Use | HFA | MLD | χ^2 |
|-------------------|-----|-----|----------|
| True Mental State | 20 | 11 | 2.6, n.s |
| Conversational | 1 | 0 | n/a |
| Idiomatic | 1 | 1 | n/a |

Table 31. *Use of Mental State Utterances in Group Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Use | HFA | MLD | χ^2 |
|-----|-----|-----|----------------------------|
| (1) | 249 | 330 | 11.3, df = 1, $p < 0.01$ |
| (2) | 83 | 383 | 193.1, df = 1, $p < 0.001$ |
| (3) | 25 | 68 | 19.9, df = 1, $p < 0.001$ |

Table 32. *Use of Mental State Utterances in Group Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Use | HFA | MLD | χ^2 |
|------------|-----|-----|----------------------------|
| Perception | | | |
| (1) | 79 | 68 | 0.8, n.s. |
| (2) | 13 | 13 | n/a |
| (3) | 7 | 5 | 0.3, n.s. |
| Desire | | | |
| (1) | 23 | 22 | 0.02, n.s. |
| (2) | 14 | 4 | n/a |
| (3) | 0 | 0 | n/a |
| Emotion | | | |
| (1) | 40 | 104 | 28.4, df = 1, $p < 0.001$ |
| (2) | 11 | 183 | 152.5, df = 1, $p < 0.001$ |
| (3) | 3 | 55 | n/a |
| Cognition | | | |
| (1) | 106 | 136 | 3.7, df = 1, $p = 0.05$ |
| (2) | 45 | 183 | 83.5, df = 1, $p < 0.001$ |
| (3) | 15 | 8 | 2.1, n.s. |

Table 33. *Use of Mental State Utterances in Group Sessions: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Use | HFA | MLD | χ^2 |
|-----|-----|-----|--------------------------|
| (1) | 100 | 60 | 10.0, df = 1, $p < 0.01$ |
| (2) | 33 | 56 | 5.9, df = 1, $p < 0.05$ |
| (3) | 27 | 22 | 0.5, n.s. |

Table 34. *Use of Mental State Utterances in Group Sessions: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Use | HFA | MLD | χ^2 |
|------------|-----|-----|---------------------------|
| Perception | | | |
| (1) | 25 | 9 | 7.5, df = 1, $p < 0.01$ |
| (2) | 9 | 2 | n/a |
| (3) | 4 | 0 | n/a |
| Desire | | | |
| (1) | 8 | 3 | n/a |
| (2) | 3 | 0 | n/a |
| (3) | 0 | 0 | n/a |
| Emotion | | | |
| (1) | 24 | 32 | 1.1, n.s. |
| (2) | 8 | 50 | 30.4, df = 1, $p < 0.001$ |
| (3) | 16 | 21 | 0.7, n.s. |
| Cognition | | | |
| (1) | 43 | 16 | 12.3, df = 1, $p < 0.001$ |
| (2) | 15 | 4 | n/a |
| (3) | 7 | 1 | n/a |

Table 35. *Use of Mental State Utterances in Curriculum Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Use | HFA | MLD | χ^2 |
|-----|-----|-----|-------------------------|
| (1) | 63 | 37 | 6.8, df = 1, $p < 0.01$ |
| (2) | 12 | 23 | 3.4, n.s. |
| (3) | 4 | 2 | n/a |

Table 36. *Use of Mental State Utterances in Curriculum Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Use | HFA | MLD | χ^2 |
|------------|-----|-----|-------------------------|
| Perception | | | |
| (1) | 18 | 6 | 6.0, df = 1, $p < 0.05$ |
| (2) | 3 | 4 | n/a |
| (3) | 1 | 1 | n/a |
| Desire | | | |
| (1) | 10 | 9 | 0.05, n.s. |
| (2) | 3 | 6 | n/a |
| (3) | 1 | 0 | n/a |
| Emotion | | | |
| (1) | 6 | 4 | n/a |
| (2) | 1 | 1 | n/a |
| (3) | 1 | 1 | n/a |
| Cognition | | | |
| (1) | 28 | 18 | 2.2, n.s. |
| (2) | 5 | 12 | 2.9, n.s. |
| (3) | 2 | 0 | n/a |

Table 37. *Use of Mental State Utterances in Curriculum Sessions: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Use | HFA | MLD | χ^2 |
|-----|-----|-----|----------------------|
| (1) | 17 | 5 | 6.5, df = 1, p= 0.01 |
| (2) | 4 | 5 | n/a |
| (3) | 2 | 2 | n/a |

Table 38. *Categories of Pragmatic Context of Mental State Utterances in Group Sessions: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Categories | HFA | MLD | χ^2 |
|---------------|-----|-----|------------------------|
| Self-interest | 3 | 0 | n/a |
| Sophisticated | 2 | 1 | n/a |
| Commentary | 3 | 4 | n/a |
| Information | 18 | 129 | 83.8, df = 1, p< 0.001 |
| Questioning | 20 | 3 | n/a |

Table 39. *Categories of Pragmatic Context of Mental State Utterances in Curriculum Sessions: Teachers of Children with HFA and Teachers of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Categories | HFA | MLD | χ^2 |
|-------------|-----|-----|----------------------|
| Didactic | 1 | 1 | n/a |
| Commentary | 30 | 31 | 0.01, n.s. |
| Questioning | 22 | 11 | 3.7, df = 1, p= 0.05 |
| Guiding | 22 | 18 | 0.4, n.s. |

Table 40. *Comparison of Frequencies of Utterances for Each Category of Mental State as a Proportion of All Psychological State Utterances in Curriculum Sessions: Teachers of Children with HFA and Teachers of Children with MLD.*

| Mental States | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|---------------|---------------------------|---------------------------|-----------|
| Perception | 132 (27.9) | 11 (17.7) | 2.1, n.s. |
| Desire | 77 (16.2) | 15 (24.1) | 1.9, n.s. |
| Emotion | 51 (10.7) | 6 (9.6) | 0.1, n.s. |
| Cognition | 213 (45.0) | 30 (48.3) | 0.1, n.s. |
| Total | 473 | 62 | |

Table 41. *Comparison of Frequencies of Utterances for Each Category of Mental State as a Proportion of All Psychological State Utterances in Curriculum Sessions: Children with HFA and Children with MLD.*

| Mental States | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|---------------|---------------------------|---------------------------|---------------------------|
| Perception | 31 (22.1) | 7 (58.3) | 5.8, df = 1, $p < 0.05$ * |
| Desire | 9 (6.4) | 0 | n/a |
| Emotion | 26 (18.5) | 2 (16.6) | n/a |
| Cognition | 74 (52.8) | 3 (25) | n/a |
| Total | 140 | 12 | |

* chi-square is questionable here.

Table 42. *Comparison of Referents of Mental State Utterances as a Proportion of All Referents in Group Sessions: Teachers of Children with HFA and Teachers of Children with MLD.*

| Referent | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|------------|---------------------------|---------------------------|--------------------------|
| Self | 105 (28.6) | 133 (18.7) | 10.6, df = 1, $p < 0.01$ |
| Child | 218 (59.4) | 466 (65.7) | 1.5, n.s. |
| Self/Child | 13 (3.5) | 21 (2.9) | 0.2, n.s. |
| Other | 31 (8.4) | 89 (13.6) | 3.6, df = 1, $p = 0.05$ |
| Total | 367 | 709 | |

Table 43. *Comparison of Referents of Mental State Utterances as a Proportion of All Referents in Group Sessions: Children with HFA and Children with MLD.*

| Referent | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|----------|---------------------------|---------------------------|--------------|
| Self | 141 (79.6) | 107 (79.8) | 0.0003, n.s. |
| Teacher | 8 (4.5) | 5 (3.7) | 0.1, n.s. |
| Other | 128 (15.8) | 22 (16.4) | 0.01, n.s. |
| Total | 177 | 134 | |

Table 44. *Comparison of Referents of Mental State Utterances as a Proportion of All Referents in Curriculum Sessions: Teachers of Children with HFA and Teachers of Children with MLD.*

| Referent | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|------------|----------------------------|----------------------------|-----------|
| Self | 144 (39.6) | 19 (31.7) | 0.8, n.s. |
| Child | 174 (47.9) | 33 (55) | 0.5, n.s. |
| Self/Child | 9 (2.4) | 0 | n/a |
| Other | 36 (9.9) | 8 (13.3) | 0.6, n.s. |
| Total | 363 | 60 | |

Table 45. *Comparison of Referents of Mental State Utterances as a Proportion of All Referents in Curriculum Sessions: Children with HFA and Children with MLD.*

| Referent | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|----------|----------------------------|----------------------------|---------------------------|
| Self | 91 (72.2) | 4 (33.3) | n/a |
| Teacher | 20 (15.8) | 5 (41.6) | 4.0, df = 1, $p < 0.05$ * |
| Other | 15 (11.9) | 3 (25) | n/a |
| Total | 126 | 12 | |

Table 46. *Comparison of Functional Use of Mental State Utterances in as a Proportion of All Frequencies on Functional Use in Group Sessions: Teachers of Children with HFA and Teachers of Children with MLD.*

| Functional Use | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|-------------------|----------------------------|----------------------------|---------------------------|
| True mental state | 349 (84.2) | 734 (93.9) | 2.8, n.s. |
| Conversational | 40 (9.6) | 38 (4.8) | 9.5, df = 1, $p < 0.01$ |
| Idiomatic | 25 (6.0) | 9 (1.1) | 22.7, df = 1, $p < 0.001$ |
| Total | 414 | 781 | |

