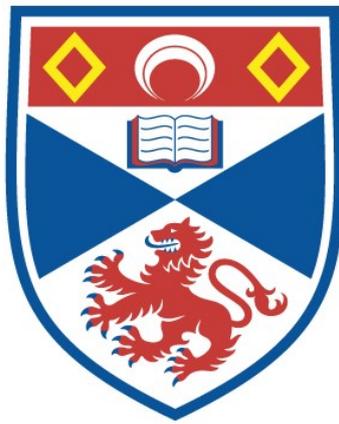


**ON SOCIAL, CULTURAL AND COGNITIVE ASPECTS OF
THEORY OF MIND IN PRACTICE**

Eva Loth

**A Thesis Submitted for the Degree of PhD
at the
University of St Andrews**



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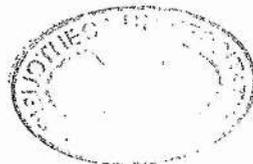
ON SOCIAL, CULTURAL AND COGNITIVE ASPECTS OF THEORY
OF MIND IN PRACTICE

by

Eva Loth

A thesis submitted in conformity with the requirements
for the degree of Doctor of Philosophy
School of Psychology
University of St Andrews

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To my parents

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ABSTRACT

Theory of mind (ToM) describes the ability to represent internal mental states. We propose that using ToM in practice depends upon the interplay of social, cultural and cognitive factors. The argument is divided into two parts.

First, we studied whether people with an Autism Spectrum Disorder (ASD) may have deficits, which impair acquisition of the cultural knowledge necessary to use ToM in practice. The acquisition of shared beliefs, such as social norms, might indirectly rely on metarepresentational capacities. Moreover, a piecemeal processing style – Weak Central Coherence (WCC) - might translate into difficulties in the acquisition of scripts of routine events, which are normally represented as holistic, hierarchically organised knowledge structures. In four experiments we show, first, that WCC may be specific, but not universal to individuals with ASD and that WCC and ToM deficits frequently overlap. Of the ASD group with different levels of ToM abilities, only those with ToM deficits had greater impairments in drawing inferences from social norms than matched control groups. Script abnormalities ranged from a profound lack of event knowledge to more subtle qualitative peculiarities. Especially ASD with WCC and ToM deficits showed a tendency to treat optional and very specific event acts that *could* occur as *should be* occurring.

The second part of the argument investigated whether power relations affect ToM usage in ordinary adults. A method to track and categorise ToM in ordinary talk was developed to study adults' accounts of real-life experiences in multi-

cultural settings. Key findings were that the quality and quantity of ToM talk differed when people accounted for experiences of situated powerlessness (that is, experiences of being discriminated against) compared to when they considered episodes in which power relations were equal. Preliminary data from an experimental study suggests that adults were more inaccurate in inferring the mental states of less powerful as opposed to equally powerful others.

We conclude by suggesting that an integrated social, cultural and cognitive framework of ToM in practice may contribute to our understanding of the social phenotype of ASD as well as it provides a new perspective on social phenomena such as intergroup relations.

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OUTLINE OF A 'CONTEXTUALISED PERSPECTIVE ON THEORY OF MIND IN PRACTICE'

1.1. INTRODUCTION

How do we perceive and make sense of the world we live in? A good part of this gigantic question, enormous in itself, is how do we understand our *social* world? Over the past two decades, psychology has seen the rapid development of a sub-discipline that suggests that to be able to interpret and predict others actions' (including our own) we need to have the ability to represent internal mental states, or in other words, to have a 'Theory of Mind'. The 'Theory of Mind approach' has brought together developmental psychologists studying typical and atypical development and primatologists. By joining forces, these parallel research strands set out to unravel primarily two questions: what is the nature of a Theory of Mind and how does it develop?

Although in line with this tradition, the proposal put forward in this thesis is to think of Theory of Mind not only in terms of a capacity but also beyond that, to consider how people use Theory of Mind in practice. To explore this question, we will be concerned with two phenomena: social dysfunctions in autism and cognitive processes involved in intergroup relations. The main task of this first chapter is to map out the framework that guided the work on these two seemingly disparate lines of research. In doing so, we shall first take a step back and give a brief review of relevant previous research.

The beginning of the 'Theory of Mind' tradition is usually credited to the primatologists Premack and Woodruff, who asked in their seminal paper of 1978 the now famous question "Does a chimpanzee have a Theory of Mind?" In his peer commentary, the philosopher Dennett (1978) pointed out that strictly one can only attribute someone with a Theory of Mind if he or she displayed evidence of understanding that another person can have a *false belief*. A false belief is a belief that is firstly, distinctly different from one's own belief and secondly, it does not need to match the states of reality. Demonstration of the ascription of a belief of that kind was argued to be the crucial 'litmus test' for a Theory of Mind, as otherwise it could not be ruled out that the chimp, or human being for that matter, was only making predictions based on their own representations of the world.

Some five years later, two developmental psychologists, Wimmer and Perner (1983) developed an elegant paradigm to test experimentally the understanding of a false belief, albeit not in chimpanzees but this time in three to four year old children. The following story is related to a participant child: Maxi, the protagonist, is presented with two drawers A and B. He puts some chocolate in drawer A and then goes away. In his absence, Maxi's mother moves the chocolate to drawer B. Maxi then comes back, wanting to eat some of his chocolate. At this point in the story the child is asked to predict where Maxi will look for his chocolate. The consistent finding is that at around four years of age children begin to correctly appreciate that the boy will look for the chocolate in the place where he left it because he is holding a false, or now 'out-of-date' belief about its whereabouts. By contrast, most three-year-olds suggest that the boy will look in the new place -where they know the chocolate is.

Wimmer and Perner's seminal paper inspired a whole generation of developmental psychologists to study socio-cognitive development in preschool years. It was found that around the same age as preschoolers pass false belief tasks, they display a whole range of new social competencies. For example, children begin to recognise that their own beliefs can be wrong (Gopnik & Astington, 1988), they distinguish between appearance and reality (Flavell, 1988; Flavell, Flavell & Green, 1983), understand informational access as a source of knowledge (Wimmer, Hogrefe, & Sodian, 1988) and they understand and engage in deceptive manipulation (Sodian & Frith, 1992). As all these skills are typically mastered by the age of four-years but failed by three-year olds, a number of authors suggested that around the age of four years, a fundamental conceptual change takes place in the mind of young children (e.g. Flavell, 1988; Forguson & Gopnik, 1988; Perner, 1991).

Clearly, understanding of false beliefs cannot be seen as the end-point of a child's socio-cognitive development. Around five to six years, children begin to grasp more complex second order beliefs constructions, such as inferences of the kind 'Peter believes Mary believes the ice cream van is in the park' (Wimmer & Perner, 1985). Moreover, only between eight and nine years do children begin to track speakers' communicative intentions in non-literal forms of language, such as irony or metaphor (Sullivan et al., 1995).

However, of greater interest to researchers has been how children younger than four develop the understanding of representational states of minds in the first place. Of course, these abilities do not miraculously appear around their fourth

birthday. Younger children display a variety of social predispositions and competencies before they pass false belief tasks, such as imitation, joint attention, or pretend play (Scaife & Bruner, 1975; Trevarthen, 1980; Meltzoff & Moore, 1983, 1989). These early social competencies have been linked to a representational understanding of mind in the sense of representing early developmental precursors to it (see Gómez *et al.*, 1993, for a discussion of different ways of conceptualising 'precursors').

The vital role of Theory of Mind abilities has been further highlighted by the finding reported in a seminal study by Baron-Cohen, Leslie and Frith (1985) that the majority of their participants with autism failed to understand a false belief.

Autism, or as it will be referred to in the rest of this thesis, Autism Spectrum Disorder (ASD), is a neuro-developmental disorder, characterised by deficits in social interaction, communication, imagination, and repetitive behaviours. Individuals with ASD often show a strong resistance to changes in routines, and some people with this condition have distinctly circumscribed areas of special interests or even talents. Critically, the failure of children with autism to pass the false belief test appeared to be a *specific* deficit, as the majority of a control group with learning difficulties who functioned at a comparable intellectual level, mastered the test.

What is more, a wealth of studies conducted since the study of Baron-Cohen *et al.* suggest that young children with autism often fail to display, or show severe impairments, in their early social behaviours such as pretend play, joint attention, or imitation (Mundy *et al.*, 1986; Mundy *et al.*, 1994, Lewis & Boucher, 1988; Charman *et al.*, 1997). The Theory of Mind deficit hypothesis of autism has been

one of the most influential cognitive accounts, as it generated precise and testable predictions of impairments in key areas defining this disorder, namely, the social, imagination and communication deficits. Moreover, this hypothesis has brought autism to the forefront of cognitive science. Researchers felt that enquiries into the minds of people with autism not only serve to understand the relation between cognitive abnormalities and behavioural impairments in this rare condition, but also provide an indirect avenue to obtain insights into the nature and development of cognitive abilities in general (Baron-Cohen et al., 1993; Baron-Cohen, 1995).

A number of theorists have used the empirical findings of the developmental course of early social competencies, in typical or atypical development, to formulate theories on the nature of a Theory of Mind. Differences between these proposals refer mainly to the extent to which children's understanding of mental states is seen as innate versus socially learnt, domain specific versus part of a more domain general intellectual ability, or whether a Theory of Mind is, at its core, a cognitive ability or develops from a more basic emotional understanding of people (see Carruthers & Smith, 1996, for a review of the debate).

Wellman (1990) was amongst the first who imported the term 'Theory of Mind' from the primate literature to start a systematic programme of research with children. The theory-theory view he advocates takes the notion of a *Theory of Mind* literally, because mental states are not directly observable, and because they form a system that can be used to generate predictions of future states (see Premack & Woodruff's original definition). Moreover, this view suggests that children's metacognitive understanding develops within a process of theory construction and change, not unlike the way scientists develop theories and replace them with other

ones that better fit the empirical data (Wellman, 1990, Gopnik & Wellman, 1994). Meltzoff argued that early imitation behaviour in toddlers gives evidence that they, and even still younger infants, understand others 'like me'. This, he suggested, provides the crucial precondition that fosters children's progress in this theoretical understanding (Meltzoff & Gopnik, 1993).

Perner postulated a metarepresentational ability - defined as the ability to represent the representational relation - (Perner, 1993, borrowed from Pylyshyn, 1978) to be a key feature of a Theory of Mind. He suggested that two to three year olds cannot as yet conceptualise the representational process, therefore they interpret mental states as relations to situations, and not as relations to person's representations of situations.

The ability to form metarepresentations, albeit conceptualised in a different way, is also thought to be the crucial cognitive substrate in the view of modularity theorists (Leslie, 1987; Baron-Cohen, 1995). This view postulates that a Theory of Mind is an ability specifically dedicated to the understanding of the social domain; a capacity that is innate, hard-wired, ingrained in the human genetic code. Conceptualised as a module, it is furthermore thought to work automatically and unconsciously, mandatorily and fast, and to be encapsulated from other cognitive processes. This view suggests that with development, this ability merely 'matures', as opposed to being actively acquired. The modularity view has been most fervently put forward by researchers studying Theory of Mind deficits in autism, since autism presumably involves an innate neuro-biologically based deficit. Baron-Cohen (1993, 1995) has stressed the role of joint attention in the development of a Theory of Mind, and Leslie (1987, 1994) argued that the same metarepresentational capacities that are necessary for the computation of mental states are first evidenced in pretend play.

A number of neuropsychologists, also departing from a consideration of deficits seen in autism, have suggested that Theory of Mind abilities might rely on a set of more general information processing skills, the group of executive functions, that are associated to the frontal lobes (e.g. Russell, 1997).

At the other end of the theory spectrum, simulation theorists argue that children derive concepts, such as belief and desire, from inspection of their own personal experience with these states, which they can then use to predict other's behaviour by mentally putting themselves in their shoes (Harris, 1992; Goldman, 1989; Gordon, 1986). These and other debates, although here presented only in a rudimentary and highly simplified way, are still ongoing (see Carruthers & Smith, 1996, also Astington & Gopnik, 1991). In recent years, they have been enriched by new perspectives, such as the emerging field of social cognitive neuroscience (Baron-Cohen, Tager-Flusberg, & Cohen, 2000).

In summary, the work discussed so far has been predominantly concerned with the investigation of the nature and development of the capacity to understand other minds in young children or individuals with a profound developmental disorder.

1.2. THE ORIGINS OF THE PRESENT APPROACH: TWO APPARENT PARADOXES

Two separate phenomena suggested to us that a metarepresentational ability *per se* might not in all circumstances guarantee that someone has a full understanding of others' mental lives, and of how these are related to their social actions.

1. Theory of Mind and social adaptation in high-functioning individuals with autism or Asperger's Syndrome

The first puzzle is related to the finding that a minority of intelligent individuals with high-functioning autism or Asperger Syndrome perform well on a variety of experimental Theory of Mind tasks (Bowler, 1992; Dahlgren & Trillingsgaard, 1996). Still, they display a variety of social incompetencies in their everyday life (e.g. Frith, 1989; Klin et al., 2000; 2002). Hence, the first question that concerns us is what are the factors that might prevent these talented individuals from translating their apparent Theory of Mind skills into naturalistic situations?

2. Theory of Mind usage in intergroup relations

A second apparent paradox emerged from considerations of a phenomenon in a rather different area. Within the Theory of Mind approach, relatively little work has explored Theory of Mind in typical adults. However, a handful of isolated studies suggests that adults sometimes display curious 'mistakes' on Theory of Mind tasks. Mitchell *et al.* (1996; in submission) showed that adults sometimes displayed a 'realist bias', as they tended to make judgements about whether or not a character would believe a message depending upon whether they themselves knew the message was true. Nelson, Plea and Henseler (1998) reported that a minority of their adult participants seemed to 'fail' the standard Maxi false belief task, but not because they did not have a genuine understanding of mental states. Instead, some adult participants predicted that Maxi would look for the chocolates in the place where they actually were by drawing on real-world knowledge and personal experiences.

More consistent evidence for adults' fallibility comes from different approaches within social psychology. For the past forty years, attribution theory has occupied a central place in social psychology (Jones & Davis, 1965; Kelley, 1967). Although this theory shares with the Theory of Mind approach its ancestry in Heider's (1958) 'folk psychology', the further development and application of this theory followed a rather different path. Whilst Theory of Mind researchers assume that people understand social behaviour on the basis of belief-desire inferences, attribution theorists divided perceivers' causal inferences into two categories: dispositional and situational (see Malle et al., 2000, for a critical review). This research suggests that adults tend to attribute actors' behaviour to their predispositions and neglect information of the situation, (Ross, 1977), they readily stereotype members of other groups (Fiske & Taylor, 1984), and assumptions concerning the current state of reality contaminates their recollection of prior information (Fischhoff, 1982).

Studies investigating the construct of 'empathic accuracy' (Ickes, 1993; Klein & Hodges, 1998), the ability to accurately infer what another person is thinking or feeling, may be influenced by motivational factors and the familiarity between the perceiver and the target. In other words, this research suggests that differences in empathic accuracy may not, or at least not only, lie in stable inter-individual differences, but emphasises the effect of factors that characterise the relation between perceiver and target.

What is more, the possibility that adults do not in all circumstances understand others' thoughts and feelings, or the meaning of their actions, is dramatically illustrated by accounts of historical real life events. Survivors of the

holocaust, such as Primo Levi or Simon Wiesenthal, have documented horrors and sufferings inconceivable to those of us fortunate enough to be born into a 'civilised', 'free' world. In Hitler's concentration camps, in Auschwitz, Bergen-Belsen, Dachau, Treblinka and many others, human beings were imprisoned, on the basis of their race, their religion, their disability or political views, discriminated against and dehumanised in the most extreme ways: degraded to beings less than human, to objects. To what extent do people in these situations understand the minds of the other? Staub (1989), for example, wrote of Amos Goeth, SS commandant at Auschwitz:

"This man, who was even more cruel and sadistic than his SS role required, apparently had no capacity to see his behaviour from the perspective of others (...). He was unable to appreciate that his prisoners, these 'objects' in his possession, had feelings and needs of their own that did not fit his needs and preferences – a not uncommon human blindness but in this case extreme in degree" (p. 128).

The depiction of an oppressor as unaware of the mental states of those who he suppresses does not appear to be a single case. Similar impressions can be found – albeit to varying degrees - in the commentaries of various other real-life intergroup relations, ranging from analyses of the relation between the colonisers and the colonised (Kiernan, 1996; Memmi, 1990; Sartre, 1961/1967) through to 'everyday racism' in contemporary societies (Essed, 1991). By contrast, the oppressed, whose fate is dependent upon the actions of their oppressors, have often been portrayed as having a better understanding of the mind of their oppressors. Despite historical and other differences, one common factor of these accounts is striking power differentials between the groups involved, i.e. the amount of power that members of

one group have over members of another one. When considering these accounts, the question that emerged was whether Theory of Mind usage may be modulated by social factors, and may vary across different social relations, specifically group and power relations.

Taken together, the puzzle that people with autism who pass Theory of Mind tasks may not be able to translate their Theory of Mind into commensurate social adaptation, and the possibility that adults, too, might not always be 'perfect mindreaders', led us to formulate a critique of some of the 'tacit assumptions' of the traditional Theory of Mind approach.

1.2.1. Critique of some assumptions of the Theory of Mind approach.

Our critique involves five points:

1) A focus on the structure of a metarepresentational mechanism, paired with a developmental perspective, led to a neglect of issues of on-line usage.

The lines of inquiry into the typical and atypical acquisition of a representational understanding of mind, as well as the parallel research avenue investigating the origins of Theory of Mind in non-human species, shares a developmental (ontogenetic or phylogenetic) perspective. The flipside of viewing Theory of Mind as a gradually developing capacity, however, is to construe it as a competence and therefore to neglect issues of on-line usage. Paradoxically, in this view, Theory of Mind abilities are only seen as flexible within relatively broad developmental time windows, say between three and four years, but on a moment-to-moment (or processing) time scale, they are construed as rather static. However,

every time we think about what someone believes, we perform a mental act in practice, which is situated in a particular physical and social context. Hence, following Chomsky's (1968) original distinction, we argue for the need to distinguish between Theory of Mind competence and performance (see also Lillard, 1998, for a similar argument).

2) Structure oriented theories of a Theory of Mind have largely neglected a consideration of content.

As mentioned earlier, theorists such as Leslie (1987) and Baron-Cohen (1993, 1995) made important contributions in showing that in autism, the cognitive architecture essential for the human capacity to compute metarepresentations, that is, to attribute *mental attitudes*, is impaired. Linguistically, mental attitudes are expressed in mental state terms, such as 'believing', 'wanting', 'intending' or 'expecting', as for example in the sentence "(I think) he doesn't want [x]". Hence, as is common in cognitive science (see Shweder, 1984), the concepts of 'Theory of Mind' and 'metarepresentations' thus construed involved a central concern with process and structure. This entails, however, a second criticism: the relative indifference to content, the [x] in the above formula.

3) Cultural decontextualisation

In contrast to many other modular systems as initially proposed by Fodor (1983), a Theory of Mind is not an input system (such as visual processes), but a central system. If we ask the question "*What* does X think Y thinks?" we need to consider the nature of that "*what*", the propositional content. This propositional

content may rely on observations directly obtained from the immediate environment. However, our argument is that this content often relies on cultural knowledge.

4) *Cognitive decontextualisation*

A neglect of content furthermore implies that a metarepresentational system is seen somewhat in isolation. Instead, we argue that mindreading functions may not only be the product of a metarepresentational mechanism, but also of other cognitive mechanisms with which Theory of Mind is *articulated*. Therefore, we need to specify the nature of that propositional content also because this leads us to identify on what other cognitive processes their representation relies. (For example, attentional processes, visual processes, memory processes and so forth – anything that can act as an ‘input system’, using the modularist model). This proposal does not deny the possible existence of domain specific Theory of Mind mechanisms as suggested, for example, by the modular accounts of Leslie or Baron-Cohen, but emphasises that, when carrying out mindreading functions, these mechanisms must work in collaboration with other cognitive mechanisms.

5) *Social decontextualisation*

Theory of Mind research has neglected to view the participants as truly social agents. In the endeavour to map behavioural abnormalities onto cognitive deficits, and to relate those in turn to biological abnormalities, behaviour, and especially social behaviour, has come to be viewed as something isolated, or decontextualised from its socio-cultural environment. As Ames *et al* (2001) have noted, participants in experimental situations have been portrayed- at least implicitly - as ‘lone mindreaders’. In this way, traditional Theory of Mind research has

consistently neglected a consideration of the identity of those who engage in social actions, the 'bearers' of this Theory of Mind capacity. As a consequence, his or her relations to the 'targets', those minds they read, have been neglected. This research has thus firstly, disembodied a cognitive capacity from a person, and secondly, persons from their social environment. Therefore, the possibility that social contextual variables may moderate Theory of Mind usage has been left unexplored.

1.3. FIRST STEPS TOWARDS A CONTEXTUALISED VIEW ON THEORY OF MIND IN PRACTICE

How does Theory of Mind usage operate in practice? We argue that on the one hand, we need social-contextual knowledge, i.e. information obtained from immediate cues, such as facial expressions, but most relevant here, cultural knowledge of norms and routines, for a Theory of Mind to operate effectively in practice. On the other hand, it is suggested that social contextual factors, such as power relations, may influence or moderate how Theory of Mind works in practice.

In order to study Theory of Mind in practice, it is therefore necessary to integrate the social, cultural and cognitive levels. The remainder of this section is devoted to expand on this proposal, as we introduce the concept of cultural knowledge, imported from cultural psychology, and discuss the identity of the mindreader, as derived from Social Identity theory.

We suggest that integrating the cultural and cognitive levels may open up a further way of studying social abnormalities in autism. More specifically, this approach may allow us to address why even people with ASD who pass Theory of Mind tasks might not be able to translate this skill into full social understanding and

adaptation. We further propose that integrating a Theory of Mind with the social level may provide a new way of approaching traditional issues of social psychology, such as intergroup behaviour, power and discrimination.

1.3.1. Cultural contextualisation

It is argued that for a Theory of Mind system to be fully operational, it has to work in collaboration with other systems to acquire its contents or inputs. A good part of such contextualised knowledge must be 'cultural knowledge'. Following two recently developed lines of research, 'cognitive anthropology' and 'cultural psychology, cultural knowledge is seen as a mediator between cognition and specific behaviour, which we need in order to frame and order our experiences and to imbue them with meaning. Different authors have used different terms for what is here called cultural knowledge. For example 'cultural models' (Quinn & Holland, 1987), 'higher-order cultural artefacts' (Cole, 1996/ Wartofsky, 1973), 'cultural meaning systems' (D'Andrade, 1984) 'social knowledge' (Schutz, 1970), a 'frame' in which symbols are related in a 'web of significance' (Geertz, 1973) or 'cultural representations' (Sperber, 1996). Quinn & Holland (1987) defined cultural knowledge as "[...] presupposed, taken-for granted models of the world that are widely shared (although not necessarily to the exclusion of other, alternative models) by the members of a society and that play an enormous role in their understanding of that world and their behaviour in it" (p.4).

As an illustration of the role of cultural knowledge for our understanding of the meaning of social actions, consider this fictitious anecdote about the Tibetan and

Mongolian belief in the *Nagas*: in traditional Tibetan myth, *Nagas* are mystical beings, half man, half snake, who dwell in water regions and are believed to control all natural phenomena including the weather. As many Tibetans and Mongolians lead a Nomadic existence and thus strongly depend on their natural environment, a range of customs and traditions serves the purpose of keeping the *Nagas* in a friendly mood. They will keep shrines to worship the *Nagas*, perform ceremonies and offer incense and butterlamps to keep themselves in favour and take particular care in keeping the water clean and pure, since this is the home of the *Nagas*. Another part of this belief is that all fish are children of the *Nagas*, consequently they should not be harmed or eaten.

For the Western modern mind, these beliefs and customs are little more than naïve superstitions of apparently 'undeveloped' people. After all, we know that forces other than a Naga in a gentle or angry mood influence the weather, and that it is beyond the control of human beings to influence these forces. Similarly, the belief that fish are descendants of the *Nagas* appears doubtful in light of evolutionary theory. If taken out of the (cultural) context, a practice such as not eating fish may seem irrational, as fish may enrich their very simple diet with essential proteins. The point, however, is, that this practice makes a great deal of sense, it is internally coherent, considered within the more global frame of beliefs in the *Nagas*. If one Mongolian observed another Mongolian carefully emptying a jar of sand in a stream, the observer may infer that the actor believes that the *Nagas* are angry. By performing this little ritual, he hopes to put himself and his family in favour before embarking on a long journey. However, if a Western visitor observed the same behaviour, the Mongolian's activity may remain opaque; it might be seen as irrational, strange or simply stupid. Although both the Western and the Mongolian

observer can reasonably be credited with a Theory of Mind capacity, their interpretations of the activity are very different, and heavily depend on the degree of knowledge of the cultural frame in which the Mongolian actor's behaviour takes place. Hence, the example highlights the relevance of cultural knowledge for the interpretation of experiences.

How is cultural knowledge acquired and organised?

In Bruner's (1986, 1990) view, culturally shared meanings are negotiated through shared modes of discourse. He argued that narrative thinking is one fundamental mode of thought (the other one being the paradigmatic mode). Knowledge of routine events, 'the canonical', develops through children telling others and themselves little stories about the happenings of the day, which aids them in establishing meaning of what happened and in forming more general knowledge structures of those routine events (Nelson, 1989).

Not contradicting Bruner's proposal, but more radically, Shweder (1984) asserted that cultural knowledge does not comply with the principles of logical reasoning, because the mind does not always work according to these 'enlightenment' principles. If that was so, he argued, then the ethnographic record would expose many people as 'deficient logicians', 'faulty statisticians', and 'muddled empirical scientists', as they hold 'false beliefs' and engage in institutionalised practices that strike us as highly irrational. Shweder argued that cultural ideas and practices are neither founded in logic nor empirical sciences, that they fall beyond the scope of inductive and deductive reasoning, and that they are neither rational nor irrational, but best described as 'nonrational'. Sperber (1985), by

calling cultural beliefs, for example religious beliefs such as in the holy trinity, 'apparently irrational beliefs', made a similar argument.

In sum, according to these authors the meaning of human actions and human beliefs does not solely depend upon logical reasoning abilities but also, and most fundamentally, upon the ability to situate them in their proper cultural context. For this, one needs to possess the appropriate cultural knowledge.

Do people with ASD have impairments in their acquisition of cultural knowledge?

Could it be that people with an autistic condition navigate through their own culture - perhaps not exactly like an 'anthropologist on mars', as half-jokingly suggested by Sacks (1995) - but like a foreigner who lacks knowledge of routine events, social rules and conventions necessary to understand individual actions? Consider again the example of the Mongolian *Nagas*. The Theory of Mind deficit hypothesis of autism traditionally predicts that people with ASD have equal difficulties interpreting a Mongolian's and the Westerner's actions, because of problems understanding the nature of their underlying mental states. However, perhaps people with autism may beyond this also experience difficulties similar to those of the Western observer confronted with the strange actions of the Mongolians whose cultural meaning he is unaware of. Because of problems with the background knowledge they might not be able to interpret the significance of particular behaviours as embedded within cultural frames. To stretch the example even further, the proposal is made that a Mongolian child with autism might not only have a deficit in Theory of Mind, but would also have difficulties acquiring the belief in the *Nagas* in the first place, with all its implications and entailments for the understanding of associated social practices.

The consequences of lacking cultural knowledge would be profound. A cognitive frame that imbues actions with meaning would be missing or dysfunctional.

What suggests that people with autism might have difficulties acquiring cultural knowledge? If, as has been argued above, cultural knowledge cannot be fully understood on the basis of logical reasoning abilities only, perhaps other distinct cognitive abilities participate in this acquisition process? Based on considerations of developmental theories of how typically developing children acquire cultural knowledge, we reasoned that two distinct cognitive abilities might be involved in this acquisition process. First, theorists, such as Bruner (1990) and Sperber (1996) have suggested (albeit in somewhat different ways) that the acquisition of shared cultural beliefs, such as social norms or real world knowledge, might rely on metarepresentational capacities. This would predict that specifically individuals with autism who lack such a Theory of Mind ability might also have difficulties with the acquisition of those shared cultural beliefs.

A second facet of cultural knowledge consists of event knowledge or scripts of routine events. These have been argued to be represented as holistic knowledge structures (Schank & Abelson, 1977; Nelson, 1986). In addition to Theory of Mind impairments (and possibly independent from them), it is currently assumed that people with ASD might also have a tendency to process information locally, in a detail-focused fashion (Frith, 1989; Happé & Frith, 1994). We reasoned that such a cognitive style might disadvantage people with ASD to grasp the holistic character of script knowledge. Consequentially, this might impair even those individuals with an autistic condition who have a Theory of Mind capacity, as measured by standard tests, and who, therefore, should be expected to be more able to make sense of

others' actions in everyday life. These are the fundamental hypotheses underlying the first part of this thesis.

1.3.2. Social contextualisation

The proposal we put forward in the second part of this thesis is that social contextualised factors defining the social relation between self and other, might modulate Theory of Mind usage in practice. To push this proposal forward, it is necessary to consider *why* people might use Theory of Mind flexibly and differently across different social relations. In doing so, it is necessary to take the adult mindreader out of his or her social isolation and to place him or her in a social context. Who are these adult mindreaders? And how are they related to others?

A lot of work in social psychology is concerned with group behaviour. One important question is how the individual and the group are related. The writer Levi, ex-prisoner 174517 in Auschwitz, wrote to his editor: "I do not understand, I cannot tolerate the fact that a man should be judged not for what he is but because of the group to which he happens to belong (Levi, 1986: p. x). Two related lines of research, Social Identity Theory (Tajfel, 1978; Tajfel & Turner, 1982) and Self Categorisation Theory (Turner *et al.*, 1987) suggest that – depending on the social context – this is exactly what people do. A core concept of this theory is that the self is multi-levelled, defined at different levels of abstraction. On the personal level 'I' differentiate myself from 'you', on the group level 'we' differentiate ourselves from 'them', members of another group, and on superordinate level my identity as a human being (in contrast to other species) is stressed. Social Identity researchers have been primarily interested in the intermediate group level, with the idea being

that through identification with different social groups or categories, the group is located in the individual. Moreover, Tajfel (1979) assumed that people are driven by the desire to obtain or maintain a positive view of the self. Membership of different groups contributes to that positive self-evaluation, as long as one's own group, the ingroup, is evaluated as 'better' in comparison with some other outgroup. Social Identity Theory has been one of the most influential approaches to intergroup behaviour and discrimination. The Social Identity approach serves as a framework to place the mindreader in a social context and to argue that power differentials are flexible across different social contexts and social relations. To this approach, which has hitherto neglected a consideration of cognitive processes, we import a Theory of Mind perspective.

Our main hypothesis is that it is strategically beneficial for those who are powerless to take the mental perspective of those in power, as well as it might be beneficial for those in power to neglect or even deny an independent mental perspective of those whom they suppress.

Taken together, to study these two distinct phenomena we suggest adopting a contextualised perspective of Theory of Mind in practice that considers how social, cultural and cognitive processes are at play in the mindreading process.

1.4. OUTLINE OF THESIS ORGANISATION

The empirical research presented in this thesis is divided up into two parts: in the first part we will explore whether people with autism might lack cultural knowledge, and whether hypothesised impairments might be related to distinct cognitive abnormalities associated with this disorder.

In Chapter 2, we will give an introduction to autism and Asperger's Syndrome. Two of the currently most prominent cognitive or psychological accounts will be reviewed: the Theory of Mind deficit account and the theory of Weak Central Coherence. We will discuss the contributions of each account for the understanding of Autism Spectrum Disorders, as well as some limitations, as pointed out by other researchers. We will propose one possibility of addressing some of the outstanding questions in a different way, by starting from the concept of cultural knowledge. Two facets of this concept will be examined: the understanding of real world knowledge of social norms and event scripts. Alternative hypotheses will be discussed that suggest that either Theory of Mind or Central Coherence or both may participate in the acquisition of these forms of cultural knowledge. Therefore, a first empirical study, presented in Chapter 3, is devoted to the characterisation of our participants with autism or Asperger's Syndrome, as well as control groups comprising individuals with learning difficulties and typically developing children and adults, in terms of their abilities in these two domains. In Chapters 4 to 6, we will investigate whether people with ASD might have relative impairments in two facets of cultural knowledge and how these are related to different degrees of Theory of Mind impairments and Weakness in Central Coherence. Study 2, presented in Chapter 4, will deal with social norms and real

world knowledge. In Studies 3 and 4 we will investigate generalised representations of routine events (Nelson, 1986, Schank & Abelson, 1977). In Chapter 5 we will present the results of a qualitative and quantitative study in which participants were asked to produce narratives of common and routine events. Chapter 6 will be concerned with a new Frequency Rating Task in which participants were asked to rate whether actions and elements that are central or optional to the event occur 'always' through to 'never' in specific instances. Chapter 7 summarises the results and gives an outlook for future research.

With Chapter 8 we turn to the second part of this thesis. Starting with our intuitive impressions of historical accounts of extreme intergroup situations, we review the extent to which social psychology has been concerned with the issues of power, intergroup discrimination and cognitive processes involved in these. Whilst by and large, power – despite its central role in social relations – remains a relative lacuna in social psychology in general, we will draw on a recent research strand within the social cognition paradigm that investigated the influence of power on impression formation. Whilst acknowledging its advances, a number of assumptions of this approach will be criticised. Therefore, a different view is proposed that imports a Theory of Mind perspective to the Social Identity approach to intergroup behaviour.

Within this framework, two empirical studies were conducted. In Study 5, will explore how adults use Theory of Mind in naturalistic language, and how different social conditions, notably power differentials, might affect Theory of Mind usage. As a starting point, it seemed reasonable to suppose 'race' or 'ethnicity' as one social category that entails different degrees of power (see Essed, 1991).

The study consisted of ethnographic interviews in which informants from different cultural and ethnic backgrounds were asked to talk about their experiences with members of their own and other ethnicities. However, race was not presupposed as defining someone as relative powerful or powerless, rather we were interested in the participants' subjective construal of power across different experiences. This initial aim could only partially be pursued as participants – independent of their ethnicity or any other socio-structural variable - tended to subjectively construe them as powerless. However, the material allowed us to explore a related question. A number of participants talked about experiences with different forms of racism. Hence, we could compare possible differences and patterns of Theory of Mind usage as manifest in *situated power usage*.

But in conducting the analysis, we faced an immediate challenge: how can we track and categorise Theory of Mind usage? As far as we are aware, no method has been published that allowed us to adequately address the questions at hand. Therefore, a first task consisted in devising a methodological instrument that allowed us to organise and quantify differential Theory of Mind usage. This method is presented in Chapter 9, and applied in Chapter 10 to the qualitative and quantitative analysis of the interview material. Patterns of differential Theory of Mind usage in accounts of experience with discrimination will be compared to the way participants accounted for other kinds of experiences. Moreover, we will analyse how for the powerless, Theory of Mind usage is related to their own subsequent behaviour – the extent to which participants also acted from the perspective of those who were in power. Chapter 11 presents a first endeavour to explore the possible effect of power on Theory of Mind usage experimentally. In doing so, we integrated the 'Reading the mind in the eyes task', an advanced test of

Theory of Mind (Baron-Cohen et al., 1997, 2001) in a role-play scenario in which students were either assigned to a powerful or powerless position. Chapter 12 summarises the findings of the second part of this thesis and gives an outlook for future directions in studying Theory of Mind in adults' intergroup relations.

In the final chapter, we will critically assess the extent to which these two empirical research strands have served as a vehicle to attain a more complete understanding of how social, cultural and cognitive factors may jointly participate in the 'mindreading process.

PART I:

AUTISM, THEORY OF MIND AND CULTURAL KNOWLEDGE

THE THEORY OF MIND AND CENTRAL COHERENCE ACCOUNTS OF AUTISM SPECTRUM DISORDERS

2.1. INTRODUCTION

Autism is a severe and pervasive developmental disorder, first recognised by the American paediatrician Leo Kanner as early infantile autism in 1943. In a collection of case studies, he insightfully described the striking behavioural abnormalities shown by his young patients that remarkably differed from the clinical pictures displayed in any other then known psychiatric condition.

In the absence of an identified biological cause, autism has since been characterised and clinically diagnosed on the basis of behavioural abnormalities, many of which still bear on Kanner's original observations. Abnormalities in social and communication development, alongside a display of repetitive interests and activities, currently form the essential core diagnostic criteria (DSM-IV, American Psychiatric Association, 1994; ICD-10, World Health Organisation, 1993).

Abnormalities in all three areas may be manifest in a variety of different ways among different individuals with an autistic condition as well as tending to change their expressions within any one individual over the course of his or her development. Although autism has often been discussed in terms of 'autistic children', the term 'pervasive' suggests that it is a life-long condition that does not 'go away' when adulthood is reached. Social abnormalities range from an aloof avoidance of others to 'odd' attempts to establish contact, say by giving a

monologue about a specialised topic such as trains, oblivious to the signs of disinterest in the other (Wing & Gould, 1979). Children with autism typically show abnormalities in eye contact notably in communicative situations, a lack of symbolic play, or show severe impairments in responding to others' emotions. People with autism often develop language with a considerable delay, and even where verbal language is acquired it is sometimes used in an echolalic fashion (repeating phrases instead of giving an answer). Most language difficulties relate to the pragmatic aspects of language usage, manifest, for example, in a tendency to interpret utterances in an overly literal sense, a failure to understand jokes and lies or failures in initiating or sustaining a conversation (Tager-Flusberg, 1981; 1993). The category of repetitive interests and activities includes relatively low level stereotypic movements, such as hand flapping, activities such as lining up objects or spinning toys around (instead of playing with them), as well as a strong insistence to sameness or the adherence to particular routines.

However, arguably, the puzzle and fascination with autism is that it does not present a blanket picture of impairments. Against the background of social impairments, many people with autism show areas of relatively preserved abilities. About ten times more often than in other developmental disorders, people with autism have special talents or skills, for example in memory, drawing, calendar calculation or music that exceeds the performance of most of us (Rimland & Hill, 1984).

The different symptom manifestations are further contributed by the individual's general intellectual level, as autism can be accompanied by varying degrees of learning difficulties. Two thirds of affected individuals function

intellectually in the range of moderate to severe learning difficulties (De Myer *et al.*, 1974; Lockyer & Rutter, 1969; Wing & Gould, 1979), but a 'talented minority' (Happé, 1994a), often referred to as people with high-functioning autism (HFA), have intelligence in the normal range. Hence, more severely learning disabled people with autism who function at the mental level of a young child may continue to display in adulthood behaviours that more able individuals with autism tend to display only in childhood.

From the above it was hoped to convey the impression that despite the emphasis on behavioural abnormalities, there is no single behavioural feature that is universal to all people with autism at all times (see Frith, 1989). The current trend to speak of autism as the 'autistic spectrum' (Wing, 1988), the 'autistic syndrome', or the notion of an 'autistic continuum' (Wing and Gould, 1979) highlights the diversity among children and adults with such a diagnosis.

Asperger Syndrome

In a seminal paper, Wing (1981) introduced the work of the Austrian Psychiatrist Hans Asperger to a wider English speaking community. Only one year after Kanner's publication, but independently from him, Asperger had published an account of four patients that resembled remarkably those described by Kanner. These patients too displayed awkward social naiveties and communication problems in conjunction with intensely pursued bizarre or idiosyncratic interests and inflexible routines. The term he chose to describe these children was autistic psychopathy in childhood. Wing (1991) suggested to reserve the label Asperger's Syndrome (AS) for individuals who function at the high-end of the autism spectrum. However, she did not provide explicit guidelines for diagnosis, and subsequent attempts at

definition differed in terms of what was seen as necessary or integral to this diagnosis in distinction from a diagnosis of autism (Gillberg & Gillberg, 1989; Szatmari, Bartolucci, & Bremner, 1989; Tantam, 1988; Klin et al., 1995). At the time this thesis is written, the status of Asperger Syndrome and its relation to autism is the subject of a vivid debate (Pomeroy, 1998). Most researchers agree that Asperger's Syndrome falls within the autism spectrum, but there is disagreement as to whether or not it deserves a separate label in distinction from individuals with high-functioning autism (see papers in Klin, Sparrow, & Volkmar, 2000, for the debate).

Currently, the diagnosis of Asperger's Syndrome is reserved for those individuals for whom a diagnosis of autism is excluded specifically due to an early history of relatively normal language acquisition as well as intelligence in the normal range (DSM-IV, APA, 1994; ICD-10, WHO, 1990). Impairments shown by individuals with Asperger's syndrome in the three diagnostically relevant areas are usually more subtle than in the more severely affected persons with autism of Kanner's type. People with Asperger's Syndrome have a significantly higher chance of leading an independent or semi-independent life, and to channel their specific interest into a professional career. However, in these individuals, social naivety and a lack of common sense may stand out even more sharply against the background of otherwise normal intelligence. It is as yet unclear, whether or not autism and Asperger's syndrome may differ in terms of their aetiology or their cognitive profile. In addition, Autism Spectrum Disorders also include individuals with the somewhat vague sounding diagnosis, PDD-NOS; Pervasive Developmental Disorder – Not Otherwise Specified, who show autistic features but do not fit the full clinical picture (Towbin, 1997).

A number of family and epidemiological studies suggest that both conditions involve a high genetic component. One indicator for this is that males are more often affected than females (3-4 :1, Wing, 1976; Rutter, 1978). The gender ratio is even more strongly biased towards males in both high-functioning autism and Asperger Syndrome. (9:1 in milder forms of high-functioning autism, Wing, 1981, and 8:1 in Asperger Syndrome, Ehlers & Gillberg, 1993). Secondly, a tendency of more than one family member having a diagnosis of autism or Asperger's Syndrome is much higher than the prevalence of both conditions in the population at large (Gillberg, 1989; Folstein & Santangelo, 1998). And a final indicator for a genetic/ heritable link as well as the suggestion that autism and Asperger's Syndrome are part of the same spectrum is the finding that autism and Asperger Syndrome sometimes co-occur in the same families.

The relation between the genotype, brain abnormalities and the cognitive or behavioural phenotype do not appear to be straightforward. Rather, genetic factors are seen as a predisposition, which might in combination with environmental factors (pre-, peri- or postnatal) or mere chance factors then cause brain abnormalities (Gillberg, 1991). Frith & Happé (1994) suggested that these different factors might channel into one common final pathway that affects the same specific components of the brain.