Table 47. *Comparison of Functional Use of Mental State Utterances in as a Proportion of All Frequencies on Functional Use in Group Sessions: Children with HFA and Children with MLD.*

| Functional Use | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|-------------------|----------------------------|----------------------------|-------------|
| True mental state | 163 (87.1) | 130 (94.2) | 0.4, n.s. |
| Conversational | 7 (3.7) | 0 | n/a |
| Idiomatic | 6 (3.2) | 0 | n/a |
| Special code | 11 (5.8) | 8 (5.8) | 0.001, n.s. |
| Total | 187 | 138 | |

Table 48. *Comparison of Functional Use of Mental State Utterances in as a Proportion of All Frequencies on Functional Use in Curriculum Sessions: Teachers of Children with HFA and Teachers of Children with MLD.*

| Functional Use | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|-------------------|----------------------------|----------------------------|--------------|
| True mental state | 384 (81.1) | 51 (82.2) | 0.007, n.s. |
| Conversational | 68 (14.3) | 9 (14.5) | 0.0007, n.s. |
| Idiomatic | 21 (4.4) | 2 (3.2) | n/a |
| Total | 473 | 62 | |

Table 49. *Comparison of Functional Use of Mental State Utterances in as a Proportion of All Frequencies on Functional Use in Curriculum Sessions: Children with HFA and Children with MLD.*

| Functional Use | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|-------------------|----------------------------|----------------------------|-----------|
| True Mental State | 118 (84.2) | 11 (91.6) | 0.1, n.s. |
| Conversational | 4 (2.8) | 0 | n/a |
| Idiomatic | 2 (1.4) | 0 | n/a |
| Special code | 16 (11.4) | 1 (8.3) | n/a |
| Total | 140 | 12 | |

Table 50. *Comparison of Use of Mental State Utterances as a Proportion of the Overall Use of Utterances in Group Sessions: Teachers of Children with HFA and Teachers of Children with MLD.*

| Use | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|-------|----------------------------|----------------------------|---------------------------|
| (1) | 289 (69.9) | 330 (42.2) | 39.6, df = 1, $p < 0.001$ |
| (2) | 96 (23.1) | 383 (49) | 45.1, df = 1, $p < 0.001$ |
| (3) | 29 (7) | 68 (8.7) | 0.9, n.s. |
| Total | 414 | 781 | |

Table 51. *Comparison of Use of Mental State Utterances as a Proportion of the Overall Use of Utterances in Group Sessions: Children with HFA and Children with MLD.*

| Use | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|-------|----------------------------|----------------------------|--------------------------|
| (1) | 116 (62) | 60 (43.4) | 5.0, df = 1, $p < 0.05$ |
| (2) | 39 (20.8) | 56 (40.5) | 10.6, df = 1, $p < 0.01$ |
| (3) | 32 (17.1) | 22 (15.9) | 0.06, n.s. |
| Total | 187 | 138 | |

Table 52. *Comparison of Use of Mental State Utterances as a Proportion of the Overall Use of Utterances in Curriculum Sessions: Teachers of Children with HFA and Teachers of Children with MLD.*

| Use | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|-------|----------------------------|----------------------------|---------------------------|
| (1) | 375 (79.2) | 37 (59.6) | 2.7, n.s. |
| (2) | 74 (15.6) | 23 (37) | 13.9, df = 1, $p < 0.001$ |
| (3) | 24 (5) | 2 (3.2) | n/a |
| Total | 473 | 62 | |

Table 53. *Comparison of Use of Mental States Utterances as a Proportion of the Overall Use of Utterances in Curriculum Sessions: Children with HFA and Children with MLD.*

| Use | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|-------|----------------------------|----------------------------|-----------|
| (1) | 102 (72.8) | 5 (41.6) | 1.5, n.s. |
| (2) | 26 (18.5) | 5 (41.6) | 2.9, n.s. |
| (3) | 12 (8.5) | 2 (16.6) | n/a |
| Total | 140 | 12 | |

Table 54. *Comparison of Categories of Pragmatic Context of Mental State Utterances as a Proportion of the Overall Use of Pragmatic Categories in Curriculum Sessions: Teachers of Children with HFA and Teachers of Children with MLD.*

| Categories | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|-------------|----------------------------|----------------------------|------------|
| Didactic | 4 (0.9) | 0 | n/a |
| Commentary | 181 (40.5) | 31 (51.7) | 1.6, n.s. |
| Questioning | 133 (29.7) | 11 (18.3) | 2.4, n.s. |
| Guiding | 129 (28.9) | 18 (30) | 0.02, n.s. |
| Total | 447 | 60 | |

Table 55. *Comparison of Categories of Pragmatic Context of Mental State Utterances as a Proportion of the Overall Use of Pragmatic Categories in Group Sessions: Children with HFA and Children with MLD.*

| Categories | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|---------------|----------------------------|----------------------------|-----------|
| Self-interest | 4 (2.2) | 0 | n/a |
| Sophisticated | 2 (1.1) | 1 (0.7) | n/a |
| Commentary | 14 (7.7) | 4 (2.9) | n/a |
| Information | 138 (76.2) | 129 (94.1) | 2.9, n.s. |
| Questioning | 23 (12.7) | 3 (2.2) | n/a |
| Total | 181 | 137 | |

Table 56. *Comparison of Categories of Pragmatic Context of Mental State Utterances as a Proportion of the Overall Use of Pragmatic Categories in Curriculum Sessions: Children with HFA and Children with MLD.*

| Categories | HFA frequency (percent) | MLD frequency (percent) | χ^2 |
|---------------|----------------------------|----------------------------|-----------------------------|
| Self-interest | 1 (0.04) | 1 (0.8) | n/a |
| Sophisticated | 0 | 0 | n/a |
| Commentary | 10 (4) | 5 (41.7) | 28.4, df = 1, $p < 0.001$ * |
| Information | 110 (44) | 6 (50) | 0.1, n.s. |
| Questioning | 129 (51.6) | 0 | n/a |
| Total | 250 | 12 | |

APPENDIX 5: ADDITIONAL RESULTS ON MENTAL STATE LANGUAGE: SELF AND OTHERS AT HOME

All Tables in this Appendix are referred to in the text.

Table 1. *Functional Use of Mental State Utterances in All Home Visits: Parents and Children with HFA.*

| Functional Use | Parent | Child | χ^2 |
|-------------------|--------|-------|---------------------------|
| True mental state | 1158 | 728 | 98.0, df = 1, $p < 0.001$ |
| Conversational | 46 | 45 | 0.01, n.s. |
| Idiomatic | 45 | 22 | 7.9, df = 1, $p < 0.01$ |

Table 2. *Functional Use of Mental State Utterances in All Home Visits: Parents and Children with HFA (in each mental state).*

| Functional Use | Parent | Child | χ^2 |
|-------------------|--------|-------|---------------------------|
| <i>Perception</i> | | | |
| True mental state | 215 | 138 | 16.8, df = 1, $p < 0.001$ |
| Conversational | 31 | 21 | 1.9, n.s. |
| Idiomatic | 22 | 12 | 2.9, n.s. |
| <i>Desire</i> | | | |
| True mental state | 149 | 118 | 3.6, df = 1, $p = 0.05$ |
| Conversational | 6 | 8 | 0.3, n.s. |
| <i>Emotion</i> | | | |
| True mental state | 349 | 215 | 31.8, df = 1, $p < 0.001$ |
| Conversational | 1 | 1 | n/a |
| <i>Cognition</i> | | | |
| True mental state | 445 | 257 | 50.3, df = 1, $p < 0.001$ |
| Conversational | 8 | 15 | 2.1, n.s. |
| Idiomatic | 23 | 10 | 5.1, df = 1, $p < 0.05$ |

Table 3. *Functional Use of Mental State Utterances in All-Home Visits: Parents and Children with MLD.*

| Functional Use | Parent | Child | χ^2 |
|-------------------|--------|-------|---------------------------|
| True mental state | 624 | 330 | 90.6, df = 1, $p < 0.001$ |
| Conversational | 38 | 18 | 7.1, df = 1, $p < 0.01$ |
| Idiomatic | 44 | 28 | 3.5, df = 1, $p = 0.05$ |

Table 4. *Functional Use of Mental State Utterances in All Home Visits: Parents and Children with MLD (in each mental state).*

| Functional Use | Parent | Child | χ^2 |
|-------------------|--------|-------|---------------------------|
| <i>Perception</i> | | | |
| True mental state | 133 | 51 | 36.5, df = 1, $p < 0.001$ |
| Conversational | 26 | 5 | 14.2, df = 1, $p < 0.01$ |
| Idiomatic | 24 | 12 | 4.0, df = 1, $p < 0.05$ |
| <i>Desire</i> | | | |
| True mental state | 61 | 32 | 9.0, df = 1, $p < 0.01$ |
| Conversational | 3 | 0 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 89 | 42 | 16.9, df = 1, $p < 0.001$ |
| Conversational | 2 | 0 | n/a |
| <i>Cognition</i> | | | |
| True mental state | 341 | 205 | 33.9, df = 1, $p < 0.001$ |
| Conversational | 7 | 13 | 1.8, n.s. |
| Idiomatic | 20 | 16 | 0.4, n.s. |

Table 5. *Use of Mental State Utterances in All Home Visits: Parents and Children with HFA.*

| Use | Parent | Child | χ^2 |
|-----|--------|-------|---------------------------|
| (1) | 829 | 628 | 27.7, df = 1, $p < 0.001$ |
| (2) | 293 | 101 | 93.6, df = 1, $p < 0.001$ |
| (3) | 127 | 121 | 0.1, n.s. |

Note: (1) Initial Use of Term, (2) Repetition of parent's/other person's use of word in the previous two turns, (3) Repetition of child's use of word in the previous two turns.

Table 6. *Use of Mental State Utterances in All Home Visits: Parents and Children with MLD.*

| Use | Parent | Child | χ^2 |
|-----|--------|-------|---------------------------|
| (1) | 499 | 298 | 50.7, df = 1, $p < 0.001$ |
| (2) | 128 | 49 | 32.2, df = 1, $p < 0.001$ |
| (3) | 79 | 45 | 9.3, df = 1, $p < 0.01$ |

Table 7. *Referents of Mental State Utterances in All Home Visits: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Referent | HFA | MLD | χ^2 |
|---------------|-----|-----|-----------|
| Self | 280 | 250 | 1.7, n.s. |
| Parent | 78 | 84 | 0.2, n.s. |
| Self + Parent | 0.5 | 2 | n/a |
| Other | 31 | 41 | 1.4, n.s. |

Table 8. *Functional Use of Mental State Utterances in All Home Visits: Parents of Children with HFA and Parents of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Functional Use | HFA | MLD | χ^2 |
|-------------------|-----|-----|-------------------------|
| True mental state | 550 | 624 | 4.7, df = 1, $p < 0.05$ |
| Conversational | 22 | 38 | 4.3, df = 1, $p < 0.05$ |
| Idiomatic | 21 | 44 | 8.1, df = 1, $p < 0.01$ |

Table 9. *Functional Use of Mental State Utterances in All Home Visits: Parents of Children with HFA and Parents of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Functional Use | HFA | MLD | χ^2 |
|-------------------|-----|-----|---------------------------|
| <i>Perception</i> | | | |
| True mental state | 102 | 133 | 4.1, df = 1, $p < 0.05$ |
| Conversational | 15 | 16 | 2.9, n.s. |
| Idiomatic | 10 | 24 | 5.8, df = 1, $p = 0.01$ |
| <i>Desire</i> | | | |
| True mental state | 71 | 61 | 0.7, n.s. |
| Conversational | 0 | 3 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 166 | 89 | 23.2, df = 1, $p < 0.001$ |
| Conversational | 0.5 | 2 | n/a |
| <i>Cognition</i> | | | |
| True mental state | 211 | 341 | 30.6, df = 1, $p < 0.001$ |
| Conversational | 4 | 7 | n/a |
| Idiomatic | 11 | 20 | 2.6, n.s. |

Table 10. *Functional Use of Mental State Utterances in All Home Visits: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Functional Use | HFA | MLD | χ^2 |
|-------------------|-----|-----|-------------------------|
| True mental state | 346 | 330 | 0.4, n.s. |
| Conversational | 21 | 18 | 0.2, n.s. |
| Idiomatic | 10 | 28 | 8.5, df = 1, $p < 0.01$ |
| Special code | 26 | 16 | 2.4, n.s. |

Table 11. *Functional Use of Mental State Utterances in All Home Visits: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Functional Use | HFA | MLD | χ^2 |
|-------------------|-----|-----|---------------------------|
| <i>Perception</i> | | | |
| True mental state | 65 | 51 | 1.7, n.s. |
| Conversational | 10 | 5 | 1.7, n.s. |
| Idiomatic | 6 | 12 | 2.0, n.s. |
| <i>Desire</i> | | | |
| True mental state | 56 | 32 | 6.5, df = 1, $p = 0.01$ |
| Conversational | 4 | 0 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 102 | 42 | 25.0, df = 1, $p < 0.001$ |
| Conversational | 0.5 | 0 | n/a |
| <i>Cognition</i> | | | |
| True mental state | 122 | 205 | 21.1, df = 1, $p < 0.001$ |
| Conversational | 7 | 13 | 1.8, n.s. |
| Idiomatic | 5 | 16 | 5.8, df = 1, $p = 0.01$ |
| Special code | 26 | 16 | 2.4, n.s. |

Table 12. *Use of Mental State Utterances in All Home Visits: Parents Children with HFA and Parents of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Use | HFA | MLD | χ^2 |
|-----|-----|-----|---------------------------|
| (1) | 394 | 499 | 12.3, df = 1, $p < 0.001$ |
| (2) | 139 | 128 | 0.4, n.s. |
| (3) | 60 | 79 | 2.6, n.s. |

Note: (1) Initial Use of Term, (2) Repetition of parent's/other person's use of word in the previous two turns, (3) Repetition of child's use of word in the previous two turns.

Table 13. *Use of Mental State Utterances in All Home Visits: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Use | HFA | MLD | χ^2 |
|-----|-----|-----|-----------|
| (1) | 298 | 298 | n/a |
| (2) | 0.3 | 49 | n/a |
| (3) | 57 | 45 | 1.4, n.s. |

Table 14. *Categories of Pragmatic Context of Mental State Utterances in All Home Visits: Parents of Children with HFA and Parents of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Categories | HFA | MLD | χ^2 |
|-------------|-----|-----|---------------------------|
| Didactic | 5 | 11 | 2.2, n.s. |
| Commentary | 294 | 473 | 41.8, df = 1, $p < 0.001$ |
| Questioning | 233 | 160 | 13.5, df = 1, $p < 0.001$ |
| Guiding | 38 | 108 | 33.6, df = 1, $p < 0.001$ |

Table 15. *Categories of Pragmatic Context of Mental State Utterances in All Home Visits: Parents of Children with HFA and Parents of Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Categories | HFA | MLD | χ^2 |
|-------------------|-----|-----|---------------------------|
| <i>Perception</i> | | | |
| Didactic | 1 | 8 | n/a |
| Commentary | 50 | 116 | 26.2, df = 1, $p < 0.001$ |
| Questioning | 36 | 29 | 0.7, n.s. |
| Guiding | 29 | 98 | 37.5, df = 1, $p < 0.001$ |
| <i>Desire</i> | | | |
| Didactic | 1 | 2 | n/a |
| Commentary | 29 | 38 | 1.2, n.s. |
| Questioning | 38 | 23 | 3.7, df = 1, $p = 0.05$ |
| Guiding | 5 | 1 | n/a |
| <i>Emotion</i> | | | |
| Didactic | 1 | 0 | n/a |
| Commentary | 68 | 42 | 6.1, df = 1, $p = 0.01$ |
| Questioning | 97 | 47 | 17.4, df = 1, $p < 0.001$ |
| Guiding | 1 | 2 | n/a |
| <i>Cognition</i> | | | |
| Didactic | 1 | 1 | n/a |
| Commentary | 147 | 277 | 39.8, df = 1, $p < 0.001$ |
| Questioning | 62 | 61 | 0.008, n.s. |
| Guiding | 3 | 7 | n/a |

Table 16. *Categories of Pragmatic Context of Mental State Utterances in All Home Visits: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Categories | HFA | MLD | χ^2 |
|---------------|-----|-----|---------------------------|
| Self-interest | 5 | 0 | n/a |
| Sophisticated | 14 | 3 | n/a |
| Commentary | 190 | 268 | 13.3, df = 1, $p < 0.001$ |
| Information | 109 | 49 | 22.8, df = 1, $p < 0.001$ |
| Questioning | 27 | 51 | 7.4, df = 1, $p < 0.01$ |

Table 17. *Categories of Pragmatic Context of Mental State Utterances in All Home Visits: Children with HFA and Children with MLD (observations of the HFA group standardised to length of observations of the MLD group).*

| Categories | HFA | MLD | χ^2 |
|-------------------|-----|-----|---------------------------|
| <i>Perception</i> | | | |
| Self - Interest | 2 | 0 | n/a |
| Sophisticated | 3 | 2 | n/a |
| Commentary | 52 | 42 | 1.1, n.s. |
| Information | 5 | 2 | n/a |
| Questioning | 12 | 7 | 1.3, n.s. |
| <i>Desire</i> | | | |
| Self-interest | 1 | 0 | n/a |
| Sophisticated | 2 | 0 | n/a |
| Commentary | 43 | 34 | 1.0, n.s. |
| Information | 8 | 1 | n/a |
| Questioning | 6 | 5 | 0.1, n.s. |
| <i>Emotion</i> | | | |
| Self-interest | 0 | 0 | n/a |
| Sophisticated | 3 | 0 | n/a |
| Commentary | 68 | 36 | 9.8, df = 1, $p < 0.01$ |
| Information | 25 | 2 | n/a |
| Questioning | 8 | 3 | n/a |
| <i>Cognition</i> | | | |
| Self-interest | 2 | 0 | n/a |
| Sophisticated | 6 | 1 | n/a |
| Commentary | 27 | 156 | 90.9, df = 1, $p < 0.001$ |
| Information | 71 | 44 | 6.3, df = 1, $p < 0.05$ |
| Questioning | 0 | 36 | n/a |

Table 18. *Frequencies of Each Category of Mental State Utterances in All Home Visits and in Group Sessions: Parents and Teachers of Children with HFA (observations of home standardised to observations of Group Sessions).*

| Mental States | Parent | Teacher | χ^2 |
|---------------|--------|---------|---------------------------|
| Perception | 53 | 115 | 22.9, df = 1, $p < 0.001$ |
| Desire | 31 | 43 | 1.9, n.s. |
| Emotion | 70 | 64 | 0.3, n.s. |
| Cognition | 96 | 192 | 32, df = 1, $p < 0.001$ |

Table 19. *Frequencies of Each Category of Mental State Utterances in All Home Visits and in Curriculum Sessions: Parents and Teachers of Children with HFA (observations of home standardised to observations of curriculum sessions).*

| Mental States | Parent | Teacher | χ^2 |
|---------------|--------|---------|---------------------------|
| Perception | 76 | 132 | 15.1, df = 1, $p < 0.001$ |
| Desire | 45 | 77 | 8.4, df = 1, $p < 0.01$ |
| Emotion | 101 | 51 | 16.4, df = 1, $p < 0.001$ |
| Cognition | 138 | 213 | 16, df = 1, $p < 0.001$ |