The work presented in this thesis is aimed at contributing to the understanding of abnormalities in cognitive mechanisms involved in autism spectrum disorders. It is currently assumed that the complex behavioural picture is not the result of one impairment only, but that the cognitive profile of autism spectrum disorders involves three distinct cognitive abnormalities: a deficit in

Theory of Mind, a weakness in Central Coherence and central executive dysfunctions (see, for example, Baron-Cohen & Swettenham, 1997; Happé, 2001). As noted in Chapter 1, a deficit in Theory of Mind describes impairments in the understanding that others' behaviour is based on representational mental states (Baron-Cohen, Leslie & Frith, 1985; Baron-Cohen, 1995). Frith coined the term Weakness in Central Coherence to describe a tendency to process information locally rather than holistically (Frith, 1989; Frith & Happé, 1994). Executive functions is an umbrella term for a group of neuropsychological skills associated with the frontal lobes, which are assumed to be involved in planning, flexibility, particularly set shifting, and to be necessary for the inhibition of prepotent responses. (e.g. Hughes & Russell, 1993; Ozonoff, Rogers & Pennington, 1991; Ozonoff & Jensen, 1999; Ozonoff, 1995; Pennington & Ozonoff, 1996; Rumsey & Hamburger, 1988; Russell, 1997).

The Theory of Mind hypothesis and the Central Coherence Theory provided the backbone of the studies described in subsequent chapters. In the following sections, how they have contributed to the understanding of different parts of the autism syndrome will be reviewed. As the executive function theory was not specifically investigated in the present research, the reader is referred to current research findings within this perspective and excellent reviews documented elsewhere (e.g. Hughes, 2001; Ozonoff & Strayer, 2001; Russell, 1997).

2.2. THE THEORY OF MIND HYPOTHESIS OF AUTISM

2.1.1. The success story

The Theory of Mind deficit hypothesis postulates that core impairments in autism spring from a specific cognitive deficit in representing mental states (Baron-Cohen, Leslie & Frith, 1985; Frith, 1989; Baron-Cohen, 1995). As reviewed in Chapter 1, the theory was built on the seminal finding reported by Baron-Cohen et al. (1985) that around 80% of participants with autism failed to understand a false belief in the 'unexpected transfer' task while the majority of people with learning difficulties of comparable mental age passed the task. In this view, the primary core impairment is essentially cognitive in nature, and not the result of emotional or affective deficits, as for example the alternative account of Hobson (1989) suggests. The Theory of Mind theory has arguably been one of the most stimulating theories for research from the mid eighties. Not only does the idea of 'mindblindness' (Baron-Cohen, 1995) fit intuitively well with the triad of social, communication and imagination impairments that are an essential part of the clinical picture. The strength of this theory is also the capacity to generate precise and testable predictions of which behaviours in the three above mentioned areas should be impaired or relatively intact in autism.

A great deal of research has shown that people with autism typically fail the whole set of standard false belief tasks (see Table 2.1.), they also fail to understand the appearance-reality distinction (Baron-Cohen, 1989c), and use mental state terms to a much lesser extent in narratives than verbal mental age matched control groups in narratives (Baron-Cohen et al., 1986). What is more, many of the early abnormalities in social interaction that form part of the diagnosis – pretend play,

social referencing, imitation, joint attention – can be theoretically accounted for as early signs or developmental precursors of a Theory of Mind.

Further evidence for the role of Theory of Mind deficits for the behavioural phenotype of autism comes from linking a range of language, especially communication deficits, to underlying Theory of Mind impairments. Notable is the work by Tager-Flusberg who found that people with autism rarely use language to share attention, they fail to provide new information that the listener cannot know, or to express intentions and other mental states in their language (Tager-Flusberg, 1992, 1993, 1997, 2001). Drawing on Sperber and Wilson's (1986) Relevance Theory that suggests that communication heavily relies on the understanding of speakers' informative and communicative intentions, Happé (1993) has shown that most people with autism have difficulties understanding non-literal speech, such as jokes, irony, white lies etc., that are part of pragmatic language.

Particularly illuminating for the specific consequences of Theory of Mind impairments has been research that employed 'the fine cuts method' This term was coined by Frith & Happé to describe empirical investigations that pit against each other behaviours that only differ in the involvement of a mentalistic component. Other cognitive demands (e.g. in executive functions, the understanding of linguistic instructions or motivational incentives) are sought to be kept at a similar level.

Sodian and Frith (1992), for example, showed that people with autism performed poorly on tasks involving deception, which require the manipulation of a competitor's belief by telling a lie or pointing to a wrong location. However, these same individuals were unimpaired on tasks involving sabotage, which only necessitate manipulating behaviour.

In a similar vein, the failure of people with autism in understanding mental representations were found to contrast with performance on tasks that required other types of 'external' representations. Leekam and Perner (1991) used an ingenious scenario created by Zaitchik (1990) in which participants witnessed how a picture of a toy cat was taken with a polaroid camera. The photo was then placed face down, meanwhile the cat was removed from location A, say, a chair, to a new location, say a bed. The test question then asked, "In the photo, where is the cat sitting?" In contrast to their poor appreciation of false or out-of-date beliefs, the participants with autism showed all intact understanding of the 'out-of-date' photograph. Interestingly, normal children younger than four years were as much impaired on this task as on the false belief version (Zaitchik, 1990), which suggests that the autism group and typically developing 3-year olds may struggle with false beliefs for different reasons.

Challenging the idea that autism involves an across-the-board deficit in understanding emotions, people with autism were found to be able to accurately identify basic emotions, such as happiness or sadness. At the same time, they struggled with complex 'cognitive' emotions, such as surprise, that require an understanding that something contrasting a person's belief had occurred (Baron-Cohen, Spitz, & Cross, 1993). Table 2.1. gives a summary of research findings that lent support to the Theory of Mind deficit hypothesis in autism.

In summary, the success story of the Theory of Mind account of autism is mainly due to its precise predictions regarding differential impairments in social behaviours, communication and imagination largely supported by an extensive empirical research programme.

Table 2.1. Selection of empirical findings supporting the Theory of Mind deficit hypothesis

Display of deficits in early precursors of Theory of Mind	
Mundy et al. (1986, 1989), Mundy, Sigman & Kasari (1994)	Autism group showed impairments in referential looking, joint attention deficits were found to relate to impairments in language development
Lewis & Boucher (1989)	Impairments in 'spontaneous' pretend play
Loveland & Landry (1986)	Autism group showed deficits in 'protodeclarative' pointing but not in 'protoimperative' pointing
Representational Theory of Mind deficits	
Baron-Cohen et al (1985)	Majority of autism group failed the Sally-Ann version of the 'unexpected transfer' paradigm
Baron-Cohen et al (1986)	Autism group did not use mental state terms in their language
Baron-Cohen (1989c)	Autism group failed to distinguish between 'appearance' and 'reality'.
Perner, Frith, Leslie, & Leekam. (1989)	Autism group failed to understand that 'seeing-leads-to knowing'
Perner et al (1989)	Autism group failed 'Smarties' – unexpected content task
Theory of Mind deficits in communication	
Happé (1994b)	People with HFA failed to understand non-literal language in 'strange stories', e.g. lie, white lie, double bluff, irony, sarcasm related to level of Theory of Mind competence measured on standard tasks
Happé (1993)	Autism group failed to understand metaphors
Tager-Flusberg (1992, 1993) Tager-Flusberg & Sullivan, (1995)	Rare use of language to join attention, few usage of mental state terms in narratives,
Surian, et al. (1996)	Autistic Theory of Mind failers failed to adhere to Gricean Maxims
Loveland et al. (1990)	Children with autism did not consider their listeners' needs when telling a story and produced bizarre or inappropriate utterances
'Fine cuts' distinctions	
Sodian & Frith (1992)	Autism group failed to understand deception but not sabotage
Leekam & Perner, 1991; Leslie & Thaiss; Charman & Baron-Cohen	Autism group failed to understand 'false belief' but not 'false photographs', 'false maps' or 'false drawings'
Baron-Cohen et al (1993 a)	Autism group failed to recognise 'cognitive emotions' (e.g. surprise) but understood 'basic emotions' (e.g. happiness)
Baron-Cohen (1989b)	Autism impaired in use/ understanding of protodeclarative pointing, but relative intact of protoimperative pointing

2.1.2. Limitations of the Theory of Mind hypothesis:

However, despite the success of the Theory of Mind hypothesis, a number of limitations have been noted both at the theoretical and the empirical levels:

1. Mentalising impairments are not universal to all people with autism.
2. Mentalising impairments are not unique to autism.
3. Mentalising impairments cannot explain the entire range of symptoms that define the autistic syndrome.

Mentalising impairments are not universal to all people with autism.

One of the first challenges of the Theory of Mind hypothesis relates to the requirement of a 'good' theory to account for universality. Remember that even if around 80% of people with autism failed to take a character's false belief into account to make predictions, this means that a small minority of around 20% passed the test! Likewise, some children with autism or Asperger's Syndrome were found to display some of the 'precursor' behaviours. However, where people with autism or Asperger's Syndrome passed the test, they were usually chronologically older, and crucially, had a higher mental age than typical children who master the task. Hence, from a developmental perspective, the universality issue could be rescued by the somewhat weaker claim that autism or Asperger's Syndrome involves a gross delay in Theory of Mind acquisition (Baron-Cohen, 1989). What is more, false belief understanding cannot be seen as representing the end-point in Theory of Mind development. In school years and through to adolescence, children make further improvements, such as being able to represent recursively embedded second and higher order mental states (see Chapter 1). Could it be that higher functioning

individuals with ASD fail to understand higher-order mental states, which is necessary to understand real-life communication, such as irony? A number of studies have established that a minority of people with autism and Asperger Syndrome also successfully pass second order false belief tasks (Ozonoff et al., 1991; Bowler, 1992; Dahlgren & Trillingsgaard, 1996). This suggests that at least a minority with this condition may have insight into the mind at the level of a normal 6-8 year old. Again, people with an autistic condition who passed the test were older and that leaves the possibility their Theory of Mind development was delayed at an earlier point. Nonetheless, these findings suggest individual differences between people with an autistic condition in terms of the level of their Theory of Mind impairments.

What are the moderating variables for success on false belief tasks in people with ASD? Happé (1995) reviewed a large number of studies using false belief tasks in autistic populations prior to 1995. Her meta-analysis suggests that for people with autism the probability of passing false belief tasks was related to their general level of development, notably their verbal mental age. Individuals with autism needed a far higher full scale IQ than those with learning difficulties in order to have a chance of passing the tasks.

Yirmiya, Solomonica-Levi, Shulman, & Pilowsky (1996) found that for the autism group, verbal ability correlated with Theory of Mind performance, whereas for a control group of individuals with learning difficulties, Theory of Mind correlated with non-verbal IQ. Tager-Flusberg (1997, 2000) found language, and specifically syntactic ability, to be the single best predictor of false-belief performance for children with autism. Moreover, people with a diagnosis of Asperger's Syndrome on the whole pass false belief tasks more often than those with

autism (e.g. Bowler, 1992; Ozonoff, Rogers, & Pennington, 1991). It is currently debated whether differences in Theory of Mind performance may represent a cognitive domain that possibly distinguishes high-functioning autism from Asperger Syndrome (Ozonoff & McMahon Griffith, 2000).

Theory of Mind deficits are not unique to people with autism.

Delays in the development of the ability to represent mental states have been found in other conditions, for example, in children who were born deaf (Peterson & Siegal, 1995), and children with general learning difficulties (Yirmiya, Erel, Shaked, & Solomica-Level, 1998). 'Hard to manage' children with disruptive conduct disorder (Happé & Frith, 1996; Dunn & Hughes, 2001; Hughes, Dunn & White, 1998) showed biases towards a theory of 'nasty minds', and in conjunction with executive function deficits, slight ToM impairments were related to violent pretend play. Additionally, Theory of Mind deficits have also been found in adults with schizophrenia (Corcoran 2000; Langdon & Coulthart, 2001) and people with acquired right hemisphere damage after stroke (Happé, Brownell, & Winner, 1999). These conditions do not share the characteristic social, imagination, and communication deficits with the autism syndrome.

Mentalising deficits cannot explain the entire range of symptoms defining the autistic syndrome

As a domain-specific ability, dedicated to the social domain, the Theory of Mind account has trouble generating predictions for the presence or absence of the non-social features that form part of the syndrome. For example, from a Theory of Mind perspective, repetitive behaviours and restricted interests, which form an

essential diagnostic category, are assigned the status of 'secondary symptoms of Minds'—the by-product or consequence of an attempt to re-establish order in an otherwise confusing and unpredictable world (e.g. Frith, 1989; Joliffe et al., 1992).

Moreover, as Happé (1997, 1999) has pointed out, as a deficit account its weakness becomes particularly apparent in relation to preserved or superior skills and the fascinating unusual talents. For example, why and how could a deficit in Theory of Mind relate to good rote memory drawing abilities, absolute pitch or astounding abilities in calendar calculation?

Researchers have been most concerned with the first and third criticism. The criticism that Theory of Mind deficits have been found in other populations may be less challenging. Possibly, their difficulties with false belief tasks might have different reasons or their mentalising deficits take a different developmental course, and are not – as in autism - accompanied by the earlier deficits in 'precursors' to a Theory of Mind.

Let us now consider different suggestions concerned with the universality issue. Not only is the finding that some people with ASD pass Theory of Mind tasks a challenge for the universality claim, it raises another important question: why does good performance on standard Theory of Mind tasks not translate into commensurate social competence in unstructured naturalistic situations?

A first suggestion was that task success might not reflect genuine mentalising competence. Perhaps people with autism use compensatory strategies, which allows them to 'hack out' the correct solution (see Frith, 1989) but this does not mean that they have an intuitive understanding of the characters mental states.

This possibility was given further room by the critique that standard experimental Theory of Mind tasks might have more the character of an explicit problem solving situation - where the problem to be solved is explicitly spelled out in form of the test question (Klin, 2000). Crucially, the character of most naturalistic situations is quite different. Participants in real life are required to spontaneously detect the relevant aspects of the social situation, as for example emotional expressions, and to quickly respond to them.

In order to account for the possibility that task success may be an artefact of a problem-solving situation, some authors have sought to create more naturalistic situations, as well as they have begun to investigate subtler mindreading difficulties. These include to present people with ASD with stories of everyday life (Kaland et al, 2002), using movies instead of static stories as stimuli (Heavey et al., 2000), or to present them with situations, such as embarrassment (Hillier & Allinson, 2002). As a good slice of the high-functioning group with ASD were now caught as failing these naturalistic tasks, the possibility remains that their Theory of Mind competence might have been fragile. This might have allowed them to show relatively good performance on tasks in which the to-be-computed mental state is presented in a more explicit way, but does not reflect a full intuitive understanding of more demanding social situations. However, a smaller minority has been found to perform relatively well across a range of different task situations, which suggests that a small proportion of people with ASD might after all possess true Theory of Mind competencies.

A second possibility could be that what these high-functioning individuals experience is not so much be a competence, but rather a performance problem in the

sense that the difficulty for them consists of using their existing Theory of Mind on-line in a complex, rapidly changing environment (Vinden & Astington, 2000; Klin, Schultz & Cohen, 2000). Here, we shall distinguish between two different types of accounts of such a performance difficulty.

Recently, a number of authors have suggested thinking of Theory of Mind in a broader sense. Tager-Flusberg and Sullivan (2000) suggested a 'componential model of Theory of Mind', which consists of two components. These two components are assumed to depend on distinct underlying neuro-cognitive mechanisms and to have different developmental trajectories. A 'cognitive component' refers to what has traditionally been regarded as a representational Theory of Mind in the narrower sense. A second 'social-perceptual component' includes immediate or on-line facets of social perception, such as the ability to distinguish between people and objects and emotion processing, especially the recognition of facial expressions of emotions. Tager-Flusberg and Sullivan (2000) referred to earlier independent suggestions by Baron-Cohen and Hobson that the cognitive Theory of Mind component develops from this social-perceptual component – joint attention mechanisms and eye direction detection in Baron-Cohen's model, and basic emotions in Hobson's proposal. The suggestion is that the social-perceptual component may remain impaired in high-functioning people with autism or Asperger's syndrome even after they have acquired a representational understanding of mental states.

Evidence that the perceptual component may be impaired comes from studies by Baron-Cohen et al (1997, 2001) that found that people with high-

functioning autism or Asperger's Syndrome had difficulties reading mental states from photographs of the eye region. Although this task required participants to understand the cognitive component of mental states, such as expressions of embarrassment, it is possible that their difficulties related to impairments in perceiving the cues emitted by the eyes, rather than having a deficit in terms of the mental lexicon of the expressions involved.

Klin (2000) asked high-functioning individuals with autism who had passed standard Theory of Mind task to watch a silent cartoon modelled on Heider's famous paradigm. It has been repeatedly found that people without a clinical condition readily anthropomorphize the stimuli (composed of moving geometrical shapes), and attribute mental states to the geometric figures, as for example "the small triangle was jealous of the big triangle etc". By contrast, Klin et al found that about three-quarters of the participants with autism restricted their narratives only to physical geometric descriptions.

In a recent study using sophisticated eye-tracking technology, Klin et al (2002) found that typical viewers of film sequences depicting complex social interactions focused on the eye-region, whereas viewers with autism predominantly focused on the mouth region. This study implies that not attending to the relevant social perceptual cues emitted by the actors might be – on the processing scale – a precursor for difficulties integrating relevant input information with mentalistic computations.

Another possibility for deficient usage of Theory of Mind in practice could be that these social impairments in people with high-functioning autism or Asperger's Syndrome may be due to other cognitive abnormalities associated with

these disorders that are of independent origins but participate in the on-line mindreading process. There is mounting evidence that beside Theory of Mind impairments, further cognitive abnormalities associated with the autistic syndrome are central executive dysfunctions and a weakness in Central Coherence. For example, it has been found that people who pass Theory of Mind tasks still display a weakness in Central Coherence (Frith & Happé, 1994). These cognitive abnormalities might impair individuals with autism or Asperger's Syndrome to compute relevant input information on which a specialised Theory of Mind mechanism relies to make mentalistic inferences.

In summary, most researchers agree that a substantial delay in Theory of Mind acquisition is a central cognitive abnormality in autism spectrum disorders but few would maintain that it can account for the entire autistic syndrome. Disagreement is as to whether Theory of Mind deficits are the core impairment or whether, alternatively, difficulties representing mental states may be part of a wider cognitive or emotional abnormality. Whilst earlier research mainly concentrated on the exploration of between-group differences, evidence that some people with autism pass so-called standard theory of mind tasks calls for the need to consider in more detail the reasons for individual differences in Theory of Mind amongst the ASD population and how they relate to behavioural differences in social adaptation and communication.

2.3. SEEING THE PIECES BUT IGNORING THE WHOLE:

THE CENTRAL COHERENCE THEORY

2.3.1. Origins of Central Coherence Theory: classic findings

At a time when most research with autism concentrated on the social part of the syndrome, Frith (1989) developed an ambitious theory that aimed to relate the social and non-social features on the basis of one common underlying cognitive peculiarity: weak Central Coherence. This term describes a preference to process incoming information in a featural manner, with an eye for detail but at the expense of integrating information into a coherent whole. Frith's theory was built on a number of empirical findings, whose significance laid dormant during the decade during which most research concentrated on social dysfunctions. For example, pioneering experimental work by Hermelin and O'Connor (1967) showed that people with autism had a relatively good memory for unconnected word strings. In contrast to control groups, who markedly improved when words were presented as meaningful sentences, the participants with autism did not seem to benefit from meaning in the same way (Hermelin & O'Connor, 1967). Most influential, however, was arguably the unexpected result by Shah & Frith (1983) who gave relatively low functioning children and adolescents with autism the children's version of the Embedded Figures Task (EFT). This task requires locating a simple shape, for example, a triangle, within a larger and more complex figure. The challenge is that the complex design is arranged so as to obscure the location of the simple shape. Contrary to the expectation that autism might involve visuo-spatial deficits, the autism group excelled on this task, performing significantly better than both normal children and children with learning difficulties matched in terms of their mental age.

This suggested that autism cannot in all respects be seen as a disability, particularly as even individuals with autism at the lower-functioning end with accompanying learning difficulties demonstrated this superior performance. Moreover, the study also indicated that autism might involve abnormalities in information processing in the non-social domain (see also Joliffe & Baron-Cohen, 1997).

Another commonly reported 'islet of ability' of the cognitive profile of people with autism is good performance on the Block Design sub-scale of the Wechsler Intelligence Test, relative to both performance on other sub-tests and the person's overall mental age (Lockyer & Rutter, 1970; Prior, 1979). Although Wechsler used the task as a measure for abstract conceptualisation and visual spatial skills, the task was first developed by Kohs (1923) within the Gestalt tradition and the intent to measure the ability to break up overall patterns into their logical units. Only if this is achieved can the participant successfully reconstruct the pattern from the available blocks.

In an early study, Frith and Snowling (1983) compared children with autism and dyslexia on a series of tasks that required integrating words by using the semantic context. For example, on a 'Homographs Task' (words with one spelling but two different meanings and pronunciations, as for example "In her dress there was a big tear", and "in her eye there was a big tear") participants were simply asked to read the sentences. Frith and Snowling found that children in the autism group showed impairments in using the preceding sentence context to determine the pronunciation of the homographs.

In order to account for the above-mentioned series of findings, Frith drew on insights from Gestalt psychologists who have argued that we normally have a 'drive'

to process the holistic properties of a stimulus prior to its constituent parts. Only if this drive is overcome, can we detect a part that is embedded within the holistic percept (Koffka, 1935; Kohler, 1929). If normal information processing is characterized by a 'force' that pulls together large amounts of information to extract a gist, establish coherence, or give 'global meaning', what would happen if such a drive were weaker than normal? Information might be processed more locally, in a piece-meal fashion and with a focus on details over the whole. Frith suggested that such a tendency might penetrate information processing across different domains, but with rather different consequences for each. In the non-social domain, a tendency to attend to local information, paired with a resistance to context information, might at times be advantageous. However, the same tendency would inevitably lead to disadvantages in situations where it is necessary to integrate information in its context in order to extract meaning: the social domain.

In recent years, Central Coherence Theory has stimulated a considerable amount of empirical research. One of the appeals of this theory is that it seems to fit with intuitions about a "good eye for details". For example, many children with autism are good at putting together jigsaw puzzles and are often as quick when the pieces are upside down than when they are upright. When looking at a picture they might remark on a little ball in the left corner, but not on the global scenery. Another clear asset of Central Coherence Theory is that it has the potentiality to account for those parts of the syndrome that are spared or skills and abilities at which people with ASD are good. Before Frith's proposal, this interesting part of the autistic syndrome remained unaccounted for, as no deficit theory has the power to explain superior abilities (see Happé, 1999).

2.3.2. The current state of the art

In recent years, a considerable amount of research generated by the Central Coherence Theory was particularly motivated by the aim to specify the nature of cognitive abnormalities related to the strength of the autistic intellect in the visuo-spatial and perceptual domains. Yet a parallel research avenue further explored the predicted impairments in extracting meaning in the semantic domain. Table 2.2 gives a summary of empirical findings in these three areas. Shah and Frith (1993) replicated earlier findings that people with autism performed better on the Block Design test than their mental age would predict. Even more telling for a fragmented cognitive style were the results on a second condition, in which the patterns were presented as pre-segmented. Unlike typical control participants who markedly improved in this condition, the autism group was not to the same extent aided by pre-segmentation. This suggested that they already spontaneously resisted the Gestalt force and might also have perceived the line drawings as segmented into block units in the unsegmented condition.

Jolliffe & Baron-Cohen (1997) replicated peak performance on the Embedded Figures task in adults with either high-functioning autism or Asperger's Syndrome. Complementing Shah & Frith's (1983) earlier findings, this result showed that a good eye for detail might be prevalent across ability levels.

However, taking the idea of Central Coherence further, it could be predicted that normal people find it harder to spot a target shape when hidden in a meaningful gestalt than when it is embedded in meaningless or abstract figures. On the contrary, people with autism - who are expected to have this drive for meaning to a lesser extent - should not be disturbed by the meaningful shape in the same way.

Table 2.2 Selected findings supporting and challenging Central Coherence Theory
(✓ = supporting CC Theory, - = challenging CC Theory, ✓/- = mixed results)

Task	Finding	
Block Design Task (Shah & Frith, 1993)	Autism group performed superior to controls	✓
Embedded Figures Task (Children's version) (Shah & Frith, 1983)	Autism group performed superior to controls	✓
Embedded Figures Task (Adult version) (Joliffe & Baron-Cohen, 1997)	Autism group performed superior to controls	✓
Modified version of EF task (Bryant & Brison, 1996)	As controls, ASD group was also slower in finding a target figure when hidden in a meaningful design	-
Navon's task (Mottron & Belleville, 1993)	Autism group showed efficient global processing when letters were congruent on the local and global levels, but impaired efficiency in processing the global component in the incongruent condition	✓/ -
Navon's task (Ozonoff, Strayer, McMahon & Filoux, 1994)	People with autism showed as much global advantage as normal participants	-
Navon's task (Plaisted, O'Riorden & Baron-Cohen, 1998)	Autism group made global errors in a divided attention condition, but was as quick in responding to the global target in the selective attention condition	✓/ -
(Rhinehart et al, 2000)	Faster response to global, as compared to local stimuli, slower response to local stimuli when global form was associated with different response, incongruent local information disturbed the processing of global stimuli	✓/ -
Visual illusions Happe, (1997)	Low-functioning individuals with autism succumb under visual illusions	✓
Thouless paradigm Ropar & Mitchell (2002)	Autism group exaggerated circularity to a smaller extent in the prior knowledge condition than when ambient perspective cues were given	✓/ -
Visual illusions Ropar & Mitchell (1999, 2001)	Autism group was susceptible to visual illusions measured by manual adjustment and verbal responses	-
Homograph task (Frith & Snowling, 1983)	Children with autism fail to use sentence information to disambiguate pronunciation of homographs	✓
Homograph Task (Frith & Snowling, 1986)	Children with autism improve when being instructed to read for meaning	✓
Homograph Task (Happe, 1997)	Replication of Frith & Snowling in older and higher-functioning individuals who passed Theory of Mind tasks	✓
Sentence Completion task (Happe, 2001)	Children with autism complete sentences locally, in a meaningless fashion	✓

Brian and Bryson (1996) tested this prediction with results challenging for Central Coherence Theory, as the participants with autism were also slower in finding the embedded figure in the meaningful picture.

Of particular interest is the question whether a putative weakness in Central Coherence indeed translates into preserved or superior skills, for example, the sometimes occurring extraordinary drawing talents or the musical 'absolute pitch'. Pring, Hermelin and Heavey (1995) gave the Block Design Test to people with autism with or without a considerable drawing talent. The two autism sub-groups were then compared with typical children who were also divided up depending upon whether or not they had an artistic talent. Both 'talented' groups (including those with and without autism) outperformed the children (with and without autism) who did not have a drawing talent in performance speed. Whilst there was no difference between the performance of the two talented groups, in the 'non-talented' groups, the children with autism performed better than those without autism, which replicates Shah and Frith's finding discussed above. Interestingly, this finding points to the possibility of individual differences on the Block Design Task both within the normal and the autism population.

In summary, with the exception of Brian and Bryson's finding, the Block Design and Embedded Figures Tasks have produced the most robust results.

Given that Weak Central Coherence is conceptualised as an amodal force, Happé (1997) reasoned that this cognitive style could also affect very low levels of perception. It has consistently been found that healthy individuals succumb to visual illusions, such as the famous Muller-Lyer illusion in which a line appears shorter when

bracketed by arrows pointing away than arrows pointing to the line. However if people with autism had fragmented perception, they may mainly focus on the instructed part without integrating it with the illusion-inducing context. Hence, Happé predicted that people with autism would be better at resisting visual illusions. She asked participants with and without autism to compare a number of standard visual illusions with a comparison element (e.g. line, triangle, circle) and to indicate whether they looked the same. In line with her prediction, she found that people with autism significantly more often resisted the illusion than comparison groups. However, recently, Ropar and Mitchell (1999, 2001) have criticised the methodology used in Happé's original study. They pointed out that the procedure lacked a condition in which participants could score correct for answering 'different', which therefore raised the possibility that the result might have been an artefact of the questioning. The same predictions were tested using a more sophisticated computer method that relied less heavily on verbal responses, as participants were asked to manually adjust the size of one of the inner circles of the Titchener illusion so that it matched the other. With two separate samples Ropar and Mitchell (1999, 2001) failed to replicate Happé's finding – their participants with autism were just as susceptible to the visual illusion as controls. Moreover, when performance on the Block Design and Embedded Figures task was also tested, correlation analyses showed little or no evidence for the suggestion that WCC was the common factor accounting for susceptibility.

Further research investigating visual-perceptual abnormalities in Autism Spectrum Disorders was motivated by a rival account, the Absence of Global

precedence Theory” (also called Hierarchical Deficit account) (Mottron & Belleville), which was developed from Navon’s (1977) Global Precedence Theory. This account suggests that normally the perception of global stimuli precedes the perception of local stimuli, and that global processing is normally not interfered with by local details. Much of this research has employed Navon’s ‘hierarchical letter paradigm’, in which a large letter is composed of smaller ones. A global advantage effect would be manifest if the participant responded faster and more accurately to the large ‘global’ letters, whereas a ‘global interference effect’ would be demonstrated by slower and less accurate responses.

A number of studies using this paradigm (see Table 2.2) have produced mixed results. Suggestions have been made that inconsistencies in these findings may be related to differences in population characteristics (Rhinehart et al., 2000) or task administration, such as the duration of stimuli (Jolliffe & Baron-Cohen, 1997). In summary, the inconsistency in performance shown by the autism group on this line of research represents a challenge for Central Coherence Theory, which suggests global processing may be deficient in autism in some conditions (Mottron and Belleville, 1993) but normal under others (Ozonoff, Strayer, McMahon & Filloux, 1994; Mottron, Burack, Stauder & Robaey, 1999).

Research investigating weakness in Central Coherence in the semantic domain include Happé’s study (1997) who replicated Frith & Snowling’s (1983) original finding that people with autism have difficulties using preceding sentence information to disambiguate pronunciation of homographs in a higher-functioning group that passed

Theory of Mind tasks. Jolliffe (1997) designed an Inference and an Ambiguous Sentence Task. Here, people with autism demonstrated failure to select the most coherent bridging inference and to use context to interpret an ambiguous sentence. More recently, Happé (2000) used a Sentence Completion Task that consists of a set of sentence stems (e.g. the sea tastes of salt and...) and the participant is required to complete the sentence with whatever first comes to his or her mind. It was found that people with autism more often completed the sentence locally with a common associate to the last word, for example, salt and pepper, ignoring the preceding sentence context which results, as in the above example, in meaningless sentences.

In summary, currently a wealth of research that supports the notion of weak Central Coherence in ASD in the visuo-spatial, perceptual, and semantic domains stands alongside a mounting number of studies that failed to find a preponderance for featural processing.

2.3.3. Outstanding questions

1. Is WCC as a relative tendency? As acknowledged by Happé (1997), a weakness of the theory in its current conceptualisation lies in the loose definition of the very notion of Central Coherence and the mechanisms involved. Clearly, the tenet that people with autism perceive the world in a fragmented, piece-meal fashion cannot be absolute: Individuals with autism see houses and not only windows and doors, and they perceive people and not only individual body parts. Hence, it appears more plausible to think of a fragmented perceptual style as a relative tendency (see also Baron-Cohen &

Swettenham, 1997). If their preference for details is relative, however, it remains unclear as to 'what' it is relative to.

2. Are there individual differences in CC amongst people with ASD and in the typical population? Although Central Coherence Theory has been studied in people with an autistic condition at very different levels of intellectual abilities, it remains unclear whether amongst the autism/ Asperger Syndrome groups, there may be degrees of weakness in Central Coherence, perhaps akin to levels of Theory of Mind understanding. Large inter-individual differences on more standard tests, such as the Block Design Task or the Embedded Figures Test, suggest considerable variability within the 'normal' range.

3. What is the developmental trajectory of Central Coherence in the normal population? What is lacking to date, are clear guidelines for comparison – Central Coherence Theory has mainly been developed in relation to its putative abnormality in autism – so that at this moment relatively little is known about how this cognitive style develops in normal children. What is the normal developmental trajectory of Central Coherence, or else could it be a relatively stable tendency? One interesting possibility, discussed by Happé (1999) relates to Takeuchi and Hules' (1993) suggestion that absolute pitch can be learned by most children before about 6 years of age, due to their 'ability' to perceive individual features. Happé (1999) suggested that a local processing bias might remain pervasive in autism throughout development, thus enabling the high frequency of absolute pitch seen in this condition whereas in normal children there would be a 'development' or shift from featural to 'relational' processing in middle childhood.

4. Within-subject data: is CC an amodal force, penetrating at once information processing in different domains? Most studies to date have employed between-subject designs but little is actually known about Frith's central claim that Central Coherence is an amodal force, which influences at once different areas within individuals.

Consequentially, the prediction would be that there should be a high correlation between the performances of different CC tasks tapping on different domains. One of the few relevant studies was conducted by Happé, Briskman and Frith (2001), in which parents of children with autism, dyslexia or normally developing children were compared on a battery of tasks that involved visual illusions, the Embedded Figures Task and the Sentence Completion Task. Although for fathers of children with autism, a tendency towards weakness in Central Coherence mainly yielded advantages, in line with Frith's original theory, they too, showed relative impairments on the semantic Sentence Completion Task.

5. A neurofunctional account? A neurofunctional account for the hypothesised drive for weak Central Coherence is as yet missing.

6. How does Weak Central Coherence affect social behaviour? Central Coherence Theory also generates predictions about social abnormalities. As Klin et al (2002) have noted, research on Central Coherence Theory has so far made few attempts to substantiate the distinct association between weak Central Coherence and the social dysfunctions in autism.

To sum up, Central Coherence Theory is unparalleled in the effort to account for an important aspect of the clinical picture of autism spectrum disorders – spared or even

superior skills – that none of the deficit accounts, as the Theory of Mind hypothesis or the executive dysfunction theory, can adequately address.

Considerable empirical evidence lends support to the prediction that a piecemeal processing style leads to advantages in the perceptual and visuo-spatial domains, but to disadvantages in the semantic domain. Future work is needed to address outstanding questions on the empirical and theoretical levels.

2.4. A NEW APPROACH: STUDYING CULTURAL KNOWLEDGE WITHIN THE FRAMEWORK OF A CONTEXTUALISED PERSPECTIVE ON THEORY OF MIND IN PRACTICE

The aim of the empirical research presented in subsequent chapters was to investigate the extent to which individuals with an autism spectrum disorder might have deficits or abnormalities in the acquisition of different facets of cultural knowledge. The approach put forward acknowledges the possibility that a few people with this condition could have genuine metarepresentational capacities, but it is suggested that their remaining difficulties (as well as difficulties for the more severely affected individuals) may lie in the disability to connect those with relevant ‘input’ or content information.

On a meta-theoretical level, both the Theory of Mind and Central Coherence accounts assume a causal model of three levels of explanation. The diversity of behavioural manifestations is caused by one (or more) cognitive abnormalities which are in turn rooted in one (or more) biological abnormalitie(s) (Morton & Frith, 1994).

The present proposal is that we need to add another level to the picture – the cultural level –, which is thought to mediate between cognition and specific behavioural manifestations.

Chapter 1 introduced cultural psychology, which argues that culture influences how and what we think. Recall Quinn and Holland's definition of cultural knowledge (1987) as some "...presupposed models of the world that are widely shared by the members of a society and that play a crucial role in their understanding of that world and specific actions in it." (p.4). By putting culture in the middle, the overarching question that concerns us is thus: Could it be that autism spectrum disorders involve impairment in the acquisition of those facets of cultural knowledge? To make this concept more tangible, let us think of it as real world knowledge of social norms and customs, a set of beliefs that guide us in what social actions are expected, acceptable or inappropriate in different situations, and as event knowledge, or scripts.

To avoid misunderstandings: the present proposal does not suggest that individuals with autism or Asperger's Syndrome are in every respect 'acultural'. As Baron-Cohen (1993) has pointed out, many people with an autistic condition can even be innovative in creating novel cultural artefacts, such as paintings, or in the construction of systems, such as in the domains of engineering or physics (Baron-Cohen, 2003). In Tomasello's account, creation and innovation are, however, only one facet of cultural advancements. The other part, he suggests, consists of the ability to faithfully pass on those inventions and innovations to other members of the community. Our proposal relates to this second facet of cultural learning, specifically to the more

narrow part of it that we, following the above definition, call cultural knowledge or cultural representations.

Why should we expect cultural knowledge to be impaired in ASD? So far, we know very little about the exact cognitive mechanisms necessary for the acquisition of cultural knowledge. Of course, there is a first possibility that cultural knowledge is acquired on the basis of general learning mechanisms. However, as discussed in Chapter 1, theorists have argued that the representation of cultural knowledge might not follow logical reasoning principles but that cultural knowledge is organised in a different, 'non-logical' way. In this light, a 'paradigmatic mode of thought' (Bruner, 1986), as for example, deductive and inductive reasoning skills, might not lead one the whole way to cultural knowledge acquisition.

A second possibility would be that cultural knowledge acquisition might rely on distinct cognitive abilities. Several authors – albeit coming from different departure points – have argued that in fact Theory of Mind might play a role in cultural knowledge acquisition (e.g. Mead, 1934; Theory of Mindasello, Kruger & Ratner, 1993; Theory of Mindasello, 1999; Sperber, 1996, 1997). Tomasello suggested that Theory of Mind or its precursors (imitation, joint attention) enable the child to engage in cultural forms of learning that may be beyond the reach of other non-human species: imitative learning, instructive learning and collaborative learning. Through these cultural learning processes, the child can actively learn about the culture in which he or she is raised.

Bruner (1986) suggested that Theory of Mind may be part of a broader mode of thinking: the interpretive mode. Sperber has argued that a metarepresentational ability

might be necessary to acquire shared beliefs. The content of these beliefs, often downplayed in the Theory of Mind literature, is, as Sperber has pointed out, non-trivial, because they are so widely shared. Addressing the question "how do beliefs become cultural?", he suggested (Sperber, 1996, 1997) to distinguish between two 'types' of beliefs, both of which can either be descriptive or normative but they fundamentally differ in terms of the way in which they are acquired. Intuitive beliefs (e.g. "Charcoal is black") are acquired either through perceptual experiences or inferences thereof; they are common and widely shared within and between cultures, because as humans, we share a similar perceptual apparatus. Reflective beliefs, on the contrary, are of an altogether different nature: reflective beliefs are acquired vicariously, not through one's own experience, but they are communicated to us by others, whom we trust, for example the belief that 'the earth is round', that 'god sees everything' or that 'there are male and female plants'. These beliefs are often only half-understood ideas (Sperber calls them semi-propositional representations, 1985b), beyond the realm of full understanding of the child or sometimes even the adult (as in the case of religious beliefs, or scientific beliefs, such as relativity theory $E=mc^2$). However, they are reflectively represented in the mind in the sense that they are believed in virtue of second-order beliefs about them. (e.g. "What Mum says is true. Mum says God is everywhere".)

In brief, Sperber's suggests the possibility that the Theory of Mind deficit involved in autism may impair individuals with this condition even in the acquisition of many cultural beliefs that on the surface 'look' as if they were simply 'primary representations'.

Yet a third possibility could be that some facets of cultural knowledge might be impaired in autism due to factors independent from Theory of Mind. More specifically, previous theories (Schank & Abelson, 1977; Mandler, 1983; Nelson, 1986) have established that one facet of cultural knowledge; scripts (also called 'generalised event representations') are hierarchically organised, holistic knowledge structures. It could be expected that people with preponderance for piecemeal processing might be disadvantaged in grasping the character of those knowledge structures.

Hypotheses:

Based on these different arguments, a number of alternative hypotheses were generated:

1) The null-hypothesis would be that cultural knowledge is acquired through general learning mechanisms, or that it might be mediated by language. In this case, we would expect cultural knowledge to be relatively intact in ASD and only contingent on the individual's general intellect, especially verbal intelligence. In other words, we would expect to see a continuous impairment in cultural knowledge from high to low functioning autism; and at each level of intellectual functioning, it should be at a similar level in people with ASD as in people with corresponding learning difficulties but without autism.

2) If some aspects of cultural knowledge (i.e. event scripts) relied on distinct cognitive abilities that are abnormal in ASD independent from Theory of Mind impairments - Weak Central Coherence - then we would expect to find a between-group

difference. The ASD group as a whole, including those who pass Theory of Mind tasks, would be predicted to show more impairment in cultural knowledge than control groups who do not have this processing preference.

3) If the acquisition of some aspects of cultural knowledge (real world knowledge of social norms and customs, scripts to some extent) relied indirectly on Theory of Mind, then individual differences amongst the ASD population would be expected. People with ASD who fail standard Theory of Mind tasks should show greater impairments than individuals with this condition who pass the tasks.

3

THEORY OF MIND AND CENTRAL COHERENCE: ARE THERE INDIVIDUAL DIFFERENCES AMONGST INDIVIDUALS WITH AN AUTISM SPECTRUM DISORDER?

3.1. INTRODUCTION

The overall aim of the main studies, reported in Chapters 4 to 6, was to investigate whether people with an Autism Spectrum Disorder (ASD) would show to a greater extent difficulties in their understanding of cultural knowledge than individuals who function at a similar intellectual and developmental level but who do not have an autistic condition. Since the argument was that possible abnormalities in the development or usage of cultural knowledge may be related to distinct cognitive abnormalities in Theory of Mind (Theory of Mind) or Central Coherence (CC), the present study involved two experiments that were aimed at assessing the extent to which participants who took part in this research showed abnormalities in these two cognitive abilities.

3.2. OVERVIEW OF PARTICIPANTS AND GENERAL PROCEDURE OF STUDIES 1-4

3.2.1. Participants

In all studies that comprise the empirical research of the first part of this thesis, four participant groups took part. These included overall twenty-five individuals with an

Autism Spectrum Disorder (ASD), ten individuals with moderate global learning difficulties¹ (of which one girl had Down's syndrome), sixteen normally developing children aged six to ten years and sixteen adults. Since we aimed to compare potential impairments in cultural knowledge between people with ASD with different levels of Theory of Mind competence and previous research has shown that Theory of Mind abilities require higher chronological age and intellectual abilities (Yirmiya et al., 1996, 1998; Happé, 1994c, 1995, see Chapter 2), we deliberately targeted individuals from the very high to the medium functioning range of the autism spectrum.