Table 20. *Referents of Mental State Utterances in All Home Visits and in Group Sessions: Parents and Teachers of Children with HFA (observations of home standardised to observations of Group Sessions).*

| Referent | Parent | Teacher | χ^2 |
|----------|--------|---------|---------------------------|
| Self | 89 | 105 | 1.3, n.s. |
| Child | 123 | 218 | 26.5, df = 1, $p < 0.001$ |
| Other | 25 | 31 | 0.6, n.s. |

Table 21. *Referents of Mental State Utterances in All Home Visits and in Curriculum Sessions: Parents and Teachers of Children with HFA (observations of home standardised to observations of curriculum sessions).*

| Referent | Parent | Teacher | χ^2 |
|----------|--------|---------|------------|
| Self | 128 | 144 | 0.9, n.s. |
| Child | 177 | 174 | 0.02, n.s. |
| Other | 35 | 36 | 0.01, n.s. |

Table 22. *Functional Use of Mental State Utterances in All Home Visits and in Group Sessions: Parents and Teachers of Children with HFA (observations of home standardised to observations of Group Sessions).*

| Functional Use | Parent | Teacher | χ^2 |
|-------------------|--------|---------|---------------------------|
| True mental state | 232 | 349 | 23.6, df = 1, $p < 0.001$ |
| Conversational | 9 | 40 | 19.6, df = 1, $p < 0.001$ |
| Idiomatic | 9 | 25 | 7.5, df = 1, $p < 0.01$ |

Table 23. *Functional Use of Mental State Utterances in All Home Visits and in Group Sessions: Parents and Teachers of Children with HFA (observations of home standardised to observations of Group Sessions).*

| Functional Use | Parent | Teacher | χ^2 |
|-------------------|--------|---------|---------------------------|
| <i>Perception</i> | | | |
| True mental state | 43 | 93 | 18.4, df = 1, $p < 0.001$ |
| Conversational | 6 | 14 | 3.2, n.s. |
| Idiomatic | 4 | 8 | n/a |
| <i>Desire</i> | | | |
| True mental state | 30 | 25 | 0.4, n.s. |
| Conversational | 1 | 18 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 70 | 64 | 0.3, n.s. |
| Conversational | 1 | 0 | n/a |
| <i>Cognition</i> | | | |
| True mental state | 89 | 167 | 23.8, df = 1, $p < 0.001$ |
| Conversational | 2 | 8 | n/a |
| Idiomatic | 5 | 17 | 6.5, df = 1, $p = 0.01$ |

Table 24. *Functional Use of Mental State Utterances in All Home Visits and in Curriculum Sessions: Parents and Teachers of Children with HFA (observations of home standardised to observations of curriculum sessions).*

| Functional Use | Parents | Teachers | χ^2 |
|-------------------|---------|----------|---------------------------|
| True mental state | 333 | 384 | 3.6, df = 1, $p = 0.05$ |
| Conversational | 13 | 68 | 37.3, df = 1, $p < 0.001$ |
| Idiomatic | 13 | 21 | 1.9, n.s. |

Table 25. *Functional Use of Mental State Utterances in All Home Visits and in Curriculum Sessions: Parents and Teachers of Children with HFA (observations of home standardised to observations of curriculum sessions).*

| Functional Use | Parent | Teacher | χ^2 |
|-------------------|--------|---------|---------------------------|
| <i>Perception</i> | | | |
| True mental state | 62 | 102 | 9.7, df = 1, $p < 0.01$ |
| Conversational | 9 | 15 | 1.5, n.s. |
| Idiomatic | 6 | 15 | 4.5, df = 1, $p < 0.05$ |
| <i>Desire</i> | | | |
| True mental state | 43 | 27 | 3.6, df = 1, $p = 0.05$ |
| Conversational | 2 | 50 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 101 | 51 | 16.4, df = 1, $p < 0.001$ |
| <i>Cognition</i> | | | |
| True mental state | 128 | 204 | 17.4, df = 1, $p < 0.001$ |
| Conversational | 2 | 3 | n/a |
| Idiomatic | 7 | 6 | 0.1, n.s. |

Table 26. *Use of Mental State Utterances in All Home Visits and in Group Sessions: Parents and Teachers of Children with HFA (observations of home standardised to observations of Group Sessions).*

| Use | Parent | Teacher | χ^2 |
|-----|--------|---------|---------------------------|
| (1) | 166 | 289 | 33.2, df = 1, $p < 0.001$ |
| (2) | 59 | 96 | 8.8, df = 1, $p < 0.01$ |
| (3) | 25 | 29 | 0.3, n.s. |

explained: "It's because he always keeps quiet; he has good manners.". Then Michelle, another teacher turned to Patrick saying: "Being praised again!"; *Patrick blushed* and she asked him: "*You're embarrassed, aren't you?*". Patrick just gave a smile and did not say anything.

Embarrassment was also expressed verbally by the same high-functioning adolescent. His teacher, Michelle asked Patrick whether he liked watching himself on the video and he said: "no". When she asked him: "what he didn't like about it", he said that he felt "*embarrassed*".

Recognition of another's feeling state

Here, the existing evidence has shown that autistic children did not have difficulty in understanding simple emotions (i.e., happiness, sadness, anger), but they were not able to recognise complex emotions, arising from beliefs (i.e., surprise) (Baron-Cohen, 1991d). All the incidents reported below support autistic children's ability to predict another person's simple emotions, such as happiness, frustration and dislike.

The following incident shows that a person with HFA/AS can make an apposite prediction of others' feelings (first-order theory of mind), although its verbal expression does not include an explicit reference to emotional states. For example, when Patrick was sitting next to his teacher, Michelle, during dinner time, he gave her a pat on the back and said with a little smile: "*You are lucky to be here for lunch.*". Michelle nodded and smiled to him. Then, the teacher explained to me that the normal arrangement was not to have lunch with the children (as was happening on that day) but to be on her break at that time, so that she would be with them when they would be playing in the garden. However, she did not like being outside, "unless it's a really warm day" (as Patrick added a few minutes later). Patrick knew that. Michelle had been lucky to be with the children at dinner time,

Table 56. *Use of Mental State Utterances in Children with HFA: Home and Curriculum Sessions (observations of home standardised to observations of curriculum sessions).*

| Use | Home | School | χ^2 |
|------------|------|--------|---------------------------|
| Perception | | | |
| (1) | 36 | 23 | 2.9, n.s. |
| (2) | 6 | 6 | n/a |
| (3) | 6 | 2 | n/a |
| Desire | | | |
| (1) | 27 | 7 | 11.8, df = 1, $p < 0.001$ |
| (2) | 3 | 2 | n/a |
| (3) | 5 | 0 | n/a |
| Emotion | | | |
| (1) | 42 | 20 | 7.8, df = 1, $p < 0.01$ |
| (2) | 12 | 5 | 2.9, n.s. |
| (3) | 8 | 1 | n/a |
| Cognition | | | |
| (1) | 75 | 52 | 4.1, df = 1, $p < 0.05$ |
| (2) | 7 | 13 | 1.8, n.s. |
| (3) | 15 | 9 | 1.5, n.s. |

Table 57. *Categories of Pragmatic Context of Mental State Utterances in Children with HFA: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Categories | Home | School | χ^2 |
|---------------|------|--------|---------------------------|
| Self-interest | 2 | 4 | n/a |
| Sophisticated | 6 | 2 | n/a |
| Commentary | 44 | 14 | 15.5, df = 1, $p < 0.001$ |
| Information | 45 | 138 | 47.3, df = 1, $p < 0.001$ |
| Questioning | 48 | 23 | 8.8, df = 1, $p < 0.01$ |

Table 31. *Categories of Pragmatic Context of Mental State Utterances in All Home Visits and Curriculum Sessions: Parents and Teachers of Children with HFA (observations of home standardised to observations of curriculum sessions).*

| Categories | Parent | Teacher | χ^2 |
|-------------|--------|---------|---------------------------|
| Didactic | 3 | 4 | n/a |
| Commentary | 178 | 181 | 0.02, n.s. |
| Questioning | 141 | 133 | 0.2, n.s. |
| Guiding | 23 | 129 | 73.9, df = 1, $p < 0.001$ |

Table 32. *Frequencies of Each Category of Mental State Utterances in All Home Visits and in Group Sessions: Parents and Teachers of Children with MLD (observations of home standardised to observations of Group Sessions).*

| Mental states | Parent | Teacher | χ^2 |
|---------------|--------|---------|----------------------------|
| Perception | 66 | 86 | 2.6, n.s. |
| Desire | 23 | 26 | 0.2, n.s. |
| Emotion | 33 | 342 | 254.6, df = 1, $p < 0.001$ |
| Cognition | 134 | 327 | 80.8, df = 1, $p < 0.001$ |

Table 33. *Frequencies of Each Category of Mental State Utterances in All Home Visits and in Curriculum Sessions: Parents and Teachers of Children with MLD (observations of home standardised to observations of curriculum sessions).*

| Mental States | Parent | Teacher | χ^2 |
|---------------|--------|---------|-------------------------|
| Perception | 19 | 11 | 2.1, n.s. |
| Desire | 6 | 15 | 3.8, df = 1, $p < 0.05$ |
| Emotion | 9 | 6 | 0.6, n.s. |
| Cognition | 37 | 30 | 0.7, n.s. |

Table 34. *Referents of Mental State Utterances in All Home visits and in Curriculum Sessions: Parents and Teachers of Children with MLD (observations of home standardised to observations of curriculum sessions).*

| Referent | Parent | Teacher | χ^2 |
|------------|--------|---------|-----------|
| Self | 29 | 19 | 2.1, n.s. |
| Child | 29 | 33 | 0.2, n.s. |
| Self/Child | 1 | 0 | n/a |
| Other | 10 | 8 | 0.2, n.s. |

Table 35. *Functional Use of Mental State Utterances in All Home Visits and in Group Sessions: Parents and Teachers of Children with MLD (observations of home standardised to observations of Group Sessions).*

| Functional Use | Parent | Teacher | χ^2 |
|-------------------|--------|---------|----------------------------|
| True mental state | 226 | 734 | 268.8, df = 1, $p < 0.001$ |
| Conversational | 14 | 38 | 11.1, df = 1, $p < 0.001$ |
| Idiomatic | 16 | 14 | 1.9, n.s. |

Table 36. *Functional Use of Mental State Utterances in All Home Visits and in Group Sessions: Parents and Teachers of Children with MLD (observations of home standardised to observations of Group Sessions).*

| Functional Use | Parent | Teacher | χ^2 |
|-------------------|--------|---------|----------------------------|
| <i>Perception</i> | | | |
| True mental state | 48 | 65 | 2.5, n.s. |
| Conversational | 9 | 14 | 1.1, n.s. |
| Idiomatic | 9 | 7 | 0.2, n.s. |
| <i>Desire</i> | | | |
| True mental state | 22 | 9 | 5.4, df = 1, $p < 0.05$ |
| Conversational | 1 | 17 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 32 | 342 | 256.9, df = 1, $p < 0.001$ |
| Conversational | 1 | 0 | n/a |
| <i>Cognition</i> | | | |
| True mental state | 124 | 318 | 85.1, df = 1, $p < 0.001$ |
| Conversational | 2 | 7 | n/a |
| Idiomatic | 7 | 2 | n/a |

Table 37. *Functional Use of Mental State Utterances in All Home Visits and in Curriculum Sessions: Parents and Teachers of Children with MLD (observations of home standardised to observations of curriculum sessions).*

| Functional Use | Parent | Teacher | χ^2 |
|-------------------|--------|---------|-----------|
| True mental state | 63 | 51 | 1.3, n.s. |
| Conversational | 4 | 9 | n/a |
| Idiomatic | 4 | 2 | n/a |

Table 38. *Functional Use of Mental State Utterances in All Home Visits and in Curriculum Sessions: Parents and Teachers of Children with MLD (observations of home standardised to observations of curriculum sessions).*

| Functional Use | Parent | Teacher | χ^2 |
|-------------------|--------|---------|-----------|
| <i>Perception</i> | | | |
| True mental state | 14 | 11 | 0.4, n.s. |
| Conversational | 3 | 0 | n/a |
| Idiomatic | 2 | 0 | n/a |
| <i>Desire</i> | | | |
| True mental state | 6 | 6 | n/a |
| Conversational | 1 | 9 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 9 | 6 | 0.6, n.s. |
| Conversational | 1 | 0 | n/a |
| <i>Cognition</i> | | | |
| True mental state | 35 | 28 | 0.8, n.s. |
| Conversational | 1 | 0 | n/a |
| Idiomatic | 2 | 2 | n/a |

Table 39. *Use of Mental State Utterances in All Home Visits and in Group Sessions: Parents and Teachers of Children with MLD (observations of home standardised to observations of Group Sessions).*

| Use | Parent | Teacher | χ^2 |
|-----|--------|---------|----------------------------|
| (1) | 181 | 330 | 43.4, df = 1, $p < 0.001$ |
| (2) | 43 | 383 | 271.4, df = 1, $p < 0.001$ |
| (3) | 29 | 68 | 15.7, df = 1, $p < 0.001$ |

Table 40. *Use of Mental State Utterances in All Home Visits and in Group Sessions: Parents and Teachers of Children with MLD (observations of home standardised to observations of Group Sessions).*

| Use | Parent | Teacher | χ^2 |
|------------|--------|---------|----------------------------|
| Perception | | | |
| (1) | 47 | 68 | 3.8, df = 1, $p = 0.05$ |
| (2) | 17 | 13 | 0.5, n.s. |
| (3) | 4 | 5 | n/a |
| Desire | | | |
| (1) | 18 | 22 | 0.4, n.s. |
| (2) | 0 | 4 | n/a |
| (3) | 2 | 0 | n/a |
| Emotion | | | |
| (1) | 21 | 104 | 55.1, df = 1, $p < 0.001$ |
| (2) | 6 | 183 | 165.8, df = 1, $p < 0.001$ |
| (3) | 6 | 55 | 39.4, df = 1, $p < 0.001$ |
| Cognition | | | |
| (1) | 95 | 136 | 7.3, df = 1, $p < 0.01$ |
| (2) | 22 | 183 | 126.4, df = 1, $p < 0.001$ |
| (3) | 6 | 8 | 0.28, n.s. |

Table 41. *Use of Mental State Utterances in All Home Visits and in Curriculum Sessions: Parents and Teachers of Children with MLD (observations of home standardised to observations of curriculum sessions).*

| Use | Parent | Teacher | χ^2 |
|-----|--------|---------|-----------|
| (1) | 51 | 37 | 2.2, n.s. |
| (2) | 12 | 23 | 3.4, n.s. |
| (3) | 8 | 2 | n/a |

Table 42. *Use of Mental State Utterances in All Home Visits and in Curriculum Sessions: Parents and Teachers of Children with MLD (observations of home standardised to observations of curriculum sessions).*

| Use | Parent | Teacher | χ^2 |
|-------------------|--------|---------|-----------|
| Perception | | | |
| (1) | 13 | 6 | 2.6, n.s. |
| (2) | 4 | 4 | n/a |
| (3) | 1 | 1 | n/a |
| Desire | | | |
| (1) | 5 | 9 | 1.1, n.s. |
| (2) | 0 | 6 | n/a |
| (3) | 1 | 0 | n/a |
| Emotion | | | |
| (1) | 6 | 4 | n/a |
| (2) | 2 | 1 | n/a |
| (3) | 2 | 1 | n/a |
| Cognition | | | |
| (1) | 27 | 18 | 1.8, n.s. |
| (2) | 6 | 12 | 2.0, n.s. |
| (3) | 5 | 0 | n/a |

Table 43. *Categories of Pragmatic Context of Mental State Utterances in All Home Visits and in Group Sessions: Parents and Teachers of Children with MLD (observations of home standardised to observations of Group Sessions).*

| Categories | Parent | Teacher | χ^2 |
|-------------|--------|---------|---------------------------|
| Didactic | 4 | 3 | n/a |
| Commentary | 172 | 375 | 75.3, df = 1, $p < 0.001$ |
| Questioning | 558 | 286 | 85.6, df = 1, $p < 0.001$ |
| Guiding | 39 | 113 | 36.0, df = 1, $p < 0.001$ |

Table 44. *Categories of Pragmatic Context of Mental State Utterances in All Home Visits and in Curriculum Sessions: Parents and Teachers of Children with MLD (observations of home standardised to observations of curriculum sessions).*

| Categories | Parent | Teacher | χ^2 |
|-------------|--------|---------|----------------------|
| Didactic | 1 | 0 | n/a |
| Commentary | 48 | 31 | 3.6, df = 1, p= 0.05 |
| Questioning | 16 | 11 | 0.9, n.s. |
| Guiding | 11 | 18 | 1.7, n.s. |

Table 45. *Frequencies of Each Category of Mental State Utterances in Children with HFA: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Mental States | Home | Group Sessions | χ^2 |
|---------------|------|----------------|----------------------|
| Perception | 34 | 44 | 1.3, n.s. |
| Desire | 25 | 12 | 4.6, df = 1, p< 0.05 |
| Emotion | 43 | 56 | 1.7, n.s. |
| Cognition | 67 | 75 | 0.4, n.s. |

Table 46. *Frequencies of Each Category of Mental State Utterances in Children with HFA: Home and Curriculum Sessions (observations of home standardised to observations of curriculum sessions).*

| Mental States | Home | Curriculum | χ^2 |
|---------------|------|------------|------------------------|
| Perception | 49 | 31 | 4.0, df = 1, p< 0.05 |
| Desire | 36 | 9 | 16.2, df = 1, p< 0.001 |
| Emotion | 62 | 26 | 14.7, df = 1, p< 0.001 |
| Cognition | 97 | 74 | 3.1, n.s. |

Table 47. *Referents of Mental State Utterances in Children with HFA: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Referent | Home | School | χ^2 |
|----------------|------|--------|---------------------------|
| Self | 118 | 141 | 2.0, n.s. |
| Teacher/Parent | 32 | 8 | 14.4, df = 1, $p < 0.001$ |
| Other | 13 | 28 | 5.5, df = 1, $p < 0.05$ |

Table 48. *Referents of Mental State Utterances in Children with HFA: Home and Curriculum Sessions (observations of home standardised to observations of curriculum sessions).*

| Referent | Home | School | χ^2 |
|----------------|------|--------|---------------------------|
| Self | 170 | 91 | 23.9, df = 1, $p < 0.001$ |
| Teacher/Parent | 46 | 20 | 10.2, df = 1, $p < 0.01$ |
| Other | 19 | 15 | 0.5, n.s. |

Table 49. *Functional Use of Mental State Utterances in Children with HFA: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Functional Use | Home | Group Sessions | χ^2 |
|-------------------|------|----------------|-----------|
| True mental state | 146 | 163 | 0.9, n.s. |
| Conversational | 9 | 7 | 0.2, n.s. |
| Idiomatic | 4 | 6 | n/a |
| Special code | 11 | 11 | n/a |