Of the autism spectrum group, thirteen individuals had received a diagnosis of Asperger's Syndrome (3 females, 10 males) and twelve a diagnosis of autism (2 females, 10 males). The gender ratio of the present sample roughly corresponds to the male-female ratio typical for this population (Wing, 1981; Ehlers & Gillberg, 1993). Participants with ASD were diagnosed by experienced clinicians according to either DSM-III or DSM-IV criteria. For four individuals with ASD, the criteria underlying diagnosis could not be traced back. None of the participants in the autism spectrum group had received a diagnosis of PDD-NOS.

Participants were recruited through a number of different avenues. Participants with ASD attended an independent special needs school specifically for

¹ Further eleven adolescents with learning difficulties were screened for suitability as controls for the Asperger's Syndrome group by initially giving them the standard false belief task and a simple sorting task. None of these individuals passed the memory control questions, and the majority even struggled with a task that required to sort simple shapes. Consequentially, these individuals had to be considered as functioning at an intellectual level too low to be suitably matched with the Asperger Syndrome group who had intelligence in the normal range or bordering the normal range.

children on the autism spectrum, or were recruited via two support groups for adolescents or adults with Asperger's Syndrome and the Scottish Society for People with Autism. Most of the adolescents and adults with Asperger's Syndrome are or have been in mainstream education.

The participants with learning difficulties were recruited via two special needs schools and one support group for adults. Typically developing children were drawn from a local primary school, and the adult control group was recruited from amongst the St Andrews student population.

The experimenter was familiar with the adolescents and adults recruited from the support groups prior to the testing sessions. The children with ASD and learning difficulties were selected in consultation with their teachers who were informed of the intent of the study and the verbal and cognitive demands of the task battery. With the teachers' permission, the children had the possibility to become familiar with the experimenter during 2 to 3 full days of classroom and playtime observation.

3.2.2. General procedure of studies 1 to 4

The majority of children with ASD or learning difficulties were seen at their school; the adolescents and adults with Asperger's Syndrome were visited at home or were tested at the Psychology department at St Andrews University. Control adults were tested at the Psychology department. With the exception of the adult control group, from whom written consent was obtained, all other groups were seen with written consent of their parents or caregivers. In addition, before each session, participants were verbally asked whether or not they wanted to participate.

The number of testing sessions varied according to individual preferences and abilities. Adolescents and adults with Asperger's Syndrome were seen on average on two separate occasions for approximately two hours each. Breaks in between tasks were given when required. For the typical children, children with ASD and with learning difficulties, testing sessions were split up into half-hour sessions. The typical children were seen on average on five occasions, the children on the autistic spectrum and with learning difficulties each six to seven times.

Some participants could not be given the whole task battery. Amongst the autism spectrum group, one child had left the school after the first testing phase, one child only entered the school after the testing sessions had already begun, and two adults were no longer available after the first home visit. In addition, for some children, data on some tasks is missing because they were not available on a particular testing day. Across the different groups, participants showed high motivation and willingness to cooperate. Of the whole sample, only one individual with Asperger's Syndrome refused to further co-operate half-way through the test battery after she had felt that she had not performed well on the Block Design Task. Therefore, exact participant details will be given for each task separately.

3.2.3. IQ estimates and group matching

To prorate the level of intellectual functioning of the two clinical groups, participants were given a short-form of the revised Wechsler Intelligence Test for

children or adults, respectively (Wechsler, 1974, 1981). The short form employed two verbal sub-scales (vocabulary, similarities) and two performance sub-scales (object assembly, picture completion). The choice of giving a short form, rather than the full test, was motivated by time constraints. Short forms have been reported to show a high validity in predicting full length IQ (ranging from .84 to .96, see for a review, Crawford, Allan and Jack, 1992), and have previously been employed in the literature (e.g. Happé, Briskman, & Frith, 2001). We are, however, aware of the limitations of IQ-prorating. Despite this, since our aim was not to specifically investigate the intelligence profile in these groups, but only sought to approximately match the two clinical groups in terms of their intellectual level, the decision of employing proratings seemed justified

Due to time constraints, the WISC-R was not given to the typically developing children, so it was assumed that their mental age roughly corresponded to their chronological age.

The ASD group had on average a verbal IQ (VIQ) of 82.6, a performance IQ (PIQ) of 99.8, and an estimated full-IQ (FIQ) of 85.6, while the learning difficulties group had on average a VIQ of 72.3, PIQ of 69.3, and FIQ of 66 (see Table 3.1). Three independent t-tests showed that the scores obtained by the ASD group were significantly higher for PIQ, ($t(26) = 12.71, p < .002$) and FIQ, ($t(26) = 6.90, p < .015$), but not the VIQ, ($t(26) = 1.84, p = n.s.$).

The autism spectrum group was then subdivided into individuals with either a diagnosis of autism or of Asperger's Syndrome. Each sub-group was compared with the learning difficulties group on the verbal IQ, performance IQ and full-scale IQ measures.

Verbal mental age estimates were 6.3 years for the autism group, and 6.9 years for the learning difficulties group. However, regarding PIQ, the subgroup with autism was functioning at a significantly higher level than the group with learning difficulties ($t(17) = 3.1, p < .01$). This is consistent with previous findings of an uneven intelligence profile in ASD (Frith, 1989; Rumsey & Hamburger, 1988; Szatmari et al., 1990; Happé, 1995). In addition, the autism group also showed a trend for higher FIQ estimates ($M = 78.8$) than the learning difficulties group, ($M = 66$), $t(17) = , p = .07$) but the two groups did not differ significantly from each other in terms of either their chronological age (CA) ($t(21) = .18, p = \text{n.s.}$), or VIQ, ($t(17) = .21, p = \text{n.s.}$).

The autism group was therefore adequately matched with the learning difficulties group, and based on verbal mental age estimates, with the 'younger' typically developing children, aged 6 to 7 years.

On average, participants with Asperger's Syndrome had an estimated VIQ of 87, PIQ of 106 and Full-IQ of 97, which falls within the normal range (defined as > 85). The Asperger Syndrome subgroup was therefore matched only with the older typical children (9 to 10 years) and typical adults. Matching the AS group with children aged 9 to 10 years was motivated by the aim to later compare their understanding on an advanced Theory of Mind task that is typically passed around this age (Happé, 1994).

A comparison between the autism and Asperger's Syndrome subgroups showed that those with Asperger's Syndrome had a significantly higher VIQ, ($t(16) = 9.88, p < .007$), and FIQ ($t(16) = 4.98, p < .04$) than the autism subgroup. In addition, the Asperger Syndrome subgroup was also on average older than the participants with

Table 3.1. Participant Characteristics: Chronological age (CA), verbal IQ (VIQ), performance IQ (PIQ) and Full-IQ (FIQ) estimates; means, standard deviations and ranges in brackets

Group		Age (CA)	VIQ	PIQ	FIQ	VMA ^a
Autism spectrum total	24	<i>M</i> 16.4 <i>SD</i> 5.9 (8.1-28.08)	<i>M</i> 82.5 ^a <i>SD</i> 19.0 (56 -116)	<i>M</i> 99.8 ^a <i>SD</i> 20.3 (66 -139)	<i>M</i> 85.6 ^a <i>SD</i> 21.9 (53 -124)	-
Autism	12	<i>M</i> 14.5 <i>SD</i> 4.7 (11.01-28.08)	<i>M</i> 70.8 ^b <i>SD</i> 13.9 (56-97)	<i>M</i> 92.3 ^b <i>SD</i> 18.9 (66-139)	<i>M</i> 78.8 ^b <i>SD</i> 18.2 (53-116)	<i>M</i> 6.4 <i>SD</i> 2.3 (4.02 – 10.85)
Asperger Syndrome	13	<i>M</i> 18.1 ^c <i>SD</i> 6.5 (8.05-26.06)	<i>M</i> 87.4 ^c <i>SD</i> 16.3 (73-116)	<i>M</i> 106.4 ^c <i>SD</i> 20.9 (74-124)	<i>M</i> 97.0 ^c <i>SD</i> 20.8 (68-124)	-
Learning Difficulties	10	<i>M</i> 15.3 <i>SD</i> 4.3 (10.05- 25.08)	<i>M</i> 72.3 <i>SD</i> 12.1 (56-90)	<i>M</i> 69.3 <i>SD</i> 17.3 (52-100)	<i>M</i> 66.0 <i>SD</i> 17.6 (49-96)	<i>M</i> 6.9 <i>SD</i> 3.7 (3.02 – 13.30)
Children (6-10 yrs)	17	<i>M</i> 8.1 <i>SD</i> 1.5 (6.01-10.11)	-	-	-	-
Younger Children (6-7 yrs)	10	<i>M</i> 6.8 <i>SD</i> .4 (6.01-7.08)	-	-	-	-
Older Children (8-10 yrs)	7	<i>M</i> 9.8 <i>SD</i> .5 (9.02-10.11)	-	-	-	-
Adults	16	<i>M</i> 27.1 <i>SD</i> 7.46 (19.06-46.01)	-	-	-	-

^a Verbal mental age estimate, combined from WISC and BPVS.

^bfrom 9 autistic individuals only

^cfrom 10 Asperger Syndrome individuals only

^dfrom 19 individuals with ASD only

autism. Therefore, these two subgroups are not directly comparable in the sense that differences in performance cannot be attributed to a diagnosis of autism or Asperger's Syndrome.

Hence, in subsequent studies presented in Chapters 4 to 6, the autism group will be compared with the 'young' 6 to 7 year old typical children and the group with learning difficulties, whilst those with Asperger's Syndrome will be compared with the 'older' 9-10 year old children and typical adults. Where the Autism Spectrum group is considered as one group, the comparison with the learning difficulties group and the typical children aged 6 to 10 years, reflects a conservative stance.

3.3. EXPERIMENT 1: ASSESSING THEORY OF MIND COMPETENCE

In order to assess the level of Theory of Mind competence in the present sample, participants were given an unexpected transfer 'False Belief' task (after Baron-Cohen, Leslie & Frith, 1985) and six of Happé's (1994) 'Strange Stories'. Both tasks have been widely used with typically developing children and children with autism and are regarded as 'standard tasks'. As discussed in Chapter 2, the False Belief task taps onto first order Theory of Mind competence, and is usually passed by typically developing children around 4 years of age. The 'Strange Stories' were designed as a test for Theory of Mind at a more advanced level, pitched at the level of typical children aged 8 to 9 years.

On the basis of the combined performances on these two tasks, a total 'Theory of Mind' score was computed that allowed us to assign participants to 'no

Theory of Mind', 'first order Theory of Mind' and 'second order Theory of Mind' groups.

3.3.1. Method and materials

False Belief task

A slightly modified version of the classic 'unexpected transfer' paradigm (Wimmer & Perner, 1983; Baron-Cohen, Leslie and Frith, 1985) was used in which a verbally narrated story was accompanied by ten photographs. The full story plot is given in Appendix 3.1. Three test questions were asked: a *prediction question* "Where will Sam *look* for the chocolates?", a *think-question* "Where does Sam *think* the chocolates are?", and a *justification question* "Why does Sam look into the red/blue box?" (dependent upon participants' responses on the prediction question). Two control questions were asked before the justification question "Where were the chocolates in the beginning?" and "Where are the chocolates now?"

Participants' responses were only included if they had passed both memory control questions correctly. Otherwise, their response was coded as 'memory failure'. For each correct answer on the three test questions, the participant was awarded one point, which resulted in a maximum score of 3.

Strange Stories Task

Six out of Happé's (1994) original twenty-four story vignettes were selected that included situations of sarcasm, lie, white lie, double bluff, persuasion, and figure

of speech (see Chapter 2). The sarcasm and double bluff stories were chosen as Happé found them to be amongst the hardest challenges for individuals who passed even standard second order Theory of Mind tasks. The persuasion, joke, lie and white lie scenarios were selected because Happé found them to discriminate best between the no Theory of Mind, first order Theory of Mind and second order Theory of Mind groups.

Procedure

The stories were played back on a tape-recorder and - following Happé's original procedure - each accompanied by a picture. Two modifications from the original procedure were introduced. Firstly, we treated the 'Is it true'-questions as test questions. Although Happé intended them to be a check for story comprehension we felt that these questions might actually go beyond mere comprehension, as they require the appreciation of the non-literal nature of the utterance. For example, in the white lie story, a girl says to her parents "it's lovely thank you, it's all that I wanted", when she is given a set of boring encyclopaedias whilst in fact all she really wanted was to have a rabbit. Given the common pragmatic language problems commonly associated with ASD, a person may incorrectly say 'it was true' what the girl said despite having correctly comprehended and memorised the elements of the story vignette, because she precisely failed to grasp the speaker's attitude (i.e. to spare her parents' feelings). In three of the stories employed in the present study, the correct responses were 'yes', and in three stories 'no', which reduces the possibility of someone showing a 'yes' bias succeeding by chance.

Secondly, whilst Happé had a separate set of 'physical' control stories which determined whether or not a participant was included for the 'Strange Stories', we felt that a more accurate check for comprehension of the story plot would be to add for each story a memory control question. The memory control questions tapped onto the crucial component underlying the joke, lie etc. (e.g. "who knocked the vase over?") and were always asked after the test questions. The control questions, as well as the original story material, are given in Appendix 3.2.

Scoring system

Responses on the 'Is it true'-questions and 'why-questions' were scored as either correct or incorrect. For each correct response, one point was awarded which resulted in a maximum score of 12. For the justification questions, correct responses included both appropriate inferences about the characters' thoughts and feelings and correct 'physical' explanations, referring to relevant aspects of physical appearance, action or objects (see Happé, 1994).

Responses scored as incorrect included justifications that were altogether wrong or vague, as well as mentalistic explanations that did not correctly capture the speaker's communicative intention. Following Happé, only one score was given per story. In the few cases in which participants' responses entailed both a correct and an incorrect justification, they were credited for their "best" answer.

Total Theory of Mind score

To compute a total Theory of Mind score for each individual, scores obtained on the False Belief (max = 3) and Strange Stories Tasks (max =12) were combined (max total = 15).

- *No Theory of Mind group.* Someone with no Theory of Mind would be expected to fail the False Belief and the Strange Stories Tasks. This would be expressed in a total score from 0-2.

- *Advanced (Second Order) Theory of Mind group.* As Happé reported that the 'irony' and 'double bluff' scenarios were most difficult to pass, a passing criterion for the 'advanced Theory of Mind group' was to pass the False Belief task, and at least four of the six Strange Stories, including the 'irony' and 'double bluff' scenarios. This would be expressed in a total score from 12-15.

- *First-order Theory of Mind group.* Following from the definition of the 'advanced Theory of Mind group', participants were assigned to the first order Theory of Mind group if they passed the False Belief Task and up to four Strange Stories but failed at least either the 'irony' or 'double bluff' stories (total score 3-12).

3.3.2. Participants

All participants as described in section 3.1., with the exception of the typical adults, participated in this experiment. Furthermore, two individuals with ASD were only available for testing on the False Belief Task.

3.3.3. Results

3.2.3.1. *Theory of Mind group assignments*

Due to space limitations, only the results of the Theory of Mind groupings, shown in Table 3.2., are reported in full. Group assignments followed largely the rules established earlier. However, the performance of four participants in the ASD group was such that group assignments in these cases deviated from the rule. The reasons for group assignment of these exceptional cases are specified below.

One individual with Asperger's Syndrome passed the 'think' question but failed the 'look' and justification questions on the False Belief Task. However, this relatively poor performance on the False Belief task contrasted with her relatively good performance on the Strange Stories Task on which she gave two correct answers on the 'is it true' question and five correct justifications. Having obtained a total score of 8 she was therefore assigned to the first order Theory of Mind group. Likewise, one boy with Asperger's Syndrome passed the 'think' and 'justification' questions but failed the preceding 'look'-question. Having correctly answered all six 'is it true questions' and having given four correct justifications, he obtained a total score of twelve. Despite his inconsistent performance on the False Belief task, he was therefore assigned to the first order Theory of Mind group. One boy with autism failed the False Belief task but gave three correct responses on the 'Is it true'-questions. As this score markedly differed from the average score obtained by the first order Theory of Mind group, and given that he could not give a correct justification, he was assigned to the no Theory of Mind group.

Table 3.2. Theory of Mind groups

Group	Theory of Mind + memory failer	No Theory of Mind	First order Theory of Mind	Advanced Theory of Mind
ASD (<i>N</i> =25)	3 (12%)	8 (32%)	7 (28%)	8 (32%)
Autism (<i>N</i> =12)	2 (16.6%)	7 (58.3%)	2 (16.6%)	1 (8.3%)
AS (<i>N</i> =13)	1 (7.6%)	1 (7.6%)	5 (38.4%)	7 (53.8%)
LD (<i>N</i> =10)	3 (30%)	0	3 (30%)	4 (40%)
Children (<i>N</i> =17)	0	0	10 (58.8%)	7 (41.2%)
6-7 yrs (<i>N</i> =10)	0	0	9 (90%)	1 (10%)
9-10 yrs (<i>N</i> =7)	0	0	1 (14.3%)	6 (85.7%)

Finally, another individual with autism completely failed the False Belief task, but answered six 'is it true' and four justification questions on the Strange Stories correctly. Despite his poor performance on the False Belief task, due to a total score of 10, he was assigned to the first order Theory of Mind group.

Based on their performance on the False Belief Task only, two individuals with autism who could not be given the Strange Stories were assigned to the no Theory of Mind group, and Theory of Mind failer + memory failer group, respectively.

3.2.3.1. IQ and Theory of Mind correlations

A set of Spearman's rank correlations was performed to explore whether Theory of Mind categories correlated with age or IQ. When the individuals with an autism spectrum disorder were considered together as one group, verbal IQ correlated with Theory of Mind categories, ($r(18) = .88, p < .01$, two-tailed). Likewise, high correlations between Theory of Mind and VIQ were found for the autism subgroup ($r(9) = .87, p < .01$), and for the individuals with Asperger's Syndrome ($r(9) = .72, p < .027$). For neither of these two subgroups separately or combined were FIQ estimates, PIQ estimates or chronological age related to performance on the Theory of Mind tasks (autism (PIQ: $r(9) = .19, p = .61$; FIQ: $r(9) = .56, p = .11$; CA: $r(12) = .06, p = .86$); Asperger's Syndrome (PIQ: $r(9) = -.31, p = .53$; FIQ: $r(9) = -.60, p = .20$; CA: $r(13) = .17, p = .60$).

For the learning difficulties group, Theory of Mind groupings correlated with VIQ, ($r(10) = .80, p < .01$), and FIQ ($r(10) = .76, p < .01$), and there was a trend for

a correlation with PIQ ($r(10) = .64, p = .064$). However, Theory of Mind groupings did not correlate with age. As expected, for the normal children, Theory of Mind groups correlated with age, ($r(15) = .75, p < .01$).

3.3.4. Summary

The main purpose of Experiment 1 was to assess levels of Theory of Mind competence in our participant population. The present results replicate those obtained in recent studies suggesting that some high-functioning adolescents or adults with autism and especially with Asperger's Syndrome can be attributed with Theory of Mind competence at the first or even second order levels (e.g. Bowler, 1992, Ozonoff et al., 1999). In addition, supporting the findings reported, for example, by Yirmiya et al. (1996), for both individuals with autism and Asperger's Syndrome, verbal IQ alone appeared to be strongly related to Theory of Mind competence.

3.4. EXPERIMENT 2 ASSESSING CENTRAL COHERENCE

The aim of Experiment 2 was to investigate the possibility of individual differences amongst people with an autistic condition in terms of their assumed tendency towards Weak Central Coherence. Important to the notion of this cognitive style is the characterisation as an amodal force, which predicts that an overall tendency to either 'weak' or 'strong' Central Coherence leads at the same time to

advantages and disadvantages in different domains. As reviewed in Chapter 2, a number of studies using between-group designs lent support to the predicted advantages of WCC in ASD in the perceptual/ visuo-spatial areas and – separately – to expected disadvantages in the semantic-conceptual domain. Moreover, a single study has found a positive relation between task performance on the Embedded Figures and Block Design Tasks in the visuo-spatial domain has been found (Jarrold *et al*, 2000). However, as far as we are aware, the relation between good performance in the visuo-spatial domain and difficulties processing information for meaning, has not been directly tested within individuals with ASD, using a repeated-measures design. Hence, we set out to investigate possible individual differences in Central Coherence as measured on the basis of the combined performance on tasks supposedly tapping onto the two facets of this construct.

3.5. METHOD

3.5.1. Materials

To assess Central Coherence in the visuo-spatial domain, the Embedded Figures and Block Design Tasks were used which have, as reviewed in Chapter 2, produced the most consistent results (e.g. Jolliffe & Baron-Cohen, 1997; Lockyer & Rutter, 1970; Prior, 1979; Shah & Frith, 1993, 1993; Venter, Lord & Schopler, 1992). For the Embedded Figures and Block Design Tasks, two versions were employed: the standard children and adults Versions of the Embedded Figures Task (Witkin,

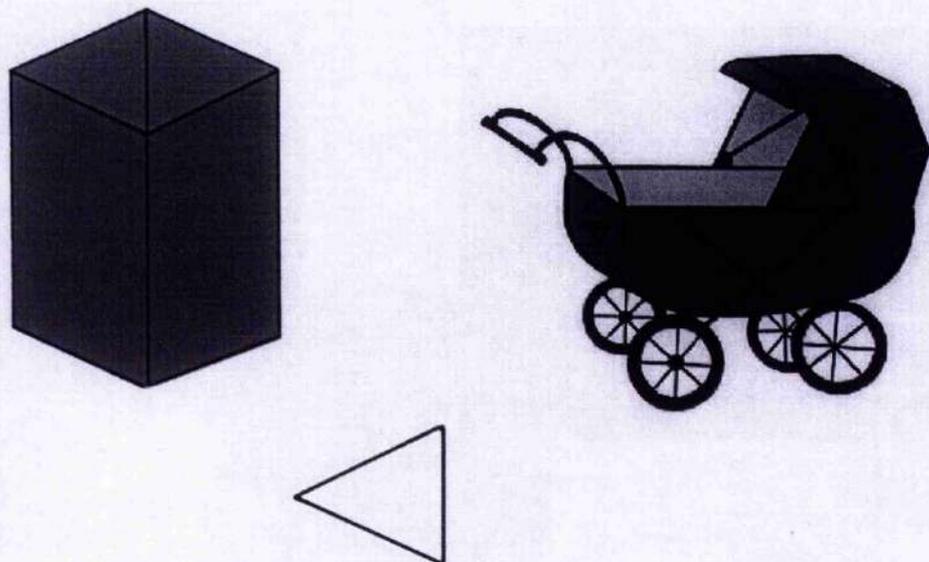
Oltman, Raskin and Karp, 1971), and the WISC-R (children) and WAIS-R (adult) versions of the Block Design Task (Wechsler, 1974; 1981) .

To assess Central Coherence in the semantic domain, we used the Sentence Completion Task as this task can be easily administered to people with ASD across ability levels (Happé, personal communication).

3.5.1.1. Embedded Figures Task (EFT, CEFT)

The Embedded Figures Task requires locating simple shapes within more complex figures, with the twist being that the complex figures are organised so as to obscure the simple shapes. An example is given in Figures 3.1a + b.

Figure 3.1a Example of EFT (left) and *b.* CEFT (right) (from Witkin et al.,1971)



Procedure

Only the task stimuli differed in the children and adults versions. Procedure, instructions and scoring system were the same. Over 25 trials, the children's version requires finding either a triangle or a house shape in complex designs. Adults were only given Form A of the standard Embedded Figures Task (Witkin *et al.*, 1971), which comprises 12 complex figures cards and 8 cards with simple shapes.

In the task administration we followed a modified procedure, introduced by Shah and Frith (1983). Participants were given the simple figure on a transparent sheet and were asked to place it over the complex form (also employed by Jarrold *et al.*, 2000, Happe, Briskman & Frith, 2001). This task administration has the advantage that it does not pose the additional requirement to hold the to-be-found figure in memory, as the standard procedure does.

Scoring

The number of errors and the time taken for each item was recorded. A time limit of 75 seconds was given.

3.5.1.2. Block Design Task (BD)

The Block Design task requires to segment each design into its logical units and then to reconstruct it using blocks, which are each red on two sides, white on two sides and red/ white on two sides. Examples from the children's version are given in Figure 3.2. The adult version consists of 9 trials, in the children's version

there are 11. In both versions, the participant is instructed to assemble the blocks as quickly as possible in order to make them look like the pattern on a picture card.

Figure 3.2. Examples of the Block Design task (from WISC-R, Wechsler, 1974)



Scoring

Following the WISC-R and WAIS-R manuals, respectively, the first two trials were scored with 2 points for passing on the first attempt, and with 1 point for passing on a second attempt. After these, only one attempt per pattern was allowed. 4 points were given if the participant assembled the blocks within the given time limit (45-180 seconds, depending on trial), plus a maximum of three bonus points for faster performance. In the children's version, a maximum of 62 points can be achieved, in the adult version, a maximum of 51 points.

In addition, from the raw score a scaled score (that takes the chronological age of the participant into account) was recorded. For both WISC-R and WAIS-R versions, scaled scores range from 1-19.

3.5.1.3. Sentence Completion Task

We used the Sentence Completion Task as previously employed by Happé (2000, Happé, Briskman & Frith, 2001). The Sentence Completion task consists of 15 sentence stems and the participant is instructed to complete each sentence with the first word that comes to his or her mind. For 10 sentence stems, the last word is frequently associated with another word as a pair (e.g. salt and pepper). The task assesses whether individuals use the preceding sentence context in order to complete the sentence in a meaningful way. If one ignored the preceding sentence context and instead focused locally on the last word, context inappropriate and meaningless associations, as for example, “the sea tastes of salt and...pepper/ vinegar”, would be the expected result. In addition, the task includes 5 control sentences, in which a local completion would be appropriate and meaningful within the sentence as a whole, as for example “the vet cares for cats and....dogs”. (see for a full list of task items, Appendix 3.3.)

Scoring

Following Happé (2000), for the test items, we distinguished between meaningful global completions, specifically local completion errors and otherwise inappropriate completions, unrelated to the sentence stem (e.g. don't know responses). A time limit was set at 15 seconds. If the participant did not respond at all within this allowed time, responses were also scored as 'otherwise inappropriate completion'. As suggested by Happé, for a total sentence completion score, the number of global (denoted by 0 points), local (denoted by 2 points) and otherwise

inappropriate completions (denoted by 1 point) were added up. In addition, the numbers of global, local and diverse inappropriate responses were scored separately. As a participant inclusion criterion for the sentence completion task, a minimum score of 6 on the control items, that is at least three correct responses out of five, was required.

3.5.2. Participants

Participant characteristics are shown in Table 3.3. Participants in the clinical groups were given either the childrens' or the adults' version of the Embedded Figures and Block Design Tasks in accordance with their mental age estimates. As the children and adults versions of the EFT and BD tasks are not directly comparable, we compared the children² with ASD with the learning difficulties group and the typically developing children as described in section 3.2. The adult ASD group, who mainly comprised individuals with AS, was compared with the normal adults. To this group, one adult with mild learning difficulties was added.

² The term 'children' is used here to facilitate the reading. In fact, some of the individuals with ASD and learning difficulties comprising this group were adolescents up to 16 years, but they were given the children's versions of the BD and EFT due to lower Full-IQ estimates and lower verbal mental not be disturbed by the meaningful shape in the same way. ages. The terms 'children ASD group' and 'young ASD' group are used interchangeably in the text. 'Young typical children', by contrast, refers to the normal 6 to 7 year old control group.

3.6. ANALYSIS

The data obtained from performances on the three tasks were analysed in three different ways:

1. For each of the three tests, separate sets of between-group analyses were performed in which the mental age matched groups (e.g. children to children and adults to adults) were compared to one other.
2. To investigate the predicted relation between good performance on the visuo-spatial tasks and relatively bad performance on the semantic sentence completion task in the ASD group, for each of the three children's groups and the two adults' groups, separate correlation analyses were performed.
3. Raw data were collapsed into categorical data to compute for each individual a 'Total Central Coherence score'.

3.7. RESULTS

3.7.1. Results of between-group analyses

3.7.1.1. *Embedded Figures Task*

Children groups – Group means of correct solutions and average times taken to track the hidden figures are shown in Table 3.4. Two separate one-way ANOVAs yielded significant main effects on number of correct solutions ($F(2, 32) = 6.98, p = .003$) and performance speed, ($F(2, 32) = 6.94, p = .003$). Pairwise comparisons showed that both the young ASD group and the typical children offered a significantly higher

Table 3.3. Participant characteristics of Experiment 2: age and IQ data

Group	N	Age	VMA*	PIQ	FIQ
Children groups					
ASD children (9 Aut, 3 AS)	12	12.5	6.8	93.5	81.5
Learning Difficulties	8	13.9	6.9	69.2	66.0
Typical Children	14	8.4	-	-	-
'Old' children	6	9.4	-	-	-
'young' children	8	6.7	-	-	-
Adult groups					
ASD adults (1 Aut, 7 AS)	8	22.5	89.1	104.2	99.0
Adult control ¹	12	23.8.	-	-	-

*combined from WISC prorating + BPVS

¹ including one adult with learning difficulties

number of correct solutions than the learning difficulties group, and also traced the embedded figures at higher speed (Tukey's $p < .05$ for each pairwise comparison). However, pairwise comparisons between the young ASD and the typical children groups on the number of correct solutions and performance speed did not yield any significant differences (Tukey's $p > .05$, for each pairwise comparison).

As the young ASD group had a slightly lower estimated VMA than the children, aged 6 to 10, taken together (see Table 3.2.), their performance was also compared with that of the 6 to 7 year olds only. The children with ASD exceeded the typical 6 to 7 year olds in performance speed, (independent t- test approached significance, $t(18) = -1.85$, $p = .06$.) By contrast, the two groups did not differ from one another in terms of the number of correct solutions ($t(18) = 1.37$, $p > .05$).

Adult groups – The adults with ASD correctly traced on average 11.5 of the 12 hidden figures, the adult control group 11.8 (see Table 3.4.) Whilst it took the ASD adults on average 15.3 seconds to trace the hidden shape, the adult control group needed on average 13.5 seconds. Independent t-tests yielded no group differences in terms of number of correct solutions ($t(18) = -1.85$, $p > .05$), or performance speed, ($t(18) = -.50$, $p > .05$).

Table 3.4. Results of the children and adults' versions of the Embedded Figures Task (Mean, standard deviations and ranges in brackets)

Groups	N	Means of correct solutions (max = 25)			Mean time (max = 75)		
		M	SD	Range	M	SD	Range
Children groups							
Child Autism spectrum	12	23.61	1.44	(20-25)	12.09	6.77	(4.44-26.33)
Autism	9	23.60	1.52	(20-25)	11.49	6.33	(4.44-26.33)
Asperger Syndrome	3	23.66	1.74	(22-25)	14.07	9.3	(8.32-24.82)
Learning Difficulties	8	18.5	6.45	(8-25)	27.59	16.84	(9.30-53.62)
Children	14	23.42	1.74	(20-25)	14.12	6.16	(5.39-27.99)
6-7 year olds	8	22.37	1.59	(20-24)	17.91	5.18	(12.13-27.99)
9-10 year olds	6	24.83	.40	(24-25)	9.06	2.71	(5.39-12.06)
Adults' groups							
Groups	N	Means of correct solutions (max = 11)			Mean time (max = 75)		
		M	SD	Range	M	SD	Range
Adult Autism Spectrum	8	11.5	.53	(11-12)	15.3	9.0	(6.11-30.4)
Adult control group	12	11.8	.40	(11-12)	13.66	5.10	(8.09-23.63)

3.7.1.2. Block Design Task

Children groups- Group means are shown in Table 3.5. The young ASD group obtained on average 23.6 points, the LD group 18.5 points and the typical children 23.4 points. Based on previous findings (e.g. Shah & Frith, 1993) the young ASD group was expected to perform better than the LD group and possibly also better than the typical children. However, a one-way ANOVA showed that there were no significant differences between the performances of these three groups, ($F(2, 30) = 2.54, p = .095$). A significant effect of group on scaled scores (which account for chronological age) ($F(2, 30) = 10.24, p = .000$) was attributable to the better performance of the normal children as compared to both the learning difficulties group and the young ASD group (Tukey's $p < .01$ for each pairwise comparison). Since the young ASD group had a lower estimated verbal mental age than the 6 to 10 year old children, considered as one group, we also compared the young ASD group with the 6 to 7 year old typical children of comparable mental age. It was now found that the ASD children outperformed the VMA matched typical children ($t(17) = -2.11, p = .03$).

Adults groups - As shown in Table 3.12, whilst the adult Autism Spectrum group achieved a group mean of 23.25 on the raw score of the Block Design task, the adult control group scored on average 36.45. An independent t-test showed that the better performance of the adult controls as compared to the ASD adult group was statistically significant ($t(23) = 6.51, p = .021$).

Table 3.5. Results of the children and adults' versions of the Block Design task

Groups	N	BD-WISC raw score (max = 62)			BD- WISC scaled score (max = 51)		
		M	SD	Range	M	SD	Range
Children groups							
Child Autism spectrum	12	23.58	16.20	(2-48)	7.33	4.46	(1-14)
Autism	9	22.88	16.13	(2-48)	6.88	3.91	(1-12)
Asperger Syndrome	3	25.66	19.85	(4-43)	8.66	6.80	(1-14)
Learning Difficulties	9	12.22	4.49	(0-42)	4.22	4.52	(1-13)
Children	12	28.0	16.29	(5-60)	12.16	3.18	(7-19)
6-7 year olds	6	13.40	8.20	(5-25)	10.40	2.88	(7-14)
9-10 year olds	6	38.42	11.71	(26-60)	13.42	2.93	(10-19)
Adult groups							
Adult Autism spectrum	8	23.25	9.34	(10-35)	8.37	3.66	(5-16)
Adult Control	12	36.45	12.23	(4-49)	11.72	3.13	(4-16)

3.7.1.3. Sentence Completion Task

Children groups - The children groups did not differ from each other in terms of correctly completed control items ($F(2, 32) = 1.67, p > .05$). However, one-way analyses of variance, followed by pairwise comparisons, showed that the young ASD group obtained an overall higher Sentence Completion score than both other groups ($F(2, 32) = 9.6, p < .001$; Tukey's $p < .01$ for each pairwise comparison). Closer inspection of the character of completions showed that interestingly, the young ASD group made specifically more local completions ($F(2, 32) = 6.4, p < .05$) than both control groups (Tukey's $p < .05$ for each pairwise comparison). The typical children completed the sentence stems significantly more often in a global fashion than the ASD children but not the learning difficulties group ($F(2, 32) = 7.32, p = .002$, (Tukey's p for pairwise comparison between ASD and typical children $< .05$). At the same time, the number of otherwise inappropriate completions did not differ between the three groups ($F(2, 32) = 1.96, p > .05$).

Adults groups -The two adults groups did not differ from each other in terms of the total Sentence Completion score obtained, ($t(18) = 1.81, p > .05$) or the number of inappropriate local completions ($t(18) = .615, p > .05$).

Table 3.6. Performance on Sentence Completion Task

Group	N	Otherwise inappropriate responses ¹ (Max = 10)	Inappropriate local completions ² (Max = 10)	Total SC score ² (Max = 20)
ASD TOTAL	21	1.6	2.14	5.38
Children groups				
ASD Children	12	2.16	3.41	8.25
Learning Difficulties	8	2.75	1.5	5.75
Typical Children	15	.76	1.15	3.0
8-10 years	6	1	0	.75
6-7 years	9	.66	1.66	4.0
Adult groups				
ASD Adults	9	.88	.44	1.55
Adult Control	15	.20	.20	.60

¹ high scores represent high number of inappropriate (but not specifically local) completions.

² high scores represents high number of local completions

³ high total scores represent high number of errors (local completions and other inappropriate responses)

3.7.1.4. Summary of between-group analyses

On the Embedded Figures Task, the findings obtained from the autism spectrum children and adult groups mirrored each other and suggested that performance on the EFT represented a spared or preserved skill. However, contrary to previous findings, we could not find support for the claim that the individuals with an autism spectrum disorder, taken as a group, or the individuals with autism or with Asperger's Syndrome viewed separately, performed superior to the normal population (see, for example, Jolliffe & Baron-Cohen, 1997). However, it is interesting to note that the speed of *some* individual children with autism far exceeded the group means obtained by even the normal 9-10 year olds. Notable was the performance of S.E., who was one of the lowest functioning children with ASD in the present sample. He was the fastest of all children, achieving a remarkable average speed of 4.44 seconds.

On the Block Design Test, the young autism spectrum group performed at a level of their estimated verbal mental age, but below the level of their chronological age. The failure of finding the predicted group difference to group with learning difficulties might be attributable to the small sample sizes. Considering this, one might be willing to consider the p-value of .095 as a very weak trend.

However, the results for the ASD adult group were more surprising, as the adults with ASD performed significantly worse than the typical adults. The full reasons for this unexpected finding are unclear, as our procedure did not differ from that used by other groups. Likewise, when performance speed - rather than raw scores as reported beforehand - was considered (as by Shah & Frith, 1993), the

significant difference remained. Given the high mean scores of the control group (36 out of 51) one possibility could be that the adult control sample (comprised of students) performed better than normal, rather than the present ASD group worse than previous samples.

Likewise, on the sentence completion task, predictions made by Central Coherence Theory were only supported for the children ASD group, but not for the adults with ASD.

3.7.2. Results of correlation analyses between the three Central Coherence Tasks.

To examine links between the three Central Coherence measures, a series of correlation analyses were conducted. For the two clinical groups, partial correlations were used that accounted for age and verbal IQ (see Jarrold et al., 2000). For the typically developing children, only age was partialled out. The results of the three children groups are shown in Table 3.6, those of the two adults groups in Table 3.7.

Children autism spectrum group.

As predicted by Central Coherence Theory, performance on the Block Design Task related significantly to both the number of correct solutions ($r(12) = .67, p < .01$) and performance speed on the Embedded Figures Task ($r(12) = -.80, p < .01$).

Central Coherence Theory also predicts that good performance in the visuo-spatial area (manifested as high numbers of correct solutions, fast performance speed

and high numbers of successfully assembled blocks) would go at the expense of impaired performance in the conceptual-semantic area – the Sentence Completion Task (represented in high numbers of local completions and high sentence completion total score). As shown in Table 3.7., contrary to this prediction, neither of the two visuo-spatial measures related to performance on the Sentence Completion Task. However, there was a trend for a negative relation between Theory of Mind score and the Sentence Completion score ($r(12) = -.50, p = .07$)

Typically developing children

Although Central Coherence Theory was specifically developed as a theory accounting for cognitive abnormalities in autism, it was based on the assumption that within the normal population, a force to process information globally would equally affect the visuo-spatial and semantic domains. Hence, a strong tendency for Central Coherence should be manifest in relatively “bad” performance on the Embedded Figures and Block Design Tasks, and relatively good performance on the Sentence Completion Task.

As expected, there was a trend for the negative relation between performance speed on the Embedded Figures Task and the number of correctly assembled blocks ($r(12) = -.57, p = .08$). However, the link between performance on the visuo-spatial and semantic tasks went into the opposite direction as predicted: children who swiftly tracked the hidden figures made at the same time *fewer* errors on the Sentence Completion task, ($r(12) = -.65, p < .05$). It is important to note that there was, however no relation between good performance on the EFT or BD and the

specific pattern of *local* completions. Furthermore, there was no relation between any of the Central Coherence measures and Theory of Mind competence.

Learning difficulties group

In this group, a strong relation between the three Central Coherence measures and between each of them to Theory of Mind competence was found. Someone who needed less time in tracking the hidden shape was also better at assembling the blocks ($r(9) = -.57, p = .07$). Individuals who gave more inappropriate completions also took longer to find the hidden shapes ($r(9) = .84, p < .05$) and tended to have difficulties assembling the blocks ($r(9) = -.71, p = .08$). Individuals with second order Theory of Mind competence were also faster at tracing the embedded figures ($r(9) = -.98, p < .01$), showed better performance on the Block Design Task ($r(9) = .75, p = .07$) and made fewer inappropriate completions ($r(9) = -.85, p < .05$).

Adults Autism spectrum.

For the adults with ASD, contrary to expectations, no relation between performance on the Embedded Figures and Block Design tasks were found ($r(8) = .03, p = \text{n.s.}$). Moreover, contrary to predictions derived from Central Coherence theory adults with ASD who were fast on the Embedded Figures Task were also less likely to make local errors on the sentence completion task ($r(8) = -.77, p = .063$). As summarised in Table 3.8., Theory of Mind scores, which ranged from first order to second order Theory of Mind competence, did not relate to any of the Central Coherence measures.

Adult control group.

As predicted, adults who were swift in tracing the hidden figures were also good at assembling the blocks ($r(12) = -.70, p < .01$). However, Table 3.8 shows that contrary to expectations, neither of the visuo-spatial Central Coherence measures correlated with performance on the Sentence Completion task.

Correlations between task performance and IQ

To shed more light on the unexpected correlations, and lack of correlations, a further set of Pearson's correlation analyses were performed that investigated the link between performance on each of the Central Coherence Tasks and the intelligence measures. For the ASD children, performance on the Block Design Task correlated with Full IQ, (Pearson's $r(9) = .72, p < .05$, 2-tailed), and with performance IQ, ($r(9) = .85, p < .05$), but there was no correlation with verbal mental age ($r(9) = .40, p = .28$). Neither performance on the Embedded Figures Task nor performance on the Sentence Completion Task correlated with any of the intelligence measures. For the adults with ASD, performance on the Block Design task correlated with performance IQ ($r(7) = .84, p < .05$, two-tailed), and a correlation with full IQ approached significance ($r(7) = .79, p = .061$). Surprisingly, performance on the Block Design Task also correlated with verbal IQ ($r(7) = .80, p < .05$). There were no correlations between the number of local completions on the Sentence Completion Task and any of the IQ measures (VIQ: $r(7) = -.44, p = .31$); PIQ: $r(7) = -.44, p = .37$; FIQ: $r(7) = -.41, p = .41$).

Table 3.7. Partial correlations between the three Central Coherence measures for the children groups (continued overleaf)

a) Young ASD group, accounting for age and VIQ

Young Autism Spectrum group						
	CEFT ^a Correct	CEFT ^b Time	BD raw score ^c	SC Local errors ^d	SC Total score ^e	Theory of Mind groups ^f
CEFT correct	-	-.80**	.67**	-.02	.06	-.004
CEFT Time		-	-.65*	.03	-.30	-.01
BD			-	.25	.36	-.36
SC Local				-	.56*	-.28
SC total					-	-.50 ¹
Theory of Mind score						-

b) Typical children, accounting for age

Typical children (aged 6-10 years)						
	CEFT Correct	CEFT Time	BD raw score	SC Local errors	SC Total score	Theory of Mind groups
CEFT correct	-	-.91**	.35	-.54	-.65*	.08
CEFT Time		-	-.57 ¹	.44	.55	-.23
BD			-	.13	.14	.54
SC Local				-	.44	-.43
SC total					-	-.22
Theory of Mind score						-

c) Learning Difficulties group, accounting for VIQ and age

Learning Difficulties group						
	CEFT Correct	CEFT Time	BD raw score	SC Local errors	SC Total score	Theory of Mind groups
CEFT correct	-	-.98**	-.69	-.56	-.89*	.97**
CEFT Time		-	-.75 ¹	.56	.84*	-.98**
BD			-	-.36	-.71 ²	.75 ¹
SC Local				-	.56	-.44
SC total					-	-.85*
Theory of Mind score						-

^aascending: high number of tracked figures represents good performance.

^bdescending: shorter performance speed represents good performance.

^cascending: high scores represent good performance.

^ddescending: high scores represent a high number of local completion errors.

^eascending: high scores represent increasingly worse performance (number of local completions and otherwise inappropriate sentence completions combined).

^fascending: high scores represent advanced Theory of Mind

*significant at the <.05 level (two-tailed)

**significant at the <.01 level (two-tailed)

¹trend: p=.07

²trend, p=.08

Table 3.8: Partial correlations between the three Central Coherence Measures for the adult groups

a) Adults with ASD, accounting for age and VIQ

Adults ASD group						
	EFT Correct	EFT Time	BD raw score	SC Local errors	SC Total score	Theory of Mind groups
EFT correct	-	-.42	.03	.79*	.73 ¹	.39
EFT Time		-	-.15	-.77 ²	-.79*	.58
BD raw score			-	.33	.27	.89
SC Local				-	.98**	.06
Total score					-	-.16
Theory of Mind score						-

b) Adult control group, accounting for age

Adult control group					
	EFT correct	EFT time	BD raw score	SC Local errors	-
EFT correct	-	-.35	.03	.10	No correl.
EFT Time		-	-.70**	-.35	With Theory of Mind scores
BD raw score			-	.32	
SC Local				-	
Total score					

* = significant at the < .05 level

** = significant at the < .01 level

¹ trend, $p = .078$ ² trend, $p = .063$

For the children with learning difficulties, performance on the Block Design Task highly correlated with PIQ ($r(8) = .97, p < .01$), with Full IQ ($r(8) = .94, p < .01$) as well as with verbal mental age ($r(8) = .77, p < .05$). Likewise, performance on the Embedded Figures Task highly correlated with PIQ; ($r(8) = -.81, p < .001$), Full IQ ($r(8) = -.87, p < .007$) and verbal mental age ($r(8) = -.88, p < .01$). And the total sentence completion score correlated significantly with verbal and full IQ estimates, as well as with age (VIQ ($r(8) = -.87, p < .05$); PIQ ($r(8) = -.64, p = .08$); FIQ ($r(9) = -.93, p < .01$).

For the typically developing children, as expected, age correlated with performance on all three tasks; Sentence Completion Task ($r(15) = -.78, p < .01$); Block Design Task ($r(12) = .75, p < .01$); Embedded Figures Task ($r(13) = -.83, p < .05$).

For the adult control group, age did not correlate with performance on any of the Central Coherence measures (EFT: $r(11) = -.19, p = .57$, BD ($r(11) = .18, p = .58$, SC $r(11) = .09, p = .80$).

3.7.2.1. Summary of correlation analyses

The results of the correlation analyses were interesting in many respects. Based on Central Coherence Theory, two predictions were made: firstly, that performance on the two visuo-spatial tasks, the Embedded Figures and the Block

Design Tasks should correlate positively. Secondly, performances on both tasks were expected to correlate negatively with performance on the Sentence Completion Task. As expected, for all three children groups, i.e. the young ASD group, the learning difficulties group and the typical children, high correlations between performance on the EFT and BD was found (although this was weaker for the typical children). Likewise, the adult control group displayed this predicted pattern. However, for the adults with ASD, this predicted correlation was lacking.

When the relation between performance on the visuo-spatial and semantic tasks was inspected, it was found that the different groups behaved very differently. Only for the adults with ASD, the expected link between swift performance on the EFT and local completion errors was found. For the children with ASD, correlations were altogether lacking. What is more, for the control groups, relations went into the opposite direction as predicted. Inspection of the learning difficulties group suggests that their performance on all three tasks was to a large extent determined by both the verbal and performance parts of their general level of intellect.

3.7.3. Central Coherence Groups

For our main purpose of assessing the impact of Central Coherence upon performances on the 'cultural knowledge' tasks of the next chapters, it was essential for us to be able to characterise participants in terms of this cognitive style. Although the pattern of correlations - and lack of correlations - found in the previous section invites to caution, we still followed the initial plan of calculating a 'Total Central

Coherence score' -in analogy to a Total Theory of Mind score as discussed in section 3.3.1. In doing so, it was firstly required to transform the raw interval scale data of all three tasks into categorical groups, which would allow us to directly compare performances on the three tasks and the children and adult versions.

Different ways of collapsing the continuous raw data into two or more groups would in principle be possible. One obvious way, for example, could be to use central tendencies as a cut-off point. This would, however, result in only two groups; 'weak' versus 'strong' Central Coherence. More importantly, based on inspections of distributions (see Figures 3.3 –3.5) we felt that such a division would be misleading, as participants who clustered around the mean or median and hence showed similar performance, would be grouped into two separate categories. At the same time, within any one category, participants would be grouped together whose performance seemed to be of rather different character. This impression was supported using correlation analyses between the raw results and the new groups, divided up on the basis of group means or medians. On the adult version of the Block Design task, for example, group assignment into a Weak versus Strong Central Coherence group, using the overall group mean as a cutting point, did not yield any significant correlation with the raw results ($r(20) = .42, p = .105$). Therefore, the cutoff criteria that were employed are specified below.

3.7.3.1. Block Design Task groups

For the Block Design Task, distributions of the performance on the children and adults' versions were considered separately. Each scale was divided up into three equal slices. For the children's version, raw scores ranged from 0 – 62 with higher scores representing better performance. Scores obtained between 0- 20.6 represented BD_{SCC} , between 20.7 and 41.2 BD_{MCC} and between 41.3 and 62 BD_{WCC} . For the adult version, raw scores ranged from 0-51. A division into three equal groups resulted in scores obtained between 0 –17 representing BD_{SCC} , between 18-34 BD_{MCC} , and between 35-51 BD_{WCC} . Figures 3.3. *a + b* show the histograms for the children and adult groups.

In order to validate whether the new categories are associated with the raw scores, Spearman's rank correlations were computed for the relation between the Block Design raw scores and the new Block Design groups. High correlations were found for both the children groups ($r(32) = .91, p < .001$.(two-tailed), and the adult groups combined, ($r(20) = .91, p = .002$).

3.7.3.2. Embedded Figures Task

For the two versions of the Embedded Figures Task, the performance speed measure was used. As most participants found the target figures well below the time limit, the criteria employed for the Block Design task, that is to divide the scale into three equal slices, would potentially be misleading. Figure 3.4. shows that for the children's version, 85% of the total sample would fall into the Weak Central Coherence Group. We therefore decided to use for both versions the performance of

the *typical* comparison groups as a baseline. When the typical children were divided up into three groups of equal sizes, the cutting points of the fastest group were at 11. Participants who performed in the range of 1-11 were assigned to the EFT_{WCC} group, children who performed between 12 and 16 to the EFT_{MCC} group and those who needed 17 seconds or above were assigned to the EFT_{SCC} group.

The same criteria were applied for the adult version of the EFT. Dividing the data of the adult control group into three groups of equal sizes resulted in assigning participants to a group of EFT_{WCC} if they had traced the shape within 10 seconds, a EFT_{MCC} group ranged from 11-16 seconds, and if a participant needed 17 seconds or longer s/he was assigned to the EFT_{SCC} group.

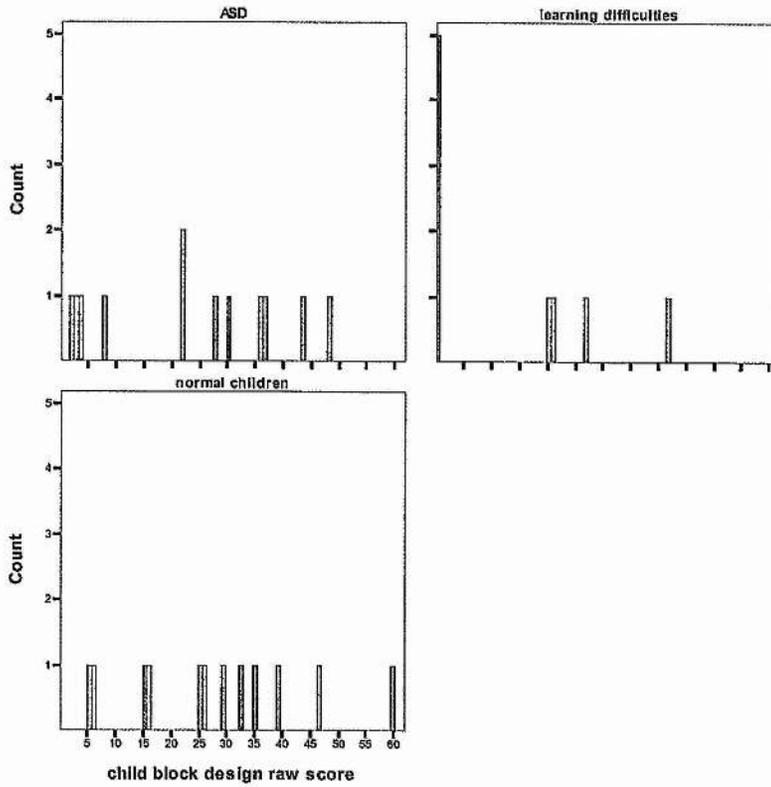
Spearman's rank correlation showed for the children groups combined and the adults groups combined, the new EFT Central Coherence Groups highly correlated with the raw data (children: $r(32) = -.92, p < .01$; adults: $r(20) = -.94, p < .01$).

3.7.3.3. Sentence Completion Task Score

The same criteria as described for the Embedded Figures task were applied to establish CC group scores for the Sentence Completion Task. The score for the number of local completions was used, as this was seen to be most diagnostic for the assessment of a Weak Central Coherence cognitive style (as opposed to the Total Score which also included other types of inappropriate completions). The performance of the normal group, comprising both children and adults on the

Figure 3.3. Histogram showing individual performances on the children or adults' version of the Block Design Task

a) Children groups



b) Adult groups

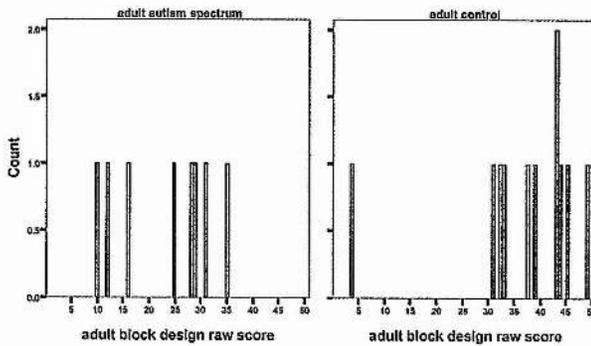
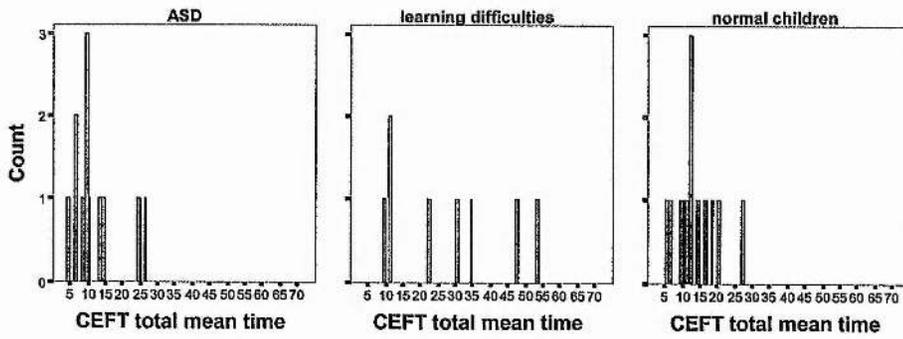


Figure 3.4. Histogram showing individual performances on the CEFT and EFT, respectively

a) Children groups



b) Adult group

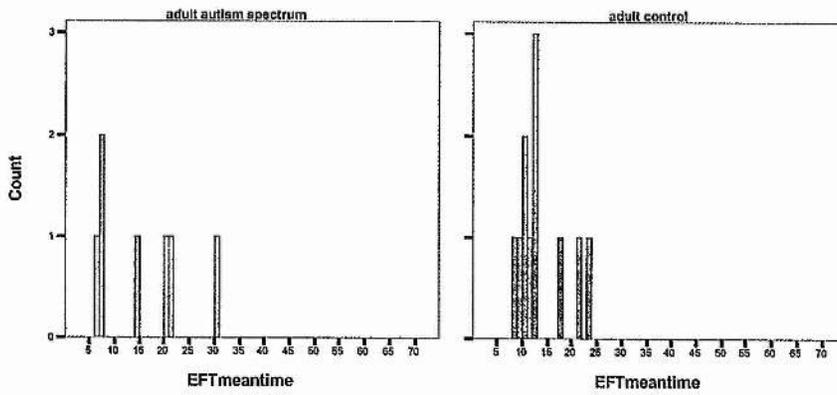
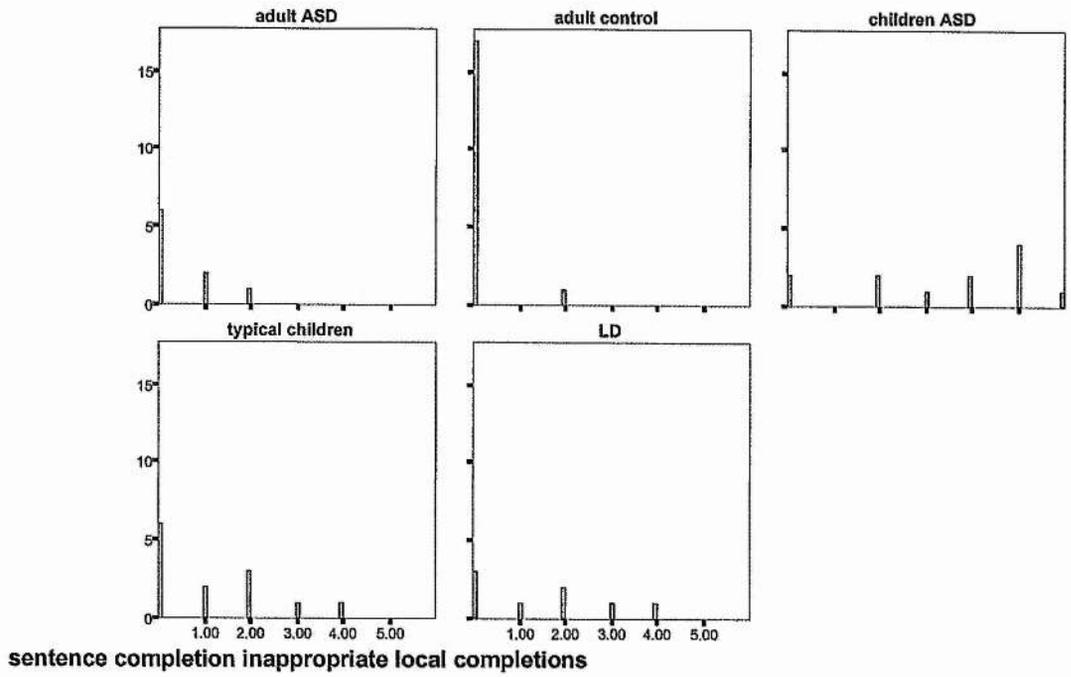


Figure 3.5. Histogram showing individual performances on the SC task.



measure of number of local completions, were used as the baseline. As can be seen in Figure 3.5., the majority of normal control participants did not make any local completions. Hence, a score of 0 represented SC_{SCC}. For the remaining participants, 50% made either 1-2 local completions or 3-4 local completions. SC_{MCC} was thus defined as scoring between 1-2, and SC_{WCC} by three or more local completion errors. Spearman's rank correlation, computed for all participants comprising the sample, showed a high correlation between the raw data and the categorical groups, ($r(52) = .98, p < .01$).

3.7.3.4. Total Central Coherence Categories

Finally, for each individual a 'Total Central Coherence score was computed by combining the scores obtained on each of the three tasks. If on any one task, we denote a tendency for Strong Central Coherence with 1 point, Medium Central Coherence with 2 points, and Weak Central Coherence with 3 points, criteria for the total Central Coherence Score were as follows:

WCC total score (8-9 points) - A person was given a WCC total score if s/he had obtained a WCC score on at least two out of the three tasks, and performed at medium level on the third task.

SCC total score (3-4 points) - Likewise, participants were assigned to the SCC group if they had obtained a SCC score on at least two out of the three tasks, and performed at medium level on the third task.

MCC total score (5-6 points) - A medium CC total score was given for participants who had obtained a score of 2 on at least two out of the three tasks. The third score could either reflect strong or weak central coherence.

Mixed style(5-7 points) - A mixed style score was introduced to account for the pattern found particularly amongst participants in the typical control groups. For example, some adults performed very well across all three tasks, hence obtained 3 points for the Embedded figures task, 3 points for the Block Design task, and 1 point for the Sentence Completion Task. The opposite pattern of someone who performed badly across the board was also characterised as mixed. In addition, this group included individuals who truly showed 'mixed' performance, such as good performance on the Embedded Figures and Sentence Completion Tasks in conjunction with relatively bad performance on the Block Design Task.

The results of Central Coherence group assignments and exact patterns of performances are shown in Table 3.9 and in Figure 3.6. The main findings were as follows:

1. Weak Central Coherence as a processing style specific to Autism Spectrum

Disorders

With the exception of one typical adult, only people with an autism spectrum disorder fell into the weak central coherence group. (Assigning this typical adult to the WCC and not the mixed group was a rather conservative decision. She excelled on the Block Design and Embedded Figures Tasks, but also made 2 local completions on the Sentence Completion Task. (However, she immediately noticed

Table 3.9. Number and percentage of participants in each Central Coherence group and exact pattern of performance. (The first number represents performance on Embedded Figures Task, the second number performance on Block Design Task and the third number performance on Sentence Completion Task.)

	SCC	MCC	WCC	Mixed style
Autism Spectrum	19% (4) 1-1-1 1-1-1 1-1-2 1-2-1	23.8% (5) 3-2-2 2-2-1 2-2-2 2 × 2-1-2	33.3% (7) 3-3-3 5 × 3-2-3 3-3-2	23.8% (5) 3-1-3 2-1-3 2 × 3-2-1 1-3-1
Autism	10 % (1) 1-1-1	20.0 % (2) 3-2-2 2-2-1	50% (5) 3-3-3 4 × 3-2-3	20 % (2) 3-1-3 2-1-3
Asperger Syndrome	27.3 % (3) 1-1-1 1-1-2 1-2-1	27.3 % (3) 2-2-2 2 × 2-1-2	18.2 % (2) 3-2-3 3-3-2	27.3 % (3) 3-2-1 3-2-1 1-3-1
Learning Difficulties	50% (5) 2× 1-1-1 2 × 1-2-1 1-1-2	20% (2) 3-2-2 3-2-2	0	30 % (3) 1-1-3 1-1-3 3-3-1
Normal children	28.6% (4) 2-1-1 2× 1-1-2	28.6 % (4) 2 × 2-2-1 2-2-2 2-2-3	0	49 % (5) 2 × 3-3-1 3 × 3-2-1
9-10 yrs	0	16.7 % (1)	0	83.3 % (5) 2 × 3-3-1 3 × 3-2-1
6-8 yrs	57.1% (4) 2 × 2-1-1 2 × 1-1-2	42.9 % (3) 2-2-2 2-2-3 2-2-1		0
Adults	8.3 % (1)	8.3% (1) 2-2-1	8.3% (1) 3-3-2	75% (9) 3 × 3-3-1 3 × 3-2-1 1-3-1 2-3-1

Figure 3.6. Distributions of Weak, Strong, Medium Central Coherence and mixed style for the different participant groups (continued overleaf)

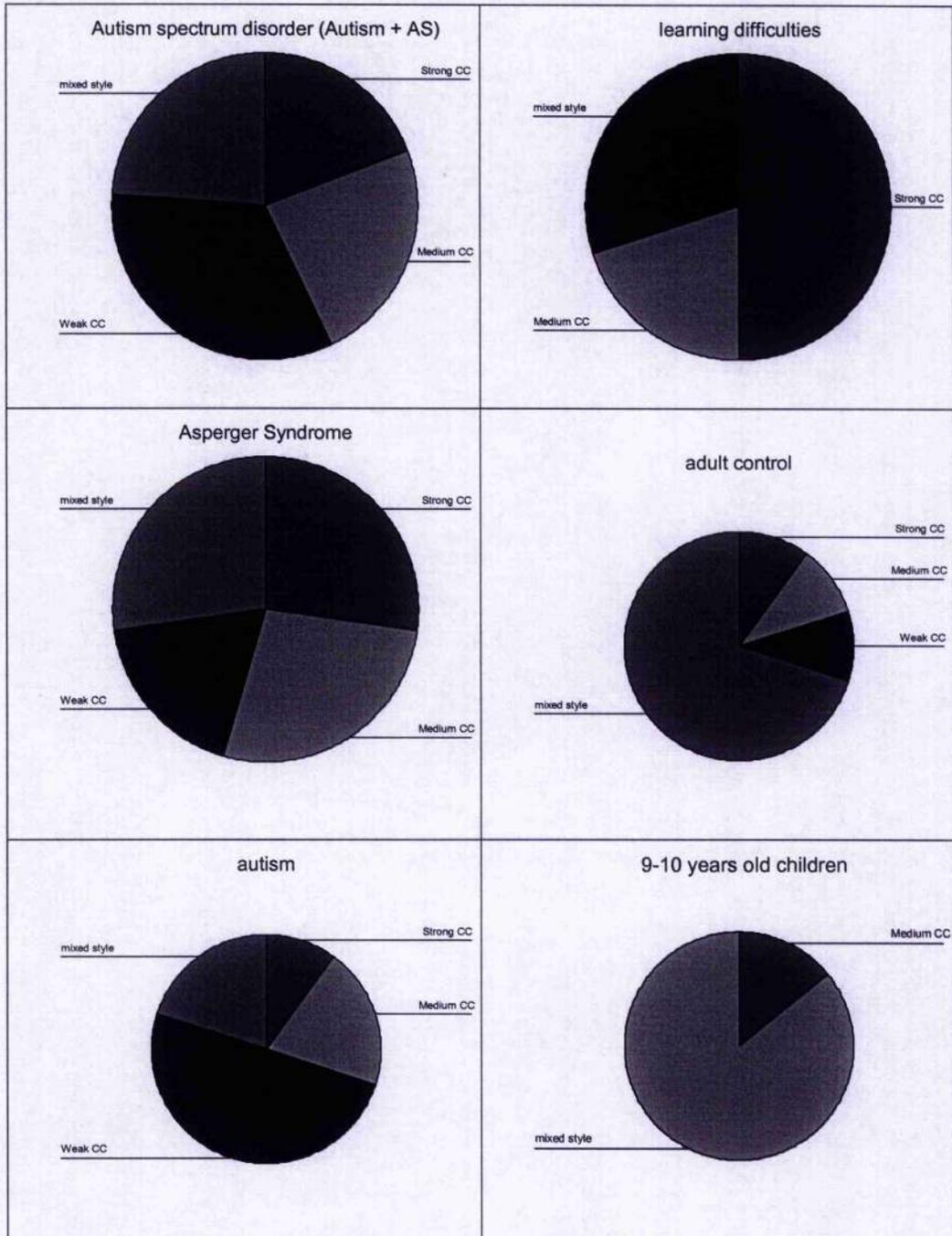
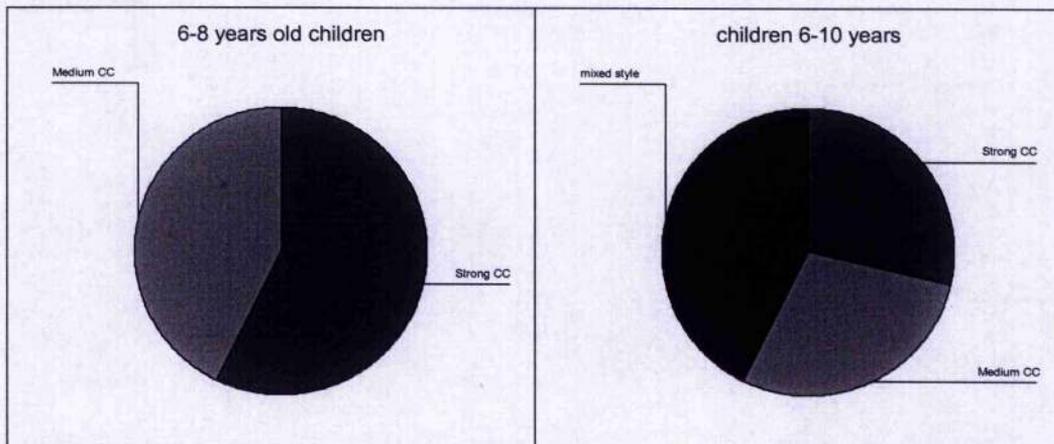


Figure 3.6. continued



the meaningfulness of these completions, and laughed, whilst people with ASD rarely recognised the meaningfulness of their sentence completions). This suggests that weakness in central coherence may be a processing style specific to people with an autism spectrum disorder. It can also appear in “normal” individuals but might be modulated by other cognitive processes.

2. Weak Central Coherence is not characteristic of all people with ASD.

Secondly, implicit in Frith’s theory is the suggestion that weak central coherence is universal in people with an autistic condition. Contrasting with this suggestion, some people in the present autism spectrum sample did not show this processing style. In fact, when participants with ASD who fell into the SCC, MCC and mixed style groups were added together, 60% of our sample of people with an autism spectrum disorder did not have an overall weakness in central coherence. A comparison between the two autism spectrum subgroups suggested that more people with autism than with Asperger

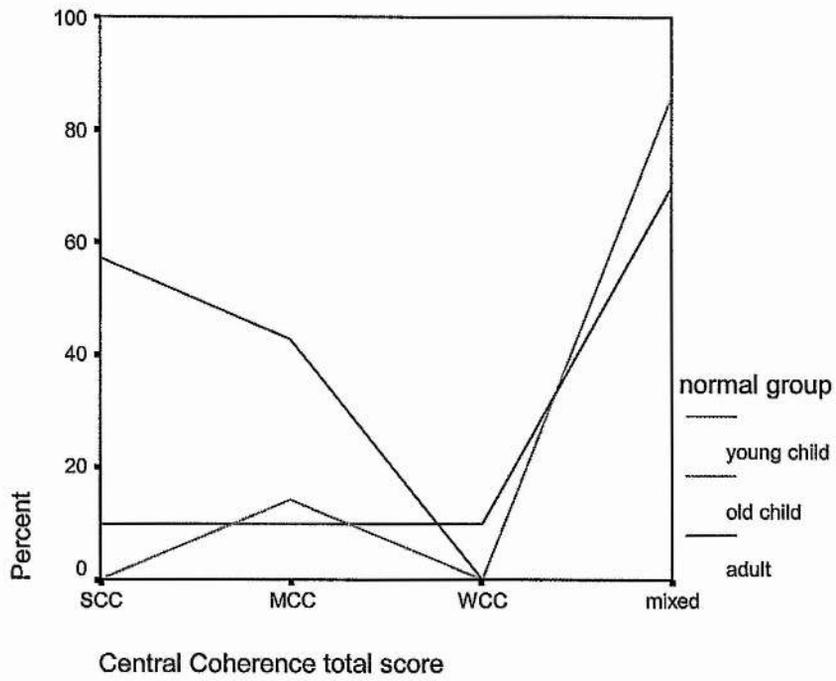
Syndrome showed weakness in central coherence, but this difference was not statistically significant.

3. Central coherence might not characterise the processing style of the typical population

Figure 3.7 shows that the majority of the 9-10 year old typically developing children and the adult controls fell into the 'mixed style' group. As can be specified from inspecting Table 3.9, this was largely the result of good performance across all three tasks. Only one adult control participant showed a 'mixed pattern' in the true sense; she performed relatively poorly on the EFT, well on the BD and also well on the Sentence Completion task. The reason that the typically developing 6 to 7 year olds fell into the Strong or Medium Central Coherence groups appeared to be the result of their consistently poorer performance on all three tasks. It seemed that general development – age- had a similar effect on performance on all three tasks

The majority of people with learning difficulties showed a tendency towards Strong Central Coherence —roughly the opposite pattern to the one observed in people with ASD. However, for the learning difficulties and children groups, errors on the Sentence Completion task did not seem to reflect a specifically piecemeal style, but the tendency to make other errors on this task. This appeared to reflect their lower developmental level of intellectual abilities.

Figure 3.7. Distribution of Central Coherence scores for the normal children and adults



3.8. DISCUSSION

Experiment 1 largely replicated the results of recent studies investigating Theory of Mind competence in individuals with autism and Asperger's Syndrome. As reported, for example, by Bowler (1992) and Ozonoff *et al* (1991), individuals with Asperger's Syndrome in the present sample, albeit most of them of adult age, had Theory of Mind competence at either the first or second order levels. The results of Experiment 1 also confirmed previous findings suggesting that verbal IQ was the best predictor for passing Theory of Mind tasks in people with autism and Asperger's Syndrome (Tager-Flusberg, 1997). However, in the present sample, age did not relate to Theory of Mind competence, possibly because the ASD group was composed of a large proportion of adolescents and adults and did not include children younger than eight years.

By asking three test questions on the False Belief Task, inconsistencies were noted in a small number of individuals with an autism spectrum condition, though none in the other groups. The fact that three individuals correctly responded to the 'think' question whilst they had previously failed the 'look'- question might suggest that having more processing time could have helped these individuals to compute the character's false belief. Moreover, inconsistencies between performances on the False Belief and Strange Stories Tasks also point to the possibility that some individuals may function in a 'borderline' range. With this, we mean that they might have a dawning, yet fragile awareness of mental states that does not fully guarantee success in every situation.

Experiment 2 went beyond the attempt to replicate previous findings on relatively common tasks used to assess Central Coherence. Novel contributions included firstly, the attempt to investigate how the two parts of the notion of Central Coherence – a good eye for detail and impairments in processing information for meaning – are linked within the same individual. Secondly, the present experiment also explored the possibility of individual differences in (Weak) Central Coherence amongst people with an autism spectrum disorder and without such a condition.

The main findings of Experiment 2 were that the notion of a Weak Central Coherence processing style appears to be specific to people with an Autism Spectrum Disorder, but such a tendency does not seem to be universal to all individuals with this condition. Moreover, this study failed to find preponderance towards either strong or weak central coherence in the majority of the present sample of typical individuals from around 9 to 10 years onwards. In addition, we failed to find a tendency for WCC across domains and even in the visuo-spatial domain, in the six to seven year old children. Their relatively worse performance on the EF and BD tasks did, however, not entail a tendency to generate more local completions. The assumption of Central Coherence theory was that the ability of typical people to perceive stimuli globally somehow occurred at the expense of the ability to perceive and process information locally. What we have found here is, first, that older children and adults have the ability to flexibly change from one processing mode to another depending upon the task at hand; and secondly, that the possibility of using a Weak Central Coherence processing style might be a relatively late acquisition in development.

This finding stands in line with Witkin et al's (1971) original suggestions of a developmental trajectory of relative 'field dependence' to 'field independence'. It also fits with the proposal made in another domain – to be considered in later chapters – that already from preschool age or before, young children are able to conceive of holistic, configurally organised knowledge structures (e.g. Nelson, 1986). On the other hand, the present finding does not fit Happé's (1999) suggestion who related Takeuchi and Hulse's (1993) finding that up to around 6 years, children are generally able to acquire absolute pitch, with a featural processing mode. Given these open questions, studying the developmental trajectory of central coherence should be one of the priorities for future research exploring this construct.

We shall now discuss in turn possible factors that could have contributed to the finding that 1) more than half of the ASD population was characterised as not having WCC and 2) why we failed to find a relation between the two components of the CC construct, i.e. the expected co-occurrence of good performance on the visuo-spatial tasks and poor performance on the conceptual-semantic task for most of the typically developing participants.

Why were more than half of the participants with ASD characterised as not having a tendency for Weak Central Coherence? The between-group analyses suggested that in terms of performance on the EFT and SCT, the present sample of individuals with ASD performed similarly to what has been reported by other groups with other samples of people with autism or Asperger's Syndrome using the same tasks (e.g. Shah & Frith, 1983; Jolliffe & Baron-Cohen, 1997). Only the finding that the adults with

ASD performed worse than the control adults on the Block Design Task was unexpected in light of previous findings, for example by Shah & Frith, 1993. However, given that the adults with ASD obtained an average group score of 23.25 (of a maximum 51), which is right in the normal range as regarded by Wechsler (1981), their performance must nonetheless be considered as reflecting a relatively preserved ability. By considering the average scores obtained by the adult control group (36.45 out of 51), one possibility for the significantly worse performance of the ASD adult group as compared to the normal adult group could be that our adult control group, all recruited from amongst a student population, performed exceptionally well even in comparison with the normal population at large.

Hence, overall the results of the three between-group analyses on the Embedded Figures, Block Design and Sentence Completion Tasks largely replicated the results found in previous studies. It seems therefore unlikely that the finding of the categorical transformation analysis that in the present sample, the majority of individuals with ASD were characterised as not having WCC, could be attributed to some spurious reasons for which participants in the present sample were very different to those tested in previous studies.

What then might have caused the unexpected findings of the correlation and total CC score analyses – not only in the ASD adult population, but also in the control groups? For the adults with ASD, the lack of correlation between performance on the EFT and BDT seemed to have been due to the fact that only the BD, but not the EFT correlated with Full IQ estimates and surprisingly, even VIQ estimates. In this sense, the EFT seems to have been a ‘purer’ test of Central Coherence.

More surprising still was the finding that for the adults with ASD, as well as the 9 to 10 year old typical children and the learning difficulties groups, good performance on the EFT correlated *positively* with good performance on the Sentence completion task.

One possibility that could account for this finding is that we need to think of Central Coherence not in terms of an *amodal* cognitive style, but one that is specifically related to the visuo-spatial domain (and perhaps the perceptual domain, which was not investigated in the present study). A good eye for detail and difficulties integrating information in context might have independent origins, but the two tendencies could in some cases occur.

An alternative possibility could be that Central Coherence was indeed an amodal force, but that individuals with high verbal abilities are able to compensate for a piecemeal processing preference. This could however not explain the result of *some* of the younger individuals with ASD who had good verbal abilities but nonetheless made a relatively large number of local completion errors on the Sentence Completion Task.

Instead, inspection of individual performances on the Sentence Completion Task suggests that those in the present sample with the most verbal language difficulties did not make the most local completions, but gave otherwise inappropriate responses - just like those with the most profound learning difficulties in the present sample. However, those with ASD who had mild learning difficulties up to the normal range of intelligence were about equally likely to generate local completions. That for the children and adults with ASD there was no relation between the number of local

completions and verbal IQ, might be indicative for the possibility that this particular pattern of performance – the neglect of meaning – is not associated to intelligence.

One explanation for the ‘mixed’ performance, of those who performed well across-the-board could be that the EFT and the BD tasks do not measure a spontaneous preference or tendency, as in fact it is only possible to successfully solve both tasks when adopting a piecemeal processing mode. In this sense, good performance on these tasks may not directly reflect a tendency to see the world in a more fragmented way, but might merely show a better ability to flexibly adopt such a processing style where requested. In order to test this possibility, future work would be needed that employs a test that does not work in pass-fail terms and does not implicitly demand to adopt a piecemeal processing style, but compares that to a spontaneous preference.

Correlation analyses between performances on the Theory of Mind and Central Coherence tasks suggested that the two abilities were not related. This seemed at first to contrast the findings obtained by Jarrold et al (2000) who reported good performance on Theory of Mind Tasks to be negatively related to performance speed on the EFT in both typically developing children and children with autism. However, closer inspection of the individual data suggested that all individuals with ASD assigned to the no-ToM group also had Weak Central Coherence, whereas Weak Central Coherence seemed to be more pervasive as it was also found in three individuals with ToM abilities at the first or second order levels. This lends some support to a finding by Happé (1997) who reported that some individuals with ToM abilities continued to fail

using the preceding sentence context on the homographs task. However, individuals with ASD with MCC, SCC or the mixed style showed to similar degrees Theory of Mind competencies at the first or second order levels.

In summary, Study 1 has been useful in allowing us to characterise the present participant population in terms of their tendency towards Theory of mind and Central Coherence. The present participant population had in about equal proportions no ToM, first order ToM or advanced ToM competencies. We interpret our findings as suggestive of individual differences in terms of Central Coherence both with regards to the ASD group and typically developing individuals. The study has raised a number of questions that may lead to future research needed to clarify the notion of Central Coherence. Within this thesis, they were not further explored, as indeed, the study was initially motivated by a different aim: to see whether degrees of Central Coherence might affect the extent to which people with ASD may experience difficulties with cultural knowledge. Given that not all individuals with ASD showed this processing style, our predictions were revised, so that we only expected those with Weak Central Coherence to show these difficulties. In the following chapters, we shall now turn to these questions.

SOCIAL INFERENCE TASK

“What is it, then, I pressed her further, that goes on between normal people, from which she feels herself excluded? It has to do, she has inferred, with an implicit knowledge of social conventions and codes, of cultural presuppositions of every sort. This implicit knowledge, which every normal person accumulates and generates throughout life on the basis of experiences and encounters with others, Temple seems to be largely devoid of. Lacking it, she has instead to ‘compute’ others’ intentions and states of mind, to try to make algorithmic, explicit, what for the rest of us is second nature. She herself, she infers, may never have had the normal social experience from which a normal social knowledge is constructed.”

Oliver Sacks, about Temple Grandin, a life-stock scientist with high-functioning autism,
in “An Anthropologist on Mars” (1995)

4.1. INTRODUCTION

A tendency to navigate through the social environment, as if “oblivious to social rules and norms” is a feature that already Kanner (1943) noted as characteristic of many of his patients with autism. Anecdotes of situations in which people with ASD enter someone’s house for a first-time visit, stating they do not like the food spotted on the dinner table or commenting upon the host’s funny hair cut, are innumerable. By ignoring social norm pressures, people with ASD sometimes appear ‘brave’ or involuntarily funny at best, more often however, their behaviour tends to cause offence in their unsuspecting audience. This is often paired with a lacking understanding of ‘how the world works’, for example, Twachtmann-Cullen noted how one of her participants stated that “for a 100 £ I can buy Mc Donald’s, every book in the world and become older than my teacher” (Twachtmann-Cullen, 1998).

Such apparent naiveté to real world knowledge and ‘blindness’ to social norms tends to stand out even more in able and older individuals with high-functioning autism or Asperger Syndrome, precisely because others do not see any mitigating factors such as an apparent limitation of the person’s intelligence.

What could explain such inappropriate conduct? Perhaps people with autism are unaware of the effect, such as feelings of hurt or embarrassment, they produce in others. Or else, they may genuinely lack knowledge of social norms and conventions, a mental guidebook that usually governs much of our behaviour. The Theory of Mind deficit hypothesis would endorse the first possibility. However, the second possibility—that people with an autistic condition may systematically lack knowledge of social norms—has received surprisingly little attention.

In an ‘informal test of social know-hows and its uses’, Dewey (1991) presented seven young men with autism with a set of stories in which the protagonists displayed behaviours likely to be seen in people with autism. For example, in one story, a young man was feeding pigeons in a park during his lunch break. He observed how a baby in a carriage began to cry, unnoticed by its mother who was swinging an older child nearby. As he had learnt from his baby nephew that when he screamed, this sometimes meant that the diaper had opened, instead of bothering the mother, he quickly checked the baby’s clothing for an open pin.

Dewey asked her participants to rate the story characters’ behaviour on a scale ranging from ‘fairly normal behaviour in that situation’ through to ‘shocking behaviour’. She found that her respondents with autism often revealed a disregard for

the social context or social convention. For example, they did not rate the behaviour of the man touching a strange baby as shocking as control participants without autism did. At the same time, the group with autism showed a tendency to judge conventional behaviours as eccentric or shocking — for example they commented upon the wasting of good food by throwing it on the ground for birds.

Dewey's study was informative by illustrating how people with autism spontaneously judged a variety of naturalistic social situations and others' behaviour. However, the study did not disentangle whether the responses by the participants with autism were the result of difficulties with mental states or with social norms, as the stories required both knowledge of social norms and the drawing of mentalistic inferences to make judgements of the characters' behaviours.

Likewise, as discussed in Chapter 2, most recent studies that were aimed at approaching characteristics of naturalistic social situations have focused on the mentalistic component of social understanding (Baron-Cohen et al., 1999; Happé, 1994; Heavey *et al*, 2000; Kaland et al., 2002). Hence, on the basis of performance on these tasks it is difficult to tease out whether real life social impairments of people with ASD are solely the result of theory of mind deficits, of abnormalities in representing cultural knowledge of social norms and customs, or of both.

We designed a new 'Social Inference Task' that aimed, firstly, to test the extent to which people with ASD were able to predict and explain someone's behaviour on the basis of real world knowledge of social norms and customs, but without requiring them to evoke mental state attributions. For example, to forecast that a 12-year old is more

likely to have a drink of orange juice than a glass of beer, or that in the morning a man has an appointment with the dentist instead of going to the cinema, does not directly necessitate to refer to the agents' mental states.

A second aim of this study was to investigate whether hypothesised deficits in social knowledge may be related to specific and known cognitive abnormalities associated with autism spectrum disorders: theory of mind deficits or a weakness in central coherence. Two alternative predictions were pitted against each other. If cultural knowledge of social norms and customs relied on general learning mechanisms or verbal language, then the ASD group would be expected to possess such cultural knowledge to a similar extent as control groups without autism who function at a similar intellectual level. An alternative suggestion would be that distinct cognitive abilities might affect either the development or usage of these shared beliefs. As discussed earlier, a number of authors have suggested that the acquisition of cultural knowledge may indirectly rely on Theory of Mind or their developmental precursors (Tomasello, 1999; Bruner, 1986, 1993). If cultural understanding were indirectly dependent on Theory of Mind, then people with ASD who have profound deficits in this cognitive capacity should show greater impairments than individuals without this condition who function at a similar intellectual level but have a representational understanding of the mind. What is more, a within-group difference would be expected, so that individuals with autism with profound metarepresentational deficits would be predicted to show greater impairments than individuals with an autistic condition with theory of mind competence at the first or second order levels.