Table 50. *Functional Use of Mental State Utterances in Children with HFA: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Functional Use | Home | Group Sessions | χ^2 |
|-------------------|------|----------------|----------------------|
| <i>Perception</i> | | | |
| True mental state | 28 | 44 | 3.5, df = 1, p= 0.05 |
| Conversational | 4 | 0 | n/a |
| Idiomatic | 2 | 0 | n/a |
| <i>Desire</i> | | | |
| True mental state | 24 | 11 | 4.8, df = 1, p< 0.05 |
| Conversational | 2 | 1 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 43 | 56 | 1.7, n.s. |
| Conversational | 1 | 0 | n/a |
| <i>Cognition</i> | | | |
| True mental state | 51 | 52 | 0.009, n.s. |
| Conversational | 3 | 6 | n/a |
| Idiomatic | 2 | 6 | n/a |
| Special code | 11 | 11 | n/a |

Table 51. *Functional Use of Mental State Utterances in Children with HFA: Home and Curriculum Sessions (observations of home standardised to observations of curriculum sessions).*

| Functional Use | Home | Curriculum | χ^2 |
|-------------------|------|------------|------------------------|
| True mental state | 210 | 118 | 25.8, df = 1, p< 0.001 |
| Conversational | 13 | 4 | n/a |
| Idiomatic | 6 | 2 | n/a |
| Special code | 16 | 16 | n/a |

Table 52. *Functional Use of Mental State Utterances in Children with HFA: Home and Curriculum Sessions (observations of home standardised to observations of curriculum sessions).*

| Functional Use | Home | Curriculum | χ^2 |
|-------------------|------|------------|---------------------------|
| <i>Perception</i> | | | |
| True mental state | 55 | 30 | 1.4, n.s. |
| Conversational | 6 | 1 | n/a |
| Idiomatic | 3 | 0 | n/a |
| <i>Desire</i> | | | |
| True mental state | 34 | 8 | 16.1, df = 1, $p < 0.001$ |
| Conversational | 2 | 1 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 62 | 26 | 14.7, df = 1, $p < 0.001$ |
| Conversational | 1 | 0 | n/a |
| <i>Cognition</i> | | | |
| True mental state | 74 | 54 | 3.1, n.s. |
| Conversational | 4 | 2 | n/a |
| Idiomatic | 3 | 2 | n/a |
| Special code | 16 | 16 | n/a |

Table 53. *Use of Mental State Utterances in Children with HFA: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Use | Home | School | χ^2 |
|-----|------|--------|-------------------------|
| (1) | 126 | 116 | 0.4, n.s. |
| (2) | 20 | 39 | 6.1, df = 1, $p < 0.05$ |
| (3) | 24 | 32 | 1.1, n.s. |

Table 54. *Use of Mental State Utterances in Children with HFA: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Use | Home | School | χ^2 |
|-------------------|------|--------|----------------------|
| Perception | | | |
| (1) | 25 | 29 | 0.3, n.s. |
| (2) | 4 | 10 | n/a |
| (3) | 4 | 5 | n/a |
| Desire | | | |
| (1) | 19 | 9 | 3.6, df = 1, p= 0.05 |
| (2) | 2 | 3 | n/a |
| (3) | 4 | 0 | n/a |
| Emotion | | | |
| (1) | 29 | 28 | 0.01, n.s. |
| (2) | 8 | 9 | 0.05, n.s. |
| (3) | 6 | 19 | 6.8, df = 1, p< 0.01 |
| Cognition | | | |
| (1) | 52 | 50 | 0.03, n.s. |
| (2) | 5 | 17 | 6.5, df = 1, p= 0.01 |
| (3) | 10 | 8 | 0.2, n.s. |

Table 55. *Use of Mental State Utterances in Children with HFA: Home and Curriculum Sessions (observations of home standardised to observations of curriculum sessions).*

| Use | Home | School | χ^2 |
|-----|------|--------|------------------------|
| (1) | 181 | 102 | 22, df = 1, p< 0.001 |
| (2) | 29 | 26 | 0.2, n.s. |
| (3) | 35 | 12 | 11.2, df = 1, p< 0.001 |

Table 56. *Use of Mental State Utterances in Children with HFA: Home and Curriculum Sessions (observations of home standardised to observations of curriculum sessions).*

| Use | Home | School | χ^2 |
|------------|------|--------|---------------------------|
| Perception | | | |
| (1) | 36 | 23 | 2.9, n.s. |
| (2) | 6 | 6 | n/a |
| (3) | 6 | 2 | n/a |
| Desire | | | |
| (1) | 27 | 7 | 11.8, df = 1, $p < 0.001$ |
| (2) | 3 | 2 | n/a |
| (3) | 5 | 0 | n/a |
| Emotion | | | |
| (1) | 42 | 20 | 7.8, df = 1, $p < 0.01$ |
| (2) | 12 | 5 | 2.9, n.s. |
| (3) | 8 | 1 | n/a |
| Cognition | | | |
| (1) | 75 | 52 | 4.1, df = 1, $p < 0.05$ |
| (2) | 7 | 13 | 1.8, n.s. |
| (3) | 15 | 9 | 1.5, n.s. |

Table 57. *Categories of Pragmatic Context of Mental State Utterances in Children with HFA: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Categories | Home | School | χ^2 |
|---------------|------|--------|---------------------------|
| Self-interest | 2 | 4 | n/a |
| Sophisticated | 6 | 2 | n/a |
| Commentary | 44 | 14 | 15.5, df = 1, $p < 0.001$ |
| Information | 45 | 138 | 47.3, df = 1, $p < 0.001$ |
| Questioning | 48 | 23 | 8.8, df = 1, $p < 0.01$ |

Table 58. *Categories of Pragmatic Context of Mental State Utterances in Children with HFA: Home and Curriculum Sessions (observations of home standardised to observations of curriculum sessions).*

| Categories | Home | School | χ^2 |
|---------------|------|--------|---------------------------|
| Self-interest | 3 | 1 | n/a |
| Sophisticated | 8 | 0 | n/a |
| Commentary | 63 | 10 | 12.8, df = 1, $p < 0.001$ |
| Information | 65 | 110 | 11.6, df = 1, $p < 0.001$ |
| Questioning | 70 | 129 | 17.5, df = 1, $p < 0.001$ |

Table 59. *Frequencies of Each Category of Mental State Utterances in Children with MLD: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Mental States | Home | Group Sessions | χ^2 |
|---------------|------|----------------|---------------------------|
| Perception | 21 | 11 | 3.1, n.s. |
| Desire | 15 | 3 | n/a |
| Emotion | 15 | 103 | 65.6, df = 1, $p < 0.001$ |
| Cognition | 91 | 21 | 43.7, df = 1, $p < 0.001$ |

Table 60. *Referents of Mental State Utterances in Children with MLD: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Referent | Home | Group Sessions | χ^2 |
|----------------|------|----------------|---------------------------|
| Self | 90 | 107 | 1.5, n.s. |
| Teacher/Parent | 30 | 5 | 17.8, df = 1, $p < 0.001$ |
| Other | 15 | 22 | 1.3, n.s. |

Table 61. *Referents of Mental State Utterances in Children with MLD: Home and Curriculum Sessions (observations of home standardised to observations of curriculum sessions).*

| Referent | Home | Curriculum | χ^2 |
|----------------|------|------------|----------|
| Self | 25 | 4 | n/a |
| Teacher/Parent | 4 | 5 | n/a |
| Other | 4 | 3 | n/a |

Table 62. *Functional Use of Mental State Utterances in Children with MLD: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Functional Use | Home | Group Sessions | χ^2 |
|-------------------|------|----------------|-----------|
| True mental state | 120 | 130 | 0.4, n.s. |
| Conversational | 6 | 0 | n/a |
| Idiomatic | 10 | 0 | n/a |
| Special code | 6 | 8 | 0.3, n.s. |

Table 63. *Functional Use of Mental State Utterances in Children with MLD: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Functional Use | Home | Group Sessions | χ^2 |
|-------------------|------|----------------|---------------------------|
| <i>Perception</i> | | | |
| True mental state | 9 | 11 | 0.2, n.s. |
| Conversational | 2 | 0 | n/a |
| Idiomatic | 4 | 0 | n/a |
| <i>Desire</i> | | | |
| True mental state | 12 | 3 | n/a |
| Conversational | 0 | 0 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 7 | 103 | 83.8, df = 1, $p < 0.001$ |
| <i>Cognition</i> | | | |
| True mental state | 35 | 13 | 10.1, df = 1, $p < 0.01$ |
| Conversational | 5 | 0 | n/a |
| Idiomatic | 6 | 0 | n/a |
| Special code | 6 | 8 | 0.3, n.s. |

Table 64. *Use of Mental State Utterances in Children with MLD: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Use | Home | Group Sessions | χ^2 |
|-----|------|----------------|---------------------------|
| (1) | 108 | 60 | 13.7, df = 1, $p < 0.001$ |
| (2) | 18 | 56 | 19.5, df = 1, $p < 0.001$ |
| (3) | 16 | 22 | 0.9, n.s. |

Table 65. *Use of Mental State Utterances in Children with MLD: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Use | Home | Group Sessions | χ^2 |
|------------|------|----------------|---------------------------|
| Perception | | | |
| (1) | 8 | 9 | 0.05, n.s. |
| (2) | 3 | 2 | n/a |
| (3) | 1 | 0 | n/a |
| Desire | | | |
| (1) | 12 | 3 | n/a |
| (2) | 1 | 0 | n/a |
| (3) | 2 | 0 | n/a |
| Emotion | | | |
| (1) | 7 | 32 | 16, df = 1, $p < 0.001$ |
| (2) | 1 | 50 | n/a |
| (3) | 0 | 21 | n/a |
| Cognition | | | |
| (1) | 66 | 16 | 30.5, df = 1, $p < 0.001$ |
| (2) | 12 | 4 | n/a |
| (3) | 13 | 1 | n/a |

Table 66. *Categories of Pragmatic Context of Mental State Utterances in Children with MLD: Home and Group Sessions (observations of home standardised to observations of Group Sessions).*

| Categories | Home | Group Sessions | χ^2 |
|---------------|------|----------------|----------------------------|
| Self-interest | 0 | 0 | n/a |
| Sophisticated | 1 | 1 | n/a |
| Commentary | 97 | 4 | n/a |
| Information | 8 | 129 | 106.9, df = 1, $p < 0.001$ |
| Questioning | 18 | 3 | n/a |

Table 67. *Comparison of Frequencies of Mental State Utterances for Each Category of Psychological State as a Proportion of All Psychological State Utterances: Parents of Children with HFA and Parents of Children with MLD.*

| Mental States | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|---------------|---------------------------|---------------------------|----------------------------|
| Perception | 265 (21.2) | 183 (25.9) | 4.3, df = 1, $p < 0.05$ |
| Desire | 156 (12.4) | 64 (9.0) | 4.7, df = 1, $p < 0.05$ |
| Emotion | 350 (28.0) | 91 (12.8) | 152.1, df = 1, $p < 0.001$ |
| Cognition | 478 (38.2) | 368 (52.1) | 20 0, df = 1, $p < 0.001$ |
| Total | 1249 | 706 | |

Note: Numbers in parentheses are percentages.