We had no concrete predictions as to whether or not Weak Central Coherence (WCC) would affect the *acquisition* or *development* of real world knowledge of norms and customs. However, as WCC is in part defined as the failure to integrate information in context, it could be expected that people with ASD with WCC *apply* their knowledge of social norms inappropriately by not relating it to the social context.

4.2. METHOD

4.2.1. Task material

Ten stories were designed to test whether individuals with ASD were able to predict and explain a character's likely behaviour or preference on the basis of social norms or real world knowledge (e.g. gender norms, age norms, common customs). For example, in one story vignette, "John has received an invitation to his best friend's wedding. The wedding is going to take place in a beautiful chapel in the countryside. Eventually, the big day arrives. John gets up early to get dressed for the wedding". The participant is then asked: "What is John going to wear?"

To choose from the four options 'wedding dress', 'suit', 'mountain jacket' and 'uniform', the participant does not need to impute a mental state to the character. However, it is necessary to extract and integrate two relevant pieces of story information – that the occasion is a wedding and that John is a man. If it was not for the wedding, going to the countryside may lend itself to wearing a mountain jacket. A wedding may be associated with a wedding dress, but this is only for the bride and not a guest, especially not when the guest is a man. Hence, a suit would be the most

appropriate choice of these options. However, although somewhat less likely, from the given story information, one could imagine a scenario in which a uniform may also be appropriate; for example, if John was a soldier.

Stories varied in terms of the number of relevant clues given. For example, in the story 'after homework', the only relevant information decisive for the character's likely choice of drink was his age. By contrast, for the story 'paintings', in order to establish that the character went to a museum, it was necessary to consider that this place had paintings and that he bought a ticket to enter. One does not need a ticket to go to the department store or railway station (although one can buy tickets at the latter, too), and although one needs a ticket to go to the theatre, the pictures (should there be any on the wall) are irrelevant.

Each set of four pictures was used in two different story contexts. The correct options were different across story pairs. This was to explore whether participants were able to use context information to justify their choices, as well as to ensure they did not choose items for other reasons, as for example, personal preference. The full set of stories, response choices and memory control questions, is given in Appendix 4.1.

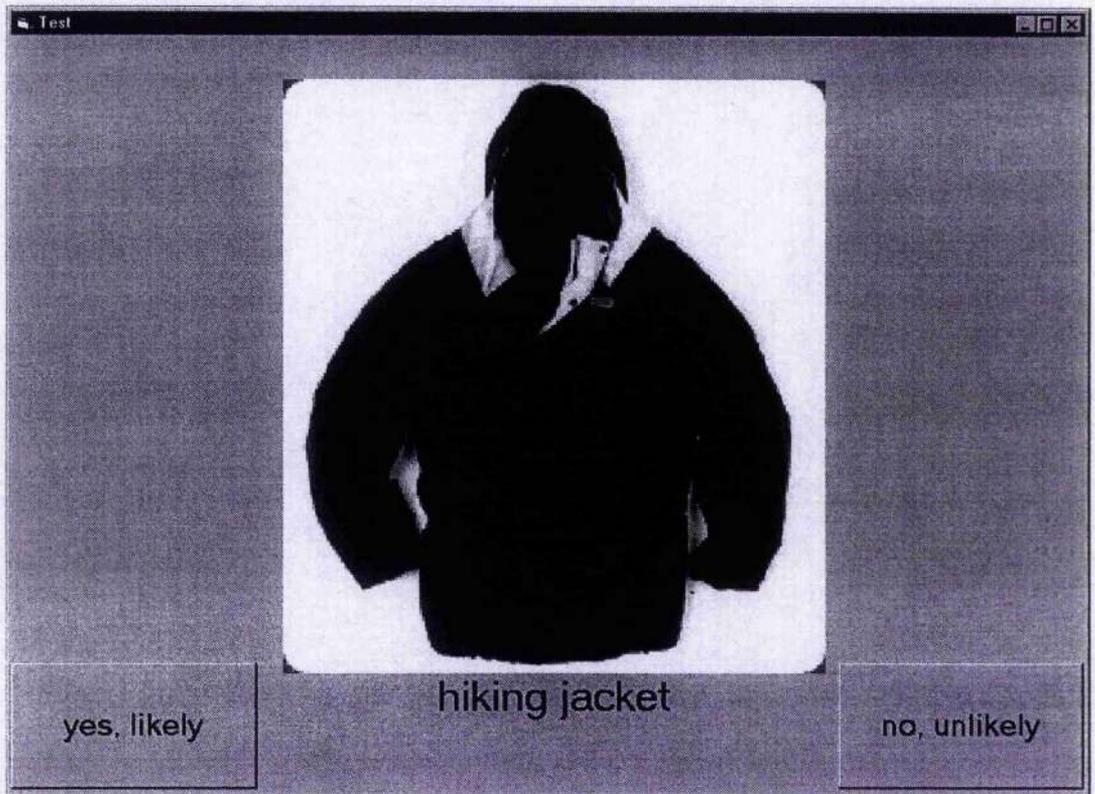
4.2.2. Procedure

The Social Inference Task was computerised and presented on a PC notebook (Toshiba Tecra 8000, 13.3-inch screen). The main aim of presenting the task in this way was to make it as attractive as possible (many people with ASD have a fascination for computers) and to enable easy administration and scoring.

To introduce the task, the experimenter told the participants that they were going to listen to some stories about different people. It was explained that after each story, the experimenter would ask one question about what the person in the story was likely going to do next. Then, they would look at four pictures on the computer, one after the other. For each picture, the participant was instructed to say whether it showed the right and likely answer, or the wrong and unlikely answer. This task introduction appeared on the screen and was read out aloud by the experimenter. Upon mouse-click, controlled in most cases by the experimenter, the first story appeared on the computer screen and was read out aloud by the experimenter. Some older and more able participants chose to read the stories out aloud themselves. After the story was read, the experimenter asked the participant if he or she had understood the story or wanted to listen to it again. If the participant signalled to be ready for the questions, the first *prediction question* was asked, for example "What is John going to wear?". Upon mouse-click, the computer then presented four photographs, one after the other (e.g. 'wedding dress', 'suit', 'mountain jacket', 'uniform'). For each photograph, the participant had the response choice between 'yes, likely' and 'no, unlikely'. One click was needed per photograph, upon which the next photograph appeared (see for an example of item presentations, Figure 4.1).

If the participant gave at least one incorrect response, a *memory control question*, tailored onto the relevant information in each story, was asked (e.g. "Where did John go?"). After presentation of all four pictures, mouse-click made a *justification question* appear on the computer screen (e.g. "Why are the other [clothes] wrong or unlikely?"). The experimenter then verbally specified this question for the four items,

Figure 4.1. Social Inference Task: example of response option



by taking the participant's responses on the prediction question (e.g. "Why is a wedding dress unlikely [likely]?" "Why is a suit likely [unlikely]?") into account. Responses were tape-recorded and later transcribed in full.

4.2.3. Coding system

4.2.3.1. Responses on prediction questions

Participants' responses were only included for stories for which he or she had passed the memory control questions. Responses on the *prediction question* were scored as either correct (1 point) or incorrect (0 points) for each story, which resulted in a maximum score of 10.

Baselines for correct responses - In stories 4, 6, 7 and 9, only one response combination across the four items was considered as appropriate. For example, in the story 'paintings', a correct prediction involved choosing the museum and rejecting the train station, the department store and the theatre. If the probability of answering each item correctly by chance is 50%, then the probability of obtaining by chance a correct answer for the story in total is $50\% \times 50\% \times 50\% \times 50\% = 6.25\%$.

For the remaining stories (1, 2, 3, 5, 8, and 10), more than one response combination on the four items was scored as correct. With this, we aimed to explore whether people with ASD were willing to consider that sometimes more than one type of drink or clothing can be possible in the same context. For the stories 1, 2, 5, 8 and 10, one item was unambiguously correct, and another one could be seen as an acceptable

exception (e.g. the uniform at the wedding). On this story, one needs to reject the wedding dress and the hiking jacket, one can include the suit and reject the uniform, or one can accept

both, but it was scored as incorrect to include the uniform but to reject the suit. Hence, the baseline probability for giving a correct response on these stories by chance was $50\% \times 50\% \times (100 - 25\%) = 18.75\%$. Story 3 'football TV' was exceptional in that only the item 'beer' (yes, likely) was relevant. Choosing beer on the basis of a situated gender stereotype and rejecting the other beverages was scored as correct, as well as choosing beer plus any of the other types of beverages. Rejecting the 'beer' and only choosing other types of drinks was scored as incorrect. This resulted in a chance baseline of 50%. (Appendix 4.2. gives the baselines for each story).

4.2.3.2. Coding system for explanations

A second analysis was concerned with the quality of correct and incorrect explanations. Clearly, someone who was able to appropriately justify his or her choice on the prediction question could be considered as having more in-depth cultural knowledge than someone has who could not justify his or her prediction, or gave an inappropriate explanation. Our coding scheme included three categories of appropriate explanations (social norm, relevant story information, canonical Theory of Mind inferences) and five categories of inappropriate explanations (inappropriate Theory of Mind inferences, inappropriate inference unrelated to story information, associative function responses, personal attitude and a diverse responses category). A definition of each category and examples are given below.

1. Appropriate social norm

For responses to be coded in this category, justifications were required to refer either explicitly or implicitly to social norms or generalised real world knowledge. An example of an explicit reference would be “it’s the kind of social norm”. An implicit reference to a norm could be evidenced by a deontic component of a more general explanation of what people, or types of people tend to do (for example “it’s not appropriate”, “it has to be 18”).

2. Relevant story information

This category included responses that referred to a relevant piece of information given in the story. For example, when asked to justify why a mountain jacket was the unlikely option in the wedding story, a participant replied: “well, there’s no one hiking at a wedding”.

3. Canonical theory of mind inferences

‘Canonical states’ describe routine or conventional happenings (see Lucariello, 1990). We introduce the term ‘canonical mental states’ to describe mental state inferences that bear on conventional expectations or stereotypes. An example for a canonical mental state explanation on the question “Why is Peter [12 years old] unlikely to have a cup of coffee?” was “most children don’t like the taste of coffee, they like orange juice or Ribena”. Hence, the inferred desire was based on a common stereotype of children in the situation of the story character.

4. *Inappropriate Theory of Mind inferences*

Previous research (e.g. Tager-Flusberg & Sullivan, 1995) suggests that people with autism use on the whole fewer mental state terms in their narratives than control groups. However, based on initial readings of the interview material, our impression was that at whilst at times, participants did use mental state terms, they did so in an inappropriate way, since the inference did neither bear on general real world knowledge (as in category 3) nor referred to some clue about a character's likely mental state in the story. For example, one participant with autism justified his rejection of the 'coffee' option on the story 'TV football': "I think they didn't want coffee because I thought it was white. I like orange-juice, I hate diluted taste, but I do like orange juice."

This explanation involves an inference of the character's mental state – "they didn't want coffee" - but the basis of this inference was rather idiosyncratic in nature. It was based on his very own preferences, likes and dislikes, which shows that he precisely failed to acknowledge that others can have differing desires, as well as that his own desires cannot influence the choices of a story character! Hence, the character of this type of 'mental state inference' is rather different to the one discussed in the above category 'canonical mental state explanations'.

5. *Inappropriate inference unrelated to story information*

This category mirrors category 2 and included explanations that are based on (non-mentalistic) inferences that cannot be drawn on the basis of the available story information. An example for this type is the response of a typical seven-year-old child

in relation to the story 'Monday morning': "Why did he not go to the dentist?" "He went to the dentist a week ago".

6. Associative function disregarding story context

This category included explanations revealing that the participant associated the item with certain (social) functions, albeit without considering the story context. This category included responses, such as "is for the coffee house", "for tooth cleaning", "to get his hair cut".

7. Personal experience or attitude

In this category, explanations were based on too narrow personal experiences or attitudes, for example "Why is Bill [40 years] not having a glass of beers?" "My dad doesn't drink beer". This category also included responses that may be phrased in social norm terms (eg. 'should be', 'is usual' etc) but had largely an idiosyncratic content ("it's not usual for men to go to the department store").

8. Diverse

The final category involved incorrect responses that did not fit into any of the categories described before, or responses that were too vague, such as "it has to be", "because that's why" and "don't know" responses.

Following Happé's (1994) scoring suggestions for the Strange Stories Task, where multiple answers were given for one item, the scoring procedure was facilitated by crediting the participant for his or her most appropriate answer. Ambiguous

responses were discussed with a second rater until agreement was reached. In a few instances in which ambiguity could not be resolved, the explanation was excluded from the analysis.

4.2.4. Participants

For this study, all individuals who had failed the False Belief Task because they had failed the memory control questions (3 participants with ASD, two with learning difficulties), were excluded from the analysis. Participants who failed to understand the false belief or mentalistic components presumably because they had difficulties to understand or memorise the story plots ('false belief + memory failer', see Chapter 3) were excluded in order to investigate whether or not predicted group differences could be attributed to Theory of Mind. Furthermore, one participant with autism and one with learning difficulties were excluded due to a lack of verbal responses on the justification question. This leaves 20 individuals on the autism spectrum (8 individuals with autism, 12 individuals with Asperger Syndrome), 7 individuals with learning difficulties, 16 normal children and 10 adults. Age characteristics, and for the two clinical groups verbal IQ details, are shown in Table 4.1.

Table 4.1. Participant characteristics (grey shades denote matched groups)

Groups	N	CA	Verbal IQ
ASD TOTAL	20	16.5	87.6
Autism	8	14.1	78.0 ¹
Asperger's Syndrome	12	18.0	94.1 ²
Learning difficulties (4 first order ToM/ 3 second order ToM)	7	14.3	74.6
Normal children	16	8.1	-
9-10 year old (second order ToM)	7	9.4	-
6-8 year old (first order ToM)	9	6.8	-
Adults	10	24.3	-

¹ from 7 individuals only

² from 9 individuals only

4.3. RESULTS

The data were analysed in three different ways. First, possible differences between diagnostic groups were considered, i.e. the autism spectrum group, considered as one group, was compared to the learning difficulties and typical children groups. We then divided those with ASD into autism versus Asperger's Syndrome and compared the autism subgroup with the verbal mental age matched learning difficulties group and the six to seven year old children. The Asperger's Syndrome subgroup was compared to the typical 9 to 10 year old typical children and adults.

For a second analysis, participants were grouped according to their level of theory of mind competence. Finally, for a third analysis, participants were grouped according to their central coherence groups. For each analysis, since small cell sizes were a concern, first parametric one-way analyses of variance were performed, followed by pairwise comparisons, using Tukey's tests. Where significant group differences were found, the data was re-analysed using non-parametric Mann-Whitney U tests.

4.3.1. Results for comparison between Autism Spectrum and control groups

4.3.1.1. Memory control questions

The autism spectrum group passed on average 8.9 out of 10 control questions, the learning difficulties group 9.0, the children 9.3 and the adults all 10. A one-way ANOVA showed that these differences were not statistically significant ($F(3, 51) = .367, p = .77$). When the autism spectrum group was split into autism versus Asperger Syndrome subgroups, those with autism passed on average 8.5 control questions and

those with Asperger Syndrome 9.1. The 6 to 7 years olds passed on average 9.1 and the 9 to 10 year old children 9.8 of the control question. Again, a one-way ANOVA did not reveal significant group differences ($F(4, 50) = .67, p = .61$).

4.3.1.2. Prediction question

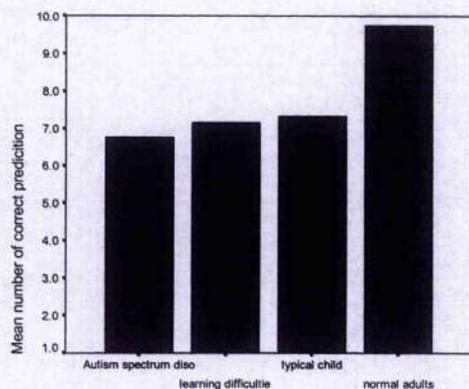
The results of participant groups' performances on the prediction questions are shown in Figure 4.2.

ASD versus Control Groups - The participants with an autism spectrum disorder did not differ from the learning difficulties and typical children control groups in terms of the means of correct predictions ($F(2, 42) = .677, p = .51$). Each of these groups, however, made significantly fewer correct predictions than the normal adults ($F(3, 52) = 5.12, p = .004$, for each pairwise comparison Tukey's $p < .05$).

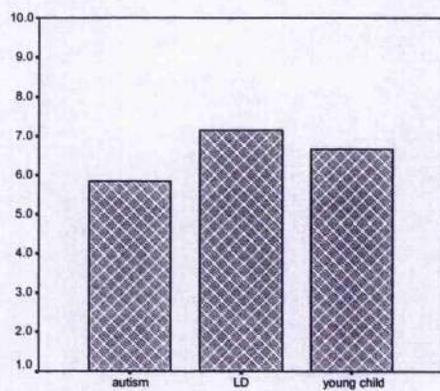
Autism vs. Asperger Syndrome - Next, the ASD group was split into subgroups with a diagnosis of autism versus Asperger's Syndrome, and each subgroup was compared to their respective control groups. A one-way ANOVA showed that the autism subgroup did not differ from the individuals with learning difficulties or the VMA matched 6 to 7 year old 'young' children in terms of means of correct predictions ($F(2, 22) = 1.02, p = .37$). However, significant group differences between the Asperger's Syndrome, 8 to 9 year-old children and adult control groups, were found ($F(2, 29) = 4.43, p = .02$). Mann Whitney's U test specified that only those with

Figure 4.2. Means of correct predictions (max = 10)

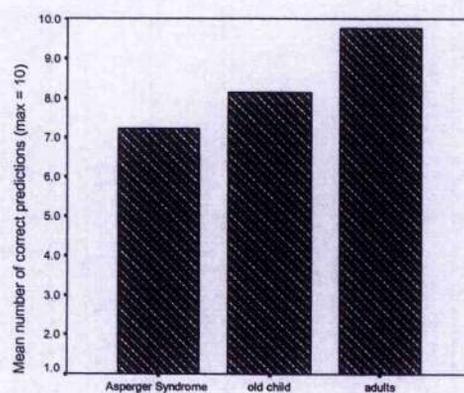
a) Autism Spectrum group versus control groups



b) Autism subgroup vs. control groups



c) Asperger Syndrome vs. control groups



Asperger's Syndrome made significantly fewer correct predictions than the adult control group ($Z = -3.28, N = 22, p < .001$). Furthermore, autism and Asperger's Syndrome subgroups did not differ significantly from each other in terms of means of correct predictions ($t(20) = -1.62, p = .121$.)

4.3.2. Results for Theory of Mind groups

To explore whether Theory of Mind competence influenced performance on the Social Inference Task, groups were split into no ToM, first order ToM, and second order ToM groups following the groupings established in Chapter 3. Participant characteristics in terms of Theory of Mind abilities are shown in Table 4.2. All participants in the control groups included in this study had Theory of Mind competence on either the first or second order levels.

4.3.2.1. Memory control questions:

The ASD no-ToM group passed on average 7.8 memory question, the ASD first order ToM group 9.3, and the ASD second order ToM group all 10. In the control groups, those with learning difficulties passed on average 9, the first order ToM children 9.2 and the second order ToM children 9.5 control questions. A one-way ANOVA established that these differences were not statistically significant, $F(6, 45) = .278, p = \text{n.s.}$.

Table 4.2. Participant characteristics, grouped according to Theory of Mind abilities

Groups	<i>n</i>	CA	Verbal IQ/ VMA estimates in brackets
ASD No ToM^a (5 autism/ 1 AS)	6	12.6	69.33 (6.8)
ASD first order ToM (2 autism/ 5 AS)	7	17.7	84.0 (7.3)
ASD second order ToM (1 autism/ 7 AS)	7	18.5	
Learning difficulties (4 1 st order ToM/ 3 2 nd order ToM)	7	14.21	74.60 (8.9)
Typical children (6-10 yrs)	16	8.1	-
2nd order ToM children (9-10 year olds)	7	9.4	-
1st order ToM children (6-7 year olds)	9	6.8	-
Typical adults	10	24.3	-

4.3.2.2. Results prediction question

The results were clear-cut and are illustrated in Figure 4.3. A one-way ANOVA showed that the ASD no ToM group alone performed significantly worse than all other groups, ($F(6, 48) = 13.77, p = .000$, Tukey's $p < .001$ for each pairwise comparison). The relevant pairwise comparisons showed that the ASD noToM group significantly more often failed to correct predict the character's likely behaviours or choices than the ASD first order ToM group ($Z = -2.05, N = 13, p < .04$), the typical first order ToM children ($Z = -2.1, N = 15, p < .02$), and than the learning difficulties group group ($Z = -2.2, N = 13, p < .02$). The performance of the ASD first order ToM group did not differ from that of the Learning Difficulties and first order ToM typical children control groups ($F(2, 20) = 2.3, p = .12$). Likewise, the ASD second order ToM group gave on average as many correct predictions as the second order ToM typical children and the adult control group ($F(2, 19) = .150, p = .86$).

However, the mean number of correct predictions did not allow us to distinguish between someone who specifically failed to predict a story character's behaviour but had understood the story and someone who failed the memory control question for that story. A concern could be that the significantly worse performance of the ASD no ToM group was the result of this group simply failing more memory control questions than the other groups. To investigate this possibility, a second analysis was conducted using proportions. Proportions were calculated by dividing the number of correct predictions by the number of correct memory questions. Results are shown in Table 4.3 and are depicted in Figure 4.3.

Figure 4.3. Means of correct predictions, participants grouped according to ToM competence

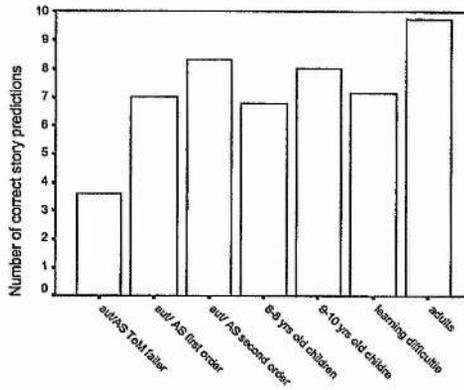


Table 4.3. Proportions of correct predictions

Groups	N	Total = 1	SD	Range
ASD noToM	6	.41	.29	(0-.7)
ASD first order ToM	7	.75	.16	(.5-1)
ASD second order ToM	7	.83	.1	(.7-1)
Child first order ToM	9	.73	-	(.6-.9)
Child second order ToM	7	.83	-	(.7-.9)
Learning Difficulties	7	.80	.15	(.6-1)
Adult	10	.97	-	(.9-1)

A one-way ANOVA showed a significant effect of ToM group on the proportion of correct predictions ($F(6, 45) = 9.53, p < .001$). Tukey's tests showed that the ASD no-ToM group made significantly fewer correct predictions, even when viewed against the total number of correctly understood stories, than all other groups ($p < .01$). This suggests that the worse performance of the ASD no-ToM group were not attributable to global difficulties with the story comprehension.

4.3.2.3. *Types of Explanations*

Next, the quality of the explanations given by the participants was considered. Results are shown in Table 4.4. For this analysis, the total number of 40 items were considered, including those 9 items that were judged as correct either way, and irrespective as to whether they were given after a correct or incorrect prediction. However, responses on stories for which the participant had failed the memory control question, were excluded.

The relevant findings were that the ASD no ToM group referred significantly less often to social norms in their explanations than the typically developing first order ToM children ($Z = -2.1, N = 15, p < .05$), the learning difficulties group ($Z = -3.01, N = 13, p < .01$), and the ASD first order ToM group ($Z = -2.5, N = 13, p < .01$). Furthermore, the ASD no ToM group gave significantly more 'associative function' responses that disregarded the story context than the learning difficulties group ($Z = -2.96, N = 13, p < .01$) and the typical children with first order ToM ($Z = -.332, N = 15, p = .001$).

Of all explanation categories, the ASD first order ToM group gave significantly more associative function responses than the typically developing 1st order ToM children ($Z = -1.93$, $N = 16$, $p = .054$) and than the ASD 2nd order ToM group. The explanations given by the ASD second order ToM group were comparable to those given by the typical second order ToM children and adult control groups, with exception of the ASD second order ToM group giving fewer appropriate 'canonical' ToM explanations than the typical second order ToM children ($Z = -2.15$, $N = 14$, $p = .05$) and than the adult control group ($Z = -2.4$, $N = 17$, $p = .035$).

Analysis for story type

To investigate whether participants found the 2-relevant information stories more difficult than the 1-relevant information, predictions for each type of story were inspected separately. Frequencies and percentages, given in Table 4.7., show that even the first and second order Theory of Mind groups did not perform at ceiling across all stories, and that all groups tended to find stories 7 and 10 most difficult.

4.3.3. Analysis for Central Coherence groups

The task required participants to extract relevant pieces of information from the story and to relate those to the photographs. In this sense, one needed to use context information (e.g. morning, evening) to judge whether a character went to the dentist or the pub. This could be seen as comparable to, for example, the demands of using the preceding sentence context in the Homograph Task (Happé, 1997).

Table 4.5. Frequencies and percentages of correct prediction for each story type

Story	Info ^a	ASD noTOM (n = 6)	ASD 1 st order ToM (n = 7)	ASD 2 nd order ToM (n = 8)	LD 1 st +2 nd order ToM (n = 7)	Child 1 st ToM order (n=9)	Child 1 st order ToM (n = 7)
"Wedding"	2	2 (33.3%)	6 (85.7 %)	8 (100%)	7 (100%)	8 (88.9%)	7 (100%)
"Friday Evening"	1	1 (16.1)	2 (28.6%)	6 (75.0%)	7 (100%)	4 (44.4%)	3 (42.9%)
"TV football"	1	4 (66.7)	3 (42.9%)	8 (100%)	5 (71.4%)	4 (44.4%)	6 (85.7%)
"Park"	1	1 (16.7%)	6 (85.7 %)	7 (85.5%)	4 (57.1%)	4 (44.4%)	6 (85.7%)
"After homework"	1	3 (50%)	6 (85.7 %)	8 (100%)	6 (85.7%)	7 (77.8%)	7 (100%)
"Mountains"	1	3 (50%)	7 (100%)	8 (100%)	7 (100%)	6 (66.7%)	7 (100%)
"Paintings"	2	0	4 (57.1%)	3 (37.5%)	1 (14.3%)	2(22.2%)	4 (57.1%)
"Christmas dinner"	1	3 (50%)	6 (85.7 %)	8(100%)	6 (85.7%)	8 (88.9%)	7 (100%)
"In a rush"	2	0	2 (28.6%)	4 (50%)	1 (14.3%)	2 (22.2%)	3 (42.9%)
"Monday morning"	1	3 (50%)	5 (71.4%)	8 (100%)	6 (85.7%)	8 (88.9)	6 (85.8%)

^a2= Combination of two pieces of information is necessary
 1= one or more clues are given that point to one response option

For this analysis, we lost four cases in the ASD group and two cases in the normal children group, as no data on the central coherence categories was available for these participants.

Correct predictions

Due to otherwise small cell numbers, for statistical analyses, the four Central Coherence groups were compared across diagnoses. However, in Table 4.6, together with the means for all Central Coherence groups irrespective of diagnosis, we also give the corresponding means of the ASD group only, characterised according to Central Coherence categories. Recall from Chapter 3 that with the exception of one typical adult, only individuals with ASD were characterised as having a Weak Central Coherence cognitive style. A one-way analysis of variance showed that the Central Coherence groups did not differ in terms of the number of correct predictions ($F(3, 43) = 2.26, p = \text{n.s.}$).

Table 4.6. Number of correct predictions: all participants grouped in Central Coherence categories, and ASD grouped in Central Coherence categories (max = 10)

CC TOTAL groups	N (<i>across all groups</i>)	Correct prediction	N (ASD only)	Correct prediction
SCC	10	6.5	3	5
MCC	11	7.4	5	7.2
WCC total	7	7	6	6.5
Mixed style	18	8.4	3	8.6

Kinds of explanations

Of the different kinds of explanations, we predicted that especially one type of inappropriate explanation might be rooted in a Weak Central Coherence cognitive style: the inappropriate associative function type. When all participants were grouped according to Central Coherence categories, significant group differences for the means of appropriate social norm explanations ($F(3, 43) = 4.2, p = .01$), inappropriate Theory of Mind explanations ($F(3, 43) = 3.6, p = .02$), and inappropriate associative functions ($F(3, 43) = 4.2, p = .01$) were found. However, post-hoc tests revealed that these significant group differences always involved the better performance of the 'mixed style' group. This is less interesting, as the majority of the mixed-style group was composed of adult controls

4.4. DISCUSSION

The study was aimed at exploring two questions: first, do people with an autistic condition have impaired cultural knowledge of norms and social customs that would affect their ability to predict and explain behaviour? Secondly, if there were such impairments, might these be related to deficits in either Theory of Mind or Weak Central Coherence?

In summary, the results were clear-cut: overall, individuals with autism or Asperger's Syndrome did not show significantly greater impairments in drawing inferences based on social norms or real world knowledge than their respective control groups. Neither did groupings into Central Coherence groups reveal statistically

significant group differences. However, only individuals with an autism spectrum disorder and Theory of Mind impairments showed consistent deficits in predicting and explaining story characters' behaviour with reference to social norms. The finding that the ASD no-ToM group made about twice as many wrong than correct predictions concerning a character's norm-based actions suggests that for this subgroup, the unpredictability of others' actions might go even beyond situations that directly require the drawing of mentalistic inferences. And even where they did make correct predictions, probing questions for explanations suggested that about half of the times their understanding of the norm was in fact only superficial and fragile.

Another finding of this study was that participants amongst the typical population did not always give mentalistic explanations as the 'default' ones. As shown in Table 4.5, with increasing age, the typically developing children and adults gave increasingly higher proportions of social norm explanations. This underscores the value of social real-world knowledge for everyday 'sense-making'. In addition, at times canonical or stereotypical mental state inferences formed part of this social norm reasoning. The typically developing children elegantly combined their real world knowledge with relevant story information to back up their mentalistic guesses (for example: "Men usually like beer, particularly when they watch a football match", "he might be thirsty after the work and wants a cold drink"). What is more, the typical children seemed to be aware that their predictions involved a component of uncertainty, which they linguistically marked, such as "he might want", "could want", "perhaps" etc.

Unexpected was the finding that the ASD no-ToM group gave most 'inappropriate ToM' explanations. On the basis of past research, suggesting that people with autism use fewer mental state terms in their narratives (e.g. Loveland et al, 1989, Loveland & Tunali, 1993; Tager-Flusberg & Sullivan, 1995), we expected the no-ToM group to use only few mental state terms in their explanations. One possibility accounting for this unexpected finding might be that their tendency to give 'Theory of Mind' explanations was directly related to their relative lack of social knowledge that other groups used instead in this context. Where those were not available, they might have attempted to evoke mentalistic explanations but failed to do so appropriately precisely because of their representational Theory of Mind deficit. Lucariello (1990) has argued that as part of narrative activities, Theory of Mind activities may be particularly stimulated where something out-of-the-ordinary, 'anti-canonical' in her words, happens. If cultural knowledge that normally structures the 'ordinary' lacks, then actions that for us are ordinary might also fall into this category. However, the 'inappropriate' character of the 'Theory of Mind' explanations offered by the ASD no ToM group suggests that this group might have deployed mental state terms more as a conversational device, an empty shell, and not as a useful cognitive tool in which mental states were related to some relevant content in order to predict or meaningfully explain other's actions. In this sense, a good proportion of responses coded as 'inappropriate ToM responses', saying, 'because he wants to' need actually to be translated into 'I don't know'.

A further interesting finding of the explanation measure was the high number of associative responses found in the subgroups of ASD with no ToM. This pattern was

specifically predicted from WCC theory, but it was also found to be most prevalent in the ASD no ToM group. For example, one participant consistently disregarded context information, such as information about the time or the identity of the character, and claimed that both the 12-year old boy and the adult would not drink coffee because that is “for the coffee house or in the morning” and they would not drink beer because “that is for the pub” etc. One explanation for significant differences between Theory of Mind groups could have been that in fact, the result might have been contributed by Weak Central Coherence, since all individuals in the no ToM group also had Weak Central Coherence. Whilst more able individuals with WCC (with ToM competence at the first or second order levels) might have used their language abilities to give meaningful explanations, this might not have been possible for these less able individuals.

The present study did not provide evidence for a lack of real-world knowledge of social norms and customs in all people with ASD, but rather suggested that the acquisition of social norms and of Theory of Mind might develop in tandem. On the other hand, can we conclude from this study that real world knowledge is relatively intact in people with ASD who function at the level of first or second order theory of mind competence? Closer inspection of the different stories showed that two of the 2-item stories – the ‘painting’ and ‘in a rush’ stories - were even difficult for many of the individuals with first or second order Theory of Mind competence, including those with and without an autism spectrum disorder. However, a closer comparison between these 2-item stories and other 1-item stories suggests that the 2-item stories were not based on social norms proper, something that could be explicitly taught, but rather they relied on real-world knowledge in a broader sense (see Appendix 4.1.).

The study had two limitations. The first limitation relates to the task material. Although correct responses and explanations on this task did not require the participant to make theory of mind inferences *per se*, some of the stories included mental state descriptions (e.g. story 9: 'looking for something'). Although participants' responses were only included if they had passed the relevant memory control questions, and although a full understanding of the characters' mental states was not necessary to make predictions, this inadvertent mentalistic component in some story cases may have disadvantaged the ASD noToM group. It would therefore be useful to refine the task by still further minimising the Theory of Mind component.

As a second limitation we need to consider the participant characteristics and relatively small numbers comprising the present sample. On the one hand, this may pose problems to generalise the findings to the autism spectrum population at large. On the other hand, the problem of small sample sizes refers generally to the danger of precluding a statistically significant effect. In this way, having found statistical effects with small cell sizes suggests a relatively high homogeneity amongst the separate subgroups.

In summary, as an exploratory study, the findings suggest that for some people with an autistic condition, impairments in social understanding may stretch beyond what has been suggested by the 'fine cuts' method in which social situations were compared in terms of whether or not the ability to draw mental inferences were required. The study also poses a number of questions that may stimulate future research.

This includes, as a first avenue, to extend this line of research to younger normally developing children. As all *control* participants included in the present study had ToM competence at either the 1st or 2nd-order level, it would be necessary to further investigate whether typically developing preschoolers acquire social norms and real-world knowledge before, with or after they develop a representational understanding of the mind. Although most of the behaviours were not prescriptive in a strict sense it is possible that they involved a deontic component. Whether or not deontic and mentalistic reasoning are distinct or interwoven domains, is subject of current debate (see Cosmides and Tooby, 1992; Jackendoff, 1996; Nunez & Harris, 1998; Bruner, 1993). Comparative research with normally developing children and people with an autism spectrum disorder may be helpful to investigate further whether separately, or in conjunction, these two reasoning abilities participate in real world knowledge acquisition.

Another way of studying the possible role of Theory of Mind for norm-based inferences would be to explore the neural correlates of this kind of social reasoning. A study using functional imaging techniques in which people with autism and psychopaths were given the Dewey stories found that in psychopaths, but not in autism, brain pathways were activated that are associated with mentalising capacities (Blair, personal communication). It would be interesting to see whether normally developing children or adults may show an activation of similar regions when reading 'social norm' stories, which do not directly involve a Theory of Mind component.

Future work is needed that investigates in more detail the understanding of norms or real world knowledge specifically in the able ASD 1st and 2nd order ToM

groups. Given that as a first study with exploratory character, the task was designed to be comprehensible for a relatively wide age range and people with moderate learning difficulties, it might have tapped on a level far below what could be expected from these able adolescents or adults. Informally, it was noted that adult controls and some of the typically developing children often evoked exceptional scenarios in order to accommodate the less likely items. For example, whilst they recognised that a dentist was not a conventional place to socialise in the evening (and rejected it on the prediction question), one participant speculated that the character could meet his friend at the dentist if the friend happened to be a dentist. In other words, people used their imagination to create less conventional but hypothetically possible scenarios. One possibility that could account for a potential discrepancy between relatively good task performance of this able ASD 2nd order ToM group and real life problems may be that they have 'over'-learnt social norms in a strict rule-type way. It may be informative to explore whether or not they may be able to use theory of mind as a vehicle for imagination, in order to account for unlikely exceptional circumstances, which could be contrasted with truly 'impossible' ones. Secondly, one may ask this able subgroup whether they may be ready to make more fine-grained distinctions between what is more or less likely. A third question that arises is how far abnormalities may extend to other social inference processes in autism or further aspects of cultural knowledge. In order to explore further the possible range of abnormalities in cultural knowledge, in the following study we turn to yet another fundamental facet of it: the representation of routine events.

EVENT REPRESENTATION IN AUTISM

5.1. INTRODUCTION

The question that motivated the studies presented in this and the subsequent chapter was how individuals with an autistic condition represent common and routine events. Event knowledge, often referred to as 'scripts' (Schank & Abelson, 1977), 'event schemas' (Mandler, 1983) or 'generalised event representations' (Nelson & Grundel, 1981) are an essential part of our cultural knowledge. As a cognitive frame, scripts tell us what could or should happen in individual experiences with routine events, such as when going to a restaurant or grocery shopping. As observed differences in scripts between different cultures underscore, this content is learnt and shared only amongst members of a given social and cultural community that share the same kinds of experienced events. For example, both Westerners and Samoans have general expectations of what happens when a friend visits them, yet the content of their represented routines varies considerably (Shore, 1996).

The notion of 'scripts' was first coined by Schank and Abelson (1977). In the attempt to model complex processes such as text or language comprehension in artificial intelligence, Schank and Abelson faced the problem that people infer much more about a situation than what is literally said. Real world based scripts were their proposed solution, defined as a high-level schematically organised knowledge structures. As schemas (Bartlett, 1932; Mandler, 1979; Rumelhardt, 1977) in general,

scripts or event schemas are thought to stand midway between immediate perceptual experiences and paradigmatic abstractions, where in a set of expectations the whole (e.g. living room) implies certain components, but the components (e.g. tables, chairs) do not imply the whole. In addition, event scripts comprise a sequence of actions that are organised within a particular spatial-temporal context and around a goal. Basic characteristics of scripts include generality, sequentiality, and causality of actions and agreement on main and central acts. Somewhat analogous to a theatre script, mental scripts not only specify the social roles of people who appropriately participate in an event, but also the presence (or absence) of requisites and material artefacts, often referred to as 'props'. For example, in a restaurant event, we expect to find waiters, cooks, and guests, as well as tables, chairs and cutlery, but no shopping carts. We predict that the waiter will bring us the food after and not before we have ordered it (temporal sequence) and expect to pay because we have consumed food (causality).

Of specific relevance for the present proposal is the assumed hierarchical organisation of scripts, which includes at the highest level *scenes*, then *slots* and at the lowest level *slotfillers*. For example, in the classic restaurant event, major scenes are ordering, eating and paying. Developmental research introduced a further distinction between *central* and *optional* (also called *peripheral*) acts. This distinction refers to the importance and probability of actions or 'props' (i.e. requisites, objects) to occur in an event. For example, a central act would be 'paying the bill', and an optional act would be 'having a pudding'. Both central and optional acts can be expressed either as generalised slots (say, having pudding) or specific slotfillers (chocolate sundae). Due to the cognitive interplay between central and optional acts and the accommodation of

specific instances into more general slots, scripts have both a structuring function and allow for a great deal of flexibility across different experiences with a given event. Taken together, scripts are considered to be powerful cognitive constructs that provide a frame or cognitive context for the interpretation of ongoing experiences, comprehension of text and stories, and the organisation of experiences in memory.

A number of studies have lent empirical support to the basic tenets of the script model. In a landmark study by Bower, Black and Turner (1979), adults showed high agreement in their temporal organisation and in their spontaneous listing of actions relevant to routine events, which were described at a relatively high level. For example, in describing a restaurant event in a study by Galambos and Ribs (1982), participants wrote 'he ate his soup', as opposed to 'he picked up his spoon, dipped it into the cup of soup, lifted it out' etc. Further evidence that scripts appear to be activated as a whole comes from memory tasks. Participants typically *falsely* recognise actions not stated in the original text but that are implied by the underlying script (Bower et al., 1979; Walker & Yekovich, 1984). Over time, memory for atypical, and irrelevant actions decreases whereas memory for typical action increases (Graesser, Gordon & Sawyer, 1979; Graesser, Woll, Kowalski, & Smith, 1980).

A research programme led by Nelson and her colleagues (reviewed in Nelson, 1986) has extensively studied the acquisition of event knowledge in young typically developing children. This research suggests that already by around 35 months of age, typical pre-schoolers possess schematised knowledge of familiar and recurrent events in a script format. One of the most common methods used to study young children's event

knowledge has been the event generation paradigm in which children are asked to produce narratives of routine events, such as a school lunch, a restaurant visit, or a birthday party (Nelson and Gruendel, 1981, 1986). The young participants showed high agreements amongst each other in terms of the main and central acts of an event, and their descriptions typically conform to the script characteristics of generality, consistency over time, temporal-sequentiality and hierarchical organisation. Generality is linguistically expressed by speaking of *you* or *they* eat, rather than using *I* or *we* forms and consistency over time is linguistically expressed by deploying the timeless present tense rather than the past tense of individual experiences. Understanding of the temporal-causal structure is shown by linguistic markers, such as *first*, *then*, and hierarchical organisation by structuring their reports in relatively high-order slots. For example, the children mentioned that activities before lunch time involve playing, but, unless specifically probed, rarely specified whether this means riding a bike or playing with dolls. With increasing age and experience, the descriptions of scripts were found to become more elaborate (more main component activities are reported) and more probabilistic in that more conditional and optional activities were included as possible components of a scripts. In sum, scripts are hierarchically organised, flexible, present from very early in development and serve as a cognitive tool to structure individual experiences.

5.2. EVENT REPRESENTATION IN AUTISM

Little systematic research is available that has studied how people with ASD represent events although speculations that people with ASD may have a poorly

acculturated view of the world (Loveland, 1991; Loveland & Tunali, 1991; Bruner & Feldman, 1993) include predictions of impaired script knowledge. This relative neglect might strike one as surprising, as the research discussed above points to the vital role of generalised event representation in modulating social interaction - a key impairment of the autism syndrome. As French (1985) noted, it is the "flexibility within parameters of certainty" that makes event schemas powerful cognitive constructs to guide comprehension and behaviour. "Neither someone with a very rigid representation of allowable components, nor someone with no representation of the central components could behave appropriately across a variety of restaurant experiences" (p. 183). What is more, in events, the social and object worlds, commonly separated by developmental psychologists, are tightly interwoven, as from scripts we do not only generate expectations of people's actions in social situations, but also of what kind of objects should, might or might not be present.

To our awareness, only two previous studies have investigated script knowledge in people with autism. Loveland and Tunali (1991) compared how individuals with autism and Down syndrome responded to social scripts in an acted out 'tea party' situation during which an experimenter talked about an unhappy experience (his stolen wallet). The children with autism did not significantly differ from the control group in their responses to the tea party situation, but a significant proportion did not spontaneously respond by comforting the experimenter for his distressing experience. The authors concluded that whilst the autistic group was relatively unimpaired regarding the script that was more instrumental in emphasis (the tea party), they experienced problems with the superimposed script that was more interpersonal in

emphasis (responding to another person's distress). This study, however, poses several problems, for example, participants were required to shift attention between two contexts (i.e. the pretend world of the tea party scenario, and the 'real world' distress situation). Moreover, the status of the distress situation as a script situation remains somewhat ambiguous.

In a recent study, Volden and Johnston (1999) found that children and adolescents with autism were on average less competent than mental age matched peers in generating core elements defining a restaurant, a movie, and a grocery store event. Instead, they mentioned more script irrelevant acts. However, when they were given a more structured task with visual support (videotaped scenario) that required participants to predict the next core element, they performed comparable to the control group. The authors concluded that whilst autistic participants had appropriate 'content' knowledge, they lacked 'microlinguistic skills' to produce a coherent narrative. However, they noted that the finding "that autistic people have even basic knowledge of everyday scripts is somewhat surprising given the inappropriate behaviour often displayed by people with autism in situations that would ordinarily be scripted" (p. 210). Their participants were relatively old and high functioning, and the scripts were relatively simple with only a few core elements, which might have led to ceiling effects.

What is more, neither of these two studies departed from clear theoretical predictions as to why and how people with autism might show script abnormalities. This leaves the possibility that these studies have not looked at specific aspects of event representation that might be impaired in people with ASD.

The present proposal is that in addition to general learning difficulties often accompanying ASD, specific cognitive abilities associated with this disorder - a weakness in central coherence and/ or theory of mind deficits - might impair acquisition of event knowledge.

5.2.1. Could a Weakness in Central Coherence affect the acquisition of script knowledge?

If the cognitive style of people with autism is characterised by a featural processing preference, then impairments could be expected for the acquisition of knowledge structures such as schemas or scripts that are defined by their configural and holistic character. However, as the hierarchical organisation is only one facet of scripts, from a Central Coherence perspective, only certain aspects of autistic people's event representation are expected to be abnormal, whilst others should remain relatively intact. Our predictions were as follows:

1. Central Coherence theory does not make any predictions as to whether or not people with ASD might have problems with the temporal-sequential organisation of events. Rather, knowledge of causal-temporal relationships would be expected to be mainly influenced by the individual's general level of intellectual functioning, so that impairments may be found in lower-functioning individuals with autism, though no more severely than in persons with similar learning difficulties without autism.

2. In the present interpretation of Central Coherence Theory, specific problems with the hierarchical organisation of events are predicted. It would be expected that a

piecemeal processing style might result in representing events more in terms of local, featural slotfillers than in terms of more global slots. However, as discussed before, the benefit of representing event actions in slots consists in creating flexibility as slots can accommodate different individual experiences that vary on the surface. If events were instead already represented at this lower level, then very minor changes might constitute a deviance from that script. For example, changes from 'spaghetti' to 'fishfingers' in a restaurant, might constitute as much a deviance from the scripted expectation for an individual on the autism spectrum as would for a typical child or adult a change within a whole slot (e.g. not ordering a meal).

3. Moreover, a representation of events in terms of surface details might also affect the understanding of optional acts as distinct from central ones, as judging whether or not an act is optional to an event requires relating the event parts to a holistic understanding of the meaning of the event as a whole. If one did not understand events in such a hierarchical fashion but rather perceived them as a linear chain of details, it would remain opaque why certain acts happen in one situation but not in another one.

Either due to their specificity or their peripheral status within the event as a whole, both slotfiller acts and optional acts might or might not happen in individual experiences. Taken together, arguments two and three both predict that piecemeal processing might affect the ability to distinguish between what could and what should occur, in the sense that both might be represented as should-be-occurring.

5.2.2. The relation between Theory of Mind and the acquisition of scripts

On the basis of the existing literature, the potential role of theory of mind in script knowledge is less well specified, and might possibly be less direct. We are not aware of any study that has explicitly attempted to relate these two areas so far.

However, scripts may not only be acquired through personal experience, but also through vicarious experiences communicated to us by others. In a first sense, Theory of Mind might have a general and indirect influence on script acquisition through the link between Theory of Mind and communication impairments. More specific predictions, however, can be generated from Bruner's account (1986, 1990). Bruner suggested that narrative thinking may be a vehicle for both script knowledge and theory of mind development. He argued that in narratives, told to others or even in monologues to themselves, (Nelson, 1989; Feldman, 1989) young children 'relive' their experiences. In doing so, narratives are proposed to scaffold metacognition about intentions, and also to consolidate young children's understanding of a script. This view would predict that in autism, script impairments and theory of mind impairments should occur at a corresponding level.

In their original formulation, Schank and Abelson (1977) implicitly discussed the role of Theory of Mind for event representation when they spoke of events as "giant causal chains". The authors specified five types of causal connections: "action results in new state", "states can enable actions", "states disable actions", "states or acts initiate mental states", and "mental states lead to actions" (my italics). The last two types emphasise the organisation of scripts around goals and activities, as for example, in a restaurant, you want to order, want to eat etc. If the waitress fails to bring a menu, this

prevents you from ordering, having to wait for the food might make you angry at the waitress which in turn may result in your giving her only a small tip.

Hence, Theory of Mind may affect representation of events in two ways. If one does not understand how expectations and intentions link different event actions, then these actions may stand as rather unconnected, and need to be learnt in a rote-type fashion. In other words, Theory of Mind might affect how different acts are meaningfully related. Secondly, one may need Theory of Mind to understand the 'culture-embodying meanings of events', as the ultimate 'goal' of many events (Bruner & Feldman, 1993) may at least in part be of a mentalistic nature: people go to a restaurant because they want to 'have a good time', or 'to relax'.

5.3. STUDY 3: EVENT NARRATIVES

The study had three aims. As an exploratory study, we were firstly interested in studying the *quality* of scripts produced by people with autism and in investigating the extent to which people with an autism spectrum disorder showed abnormalities in script knowledge as compared to control groups. Secondly, we aimed to explore the role of Central Coherence and thirdly, that of Theory of Mind on event knowledge. To study this, the script generation paradigm was used.

The choice of deploying spontaneous narratives as a method to study individuals with a developmental condition that may involve language impairments, poses potential problems (see Volden & Johnson, 1999). People with autism have been found to display abnormalities in grammar, semantics, (Tager-Flusberg, 1995), and pragmatics (Bruner & Feldman, 1993), and tend to produce overall shorter narratives (Loveland, McEvoy,

Kelley, & Tunali, 1990). However, given that the study was exploratory in nature, the potential benefit of being able to capture a variety of *specific* abnormalities in autistic people's scripts that would be harder to track in more structured tasks, prevailed. In addition to the expectation that people with autism might produce overall shorter or *worse* narratives, we expected to find specific structure and content related peculiarities in their scripts. These included:

1. a tendency to describe events in a piece-meal fashion, manifest in the usage of slotfillers in places in which a more general description is possible,
2. difficulties distinguishing between 'optional' and 'central' acts, and
3. related to Theory of Mind impairments, difficulties understanding the meaning of events and how event actions are related in an intentional, goal-directed way.

Two different events were chosen on the grounds that they were assumed to be familiar to each of the participant groups; 'going-to-a-restaurant' and 'celebrating-Christmas'¹.

Participants were asked to tell a character who has never been to Scotland or Britain what generally happens when people go to restaurants etc. All narratives were tape-recorded and later transcribed in full. This provided the material for both a qualitative and a quantitative analysis.

¹ The study involved a third event: visiting a friend. However, we lost a number of participants through a variety of practical and technical problems and as cell sizes were very small, this event was excluded from the present analysis.

As our main predictions revolved around the notions of slots, slotfillers, central and optional acts, clear-cut, operational criteria for these terms were vital.

Unfortunately, we felt that previous studies often employed coding schemes too coarse for the present purposes, and more generally, ambiguities in coding individual utterances were anticipated given that researchers' definitions of the terms were often too vague for operationalisation. Therefore, working definitions of the relevant terms were formulated based upon a pilot study with six adults, drawn from the St Andrews student population, who were asked to describe the restaurant and Christmas events to someone unfamiliar with them. These are described next.

Working definitions of terms

Central act. We consider a central act an act that occurs with a high probability and that adults denoted in their description with linguistic markers, such as 'usually', 'most of the time', 'most people' etc.

Optional act. An optional act is one that adults linguistically denoted as occurring 'sometimes', 'maybe', 'perhaps', 'under some conditions', 'if-then', or as being performed by 'some people'.

Slotfiller. The definition of a slotfiller follows Nelson and Lucariello (1985) as an act or object that can be substituted by one or more alternatives at the same categorical level (e.g. salad, soup), or that can be expressed as a higher-level category (e.g. starter) without causing alteration of the meaning of the act.

Core slotfiller. This term was introduced based on an observation from the pilot data and refers to acts or objects that can be seen as a sub-category of central slots. As

for a central act, a core slotfiller is an act or object that occurs with a high probability, linguistically denoted by the same markers as central acts. However, the special feature is that a central slotfiller is expressed in very concrete, 'low-level' terms, but crucially cannot be substituted by any higher-level description. An example for a core slotfiller would be "writing Christmas cards", "Santa Clause brings presents" or the "the waiter brings the menu". In these examples, the particular objects are relevant to the act, and cannot be easily substituted without changing the meaning of the act.

Slotfiller example. Driven by the pilot data, we introduced this term to account for descriptions that involve specific slotfillers but that were used within the context of a more general description.

5.4. METHOD

5.4.1. Participants:

Participants included 21 individuals with an autism spectrum disorder (11 with autism, 10 with Asperger's Syndrome), seven individuals with learning difficulties and 11 typically developing children. Their characteristics in terms of Theory of Mind and Central Coherence are given in Table 5.1.

Table 5.1. Participant characteristics

	ToM Scores	CC scores
ASD N = 19 Autism: 10 ^{a, b} . Asperger's S: 9	N= 19 No-ToM: 5 1 st order ToM: 6 2 nd order ToM: 8	N= 16 WCC: 8 MCC: 3 SCC: 2 Mixed: 3
Learning difficulties N = 6	N = 6 No-ToM: - 1 st order: 3 2 nd order: 3	N = 6 WCC: - MCC: 1 SCC: 2 Mixed: 3
Children: N = 11	N = 11 No-ToM 1 st order ToM: 2 nd order ToM:	N = 11 WCC: 0 MCC: 3 SCC: 3 Mixed: 5

^a5 × noToM, 2 × 1st order, 2 × second order

^b 1 × SCC, 2 × MCC, 6 × WCC, 1 × mixed style

5.4.2. Procedure

The experimenter showed the participant a black-and-white photograph of an approximately twelve year old boy with Asian features, dressed in a traditional Buddhist monk outfit, and said: "Look, this is a boy called Toku. Toku was born and lives in a country far far away from here, in East Asia. Toku has never been to Scotland, or Britain, or even to Europe. In the place where Toku lives, many things are very different to the way things are done here in Scotland. I would like you to explain to him what things are like here in Scotland: first, what happens generally when people go to a restaurant, and then what happens when people celebrate Christmas." After the general introduction, the interviewer said: "Let's start with the [restaurant] first. When people go to a restaurant, what happens normally?"

Throughout the course of the interview, neutral and more specific prompting questions were asked to encourage the participant to continue with or elaborate on his or her event description. If the participant had paused, neutral prompts were given first, for example "anything else?", "and then?", or "Can you tell me more about..?", "You said [], and what happens after that?". If the participant responded with "I don't know" or "That's it", or had missed out one or more whole scenes, more specific prompts were given to elicit the next central scene. For the restaurant event, specific prompts included, for example: "And how do people choose what they want to eat?" "What could they eat in a restaurant?" "Before they leave, what do people do?" "Is there anything that people have to do before leaving the restaurant?"

Always Questions. In our analysis we were going to distinguish between 'correct' and 'wrong' descriptions of optional acts on the basis of the use of linguistic

qualifiers. If a participant had not spontaneously qualified an optional act by saying it occurred 'sometimes', 'if-then', or was performed by 'some people', the experimenter probed for the status the participant assigned to that act, by asking 'always questions'. For example: "Do people always [eat spaghetti] when they are in a restaurant?"

Why-questions For each event, a why-question was included to explore whether the participant had an understanding of the (cultural) meaning of the event: "Why do people go to a restaurant", "Why do people celebrate Christmas?". For the complete interview protocol, see Appendix 5.1.

The study involved both qualitative and quantitative analyses. The coding criteria were slightly different for the two types of analyses, with the criteria for the qualitative analysis being more complex. Therefore, coding system and results are discussed separately for each type of analysis. The qualitative analysis is presented first.

5.5. QUALITATIVE ANALYSIS

5.5.1. Coding criteria for the qualitative analysis

For the qualitative analysis, participants' event narratives were assessed against Nelson's criteria of script competence (Nelson & Gruendel, 1981, 1986) which include generality, temporal and sequential order, and hierarchical organisation. These are specified below.

1.Generality. Generality is expressed through linguistic markers, including the timeless present tense (as opposed to the past tense of specific experiences) and usage of the forms 'you' and 'they' (e.g. 'you first wait to be seated', 'they order their meal'). Using the 'I' or 'we' forms and/or the past tense of specific experiences would show a lack of generality.

2.Temporal-sequential and causal order of acts. Comprehension of the temporal-sequential and causal order of acts would be manifested by describing the event in terms of the temporal and causal sequence in which it usually occurs, and by using linguistic markers, such as 'first', 'then', 'after' etc.

3. Hierarchical organisation: It was coded whether the participant mentioned a central or an optional act. We also coded whether each type of act was linguistically marked or not, and if so, whether it was done in an appropriate way. 'Should', 'must', 'have to', 'usually' and 'mostly', were seen as markers for central acts, 'maybe' 'perhaps', 'sometimes', conditionals and 'if-then-phrases' as markers for optional acts. Abnormalities in the understanding of the hierarchical organisation would be indicated by mixing these two kinds of acts up, and by describing events in terms of specific slotfillers without embedding them in a more general description.

5.5.2. Qualitative results

The main question was whether individuals on the autism spectrum showed abnormalities in terms of their structure and content of event narratives. Not surprisingly, it was found that both structure and content of narratives differed between higher and lower functioning individuals with ASD of the present sample. Two distinct

patterns of event narratives were identified. Most of the lower functioning individuals did not provide evidence of basic script knowledge as their narratives displayed a lacking sense of generality, temporal sequentiality and/or hierarchical organisation. Instead, their narratives consisted of a string of associations with one or a few slotfillers. Moreover, the global event did not seem to serve as a cognitive frame to structure associations; instead associations took an 'idiosyncratic' route, whereby often different event fragments were mixed up.

By contrast, on the whole, the more able individuals with autism or Asperger's Syndrome gave evidence of having basic script knowledge. They included a number of central and optional acts, mostly appropriately sequenced, in their narratives. However, many narratives given by these able individuals with ASD showed abnormalities *in addition* to, rather than *instead of* a general understanding of what different events entail. The character of these abnormalities varied between individuals with ASD and included the predicted piece-meal or microscopic descriptions. To convey a more global flavour of the different 'styles' of event narratives, first extracts of interviews with lower-functioning individuals with autism are given. They are then contrasted in a second section with those of higher-functioning individuals with ASD.

5.5.2.1. Lower level ASD: Events as a chain of associations

The following extract is taken from the interview with C.M, 13.7 years at the time of the interview. C.M. had one of the lowest verbal language skills (4.4 years) in the present sample and was assigned to the no ToM group. No data on the Central Coherence Tasks were obtained.

Extract 5.1.

E: What I want you to do is to tell Toku what people are doing when they go to a restaurant, okay?

C.M.: Chips in restaurants.

E: okay, what happens first when people are going to a restaurant?

C.M.: Fish an' chips

E: Okay, and what happens first?

C.M. (They) had beans, and sausages..and pie..for dinner.

E: Okay, and when people go to the restaurant, when they arrive, what is the first thing?

C.M.: To do a story.

E: So when they arrive at the restaurant, what is the first thing they're doing?

C.M.: They had fish and chips

E: So are people always having fish'n chips in a restaurant?

C.M.: Yeah, they do.

E: Okay, and what would happen if one day they went to a restaurant and didn't have fish'n chips but something else, what would happen?

C.M.: Or on a Fridays [...]

E: Okay, and why do people go to a restaurant?

C.M.:... in Struan House school.

[...]

C.M.: They go home.

E: ...And is there anything that they do in between? (attempting to probe for 'paying')

C.M.: Ehm, they...pack the bags, strip the beds and put a bit of washing on.

....

E: And what does a restaurant look like?

C.M.: There's shows to be on. With singers.

The extract suggests that C.M.'s understanding of what a restaurant visit entails was strongly determined by specific slotfillers. A tendency to recount specific slotfillers appears to be especially inappropriate right at the start of the narrative, because the listener lacks a frame that could accommodate the specific information about the 'fish'n

chips'. Of his entire restaurant narrative, only one utterance was coded –by adopting a generous stance - as a slot: "they go home". C.M. did not attempt to relate the single items he listed causally or sequentially to one another. It is not obvious whether his present tense usage in some instances can be interpreted as a sign for generality, as this was interwoven with past tense usage.

Remarkable was also that at various points and notwithstanding the interviewer's prompting questions, C.M. went altogether astray from the restaurant event. Instead, his responses seemed to follow an idiosyncratic chain of associations from 'fish'n chips' (which is still related to the restaurant event) over 'Fridays', and 'Struan House School' (where he usually eats fish and chips on Fridays) to the episode about the bags (which is presumably still related to his going home on the weekend, since the special needs school he attended was a boarding school). In summary, C.M.'s account did not fulfil any of Nelson's criteria for script understanding. Whilst acknowledging his low verbal abilities, his narrative was qualitatively different and far below the script competence developmental researchers have reported for typically developing preschoolers even younger than 4 years (Nelson & Grundel, 1981; Nelson, 1986).

Extract 5.2. illustrates how S.S., 14 years at the time of the interview, assigned to the no Theory of Mind and Weak Central Coherence groups and with a verbal mental age estimate of 5.1. years, evoked a chain of associations upon the question "What does a restaurant look like"? Whilst at first he listed some relevant props, associations soon drifted away from the actual question, and via a list of food stuff that can be eaten in a

restaurant, he crossed the boundary from the global restaurant event to a shopping event. Paired with the finding that he only described two central acts, his narrative conveyed the impression that he had not activated a global scheme of a restaurant. Instead, single items were taken out of the restaurant context and were locally associated with one another.

Extract 5.2.

S.S.: to his...to spaghetti, looks like...it looks like mmmm, it looks like..a table.. they have plates,..knives and forks...coffee...milk...spaghetti...potatoes...sausage rolls..beans..pasta..mashed potatoes...fish, rice...ice cream...lollipop ...coca cola..diet coke...shopping...magazine....I know, a sweet!

5.5.2.2. Event narratives of high-functioning people with ASD: piece-meal descriptions

As the next extracts illustrate, abnormalities in the production of event narratives were not only confined to the most severely affected individuals with ASD. A number of peculiarities were also found in intellectually high functioning participants with autism or Asperger Syndrome. A.C. attended the same school as the other children previously discussed and was of a similar age, 13.5 years. His performance on the WISC/BPVS revealed that he had intelligence in the normal range (VIQ 83, PIQ 139, FIQ, 116; VMA on BPVS 8.04 years). A.C. was assigned to the no Theory of Mind and Weak Central Coherence groups.

A.C.'s description of what happens when people go to a restaurant already started in a detailed manner, with a more than necessary emphasis on the seat belt, and an error in

the logical sequence of getting dressed and putting on the seat belts in the car.

Extract 5.3.

E: So, can you tell him, ehm, what happens when people are going to a restaurant?

A.C.: Travel by car

E: okay, and what happens then?

A.C.: sit in the car, puttin' on the seat belt, ALL the way to the restaurant, then will take the seat belt off, leave the car, and have to dress up APPROPRIATELY!

E: right, okay, what does it mean to be dressed up appropriately?

A.C.: appropriately, because you need to have the seat belts to the restaurant.

E: no no no, so what happens then? After people have dressed up nicely? What happens next?

A.C.: take off the seat belts, and will be into the door, and have to, have to wait until sit in some restaurants, and have to sit and the seat is reserved, just in some restaurants.

E: okay, then you're sitting down, and then what happens then?

A.C.: and as you sit down, you have to wait for the menu to come.

E: okay

A.C.: and as the menu is there, you got to look'n choose and have the choice, and the the lady go away with the menu and you have to sit and be patient and [...]

E: and what does a restaurant look like?

A.C.: carpet, and seats and nice tables

E: aha, and what else?

A.C.: lights () cases of fire, oh de-fi-nit-e-ly! I like it to be, a fire is obligatory² and the fire bell.

E: what else is obligatory? Is there anything else obligatory?

A.C.: lights, toilets, obli-gatory

A.C.: and once you finish ALL the food, you went home.

E: and is there anything that happens before that, before going home?

A.C.: they went to wash their hands, and for a weewee and then went home.

.....

E: what else do people HAVE to do when they go to a restaurant?

A.C.: need to dress appropriately, need heaters

E: and what else do they need to do?

A.C.: fire practice there

E: okay, and what else? What else is really compulsory?

A.C.: clothes

E: clothes. And before they leave, is there anything else they need to do, compulsory?

A.C.: no

In total, A.C. demonstrated a considerable understanding of what a restaurant visit entails. It is noteworthy that he linguistically differentiated between optional acts, for example, "the seat is reserved, only in some restaurants" and central acts. These were almost too strongly marked by deontic verbs (e.g. "have to dress up appropriately", "need to have the seatbelts, "have to sit", "have to wait" "got to look'n choose"). This corresponds to his enquiries in everyday life as to whether or not things are 'compulsory'. However, notwithstanding that he could list a number of central and option acts, even after massive prompting, A.C. did not mention the necessity to pay.

A.C.'s responses to the question "What does a restaurant look like?" showed that in addition to more conventional requisites of a restaurant scene, A.C. considered further items as essential that are not part of the restaurant (e.g. the fire practice), or even more interestingly, items that can be found in restaurants but that are not defining features of them (e.g. the heaters, fire bell).

² A.C. had just learned the word 'obligatory' which seemed to replace his usual favourite [things to be] 'compulsory'

Throughout his whole restaurant narrative, indeed, throughout the narratives of three events, A.C. did not use a single mental state verb – not only did he not refer to others' mental states, likewise he neither referred to his own mental states. In addition, and despite his own incessant questioning of others, as a thirteen year-old of intelligence above average, A.C. was nonplussed when asked why people go to a restaurant' ("because...that is a little bit hard"). This contrasted with the responses of the typically developing children, as even the six to seven year olds could readily give explanations, such as "to have a meal", "to celebrate something or just for their tea".

A different demonstration of a tendency to describe events in a microscopic, piece-meal style, was found in the account of K.C. K.C. was aged 10 years, 6 months at the time of the interview, had Asperger's Syndrome and went to a mainstream primary school. On the BPVS, his receptive vocabulary level of 11.7 years was even above his chronological age. As shown in the below extract, he confused different 'tracks' (Schank & Abelson, 1977) of a restaurant. Whereas he started off describing a 'posh' restaurant, in Extract 5.7. he switched to the description of a self-serving café which then blended into that of a shopping event.

Extract 5.4.

[...]

K.C. "Also you can get from the café bit, you can get food from there, they have choices...

E: what is the café bit?

K.C. The café bit is where you take a tray, and you slide it along this bar...and then you pick your food, it's all in a glass cabinet, and you pick the food you want, and then at the end, you pay for it.

[...]

K.C. You look for the food in behind the glass cabinet in the café, and you pick the one, and then the person behind it will take it and give it to you over the top of the glass cabinet. You will put it on the tray and go and pay for it.

[...]

E: And is that what happens always?

K.C. well....no, for example, if it's a shop area, and the shop you buy food, you would get a basket and you would stick it on the counter which is the big () rectangle, and you, then you go around the aisle that has the food in it, and then you take the food you want and put it in, check that you've got enough money, you go to the counter and put the basket on the table.

Peculiar and characteristic was the style of his narrative, as K.C. faithfully enumerated each individual act involved in this process. Recall from section 5.1. that Galambos and Rips (1982) noted how their adult participants precisely avoided to give such detailed descriptions. However, K.C.'s minute, piece-meal way of accounting for the event, did not result in inflexibility. Optional and variable acts were appropriately linguistically marked with qualifiers. Additionally, by using the 'you' form and the present tense he indicated an understanding of generality.

Later on, K.C.'s description of what a restaurant looks like was modelled onto a Chinese restaurant. His elaborated insistence on the presence of "Chinese lanterns" suggested that he did not treat them as a lower-level slotfiller for decoration. Instead, he seemed to assign them to a more central status, as he was only willing to compromise on the variability of the lightning as far as the intensity of the light was concerned.

(E: “Do they always have Chinese lanterns in a restaurant?” K.C: “Not always, sometimes they have a brighter one, or maybe even just a coloured light bulb with a dragon on it....”)

5.5.2.3. *Other qualitative peculiarities*

Below are summarised a number of other qualitative peculiarities that were not captured by the quantitative analysis.

a. Event narratives as heavily influenced by personal experiences and interests

Although the representation of events develops on the basis of personal experiences (Slackman & Nelson, 1984), it also requires adopting an ‘objective’ point of view in order to accommodate the interplay of actions between different actors (and not only those of oneself). Instead, some of the narratives of the very high-functioning participants with ASD with first and even second order Theory of Mind mainly revolved around their own personal experiences with the event. C.L.’s (VIQ: 80, PIQ 96, FIQ, 86, 1st order ToM, MCC) Christmas narrative, for example, was in large parts concerned with his own feelings.

Extract 5.5

10 o’clock, can’t sleep, so excited. () not going to sleep at all, a long time, ...2 hours sleep/ too excited, all of my presents, some of them are in my house,...look at them, can’t take them upstairs straight away

In a different way, the role of personal involvement was also indirectly apparent by the very neglect of certain slots or scenes that are defining for the event but do not directly concern the individual with ASD him or herself. As A.C., about two thirds of the participants with ASD 'forgot' to mention - even upon prompting - the most 'obligatory' of the central acts in a restaurant event: to pay the bill at the end.

b. Social roles

A number of participants with ASD, including some of the more higher-functioning ones, struggled in their understanding of the different social roles. For example, it was suggested that Santa Clause puts up the Christmas tree, or that the waiter prepares the food. Whilst most participants (including most people with ASD) described the actors participating in the Christmas event as 'fathers', 'mothers' 'mum and dad', 'family' etc., one participant described actors irrespective of their roles or situations consistently as 'man or lady'.

c. Mislabelling of 'canonical artefacts'

Another type of error that appears significant in relation to the possible impact of Theory of Mind deficits on cultural understanding was found in the mis-labelling of artifacts as something different to their canonical function. M.J., a 28 year old adult with Asperger Syndrome (first order Theory of Mind, Medium Central Coherence, verbal IQ: 83) suggested that in a restaurant, a waiter had "maybe a handkerchief, usually holding with a tray". Using the term handkerchief, rather than napkin, might be significant, since although the two items share the same or similar forms and functions

(one can use one for the other), they differ in terms of their intended canonical function (Bloom, 1999). Only by acknowledging this culturally defined and *intended* function, and irrespective of featural similarities, would we predict to find a napkin in a restaurant but not a handkerchief.

d. Discrepancy between event representation and acting upon general expectations.

A discrepancy between event representation and acting within a script has been found for P.G., a young man with Asperger's Syndrome who was assigned to the second order Theory of Mind group. When discussing a third event, visiting a friend, here not analysed in full, he emphasised the importance of offering a cup of tea or coffee to a friend. He stated that he would feel upset if a friend did not return this gesture and even considered that "I'd think they don't seem to be my friend anymore". The illuminating aspect of this episode was that at the same time the experimenter sat in his living room for about two hours, without ever being offered a cup of coffee or tea.

e. Why-questions

Finally, some people with ASD, and crucially amongst them even several individuals with intelligence in the normal range, struggled with the why-questions. Interestingly, participants could more readily explain why people celebrate Christmas, possibly because they could fall back on explanations that they were taught at school or by their parents and that were not available for the restaurant event. For example, R.S., an intelligent adolescent with Asperger's Syndrome, (90 verbal IQ, 124 Performance IQ, first order Theory of Mind, Medium Central Coherence), explained that people go

to restaurants for “parties”. When asked whether this was the only reason, he stated “No, no money for the supermarket”. In contrast, he had a ready made explanation for why people celebrate Christmas “it’s a time to remember the birth of baby Jesus” and stated that he “learnt in school that it’s not only about presents”.

5.5.3. Summary

Using Nelson and Gruendel’s (1981, 1986) criteria of basic script knowledge, the qualitative analysis of the event narratives identified two main patterns. Some of the lower functioning individuals with ASD seemed to altogether lack script knowledge - even beyond impairments predicted by Central Coherence Theory or Theory of Mind deficits and below what could be expected at their verbal language level. Rather, their ‘understanding of events’ appeared to consist of loose associations of specific ‘slotfillers items’ which drifted to other events, or included associations with the ‘here-and-present’, such as with the experimenter or the school. This pattern reminds one of a speculation by Nelson about the consequences of lacking script knowledge. “[...] an incapacity to interpret new information against a ‘baseline’ of routine knowledge of the event, a lacking frame or cognitive context for new experiences. Instead, it would be necessary to create ‘some’ representation, using whatever features the situation offers” (Nelson, 1986).

By contrast, for many of the higher-functioning individuals with ASD, abnormalities found seemed to be *additional* to, rather than in place of a general understanding of what different events entail. These included the predicted frequent

usage of 'slotfillers', the recounting of personal experiences or the description of irrelevant details (e.g. heaters, a fire bell), and a mixed-up understanding of roles. Notable were also apparent deficits in the understanding of the global meaning of the restaurant event and that participants with ASD frequently neglected to mention central acts that did not directly involve them.

5.6. QUANTITATIVE ANALYSIS

5.6.1. Coding system

For the quantitative analysis, participants' interview transcripts were coded according to the following eight categories: number of central slots, number of appropriate optional slots, number of inappropriate optional slots, number of spontaneous slotfillers, prompted slotfillers, slotfillers as examples, number of script inappropriate or irrelevant actions, and number of props. A definition of each of these categories is given in Table 5.2. In addition, responses to the why-questions were categorically coded as either 'correct' or 'wrong'.

Following Nelson and Gruendel (1986), as an indicator of the length of the narratives we used the total number of items produced (rather than the overall word length of narratives). This was calculated by adding together the number of items in each of the eight categories.

Table 5.2. Coding category, definition and examples

Coding category	Definition	Example
1. Number of central acts	An act that pilot adults denoted as 'usually' occurring and that is expressed at the highest level of generality to describe its meaning.	you sit down/ and have a drink/ and sit and talk for a while/ you order what you would like to eat/ order drinks first/ you have to pay for that, pay money/ they look at the menu/ the cashier takes the list to the chef/ the chef cooks the food
2. Number of appropriate optional slots	An act that pilot adults described as may or may not occurring in a specific experience and that the participant denoted as such	they <u>sometimes</u> ask the waiter for desert'/ ' <u>might</u> have coffee/ if it's a Mexican restaurant
3. Number of inappropriate optional slots	As in (2) but the participant did not denote it as such.	People are always having starters in a restaurant indeed/ they go in a taxi. Always..? Yes/
4. Spontaneous slotfillers	An act or object that occurs with a high propability, linguistically marked as central acts. The special feature is that a central slotfiller is expressed in very concrete, 'low-level' terms, but cannot be substituted by any higher-level description	afterwards they have coffee <u>and scones</u> '/ ' the..chicken curry!'
5. Prompted slotfillers	Specific item after prompting, such as: what else do people eat in a restaurant?	Steak pie and chips,'n sometimes fish'n chips
6. Slotfiller examples	A specific item embedded in a more general description	order <u>their food</u> , order <u>like</u> steak pie or pasta or anything'
7. Script inappropriate acts	An act or item that is not part of the event or irrelevant.	They're going on a bus/ they're playing/ to do a story
8. Props and roles	Objects associated with the event	menu, customer, waitress, seats, tables

5.6.2. Results of quantitative analysis

5.6.2.1. Group means for total number of items

Table 5.3. shows that when individuals with an Autism Spectrum Disorder were considered together as one group, or when they were split into autism versus Asperger's Syndrome, they produced in total a similar amount of items as the other groups.

A One-way ANOVA confirmed that for both events means of total items produced did not statistically differ between the groups (Restaurant, $F(4, 36) = 1.42$, $p = n.s.$; Christmas $F(4, 35) = .51$, $p = n.s.$). Hence, possible group differences between the ASD and control groups on specific item categories cannot be attributed to altogether shorter narratives produced by the autism or Asperger's Syndrome groups. Therefore, we subsequently compared group differences in the means of each item category.

Three sets of analyses were performed: firstly, we compared the total autism spectrum group with the normally developing children and the learning difficulties groups. This represents a conservative comparison, since the ASD group considered together as one group was higher functioning than both control groups. Then, each subgroup was compared with their respective control group(s). Thirdly, performances between the different Central Coherence groups were compared. Finally, the different Theory of Mind groups were compared. For each set of comparisons, first a set of one-way ANOVAs was performed, followed by pairwise comparisons using Tukey's tests. As small cell sizes were a concern for the usage of parametric statistics, where significant group differences were found, a second set of analyses was conducted using Mann-Whitney U tests as the non-parametric equivalent for pairwise comparisons.

Table 5.3. Total number of items produced for the Restaurant and Christmas events.

Groups	N	Restaurant (total items)	<i>N</i>	Christmas (total items)
Autism Spectrum	21	19.2	17	13.7
Autism	11	19.7	9	14.5
Asperger's Syndrome	10	18.7	8	12.8
Learning Difficulties	7	14.8	7	12.2
Typical children	11	17.81	11	10.3
Young children	5	14	5	7.3
Old Children	6	21	6	11.83

5.6.2.2. Comparisons between diagnostic groups

a. ASD versus control groups

Restaurant - First, the individuals on the autism spectrum were compared to the typical children and learning difficulties control groups. Mann-Whitney *U* tests showed that the ASD group produced more slotfillers ($Z = -3.23$, $n = 30$, $p < .01$), more irrelevant/ inappropriate acts ($Z = -3.2$, $n = 30$, $p < .01$), fewer central acts ($Z = -2.1$, $n = 30$, $p < .05$) and fewer slotfillers after prompting ($Z = -2.1$, $n = 30$, $p < .05$) than the typically developing children. Compared to the individuals with learning difficulties, the ASD group produced more irrelevant/ script inappropriate acts ($Z = 1.0$, $n = 25$, $p = .056$).

Christmas. -The only group difference found on the Christmas event was that the ASD group produced more irrelevant/ inappropriate acts than the typically developing children ($Z = -2.6$, $n = 25$, $p < .05$).

b. Autism vs Asperger Syndrome vs control groups

Next, we split the ASD group into individuals with autism versus Asperger's Syndrome. The autism subgroup was compared to the learning difficulties group and the 'young' 6 to 7 year old children, the Asperger's Syndrome group with the 'old' 9 to 10 year old children.

Restaurant - The autism group produced significantly more spontaneous slotfillers than the 6 to 7 year old typical children ($Z = -2.58$, $n = 16$, $p < .01$). Compared to the learning difficulties group, the autism subgroup produced significantly fewer central ($Z = -2.3$, $n = 19$, $p < .01$) and optional acts ($Z = -2.1$, $n = 19$, $p < .01$).

Figure 5.1. Means of event items for diagnostic groups

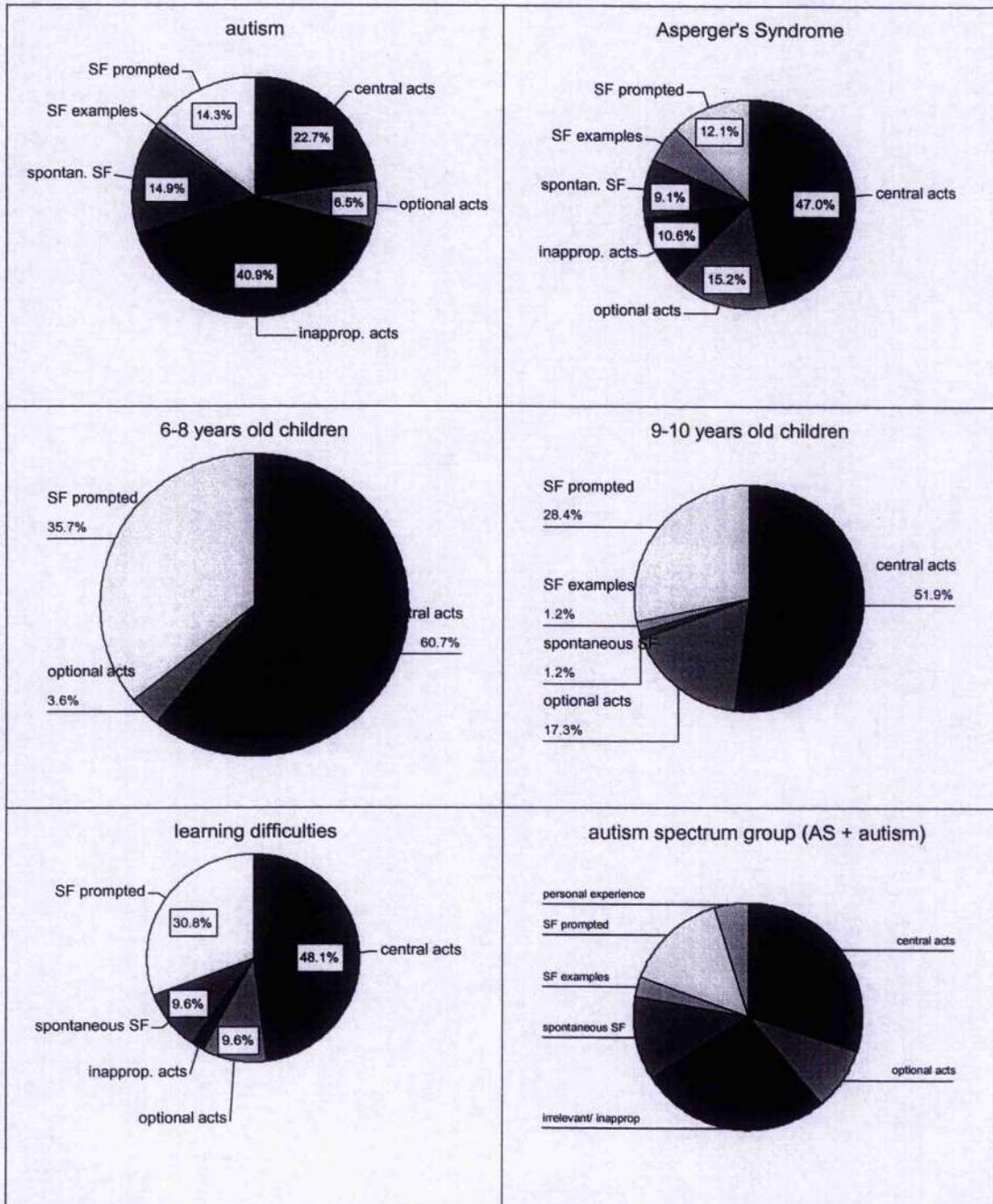


Table 5.4. Means of responses for each coding category for the restaurant event

	Central acts	Approp. optional acts	Inapprop. optional acts	Irrelevant acts	Slotfillers (SF)	Prompted SF	SF examples	Personal exp.	Props
Autism Spectrum	4.81	1.76	.70	3.6	1.81	2.1	.33	.6	5.1
Autism	3.64	1.3	.54	5.72	2.27	2.18	-	.27	4.1
Asperger's Syndrome	6.1	2.18	.88	1.4	1.3	2	.6	1	6.5
Learning Difficulties	6.57	1.16	.33	.14	.83	3.28	.28	.57	3.75
Typical children	6.91	2.9	.11	0	.1	3.28	.1	.1	6
Old children	7	4.2	0	0	.17	3.83	.16	.2	7.3
Young Children	6.8	1.6	.25	0	0	3.2	0	0	4

For both central acts and optional acts, analyses of COVARIANCE, which partialled out verbal IQ, were performed. These revealed that VIQ had no independent influence ($F(1, 19) = .64, p = \text{ns.}$) on the production of central acts, while the effect of diagnostic group still approached significance, ($F(1, 19) = 3.0, p = .078$). However, whilst there was no independent effect of VIQ on optional acts, ($F(1, 19) = .56, p = \text{n.s.}$) once it was accounted for, the initial group difference also became non-significant, ($F(1, 19) = 1.8, p = \text{n.s.}$).

Christmas - On the Christmas event, a one-way ANOVA showed a trend for a group difference on the mean number of spontaneous slotfillers ($F(4, 28) = 2.54, p = .065$). Subsequent pairwise analyses using Mann-Whitney U tests, however, did not reveal differences between the autism and the control groups. The autism subgroup, however, reported more inappropriate acts than those with learning difficulties ($Z = -2.0, n = 15, p < .05$). Compared to the 9 to 10 year old typical children, the Asperger's Syndrome group only reported significantly more inappropriate acts ($Z = -2.09, n = 15, p < .05$) and significantly fewer slotfillers after prompting ($Z = 4.5., n = 15, p < .01$).