Table 68. *Comparison of Frequencies of Mental State Utterances for Each Category of Psychological State as a Proportion of All Psychological State Utterances: Children with HFA and Children with MLD.*

| Mental States | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|---------------|---------------------------|---------------------------|---------------------------|
| Perception | 171 (20.1) | 58 (14.7) | 4.1, df = 1, $p < 0.05$ |
| Desire | 126 (14.8) | 42 (10.7) | 3.3, n.s. |
| Emotion | 216 (25.4) | 42 (10.7) | 27.9, df = 1, $p < 0.001$ |
| Cognition | 337 (39.6) | 250 (63.7) | 33.0, df = 1, $p < 0.001$ |
| Total | 850 | 392 | |

Table 69. *Comparison of Referents of Mental State Utterances as a Proportion of All Referents: Parents of Children with HFA and Parents of Children with MLD.*

| Referent | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|------------|---------------------------|---------------------------|-------------------------|
| Self | 445 (37.0) | 284 (41.9) | 2.7, n.s. |
| Child | 614 (51.0) | 285 (42.0) | 7.3, df = 1, $p < 0.01$ |
| Self/Child | 20 (1.66) | 13 (1.92) | 0.2, n.s. |
| Other | 123 (10.23) | 95 (14.03) | 5.4, df = 1, $p < 0.05$ |
| Total | 1202 | 677 | |

Table 70. *Comparison of Referents of Mental State Utterances as a Proportion of All Referents: Children with HFA and Children with MLD.*

| Referent | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|-------------|---------------------------|---------------------------|-----------|
| Self | 590 (72.2) | 250 (66.3) | 1.3, n.s. |
| Parent | 161 (19.7) | 84 (22.2) | 0.8, n.s. |
| Self/Parent | 1 (0.1) | 2 (0.5) | n/a |
| Other | 65 (7.9) | 41 (10.8) | 2.5, n.s. |
| Total | 817 | 377 | |

Table 71. *Comparison of Functional Use of Mental State Utterances as a Proportion of All Frequencies on Functional Use: Parents of Children with HFA and Parents of Children with MLD.*

| Functional Use | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|-------------------|---------------------------|---------------------------|-------------------------|
| True mental state | 1158 (92.7) | 624 (88.3) | 0.9, n.s. |
| Conversational | 46 (3.6) | 38 (5.3) | 3.0, n.s. |
| Idiomatic | 45 (3.6) | 44 (6.2) | 6.8, df = 1, $p < 0.01$ |
| Total | 1249 | 706 | |

Table 72. *Comparison of Functional Use of Mental State Utterances as a Proportion of All Frequencies on Functional Use: Parents of Children with HFA and Parents of Children with MLD.*

| Functional Use | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|-------------------|---------------------------|---------------------------|---------------------------|
| <i>Perception</i> | | | |
| True mental state | 215 (17.2) | 133 (18.8) | 0.7, n.s. |
| Conversational | 31 (2.4) | 26 (3.6) | 2.2, n.s. |
| Idiomatic | 22 (1.7) | 24 (3.3) | 5.1, df = 1, $p < 0.05$ |
| <i>Desire</i> | | | |
| True mental state | 149 (11.9) | 61 (8.6) | 4.5, df = 1, $p < 0.05$ |
| Conversational | 6 (0.4) | 3 (0.4) | n/a |
| <i>Emotion</i> | | | |
| True mental state | 349 (27.9) | 89 (12.6) | 47.3, df = 1, $p < 0.001$ |
| Conversational | 1 (0.08) | 2 (0.2) | n/a |
| <i>Cognition</i> | | | |
| True mental state | 445 (35.6) | 341 (48.3) | 18.0, df = 1, $p < 0.001$ |
| Conversational | 8 (0.6) | 7 (0.9) | 0.7, n.s. |
| Idiomatic | 23 (1.8) | 20 (2.8) | 2, n.s. |
| Total | 1249 | 706 | |

Table 73. *Comparison of Functional Use of Mental State Utterances as a Proportion of All Frequencies on Functional Use: Children with HFA and Children with MLD.*

| Functional Use | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|-------------------|---------------------------|---------------------------|---------------------------|
| True mental state | 728 (85.6) | 330 (84.1) | 0.1, n.s. |
| Conversational | 45 (5.2) | 18 (4.5) | 0.3, n.s. |
| Idiomatic | 22 (2.5) | 28 (7.1) | 13.8, df = 1, $p < 0.001$ |
| Special code | 55 (6.4) | 16 (4.0) | 2.7, n.s. |
| Total | 850 | 392 | |

Table 74. *Comparison of Functional Use of Mental State Utterances as a Proportion of All Frequencies on Functional Use: Children with HFA and Children with MLD*

| Functional Use | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|-------------------|---------------------------|---------------------------|---------------------------|
| <i>Perception</i> | | | |
| True mental state | 138 (16.2) | 51 (13.0) | 1.8, n.s. |
| Conversational | 21 (2.5) | 5 (1.3) | 1.8, n.s. |
| Idiomatic | 12 (1.4) | 12 (3.1) | n/a |
| <i>Desire</i> | | | |
| True mental state | 118 (13.4) | 32 (8.1) | 7.3, df = 1, $p < 0.01$ |
| Conversational | 8 (1) | 0 | n/a |
| <i>Emotion</i> | | | |
| True mental state | 215 (25.2) | 42 (11) | 27.5, df = 1, $p < 0.001$ |
| Conversational | 1 (0.1) | 0 | n/a |
| <i>Cognition</i> | | | |
| True mental state | 257 (30.2) | 205 (52.2) | 35.1, df = 1, $p < 0.001$ |
| Conversational | 15 (1.8) | 13 (3.3) | 2.9, n.s. |
| Idiomatic | 10 (1.1) | 16 (4.1) | 10.8, df = 1, $p < 0.01$ |
| Special code | 55 (6.5) | 16 (4.1) | 2.7, n.s. |
| Total | 850 | 392 | |

Table 75. *Comparison of Use of Mental State Utterances as a Proportion of the Overall Use of Utterances: Parents of Children with HFA and Parent of Children with MLD.*

| Use | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|-------|---------------------------|---------------------------|----------------------|
| (1) | 829 (66.4) | 499 (71) | 1.2, n.s. |
| (2) | 293 (23.4) | 128 (18.1) | 5.9, df = 1, p= 0.01 |
| (3) | 127 (10.1) | 79 (11.2) | 0.4, n.s. |
| Total | 1249 | 706 | |

Table 76. *Comparison of Use of Mental State Utterances as a Proportion of the Overall Use of Utterances: Children with HFA and Children with MLD.*

| Use | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|-------|---------------------------|---------------------------|-----------|
| (1) | 628 (73.9) | 298 (76) | 0.2, n.s. |
| (2) | 101 (11.9) | 49 (12.5) | 0.1, n.s. |
| (3) | 121 (14.2) | 45 (11.5) | 1.5, n.s. |
| Total | 850 | 392 | |

Table 77. *Categories of Pragmatic Context of Mental State Utterances as a Proportion of the Overall Use of Pragmatic Categories: Parents of Children with HFA and Parents of Children with MLD.*

| Categories | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|-------------|---------------------------|---------------------------|------------------------|
| Didactic | 10 (0.8) | 11 (1.5) | 1.7, n.s. |
| Commentary | 618 (51.5) | 473 (62.9) | 10.7, df = 1, p= 0.001 |
| Questioning | 491 (40.9) | 160 (21.3) | 53.5, df = 1, p< 0.001 |
| Guiding | 81 (6.7) | 108 (14.4) | 27.7, df = 1, p< 0.001 |
| Total | 1200 | 752 | |