5.6.2.3. Analyses for Central Coherence groups

As can be obtained from inspecting the participant characteristics in Table 5.2, 3 out of 7 participants with WCC had Theory of Mind on the first or second order levels. Although constrained by the small cell numbers, an independent effect of WCC would be shown if individuals with WCC and Theory of Mind competencies displayed similar impairments as those with WCC but no ToM. Predictions from Central Coherence Theory were that those with WCC should represent event actions and props more often

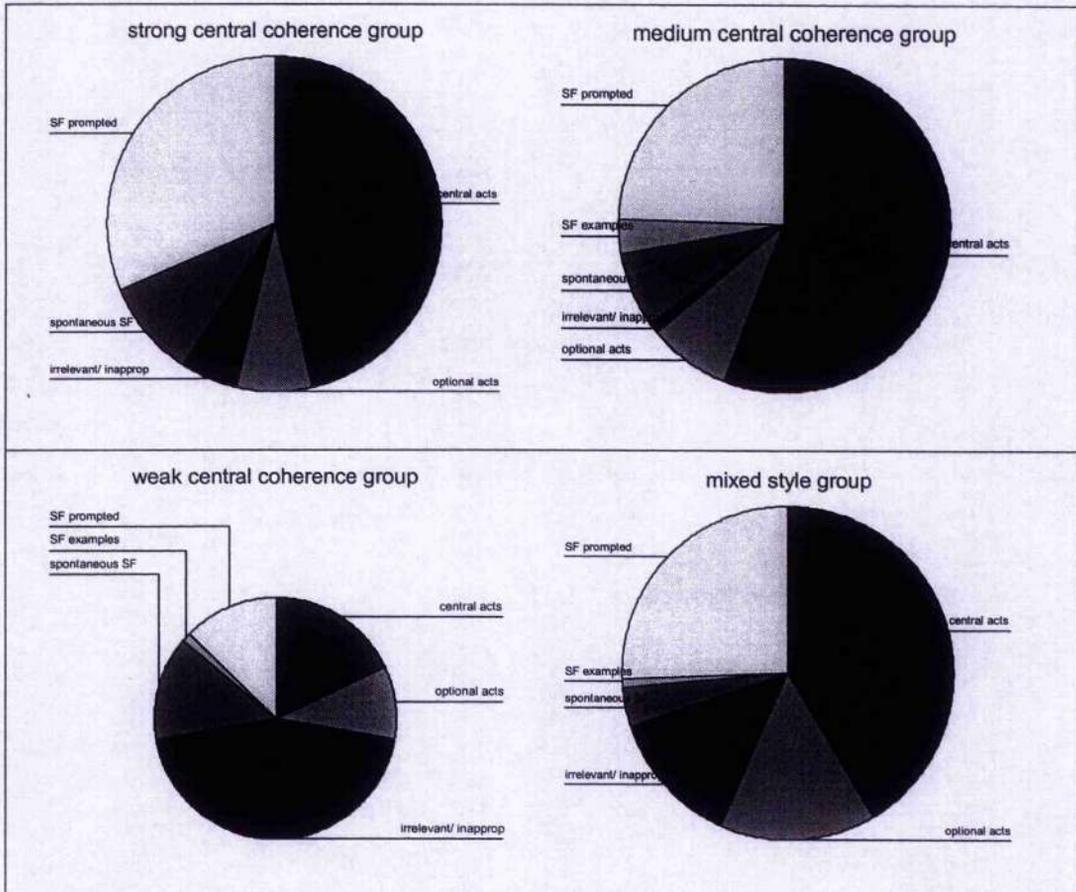
in terms of concrete slotfillers and that optional acts would be used more often in an inappropriate way.

Due to already small cell sizes, participants in the different CC groups were compared across diagnoses, but it is important to bear in mind that only those with ASD had WCC.

Restaurant - Means suggested that the WCC group produced on average more spontaneous slotfillers than all other groups (WCC : $M = 2.83$; SCC: $M = 1.67$; MCC: $M = .83$; mixed style: $M = 1.5$). In addition, a one-way analysis of variance revealed a trend for the predicted effect of Central Coherence groupings on the production of spontaneous slotfillers ($F(3, 30) = 2.38, p = .08$). However, subsequent analyses using Mann-Whitney U tests did not further support this prediction. Instead, it was found that the WCC group produced significantly fewer central acts ($Z = -2.2, n=11, p < .05$) and significantly more irrelevant acts than the MCC group ($Z = -2.3, n =11, p <.01$). There were no significant differences between the WCC group and the other CC groups, or between the latter.

Christmas - No group differences were found for the Christmas event.

Figure 5.2. Means of event items produced by Central Coherence groups for the restaurant event



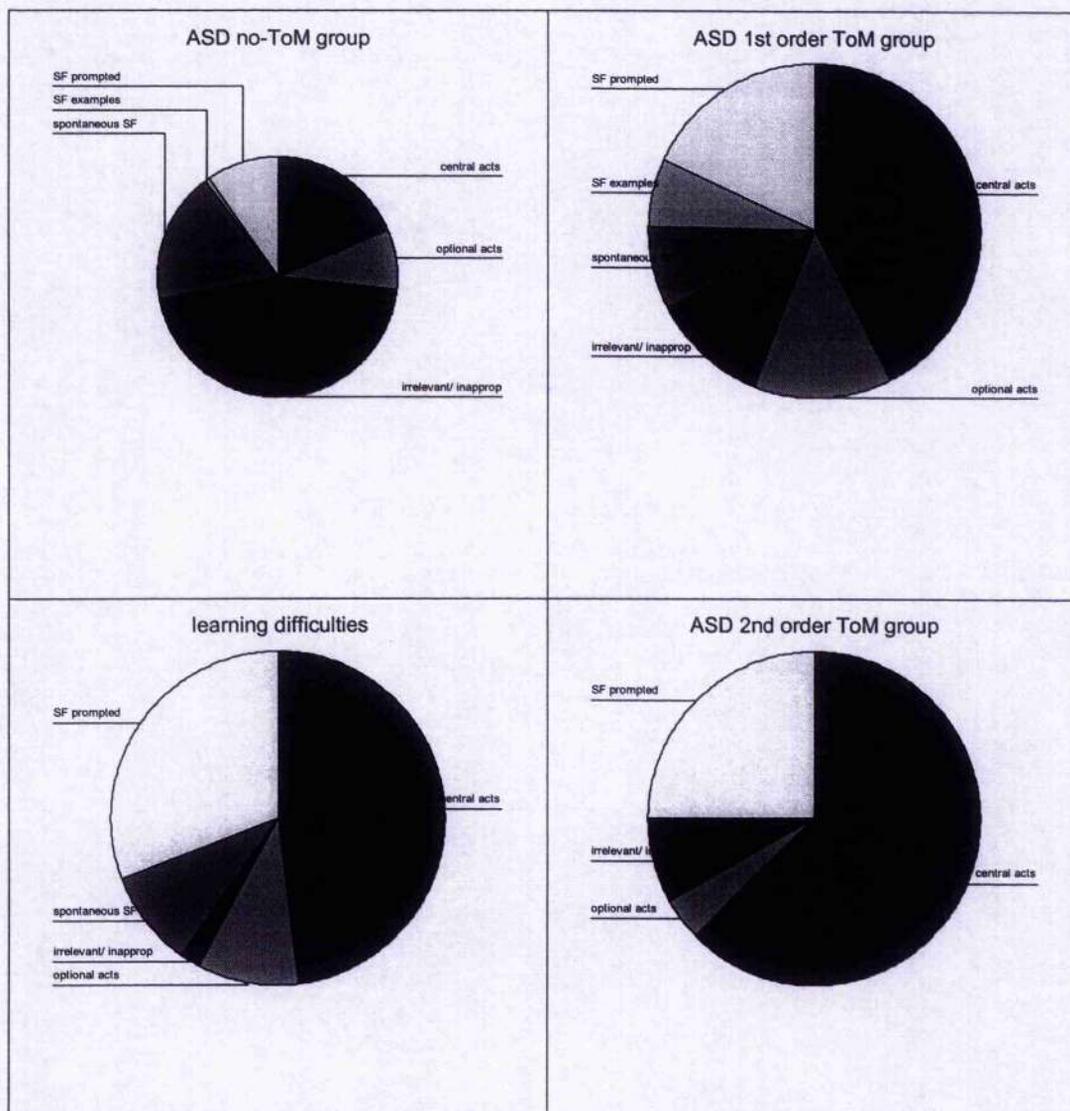
5.6.2.4. Analyses for Theory of Mind groups

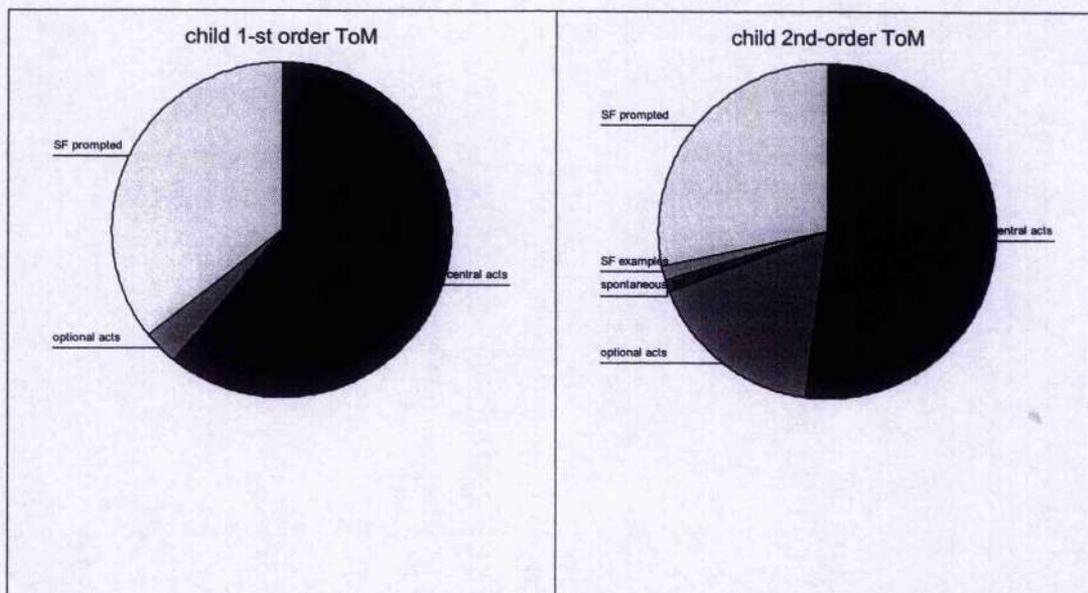
In order to explore the possible effect of Theory of Mind on script production, as in the previous study, participants with an autism spectrum disorder and the typically developing children were grouped according to ToM performance.

Restaurant - Significant group differences were found for the production of central acts ($F(5, 33) = 3.31, p = .016$), inappropriate acts ($F(5, 33) = 3.71, p = .008$), and the number of spontaneous slotfillers ($F(5, 32) = 4.80, p = .002$). The relevant pairwise comparisons using Mann-Whitney U tests specified that the ASD no ToM group produced more spontaneous slotfillers ($Z = 2.9, n = 12, p < .01$) and irrelevant acts ($Z = -2.6, n = 12, p < .01$) than the typical 1st order ToM children, and more spontaneous slotfillers ($Z = -2.95, n = 12, p < .05$) and fewer central acts than the first order ASD ToM group ($Z = -1.81, n = 12, p = .06$). In addition, the ASD no ToM group produced fewer central acts ($Z = -1.81, n = 13, p = .06$), more irrelevant acts ($Z = -2.3, n = 13, p < .01$) and fewer slotfillers after prompting ($Z = -2.1, n = 13, p < .05$) than the individuals with learning difficulties. There were no group differences between 1st and 2nd order ToM ASD groups and the typically developing children with respective Theory of Mind competence, or between either of these groups and the learning difficulties group.

Christmas – There were no significant differences on any of the response categories between the different Theory of Mind groups.

Figure 5.3. Means of event items produced by ToM groups for the restaurant event





Responses to why-questions

Restaurant - 6 out of 16 individuals in the ASD group failed to appropriately explain why people go to restaurants, whereas all individuals in the learning difficulties group were able to do so and only one out of eleven typically developing children gave an incorrect response. χ^2 -analyses showed that this difference approached significance, ($\chi^2(2) = 5.12, p = .07$).

Christmas - This analysis was conducted despite very small cell sizes due to missing cases. 11 out of 15 individuals with ASD and all individuals with learning difficulties gave an appropriate explanation. Of the 8 eight typically developing children, only one child gave an incorrect explanation. χ^2 -square analyses showed that the differences between the groups were non-significant, ($\chi^2(2) = 1.3, p = \text{n.s.}$)

5.7 SUMMARY AND DISCUSSION

In summary, the results of the quantitative analysis lent partial support to our predictions. Overall, individuals with an autism spectrum disorder showed impairments in their restaurant narratives, but few in their descriptions of Christmas. More specifically, people with an autism spectrum disorder reported more slotfillers and inappropriate acts and fewer central acts than the typically developing 6 to 10 year old children. At the same time, the ASD group did not show significantly more abnormalities than the individuals with learning who as a group had lower IQ.

When the ASD group was split into the two subgroups, it was found that the autism group produced fewer central and optional acts than the learning difficulties group. For the optional acts, this group difference vanished when VIQ was accounted for, whilst for the central acts it was found that the performance of the ASD group remained significantly worse even when VIQ was taken into account. This result is consistent with developmental research suggesting that with increasing age, children give more optional acts, whereas central events are available from early on (Nelson & Gruendel, 1986). Moreover, the autism subgroup displayed a range of abnormalities compared to the narratives of the young children of similar mental age. The only peculiarity displayed by the Asperger's Syndrome subgroup in comparison with the 9 to 10 year olds consisted of their more frequent report of inappropriate acts.

Two separate analyses for which participants were grouped either according to Theory of Mind competence or Central Coherence style were aimed at investigating if either of these cognitive abilities might affect event descriptions.

When grouped according to Central Coherence scores, means suggested that the WCC group produced the largest amount of spontaneous slotfillers and a one-way ANOVA showed a trend for an effect of CC groupings on spontaneous slotfiller production. However, subsequent Mann-Whitney *U* tests failed to lend further support to the prediction that slotfillers might be the result of a WCC cognitive style. To interpret this negative finding, it is important to bear in mind that the present group sizes were very small, which could have precluded an effect that might be found using bigger sample sizes. Whilst on the one hand it is possible that slotfillers were partially related to verbal language (the learning difficulties group - of which no participant had WCC - also spontaneously produced a relatively high number of slotfillers) the finding that three individuals with WCC who had ToM competence and VIQ in the normal range might be suggestive for an independent influence of WCC on this response pattern.

When grouped according to Theory of Mind competence, it was found that the ASD no ToM group showed a range of abnormalities compared to typically developing children with ToM competence, people with ASD with ToM competence, and the learning difficulties group. However, the ASD no ToM group only reported more slotfillers than the typical 1st order ToM children and ASD groups, but did not differ from the learning difficulties group.

Thus, as abnormalities were found according to both groupings, and acknowledging small cell numbers, as well as the overlap of individuals who fell into both the no ToM and WCC groups, the results do not permit us to clearly tease out

which of these two cognitive abilities had a greater influence on abnormalities in the event narratives.

Taking the qualitative and the quantitative results together, this study suggests that people with an autism spectrum disorder displayed a range of abnormalities in their narratives of the restaurant event, but to a lesser extent in their narratives of the Christmas event. The results obtained from the restaurant event replicate Volden and Johnston's (1999) finding that reported that their sample with autism produced fewer central and more irrelevant acts than control groups. However, the present findings go beyond this as they also suggest that some people with ASD might display further qualitative abnormalities, such as the associations with one or more slotfillers or the piecemeal staccato style.

What could have contributed to the discrepancy between the restaurant and Christmas narratives? A first possibility might be that individuals with ASD had simply fewer experiences in going to a restaurant. Although participants were asked whether they had been to a restaurant, and all participants in the ASD group confirmed this, no independent in depth information was obtained with regards to the level of their experience with this event. Interestingly, one typically developing child stated that he had never been to a restaurant. Nonetheless, he gave as good a description of the event as the other young children, and crucially did not report acts in a slotfiller fashion. He gave a number of central acts, only one optional act and had slight difficulties producing slotfillers after prompting. When asked how he knew about what happens in a restaurant, he replied that "people tell me". Hence, whilst a lack of personal experience with the event might have influenced 'negative' impairments (the production of fewer

core or optional acts), lacking experience seems less likely to account for the 'positive' abnormalities: the higher means of spontaneous slotfillers produced by the participants with an autistic condition.

A second possibility could be that Christmas might be a more salient event in several respects: it is a special event, preparations are made for it beforehand etc. Three individuals with ASD confused the restaurant event with a shopping event, but apart from one participant who continued to describe New Years Eve, no participant confused it with other events. What is more, as R.S. explained, Christmas, its significance, as well as the different aspects that the event entails, might be more explicitly discussed with parents or even at school than other more mundane events.

A third possibility could be that the structure of the Christmas event is different to that of the restaurant event. Remember that on the basis of the pilot study, we introduced the term 'core slotfillers'. In the analysis, these were treated as 'central acts', but the difference is that despite their importance and high occurrence at the event, they are described at a more specific lower level. For example, Santa Clause cannot be exchanged with any other real or fictitious character. Whilst with regards to the restaurant event, participants would only mention specific dishes as 'slotfiller examples' in the context of a more global description of eating, for the Christmas event they stated that people "usually have turkey". Hence, this structure of the event might have been favourable for a person with ASD, as a lower-level description appeared to be generally more appropriate.

Future research is needed that investigates more systematically the relative impact of personal experience and event structure and hence a possible variability in impairments across different events or event types.

The study did not permit us to clearly distinguish between the relative influence of Central Coherence, Theory of Mind and verbal language. That the results might not solely be attributable to verbal language or pragmatic communication deficits, was indicative in the qualitative analysis. For example, S.S. and K.C. gradually switched from items belonging to a restaurant event to the description of acts and items that are part of a supermarket scenario; a finding that can only be accounted for in terms of content, but not in terms of pragmatics. Nonetheless, given that we employed narratives which pose a high language demand, future research needs to address more systematically the extent to which abnormalities in event narratives reflect an input problem (i.e. abnormalities at the level of the immediate perception of event experiences), a processing problem (i.e. how the event structure is represented in the mind), or an output problem (i.e. a reflection of how events were retold rather than how they were experienced or represented).

To study abnormalities at the level of event perception and event representation, paradigms are required that keep the language demands to a minimum. In the study presented in the next chapter, we used a new Frequency Rating Task that posed less verbal production demands. Our suggestion from WCC was that this cognitive style might affect both event perception and event representation, whereas Theory of Mind impairments might be at work at all three levels.

The present findings have a number of interrelated implications. If abnormalities found were not only the reflection of impairments in verbalisation but manifested a genuine abnormality in the understanding of what events entail and how they are organised, then some individuals with ASD seem to show impairments in a second important facet of cultural knowledge - beyond the deficits in real-world knowledge of norms, discussed in the previous chapter. This in turn may have repercussions for social interaction. As French (1985) had speculated, neither someone within a very rigid representation of events, nor someone who lacked the understanding of central components, can behave appropriately across different common and routine situations. Moreover, impaired event knowledge might be directly linked to a prevalent but poorly understood feature of autism spectrum disorders: the adherence to invariant routines, which is paired with a strong resistance to changes in them. We suggest that a tendency to treat what *could* occur as what *should* occur may underpin this feature. Whilst unexpected core, relevant changes create anxiety and frustration in normal children and even adults; perhaps minor, trivial changes are assigned to a similar status in the mind of a person with an autistic disorder.

An anecdote of Fling's (2001) insightful biography of her son Jimmy who has Asperger's Syndrome, shall illustrate this idea. Fling described how Jimmy – as many children with ASD – used to be obsessed with the *Thomas the Tank Engine* television series. In the earlier episodes, Ringo Starr lent his voice to 'Mr Conductor'. However, from the day another actor took over that role, Jimmy stopped watching the show, angrily protesting that "this is not right anymore" (p. 73).

From the perspective of an assumed piece-meal processing preference, it might not be surprising that Jimmy put a relatively large emphasis on the voice given to the engine by the first actor, or perhaps a way certain words were pronounced. Whilst in the context of an animated cartoon, the voice could be regarded as a substitutable detail, for Jimmy it apparently represented a central part of the engines world. If what 'could be' is perceived as what 'should be', then changes must have a rather profound impact – as he said – things are not right anymore.

6

FREQUENCY RATING TASK

6.1. INTRODUCTION

In the previous chapter it was argued that investigations into possible abnormalities in event representation in autism spectrum disorders may be a fruitful avenue that could potentially link two fundamental areas of the clinical picture: social impairments and the insistence to adhere to strict and inflexible routines. In support of this argument, the 'script generation paradigm' employed in Study 3 proved to be useful in identifying a variety of script abnormalities in the event narratives of individuals with an Autism Spectrum Disorder across a range of intellectual abilities.

There were three aims for the study presented in this chapter. The first aim was to investigate specifically whether the hypothesised abnormalities in representing scripts in the normal 'hierarchical' fashion might result in difficulties distinguishing between acts or elements that are central to an event, those that are optional or peripheral and thus *could* but need not be occurring, and acts violating scripts. Secondly, we sought to explore whether people with autism use context information and knowledge about social roles in order to distinguish when an act would be appropriate or not. For example, in the consulting room, we would consider a doctor's request for a patient to take off his shirt as part of the 'going-to-a-doctor-script' and hence as perfectly normal. The same request made by a shop assistant in the supermarket, or, more interestingly, by the doctor on a train, now acting in his identity as a passenger

would be unthinkable. Thirdly, as in the previous studies, we sought to investigate whether predicted abnormalities might relate to a Weakness in Central Coherence and/or Theory of Mind impairments.

As discussed earlier, one possible criticism of the previous study was that the paradigm posed considerable *productive* language demands, which may have particularly disadvantaged individuals with poorer language abilities. In the present study, we therefore attempted to keep productive language requirements to a minimum. For this purpose, a new 'Frequency Rating Task' was designed. The rationale behind this task was based on Script Theory and the design drew from a paradigm used by Hudson (1988). Hudson was interested in whether young typically developing children of pre-school age and above could distinguish between script actions, actions irrelevant to a script, and script disruptions and violations. In order to test this, she told children aged four to seven years stories about familiar events, such as about going to McDonalds or grocery shopping. She then asked them to make frequency judgements for each sentence. For example "How often do you stand in a check-out line when you go grocery shopping?" Hudson reported that even the four to five year old preschoolers agreed amongst themselves that in such situation you *always* stand in line, *sometimes* buy orange juice and *never* put on your pyjamas. Based on her finding, we thus felt that a rating scale was a suitable instrument to investigate participants' understanding of the hierarchical organisation of scripts while keeping the productive language component to a minimum.

The Frequency Rating Task involved stories about a day in the life of two characters; Dr Smith and the teacher Mrs Jones. Each protagonist was presented in three different situations: the doctor on a train going to work, at work in the surgery, and shopping at the supermarket. The teacher was described at home having breakfast, then at school and finally at the cinema. Each event was described in ten sentences, and for each sentence, the participant was asked to rate the action or scene description on a five-point scale, ranging from 'always', over 'most of the time', 'sometimes', 'rarely' to 'never'. The sentences were composed of i) central event acts, ii) optional acts and slotfillers and iii) script-inappropriate items. For example, for the 'doctor-in-the-consulting-room' event, a central act was "In the consulting room, the doctor is examining the patient". An optional act was "In the consulting room, the doctor is wearing glasses" and a script violating item was, for example, "While examining a patient, the doctor is eating a sandwich".

Our predictions were that the groups without autism would rate central slots as 'always' occurring and script violating items as 'never' occurring. The prediction for optional 'slots' and 'specific' slotfillers were that, either due to their specificity or because they were only peripheral to the event, they would be rated as occurring in any of the intermediate options 'most of the time', 'sometimes' or 'rarely'.

For the autism spectrum group, predictions were motivated by their putative Weakness in Central Coherence. Recall from Chapter 5 that we argued that a piecemeal processing style might translate into a representation of events more in terms of specific and detailed surface features, rather than in terms of generalised slots. If scripts were structured in terms of slotfillers and not at the level of slots, changes in slotfiller

occurrences might be perceived as a deviance from the script (as would for us changes in a whole slot) as opposed to a possibility that might or might not occur in individual instances. For example, in a supermarket event, 'orange juice in a shopping trolley' would be assigned the same status as normally 'items in a shopping trolley'. Dependent on the individual's personal experience, orange juice would either become an integral part of that script, rated as 'always' occurring, or - if orange juice happened not to be anchored in personal experiences of shopping events - this would be rejected as occurring 'never'. Likewise, optional acts might be perceived in a more black-and-white fashion, as *should be* but not as *could be* occurring. Hence, we predicted that in the autism spectrum group, ratings of optional and slotfiller actions would swing to either extreme of the scale, as 'always' or 'never' occurring. By contrast, we predicted that ratings of central acts should not be affected because although we expected to find an equal tendency towards 'always' ratings, on these items, such a judgement would be appropriate.

Finally, we wanted to explore whether people with ASD would recognise script-inappropriate actions. In our task, these items were script inappropriate because actions were performed and props were placed in the wrong context (e.g. a doctor prescribing medicine to the shop assistant in the supermarket). If someone associated 'a doctor' with 'prescribing medicine' and disregarded context information, she might fail to recognise that the act was not appropriate in the supermarket situation.

6.2. METHOD

6.2.1. Pilot study

First, a pilot study was conducted to check whether 10 normal adults – drawn from the St Andrews student population - would rate the ‘central items’, ‘optional and slotfiller items’ and ‘script inappropriate’ items as intended and whether they would correspond with each other. Initially, we had expected ‘central items’ to be rated as occurring ‘always’, optional/ slotfiller items as occurring ‘most of the time’, ‘sometimes’ or ‘rarely’, and ‘inappropriate items’ as occurring ‘never’. Unexpectedly, agreements were found to be lower than we had hoped. Closer inspection of the response patterns revealed that for the ‘central items’, this was mainly due to some adults’ reluctance in giving ‘always’ ratings. Instead, they preferred to opt for the ‘most of the time’ response as they evoked exceptional circumstances to explain why a central script action may in specific circumstances not happen. For example, for the item “On the train, the doctor has got a ticket for his train journey”, one student said, “Even doctors can be late in the morning. Perhaps he was in a rush and wanted to buy a ticket on the train”. A similar pattern was found for the inappropriate items; again participants thought of exceptional circumstances that could accommodate an inappropriate and unlikely event action, such as a teacher reading a newspaper at the cinema. Here a student reasoned that she could have done this before the lights went out or if it was a very long film, during a break. For the optional items, disagreements were usually between ‘rarely’ and ‘sometimes’ or between ‘sometimes’ and ‘most of the time’ ratings. It seemed to us, then, that it would be difficult to find items on which adults

showed perfect agreement, simply because we could not stop them from elaborating on exceptional events however unlikely they seemed. Therefore, we chose to redefine our working definitions of items in the context of the present task¹.

We considered central items those that were rated as either occurring 'always' or 'most of the time'. Hence, a correct rating for a central item excluded 'sometimes', 'rarely' or 'never' judgements. Optional-slotfiller items were defined as being rated by the adult participants as occurring 'most of the time', 'sometimes' or 'rarely'. The criterion therefore became that rating optional-slotfiller items as occurring either 'always' or 'never' was incorrect. Finally, script inappropriate items were those rated as occurring 'never' or 'rarely'. For this item category, 'sometimes', 'most of the time' and 'always' ratings were considered as incorrect.

Five items that did not fit into these criteria (i.e., they evoked greater variability of response in our normal sample) were excluded from the final version of the task. Therefore, the final version comprised 11 central items, 35 optional-slotfiller items and 9 inappropriate items.

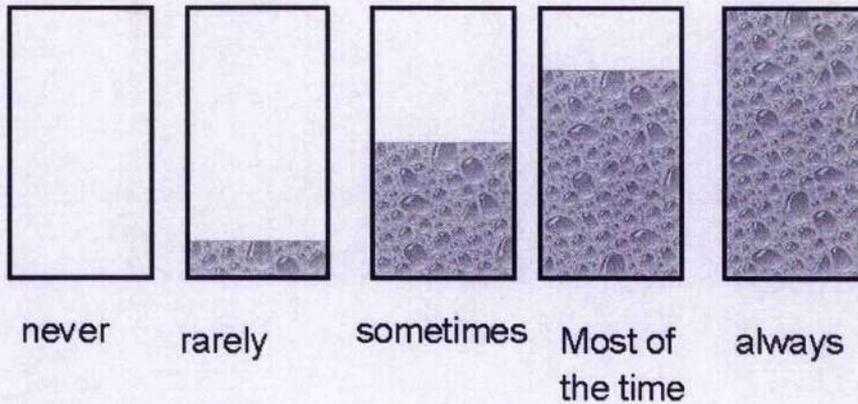
¹ In fact, the results correspond with adults' usage of 'central acts' during the pilot study of the event narratives. This information, however, was not available at the time the FRT was designed.

6.2.2. Main experiment: Procedure:

6.2.2.1. Pretest

In order to ensure that participants understood the meaning of the rating scale, participants in the two clinical groups and the young normally developing children were first shown cards depicting the visual rating scale². As shown in Figure 6.1., a full cup represented 'always', a cup about three quarters full 'most of the time', a half full cup corresponded to 'sometimes' and so forth. Below each cup, the labels 'always', 'most of the time', 'sometimes', 'rarely' and 'never' were given.

Figure 6.1. Rating scale



² Some high-functioning adults with autism or Asperger's Syndrome were not shown the rating scale as it was assumed that they would understand the meaning of it. This was done because of the risk that they might find the task too childish, which could hinder motivation.

The experimenter introduced the rating scale as follows. “In a minute we are going to listen to stories about different people, and I will ask you to say how often people do different things. Look at this card, here you see five cups. Look at this cup (pointing to the full cup). This cup means ‘always’. ‘Always’ means every time the person is in this situation. Now look at this cup: This cup is almost full, it means ‘most of the time’. ‘Most of the time’ is the same as ‘very often’. Likewise, the experimenter explained the meaning of each label. For a full script of these instructions, see Appendix 6.1. The experimenter then presented the participant with a second card, showing the same arrangement of the cups, except for the frequency labels, and said: “Can you point to the one that means ‘always’?” “Can you point to the one that means ‘rarely’?” and so forth for all five labels in random order. If the participant made at least one error, the experimenter explained the meaning of the different labels once again. If a participant persisted to make errors on the second trial, he or she did not proceed to the main task, or where he or she insisted in doing so, responses were excluded from the analysis.

6.2.2.2. Main task:

The Frequency Rating Task was presented on a portable computer (Toshiba Tecra 8000, 13.3-inch screen). The choice of presenting the task on a computer was in part motivated by the attempt to make the task more attractive for participants (particularly individuals on the autistic spectrum who often delight in computer games) and as this presentation facilitated the scoring procedure.

Written instructions were given on the computer screen and were read out aloud by the experimenter: “This is a rating task about the way people behave during the day.

There are some things that people always do when they go shopping or when they take a train. Other things, only some people do, but not everyone, or people only do them on some occasions. Now we will see what happens during the day in the life of Doctor Smith, and the teacher Mrs Jones. Surely, you have some idea of what doctors and teachers are generally like? Can you tell me if doctors and teachers normally do what Dr Smith or the teacher Mrs Jones are doing?" Upon clicking a mouse button, mostly controlled by the experimenter, the introduction for the doctor story (shown in Figure 6.2.) appeared. Again, upon clicking the mouse button, the introduction for the train event appeared (see Figure 6.3). Each event was introduced in this way. For the test items, first the sentence appeared on the screen. Upon clicking the mouse, the corresponding question and the rating scale appeared. When the participant had made his or her choice, the experimenter clicked the 'next' button to proceed to the next story item.

6.2.3. Participants

Nineteen individuals with an autism spectrum disorder (9 individuals with autism, 10 individuals with Asperger Syndrome), six individuals with learning difficulties, sixteen normal children and sixteen adults took part in this experiment. Participants' distribution of ToM and CC scores is shown in Table 6.1.

Figure 6.2. Introduction to the Doctor Story

A Day in the Life of a Doctor



This is the story about a day in the life of Doctor Smith. Step by step, we will see what Dr Smith is doing in different situations, for example, when he is taking a train to go to work. Some of the things that this doctor is doing, DOCTORS always do when they are in this situation. Some of the things Dr Smith is doing, doctors do most of the time or sometimes. But this doctor is also doing things that doctors never do, or that happen only rarely!

Figure 6.3. Introduction to the train event.

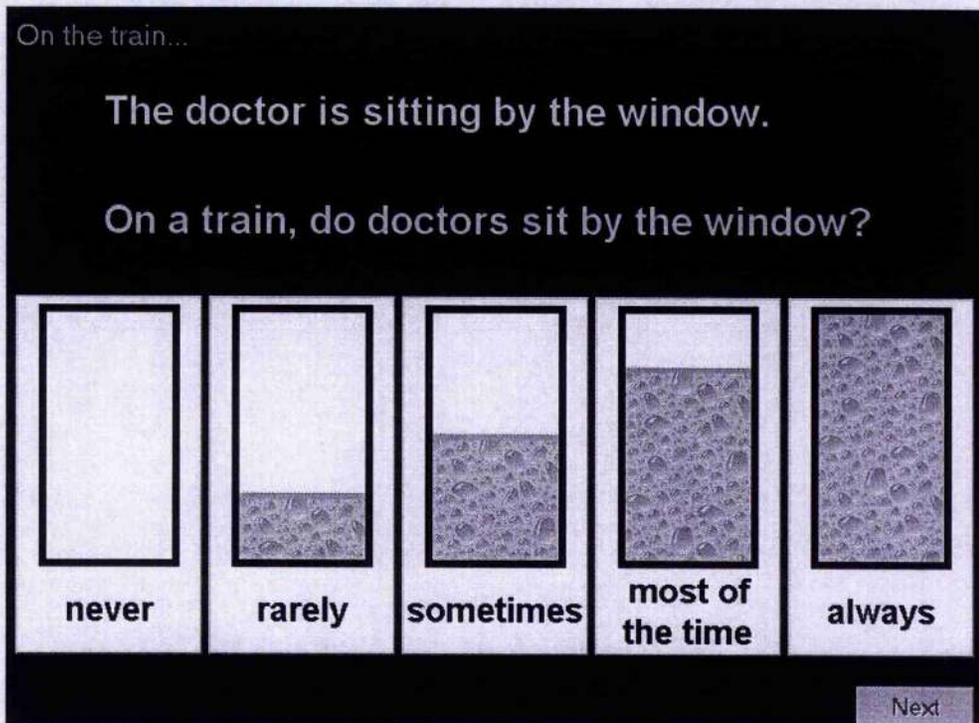
On the train



In the morning, the doctor takes a train to go to work.

Do doctors normally do what this doctor is doing when they take a train?

Figure 6.4. Example of test item presentation



Time 1: Sentence appeared on the screen.

Time 2: Question appeared together with the rating scale

Table 6.1. Participant characteristics

	ToM Scores	CC scores
ASD N = 19 Autism: 9 Asperger's S: 10	N= 19 No-ToM: 5 1 st order ToM: 6 2 nd order ToM: 8	N= 16 WCC: 8 MCC: 3 SCC: 2 Mixed: 3
Learning difficulties N = 6	N = 6 No-ToM: - 1 st order: 3 2 nd order: 3	N = 6 WCC: - MCC:1 SCC: 2 Mixed: 3
Children: N = 16	N = 16 No-ToM 1 st order ToM: 9 2 nd order ToM: 7	N = 14 WCC: - MCC: 4 (1x 9-10 yr old) SCC: 4 (all 6-8 yrs) Mixed: 6 (all 9-10 yrs)

6.2.4. Analysis

The data was analysed in two ways: first, for 'central', 'optional' and 'inappropriate' items, group means of incorrect responses were compared separately. Then we inspected in more detail the means of 'always-to-never' ratings for each item category.

6.2.4.1. Number of incorrect responses for 'central', 'optional-slotfiller' and 'inappropriate' items

As explained before, for the 'central-slot' items, both 'always' and 'most of the time' ratings were scored as correct, whereas the options 'sometimes', 'rarely' and 'never' were all scored as incorrect. However, judging central-slot behaviours, such as "The doctor pays at the check-out" as occurring 'never' is arguably more incorrect than judging it as occurring 'sometimes'. Hence incorrect responses were scored in the following way: 'sometimes'-ratings were given one point, 'rarely'-ratings two points and 'never'- ratings three points. Consequentially, the maximum score for incorrect responses on the eleven 'central slot items' was 33.

The same scaling was applied for the inappropriate items: again, we considered judging an inappropriate behaviour, such as "in the classroom, the teacher is prescribing medicine for a pupil" as occurring 'always' as more incorrect than if someone says it occurs 'sometimes'. Hence, 'always' ratings were given 3 points, 'most of the time' ratings 2 points and 'sometimes' ratings 1 point. Hence, the maximum score for incorrect responses on the nine 'inappropriate items' was 27.

For the optional-slotfiller items, correct ratings ranged from 'most of the time' to 'rarely'. 'Always'- and 'never'-ratings were considered as equally incorrect and each was scored with 1 point, since both ratings miss the character of the act just as much. This resulted in the maximum score of 35 for incorrect responses on the optional items.

6.2.4.2. Number of 'always' to 'never' ratings for each item category

To investigate in more detail the quality of responses for each item category, we followed Hudson (1990) in comparing the extent to which the groups differed in giving 'always' to 'never' ratings.

As in the previous studies, three separate sets of analyses were performed. The first set compared performance between the diagnostic groups, the second set used the central coherence score as the between-group variable and the third set considered Theory of Mind performance. The statistical analysis was conducted as follows. First a set of parametric analyses was conducted using one-way analyses of variances. Where significant group differences were found, subsequent pairwise comparisons were made using Tukey's tests and Mann-Whitney U tests as their non-parametric equivalent.

6.3. RESULTS:

6.3.1. Comparisons between diagnostic groups

6.3.1.1. Number of incorrect ratings

The results concerning the number of incorrect responses on all three item categories, comparing the Autism spectrum group with the control groups, can be seen in Figure 6.5.

Central items. As predicted, participants with an autism spectrum disorder rated central items comparable to the learning difficulties and children control groups ($F(3, 53) = 6.57, p = .002$). As subsequent pairwise comparisons showed, the significant F-value was only due to the better performance of the adult control group compared to all other groups. Likewise, when the autism spectrum group was split into the autism versus Asperger's Syndrome subgroups, each subgroup performed comparable to their respective control groups.

Optional-slotfiller items. It was predicted that people with ASD might give more incorrect responses to optional or slotfiller acts, as they might perceive actions or elements that can sometimes occur as either essential to an event or as not part of it at all. It was found that the ASD group rated optional-slotfiller items more often incorrectly than the typical adults ($Z = -4.5, n = 35, p = .000$) and children ($Z = -2.1 = 88, n = 35, p = .034$), but their amount of mistakes was comparable to that made by the learning difficulties group ($Z = -.57, n = 25, n.s.$).

Further group differences were found when the ASD group was split into autism and Asperger's Syndrome. Pairwise comparisons showed that the autism group performed significantly worse than the Asperger Syndrome group ($Z = -1.9$, $n = 19$, $p = .055$) and the young children ($Z = -1.95$, $n = 18$, $p = .05$). However, the autism and learning difficulties groups did not differ from each other ($Z = -1.6$, $n = 15$, $p = \text{n.s.}$). Whilst the Asperger Syndrome group did not differ from the old children ($Z = -1.3$, $n = 17$, $p = .19$), both groups gave significantly more incorrect ratings than the adult control group (typical children: $Z = -2.73$, $n = 25$, $p = .006$; Asperger Syndrome: $Z = -3.7$, $n = 28$, $p < .001$).

Inappropriate items. A one-way analysis of variance showed that the mean numbers of incorrect ratings of inappropriate items were not significantly different across the different groups ($F(5, 53) = 1.39$, $p = \text{n.s.}$). However, as Figure 6.7 shows, both the autism group and the young children rated about half of the inappropriate items incorrectly.

6.3.1.2. Means of 'always' to 'never' ratings for each item category

Next, for the relevant 'optional-slotfiller' category, the patterns of ratings were more closely inspected. Interestingly, this analysis now revealed a significant difference between the autism and learning difficulties group: the autism group rated optional-slotfiller items significantly more often as occurring 'always' than the learning difficulties group ($Z = -1.9$, $n = 15$, $p = .05$). Compared to the young children, the autism group gave significantly more 'always' ($Z = -2.9$, $n = 18$, $p = .002$) and 'rarely' ratings

Figure 6.5. Group means of incorrect ratings on central items (max = 11)

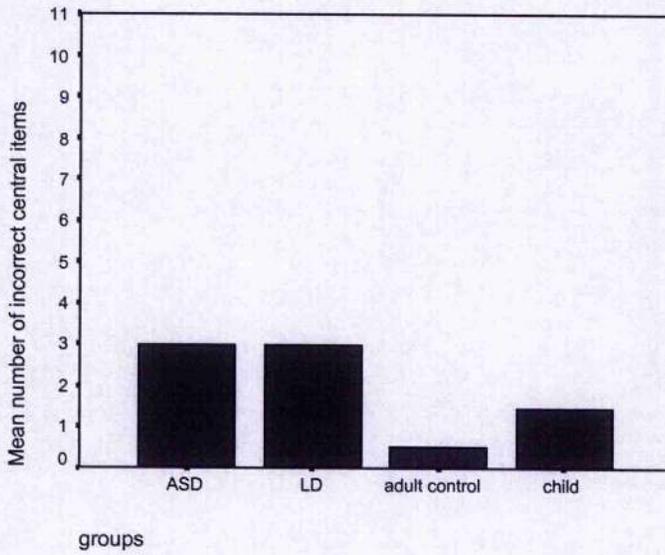


Figure 6.6. Group means of incorrect ratings on optional-slotfiller items (max = 35)

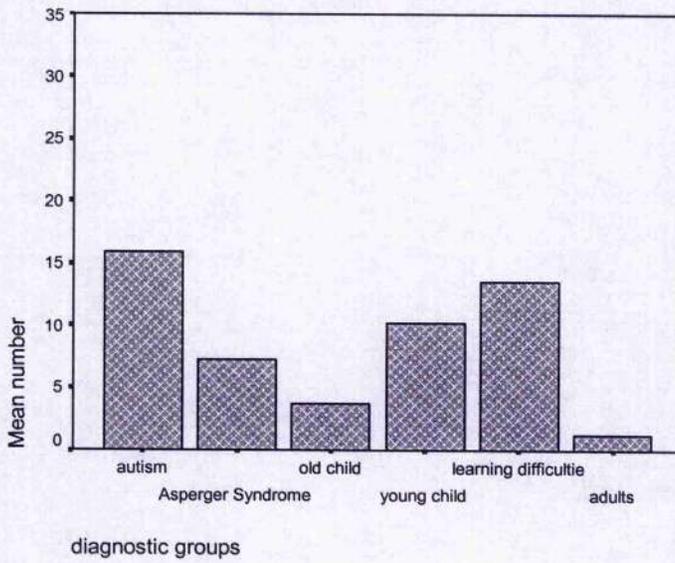
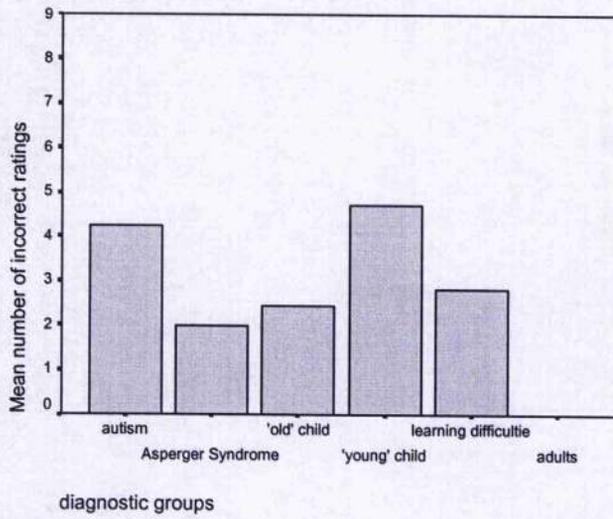


Figure 6.7. Group means of incorrect ratings of inappropriate items (max = 9)



($Z = -2.2$, $n = 18$, $p = .024$) and significantly fewer 'sometimes' ratings. ($Z = -2.8$, $p = .003$). As can be seen in Figure 6.8, the autism sub-group rated the optional-slotfiller acts in about similar proportions as 'always' through to 'never' occurring. A concern could be that ratings were done merely at random. However, Figure 6.9. shows that the participants with autism rated about two-thirds of central acts as occurring 'always' and about two-thirds of inappropriate acts as occurring 'never'. These patterns suggest that on these two item categories, ratings were given in a systematic way, which renders the possibility that ratings on the option-slotfiller category were solely the result of random responses, less likely.