Table 78. *Categories of Pragmatic Context of Mental State Utterances as a Proportion of the Overall Use of Pragmatic Categories: Parents of Children with HFA and Parents of Children with MLD.*

| Categories | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|-------------------|---------------------------|---------------------------|---------------------------|
| <i>Perception</i> | | | |
| Didactic | 3 (0.2) | 8 (1.1) | n/a |
| Commentary | 104 (8.7) | 116 (15.4) | 18.7, df = 1, $p < 0.001$ |
| Questioning | 75 (6.2) | 29 (3.8) | 4.9, df = 1, $p < 0.05$ |
| Guiding | 61 (5.1) | 98 (13.0) | 35.8, df = 1, $p < 0.001$ |
| <i>Desire</i> | | | |
| Didactic | 2 (0.2) | 2 (0.3) | n/a |
| Commentary | 61 (5.1) | 38 (5.0) | 0.008, n.s. |
| Questioning | 81 (6.7) | 23 (3.0) | 11.8, df = 1, $p < 0.01$ |
| Guiding | 11 (0.9) | 1 (0.1) | n/a |
| <i>Emotion</i> | | | |
| Didactic | 2 (0.2) | 0 | n/a |
| Commentary | 143 (11.9) | 42 (5.6) | 19.5, df = 1, $p < 0.001$ |
| Questioning | 205 (17.1) | 47 (6.2) | 42.0, df = 1, $p < 0.001$ |
| Guiding | 2 (0.2) | 2 (0.3) | n/a |
| <i>Cognition</i> | | | |
| Didactic | 3 (0.2) | 1 (0.1) | n/a |
| Commentary | 310 (25.8) | 277 (36.8) | 18.6, df = 1, $p < 0.001$ |
| Questioning | 130 (10.8) | 61 (8.1) | 3.5, n.s. |
| Guiding | 7 (0.6) | 7 (0.9) | n/a |
| Total | 1200 | 752 | |

Table 79. *Comparison of Categories of Pragmatic Context of Mental State Utterances as a Proportion of the Overall Use of Pragmatic Categories: Children with HFA and Children with MLD.*

| Categories | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|---------------|---------------------------|---------------------------|---------------------------|
| Self-interest | 10 (1.4) | 0 | n/a |
| Sophisticated | 29 (4) | 3 (0.8) | n/a |
| Commentary | 399 (55.1) | 268 (72.2) | 11.8, df = 1, $p < 0.001$ |
| Information | 136 (18.8) | 49 (13.2) | 4.5, df = 1, $p < 0.05$ |
| Questioning | 56 (7.7) | 51 (13.7) | 9.1, df = 1, $p < 0.01$ |
| Total | 724 | 371 | |

Table 80. *Comparison of Categories of Pragmatic Context of Mental State Utterances as a Proportion of the Overall Use of Pragmatic Categories: Children with HFA and Children with MLD.*

| Categories | HFA frequency(percent) | MLD frequency(percent) | χ^2 |
|-------------------|---------------------------|---------------------------|-------------------------|
| <i>Perception</i> | | | |
| Self-interest | 5 (0.7) | 0 | n/a |
| Sophisticated | 6 (0.8) | 2 (0.5) | n/a |
| Commentary | 110 (15.1) | 42 (11.3) ^a | 2.6, n.s. |
| Information | 10 (1.4) | 2 (0.5) | n/a |
| Questioning | 26 (3.5) | 7 (1.8) | 2.4, n.s. |
| <i>Desire</i> | | | |
| Self-interest | 1 (0.1) | 0 | n/a |
| Sophisticated | 4 (0.5) | 0 | n/a |
| Commentary | 90 (12.4) | 34 (9.1) | 2.3, n.s. |
| Information | 17 (2.3) | 1 (0.3) | n/a |
| Questioning | 13 (1.7) | 5 (1.3) | 0.3, n.s. |
| <i>Emotion</i> | | | |
| Self-interest | 0 | 0 | n/a |
| Sophisticated | 6 (0.8) | 0 | n/a |
| Commentary | 143 (19.7) | 36 (9.7) | 15.4, df = 1, p< 0.001 |
| Information | 53 (7.3) | 2 (0.5) | n/a |
| Questioning | 17 (2.3) | 3 (0.8) | n/a |
| <i>Cognition</i> | | | |
| Self-interest | 4 (0.5) | 0 | n/a |
| Sophisticated | 13 (1.8) | 1 (0.3) | n/a |
| Commentary | 56 (7.7) | 156 (42.0) | 149.2, df = 1, p< 0.001 |
| Information | 150 (20.7) | 44 (11.8) | 10.9, df = 1, p= 0.001 |
| Questioning | 0 | 36 (9.7) | n/a |
| Total | 724 | 371 | |

restaurant relieves diners of the obligation to shape the world around them. Going to a restaurant would thus be a way of surrendering, of giving in to society's norms and standards and by accepting the restaurant's mores and habits, individuality and inventiveness suffer.⁵¹ Finkelstein's argument is perhaps valid if diners sheepishly accept and conform to the "law" of each restaurant. This is the case neither with Hulot nor with Mitsou, who both mount a certain degree of resistance to their respective restaurants and do not entirely accept the microcosms the restaurants propose.

Claude Chabrol features lower-class diners disturbing the world as it is ordered by the restaurant in his 1984 *Poulet au vinaigre* (English title: *Cop au Vin*). At one point in this film a young couple steal money from the till at the post office where they work and have a night out at *Château Gerbeau*, the local chic restaurant, in which they are extremely conspicuous. They order foie gras, veal sweetbreads, and champagne. The couple in this scene cannot hide their class status and their posture before their food is "lower class": they "dig in" to their meal, laugh abrasively, get food on their faces and generally lack the finesse, discretion and sobriety that such a place usually demands of its customers. Like Mitsou and Hulot, they go against the grain of the restaurant, revealing their class status by exposing the staging

⁵¹. Joanne Finkelstein, Dining Out: A Sociology of Modern Manners (Oxford: Polity Press, 1989), p. 5.

podiatry was alone amongst the PSM professions in facing widespread competition from unregulated practitioners operating in the private sector¹¹. Critics again cited the public safety issue as central to the problem and used it as a justification for the rejection of partial, "indicative" closure¹².

The Government had also sought to increase the available numbers of registered podiatrists for NHS work by expanding the number of state recognised training schools, establishing four new schools in as many years. Although the Chiropodists Board had vociferously opposed this development, claiming the expansion was carried out with excessive haste, it had been over-ruled by the Privy Council¹³. In addition, the Royal Commission Report on the NHS of 1979 had concluded that there was evidence that the profession was "*trying to restrict entry for monopolistic reasons*", and could not reasonably justify such opposition¹⁴.

All plans for a functional closure of podiatry comparable with that for dentistry or midwifery were crushed following the publication of a DHSS consultative document, which highlighted the basis of government opposition based on ideological and pragmatic grounds, particularly manpower provision¹⁵.

¹¹ Editorial (1981), *Therapy*, 8:23, 3rd December, 1981.

¹² Watts WD (1981), "*Indicative Closure Will Not Protect Public*", *BJC*, 45:2, p.30.

¹³ Dagnall JC (1981), Editorial, *BJC*, 46:11, p.244.

¹⁴ Dagnall JC (1980), "*Expanding Chiropodial Education*", Editorial, *BJC*, 45:3, p.55.

¹⁵ DHSS (1981), "*Proposals for Statutory Protection of Professional Title under the Professions Supplementary to Medicine Act 1960 and Closure of the Speech Therapy*

it³⁹.

If managers could be convinced of the benefits to patients and purse alike of podiatric surgery, then medical objection alone would be insufficient to prevent the establishment of podiatric surgery within the NHS⁴⁰. This potential had been recognised by the Podiatry Association in advance of the Griffiths reforms, which set the agenda for later progress within the new NHS ^{41,42,43}.

It was at this time that the Podiatry Association sought to limit the use of the word "*podiatry*" to signify only podiatric surgical practice, distinct from the title "*chiropodist*", which was to be left to describe the traditional skills associated with that name by public and medicine alike⁴⁴. The internal closure mechanism employed, which required stringent post-registration qualifications for membership, ensured the Podiatry Association course the distinction of being the only adequate surgical training which could withstand medical

³⁹ DoH (1989), "*Working for Patients*", para 2.13.

⁴⁰ Schreiber C (1994), PA Newsletter, July Edition, p.4.

⁴¹ "...not only would we save the Government millions of pounds...but would also save the general public considerable discomfort and waiting time...With the introduction of General Managers...we will be making representations to show how we could assist to this end." . Cited in Bell DRC (1985), "*Chairman's Message*", PA Journal, July, 1985, p.2.

⁴² Although one individual podiatric surgeon had succeeded in securing a recognised post within the NHS as early as 1977, this success was considered so vulnerable that the postholder requested the Podiatry Association Executive to refrain from mentioning it in discussions with the British Medical Association, for fear it might "*jeopardise the precedence to be set within the NHS*". Cited in Allard-Williams M (1977), personal correspondence to Laxton RL, 26th July, 1977.

⁴³ Allard-Williams M (1978), personal correspondence to Laxton RL , 8th March 1978; Bell DRC (1985), "*Chairman's Message*", PA journal, April, 1985, p.2

⁴⁴ Minutes of Meeting (1985), PA Executive Committee, 27th November, 1985.

which resulted from this decision led to a new confidence previously unseen in podiatric relations with medicine. This confidence was enhanced by the introduction of general management within the NHS, which shielded podiatric surgery from the threat of exclusion by medicine.

10.4. Podiatry and Medical Dominance : The Impact of Managerialism

The introduction of general management did not immediately signal a lessening in medical dominance in relation to podiatry, but it did reflect an increasing accountability to management. Under the Griffiths reform the new District podiatry managers were separated by several tiers from senior management, and hence the decision making process. As the “new” NHS reforms took shape the emphasis upon primary care and the internal market presented significant opportunities and threats for NHS podiatry.

The generalist and specialist forms of podiatry performed differently under the new reforms, the former increasingly threatened with down-sizing, whilst the latter emerged as a prized service.

Medical dominance was clearly strengthened under GP fundholding, and podiatric professional autonomy compromised, as state registered practitioners became directly accountable to GPs. Directly employed podiatrists became salaried at rates determined by the GP, and were required to accept referrals from the GP. Length of treatment time,