The Asperger's Syndrome group gave significantly more 'always' ($Z = -2.0$, $N = 24$, $p = .003$), 'rarely' ($Z = -2.4$, $N = 24$, $p = .015$) and 'never' ratings ($Z = -3.4$, $N = 24$, $p = .004$) than the adult control group and significantly fewer 'most of the time' ($Z = -2.0$, $N = 24$, $p = .033$) and 'sometimes'- ratings ($Z = -2.9$, $N = 24$, $p = .003$). However, there were no differences between the ratings given by the Asperger's Syndrome group and the 9 to 10 year old children.

6.3.2. Frequency Ratings according to Central Coherence groups

We reasoned those frequency misjudgements as discussed above might be the result of a piece-meal processing style. Given that in Chapter 3 it was found that Weak Central Coherence was not universal to all people with an autism spectrum disorder, next it was explored whether only ASD people with Weak Central Coherence would

Figure 6.8. Ratings of optional items by diagnostic groups

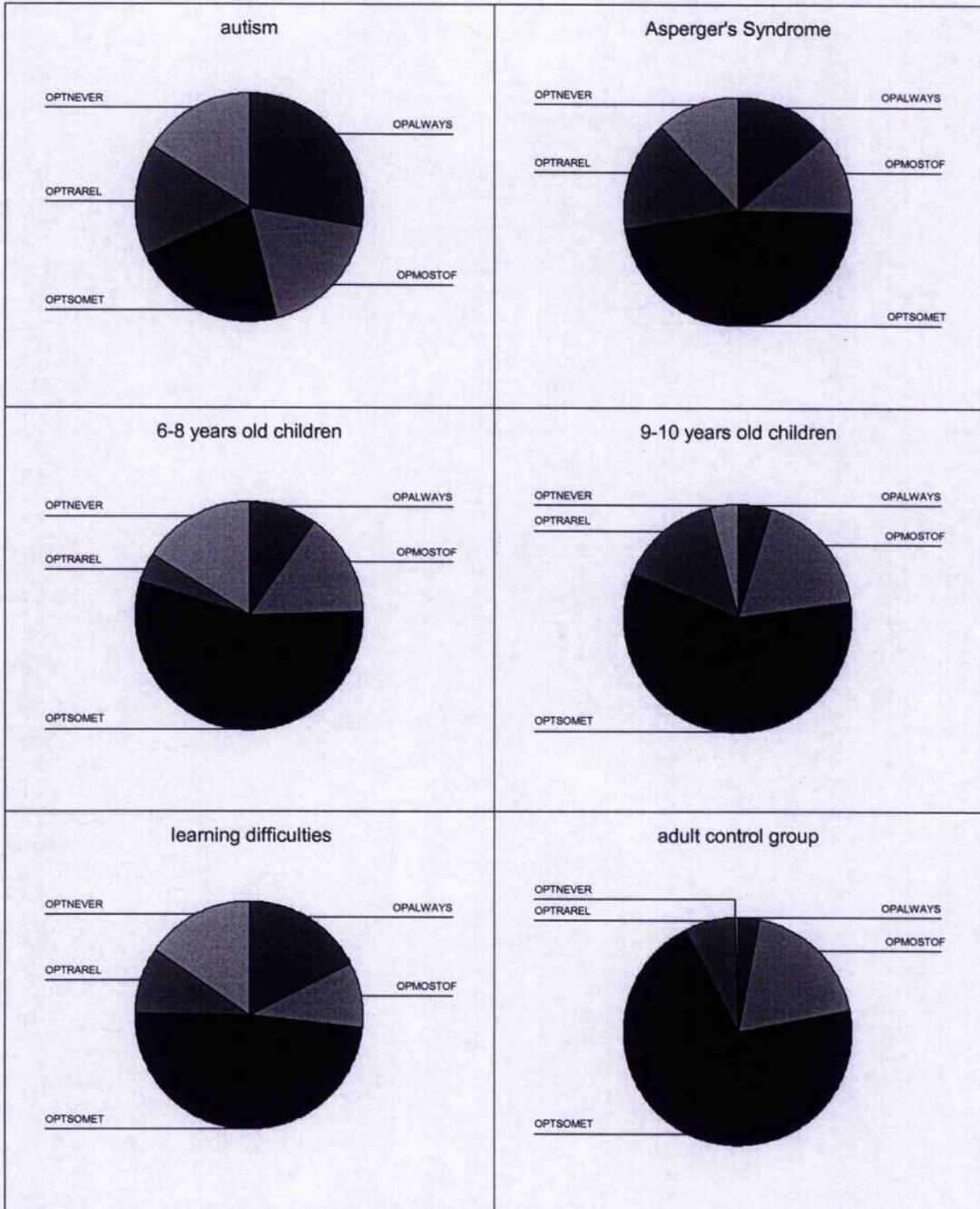
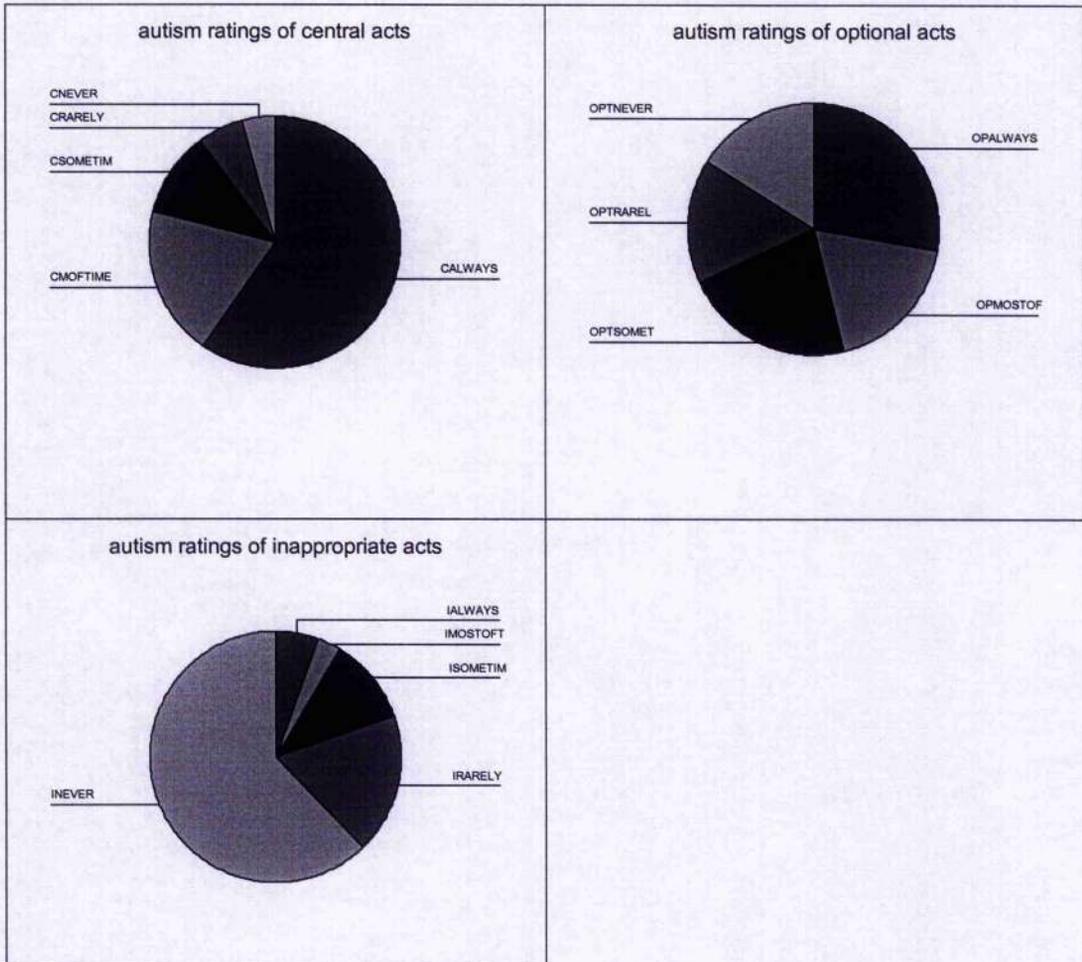


Figure 6.9. Comparison between the autism group's ratings of central acts, optional acts and inappropriate acts



display this pattern. However, as small cell sizes for ASD with Medium and Strong Central Coherence did not permit us to perform inferential statistics; Central Coherence groups were investigated across all participant groups.

To be more stringent, the adult control group was excluded from this analysis. For the interpretation of this analysis, it is important to bear in mind that only individuals with an autism spectrum disorder fell into the Weak Central Coherence group. Figure 6.10 shows the mean number of always to never ratings as given by the four Central Coherence groups.

6.3.2.1. Number of errors

Mann-Whitney U tests revealed that the WCC group made significantly more errors on the optional-slotfiller item category than the SCC group ($Z = -2.21$, $n = 17$, $p = .02$) and the 'mixed-style' group ($Z = -3.2$, $n = 22$, $p = .001$).

6.3.2.2. Mean number of 'always to never' ratings on 'optional-slotfiller' acts given by Central Coherence groups

The WCC group rated optional-slotfiller acts significantly more often as occurring 'always' ($Z = -2.8$, $N = 17$, $p = .002$) and significantly less often as occurring 'sometimes' ($Z = -3.0$, $N = 17$, $p = .001$) than the SCC group. Compared to the MCC group, the WCC group rated optional-slotfiller acts significantly less often as occurring 'sometimes' ($Z = -1.6$, $N = 18$, $p = .006$). In comparison with the mixed style group, the WCC group gave significantly more 'always' ($Z = -2.5$, $N = 18$, $p = .011$) and significantly fewer 'sometimes' ratings ($Z = -2.9$, $N = 18$, $p = .002$).

Figure 6.10. Frequency Ratings of optional-slotfiller acts given by Central Coherence groups.

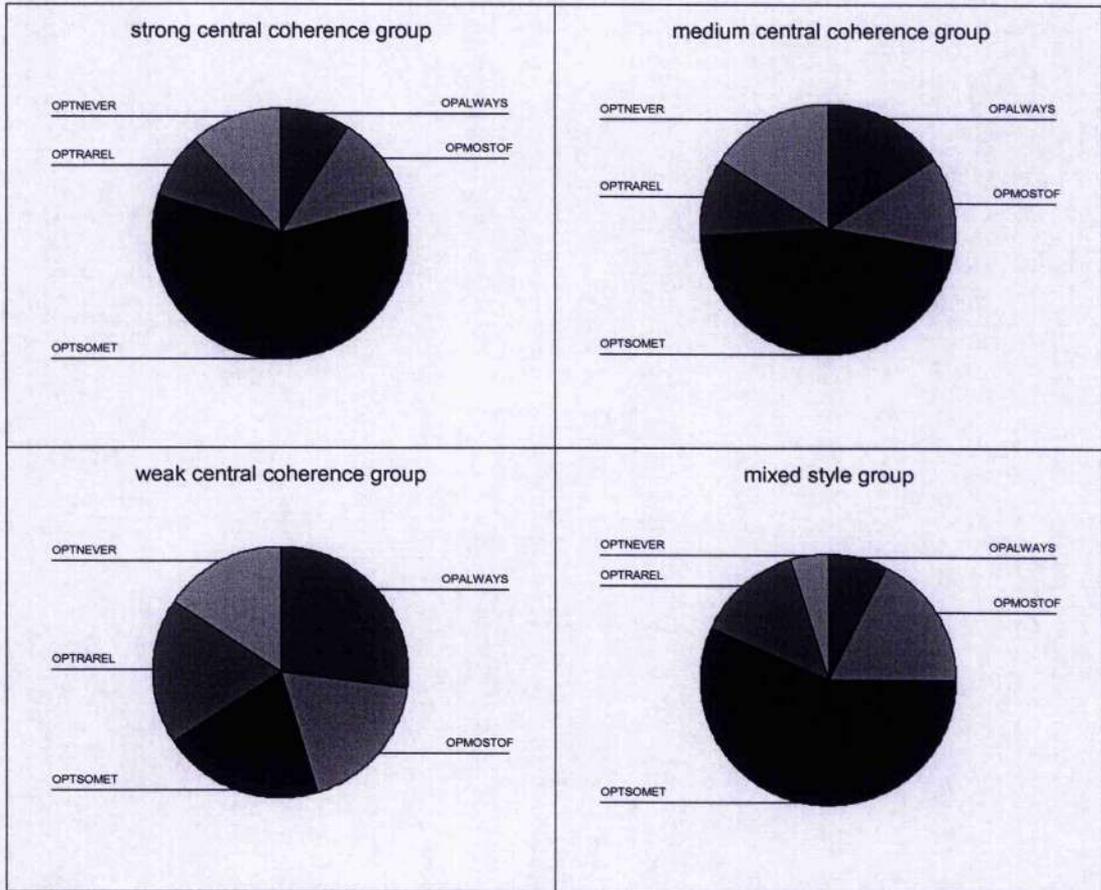
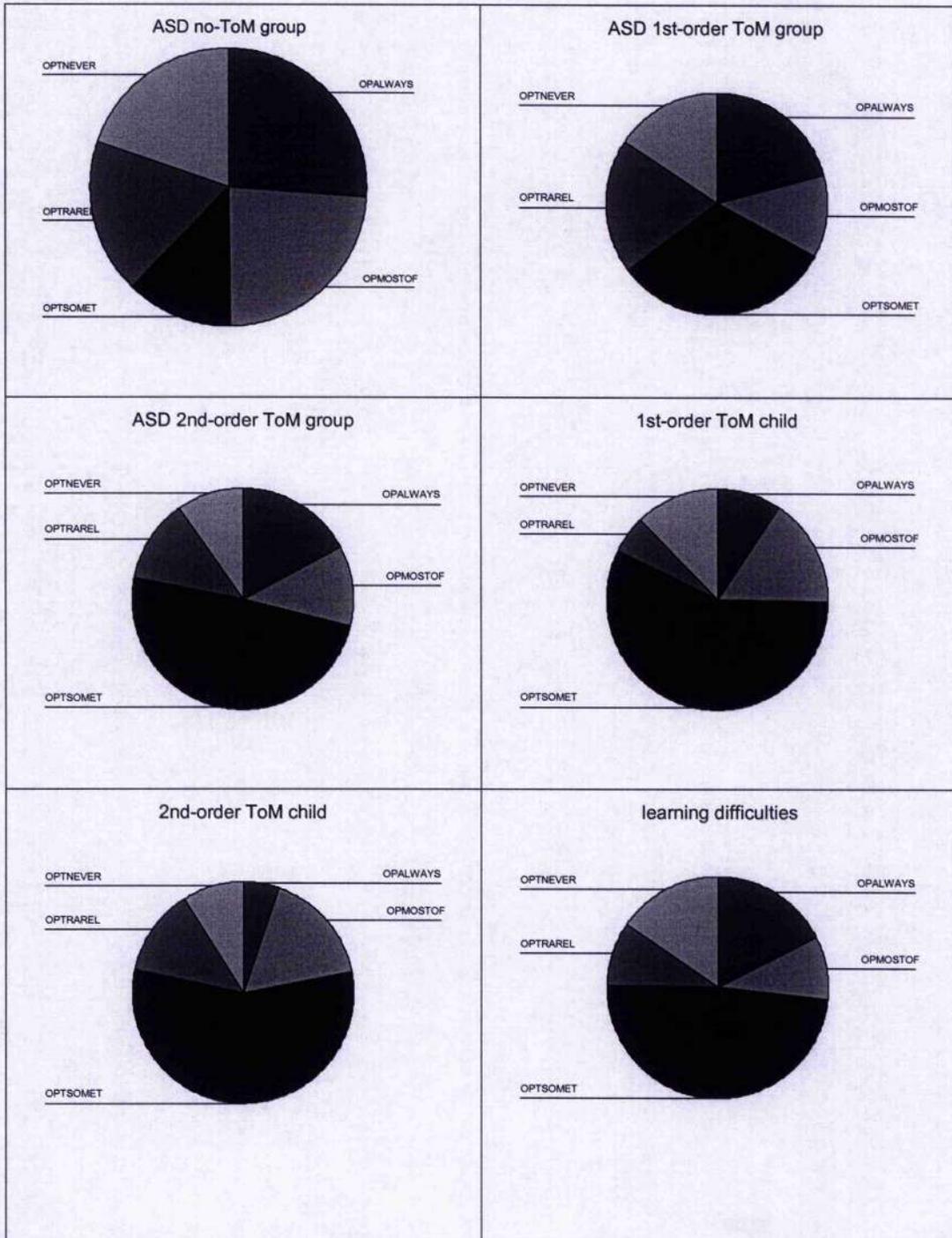


Figure 6.11. Frequency Ratings of the optional-slotfiller acts given by ToM groups



Whilst the SCC and MCC groups did not differ from each other in their ratings, both groups rated optional-slotfiller acts significantly more often incorrectly as occurring 'never' than the mixed style group. (MCC vs. mixed style: $Z = -2.78$, $N = 21$, $p = .005$; SCC vs. mixed style: $Z = -2.1$, $N = 19$, $p = .035$).

6.3.3. Frequency Ratings according to ToM groups

As a final analysis, it was investigated whether Theory of Mind abilities affected frequency judgements. Compared to the learning difficulties group, a tendency of the ASD no-ToM group to give fewer 'sometimes'-ratings approached significance ($Z = -1.6$, $p = .068$). Moreover, the ASD no-ToM group gave significantly more 'always' ratings than the typical 1st order ToM children ($Z = -2.15$, $n = 14$, $p = .029$), but there were no differences between the ratings given by the ASD no-ToM and ASD first order ToM groups.

6.4. SUMMARY AND DISCUSSION:

The first aim of this study was to investigate whether people with ASD perceived optional-slotfiller acts in a different way than people without this condition. In summary, the results suggested tentatively that a diagnosis of autism influenced ratings, as the autism subgroup gave overall more incorrect ratings than the verbal mental age matched 'young' children. The autism subgroup also gave significantly fewer 'sometimes' ratings than the matched group with learning difficulties. Arguably,

appreciation of the optional character of those items, namely that something might or might not occur, is best captured by 'sometimes' ratings.

By contrast, those with Asperger's Syndrome performed comparable to 9 to 10 year old typically developing children, but the ratings given by both groups were less relativistic than those of the adults. The second question was whether a tendency towards Weak Central Coherence affected frequency ratings of optional-slotfiller acts whilst judgements of central acts were not expected to be influenced. The results lent preliminary support to these predictions. Firstly, the WCC group (solely individuals in the ASD group) made in total more errors on the optional item category than the SCC and mixed style groups. More specifically, separate analyses of the response options 'always' to 'never' showed that compared to the SCC and mixed style groups, individuals with WCC tended to avoid 'sometimes' ratings, and gave more 'always' ratings.

Was the effect of Weak Central Coherence genuine? A similar pattern was found when participants were grouped according to their Theory of Mind competence. Here, we need to take into account that the ASD no ToM group also had slightly, though not significantly, more verbal language difficulties than the comparison groups (individuals with learning difficulties, typical children and the ASD ToM groups). This leaves the possibility that either ToM competence, modulated by verbal abilities, or verbal abilities in themselves, might have contributed to the result.

However, informative was the inspection of three individuals with WCC who had Theory of Mind at either the first or second order levels. With verbal IQs in the normal range, each of these three participants (two boys with autism and one boy with

Asperger's Syndrome) had considerably higher verbal abilities than the ASD 'WCC and ToM failers' (E.G. VIQ: 116; SS: VIQ: 97; K.C.'s verbal mental age estimate of 11.07 years was higher than his chronological age of 10.04 years). The mean numbers of incorrect ratings on the optional-slotfiller item category for the ASD no-ToM plus WCC group was 16.2 (of 35), whereas the MCC group (across diagnostic groups) gave on average 10.7, the SCC group 8.5 and the mixed style group 3.3 incorrect ratings. In comparison, E.G. (second order ToM) gave 17 incorrect ratings, S.So (second order ToM) 16, and K.C. (first order ToM) 5 incorrect ratings. Although the participant numbers are too small to draw any firm conclusions, the performance of these three individuals suggests that neither ToM performance nor verbal intelligence influenced their ratings. Of these three individuals, two boys gave as many incorrect ratings as the other lower functioning individuals with ASD in the WCC group. This suggests that for these individuals, a WCC cognitive style might have had a genuine influence on the ratings of the 'optional-slotfiller' acts.

We did not find support for the hypothesis that people with ASD, or specifically people with ASD with WCC, might misjudge the occurrences of actions that are inappropriate because of being performed in the wrong context. Although group means (see Figure 6.7.) showed that individuals with ASD gave incorrect ratings of about half of the inappropriate acts, no significant group differences were found as surprisingly, the young children made almost as many mistakes. It is unclear why the young typically developing children made as many incorrect judgements of the inappropriate items on this task, since Hudson (1988) reported that pre-schoolers even younger than the

children in the present sample readily spotted inappropriate behaviours. One possibility might be that the present 'inappropriate' acts were not as blatantly inappropriate as the ones Hudson gave children to rate. Alternatively, perhaps the young typical children, too, were relatively context insensitive and found it hard to appreciate that the same behaviour can be appropriate or inappropriate in different contexts or when performed by different people.

Finally, we need to address potential criticisms concerning the task itself. One potential problem relates to whether success on the pretest can be interpreted as reflecting a full understanding of the semantic meaning of the frequency terms. When designing the task and the pretest, inquiries were made in order to find an appropriate visual aid that could help participants to understand the meaning of these terms. However, interestingly, none of the visual communication systems commonly used in special needs schools (e.g. Makaton, Boardmaker) contained symbols for these frequency terms. The pretest employed in the present study cannot fully exclude that individuals with ASD might have passed it by using a visuo-spatial strategy that allowed them to relate the cups to the labels.

Another weakness of the task constitutes the lack of a true control condition. One possible way of approximating such a control condition could be to use parallel items, as frequently included in questionnaire designs (Breakwell, Hammond, Fife-Shaw, 1995). Two actors, say Tom and Henry could be portrayed in the same event, performing the same action (e.g. in the supermarket, both of them taking a shopping

cart). We would expect someone who genuinely understands the meaning of terms and their relation to the actions to show consistency across ratings of these parallel items.

Although the present version included 'non-social' descriptions of scenes and objects, these items were not balanced with items describing social actions. Hence, we did not analyse whether participants showed more errors in rating the occurrences of social actions versus non-social objects. This might be relevant to consider in future work, especially since we suggested a possible link between a tendency to perceive 'things' (acts and objects) that could occur as 'should occurring' and the insistence on the adherence to non-flexible routines and 'sameness'.

Despite the limitations discussed above, taken together, the present results lent preliminary support to the hypothesis that some people with ASD have difficulties understanding the occurrences of optional-slotfiller event acts. It is possible that different factors have influenced such disturbed event representation. Especially individuals with ASD whose cognitive profile included a combination of Weak Central Coherence, Theory of Mind impairments and correspondingly, verbal language impairments were at risk of failing to recognise that certain acts might or might not occur. Moreover, this tendency seems to stretch even to higher-functioning individuals with ASD with an understanding of other minds, but who maintain this preponderance for piecemeal perception.

DISCUSSION OF PART I: AUTISM AND CULTURAL KNOWLEDGE

7.1. SUMMARY OF STUDIES 1 TO 4

A new theoretical perspective, which aimed to integrate the cultural and cognitive levels, motivated the empirical research that comprised the first part of this thesis. The central question was whether cultural knowledge might be impaired in people with an autism spectrum disorder. Our argument involved two parts; the first part related to the developmental level, the second part related to the performance level.

The argument referring to the *developmental* level was that the acquisition of different facets of cultural knowledge might rely on distinct cognitive abilities, which were assumed to be abnormal in ASD. With reference to independent proposals put forward by Bruner (1990), Tomasello (1999) and Sperber (1996), it was suggested that the acquisition of real-world knowledge of social norms and customs might rely on Theory of Mind (metarepresentational capacities or their precursors). If that view was correct, then impairments in the understanding of social norms might only be restricted to the subgroup of individuals with ASD who have profound Theory of Mind deficits. Moreover, we reasoned that a second facet of cultural knowledge, the appreciation of the holistic-hierarchical structure of event scripts, requires a sense of Central Coherence. Based on the initial assumption that Weak Central Coherence might be

universal to individuals with this disorder, abnormalities in generalised representations of routine events were predicted to stretch across ability levels.

On the *performance level*, it was argued that if individuals with ASD had abnormalities in cultural knowledge, they might experience even further difficulties in making sense of canonical social behaviour than hitherto assumed. In addition to the impairments in explaining and predicting behaviour on the basis of mental states, ASD with representational ToM deficits might also have difficulties understanding social norm based behaviours. At the same time, abnormalities in event knowledge might even impair individuals with ASD with representational Theory of Mind abilities to deploy this device on-line.

We will first discuss the extent to which the present studies lent support to these arguments. Secondly, the limitations of the current studies are considered. Thirdly, implications of this research are discussed and suggestions are made for future research investigating how cultural knowledge may relate to the cognitive and behavioural phenotype of Autism Spectrum Disorders.

The relation between Theory of Mind deficits and the understanding of social norms was investigated in Study 2, by using a new Social Inference Task that required generating predictions and explanations based on norm based behaviours. However, previous research suggests that language abilities and Theory of Mind development (e.g. Tager-Flusberg, 1997; Yirmiya et al., 1996) may be closely related in ASD, so that people with Theory of Mind competencies usually also have better verbal abilities than those without Theory of Mind. Hence, evidence for the specific role of Theory of Mind

would be provided if people with ASD without ToM had greater difficulties than individuals with learning difficulties with Theory of Mind but with an equivalent level of verbal language abilities. If, by contrast, the understanding of social norms and real world knowledge relied on general learning mechanisms, perhaps even Theory of Mind failers might- depending upon their degree of accompanying learning difficulties - have some scaffold to fall back on in order to make sense of their social environment. The main finding of Study 2, the Social Inference Task, was that the ASD no ToM group showed significantly more difficulties in predicting and explaining norm based actions than individuals with learning difficulties and typically developing children of a similar verbal mental age. This suggests that at least one subgroup of people with an autism spectrum disorder might experience yet more difficulties and confusion in understanding social behaviour than the traditional Theory of Mind hypothesis suggested. In this sense, if we are 'thinking through cultures', as Shweder suggested, then this subgroup of people with autism might metaphorically lack those spectacles through which we perceive the world and that help us to make sense of our social environment.

While Study 1 lent support to the notion that WCC could be specific to autism spectrum disorders (Frith, 1989), it challenged the assumption that such a cognitive style is universal to all people with an autism spectrum condition. Only about one-third of our participants were characterised as having Weak Central Coherence, about two-thirds of the present participant population seemed to be better characterised as having Medium or even Strong Central coherence, or as showing a 'mixed style'.

Although these findings are interesting in themselves, with implications for future research discussed in Chapter 3, they rendered the present task – to tease out the possible influence of WCC on cultural knowledge – more difficult. Firstly, we needed to revise our initial hypothesis. If the hierarchical organisation of event representation was dependent on Central Coherence, only a subgroup of individuals with an autism spectrum disorder, namely those with Weak Central Coherence, should show impairments in that. Secondly, whilst overall degrees of Central Coherence and Theory of Mind did not correlate, closer inspection revealed that all individuals in the no ToM group also had WCC. And although Weak Central Coherence seems to be more prevalent than Theory of Mind deficits in ASD, stretching to higher-functioning individuals with Theory of Mind competencies, in the present sample these were effectively only three individuals.

Studies 3 and 4 lent support to the suggestion that the representation of routine events might be to varying degrees impaired in people with ASD. Especially individuals with Theory of Mind impairments and Weak Central Coherence showed little understanding of the main components comprising the structure of event knowledge, such as generality, hierarchical organisation, and even the temporal order. Abnormalities in the hierarchical event organisation were further evidenced by specifically poor ratings of the optional-slotfiller acts on the Frequency Rating Task.

However, given the overlap of individuals who showed both cognitive abnormalities, and since the comparison groups were slightly different for the two types of analysis, the results did not permit us to unambiguously tease out which of the two cognitive abilities had the greater impact. The finding that the level of Theory of Mind

abilities distinguished well between performances on the Frequency Rating Task was surprising since only Central Coherence Theory made specific predictions concerning abnormalities in the ratings of optional – slotfiller items. However, that Theory of Mind (impairments) and (abnormalities in) event knowledge might be affected at a similar level is at least implicit in Bruner's account that argued that both competencies develop from the same narrative mode of thinking. By telling stories to others (and even to oneself, as in Emmy's bedtime monologues, see Nelson, 1989) young children seem to try and make sense of their experiences. Going through them, this 'sense-making-process' is thought to foster their Theory of Mind development (because they need to explain why things happened), as well as to consolidate their general understanding of what different events entail. Still, this account remains vague with regards to the dissociation between 'specific' difficulties in the understanding of the quality of optional-slotfiller acts and relative intact ratings of central acts, which is what was found here. Therefore, the possibility that Weak Central Coherence had a genuine impact may be supported by the main finding that the Weak Central Coherence group across ability ranges showed these impairments, and although roughly one third of individuals in this group had Theory of Mind competence at the first or second order levels.

However, it is possible that in general, results were also influenced by the individual's general level of intellectual functioning, particularly his or her verbal abilities. Possibly, good verbal abilities might have helped people with high-functioning autism or Asperger's Syndrome to complete sentences in a meaningful way, as shown in Study 1, to give relatively appropriate explanations on the Social Inference Task

(Study 2), and to produce relatively coherent event narratives (Study 3). Nonetheless, almost in every individual, more subtle difficulties were found, especially on the event narratives.

7.2. LIMITATIONS OF STUDIES 1-4

The studies involved a number of limitations of which a first set relates to the characteristics of the participant sample. The present sample comprised a relatively heterogeneous group of individuals with an autism spectrum disorder, ranging from individuals with autism with moderate learning difficulties to - in some cases - very intelligent adults with Asperger's Syndrome. The decision of targeting such a relatively heterogeneous group was mainly motivated by previous insights of characteristics of people with ASD who fail versus pass standard Theory of Mind tests, which was crucial for exploring the possible effect of ToM on cultural knowledge.

1. Repercussions of this decision were that when divided into autism versus Asperger's Syndrome, we had to work with small case numbers in each subgroup. Having small sample sizes does not only raise the question whether results can be generalised to the ASD population at large, they also render the possibility of detecting existing effects more difficult. This could have contributed to negative findings, for example, the failure to find significant differences between Central Coherence groups on the spontaneous production of slotfillers in Study 5.

2. Given the practical difficulties in recruiting individuals with a relatively rare disorder, such as ASD, most of the adults were recruited via support groups for adolescents or

adults with Asperger's Syndrome. Hence, the individuals with Asperger's Syndrome were overall not only higher functioning, but also older than those with autism.

Therefore, although in several analyses the two subgroups were compared, group differences must not be attributed to details of diagnoses of autism versus Asperger's Syndrome. In other words, in the present studies we could not directly explore whether individuals with autism/ high-functioning autism differ from those with Asperger's Syndrome in their cognitive profile or understanding of cultural knowledge.

3. In designing the new tasks, we had to consider possible comprehension problems of the lower functioning individuals in our sample. Therefore, the tasks might have been too easy for the intelligent adults with Asperger's Syndrome, so that their relatively good performance cannot be seen as evidence that their understanding of cultural knowledge is fully intact.

4. As discussed above, the 'overlap' of individuals who had Theory of Mind impairments and Weak Central Coherence rendered the interpretation of the results more difficult. The results do not permit us to draw firm conclusions as to which cognitive abnormality had a greater influence on generalised event representation.

Hence, given the above limitations and that with exception of Study 1, the work presented here had exploratory character; the findings need to be seen as preliminary and in need of replication, ideally with bigger samples. However, they suggest that in a subgroup of individuals with an Autism Spectrum Disorder, notably those with Theory of Mind impairments and Weak Central Coherence, the understanding of cultural

knowledge was to a greater extent impaired than in individuals who function at a similar intellectual or developmental level.

And more generally, these findings suggest that the notion of cultural knowledge may provide a fruitful avenue to further investigate the relation between behavioural and cognitive abnormalities in ASD. It should be noted that the present approach avoids the danger of circularity pointed out by Leekam (2002) (trying to explain on the cognitive level behaviours that are in themselves part of the diagnostic criteria), as from cognitive abnormalities we have generated predictions of *further* impairments in ASD that are outside the diagnostic criteria.

7.2. IMPLICATIONS OF THIS RESEARCH AND OUTLOOK TO THE FUTURE

Event representation in people with autism and Asperger's Syndrome at different ability levels.

To explore the idea of cultural knowledge impairments in ASD further, a more systematic research programme is needed that firstly, accounts for different ability levels in ASD by using a variety of tasks that are appropriate for the mental age level of the participants. For the younger and more severely affected individuals, it will be necessary to assess the full depths of possible impairments using yet simpler tasks. With regards to the high-functioning individuals with ASD, the next question will be whether this subgroup might be able to use cultural knowledge effectively as input information for mentalistic inferences.

Exploring the relation between the perceptual and representational levels

This relation might not only be uni-directional or 'bottom-up' in the sense that event observations or cultural knowledge affect the drawing of on-line mentalistic inferences. The other interesting possibility would be to investigate the extent to which immediate event perceptions might be theory driven in ASD. It would be predicted that ordinary people selectively draw their attention to aspects of events that violate generalised expectations or representations. Furthermore, event perceptions might also be contributed by initial mentalistic inferences of actors' intentions. For example, if I know that someone intends to burgle a house, when observing the scene I might draw my attention selectively to those aspects of the environment that are relevant for the accomplishment of the act. (E.g. I might notice the alarm system outside the house and the police station across the road). However, when I am told that the person is about to make a friendly visit and observe the very same scenario, I might now notice the biscuits on the table but not the alarm system. Future research may investigate whether in people with ASD, immediate event perceptions are to the same extent guided by representational knowledge.

The role of event knowledge for cognitive development: memory and language

Researchers studying the development of generalised event representations in young typically developing children have argued that event knowledge acts as 'basic building blocks' for the development of other cognitive competencies, such as memory and acquisition of linguistic markers of modalities (Nelson, 1986). Extending this line of research to people with ASD, one interesting question would be to explore the degree

to which script abnormalities might affect those cognitive abilities or are related to their development. For example, previous research with typical children and adults has found that over time, people tend to 'fuse' different experiences with routine events in their memory (what you had for breakfast last week on Monday versus Tuesday). This was indicated by their false recognition of individual items that belong to a script but happened not to be present in a specific incident (Hudson, 1988; Bower *et al.*, 1979). By contrast, if people with ASD tended to represent events more in terms of individual details, then recall or recognition might be more accurate and to a lesser extent contaminated by generalised expectations. This suggestion would fit with anecdotal accounts of sometimes astounding memory of details of ordinary events (e.g. Park, 1982).

Relating the event representation approach to the behaviour phenotype of ASD

The relevance of all these proposals is that we argue that cultural knowledge impairments might be involved in the underpinnings of two central features of autism spectrum disorders: social abnormalities and a resistance to altered routines. Particularly the latter aspect of the autism syndrome is currently not well understood. It is sometimes seen as a by-product of the attempt to establish some order in an inherently confusing and unpredictable world (e.g. Joliffe, 1992; Baron-Cohen, 1995). This view would predict that with gradual Theory of Mind competence, such obsessions might become less intense. Although this is to our knowledge an open question, anecdotes of high-functioning people with autism or Asperger's Syndrome who are likely to have

some ToM competence but are nevertheless keen on the order of their daily routines, suggests that these two features might not always correlate.

A second suggestion is that these symptoms stem from executive functions (e.g. Turner, 1997). A potential problem with this view is that obsessions with routines are assigned to a similar status as lower-level repetitive actions - and are only seen as dysfunctional. In our view, the strength of the present proposal is that it may offer a different account for the obsessions with routines that - in the spirit of Central Coherence Theory - emphasises 'differences' over strict 'deficits'. If people with autism genuinely understand acts (and by using a similar rationale also 'props', material artefacts, objects, 'things') that *could* happen in individual experiences as *should* happen, it may be *subjectively meaningful* for a person with autism or Asperger Syndrome to insist on the adherence of surface patterns. In order to explore the validity of this proposal, it will be necessary to compare the degree to which abnormalities in cultural knowledge observed in experimental situations relate to the nature and extent of social impairments and a resistance to changes in routines in real life.

Autism as an indirect route to empirically investigate the nature and development of cultural knowledge.

Finally, the cultural knowledge approach to autism may have yet another benefit. Previous research studying cognitive abnormalities in autism (Theory of Mind, central executive functions) has been useful for theory and research about the typical development. In a similar vein, the implications of this approach are that - via the indirect route - autism can tell us something about the cognitive underpinnings of the

'normal' acquisition and understanding of cultural knowledge. For example, it suggests that Theory of Mind and a sense of coherence play a role in this learning process, which previously other authors have theorised but not empirically investigated.

7.3. CONCLUSION

In summary, the research presented in the first part of this thesis lends support to the suggestion that by evoking the cultural level, we may attain a better understanding of the way two central facets of the autism syndrome are related; the depth of social impairments and the obsession with routines. Moreover, the notion of cultural knowledge has been useful for the generation of predictions regarding the interplay between different cognitive abilities.

PART II

THEORY OF MIND, POWER AND INTERGROUP RELATIONS

THEORY OF MIND, POWER AND DISCRIMINATION

8.1. INTRODUCTION TO THE PHENOMENON AT ISSUE: INTERGROUP
DISCRIMINATION

In the preface to Fanon's *The Wretched of the Earth* (1965), Sartre described the mechanisms and function of dehumanisation in the colonies with passion and fury:

“Our soldiers overseas, rejecting the universalism of the mother country, apply the ‘*numerus clausus*’ to the human race: since none may enslave, rob or kill his fellow man without committing a crime, they lay down the principle that the native is not one of our fellow-men. Our striking power has been given the mission of changing this abstract certainty into reality: the order is given to reduce the inhabitants of the annexed country to the level of superior monkeys in order to justify the settler’s treatment of them as beasts of burden. Violence in the colonies does not only have for its aim the keeping of these enslaved men at arm’s length; it seeks to dehumanise them” (p.12).

When considering situations in which intergroup discrimination presents its most extreme expressions in dehumanisation and genocide, as well when looking at less extreme forms, a challenging question is: what is going on in the minds of those who commit these acts that enables them to do so? Recall from Chapter 1 Staub’s supposition that the SS commandant Amos Goeth did not consider the thoughts and

feelings of his victims. In a similar vein, Kiernan (1996), in his analysis of European attitudes to other cultures in the imperial age, attributed to the colonisers incomprehension of the differing mental perspectives of the colonised: "That black people had only second-rate souls, and that they were better off as slaves (...) was a conviction that faded very slowly from the European minds. He [Albert Smith] fell back on the comforting stereotype of Africans as happy, carefree creatures, shackled in body but spared the heavy load of thought and doubt" (pp 211-212).

8.1.1. The roots of a hypothesis:

The images pressed upon us from these accounts are very different from the pictures painted by developmental psychologists about the 'competent mindreader'. Notwithstanding many differences between the situations described by Sartre, Kiernan and Staub, one common aspect amongst them is extreme power differentials between members of different social groups. These accounts provided the starting point for the following question: could it be that alongside with the denial of the 'others'' basic human rights, the oppressors denied the oppressed another central feature of humanity, their own independent mental perspective?

The suggestion based on this impression is that social contextual variables determining the relation between self and other may affect theory of mind usage. But does this suggest that unawareness, or more extreme, the denial of others' mental perspectives is mutual between the oppressors and the oppressed? Let us listen to Sartre again:

“Our victims know us by their scars and by their chains, and it is this that makes their evidence irrefutable. It is enough that they show us what we made of them for us to realise what we made of ourselves” (1965, p.12).

Another example that emphasises a discrepancy between the extent, to which oppressors and the suppressed are aware of the mental states of one another, can be found again in Kiernan’s (1996) analysis.

“He (Oyono) can easily be believed when he says that the colonisers knew their subjects far less than they were known by them. ‘The eyes that live in the native location strip the whites naked. The whites on the other hand go about blind’”. (p. 218)

The issues of intergroup behaviour, conflict and oppression are today as acute as they have been in the past. With the present work, we hoped to contribute to an understanding of this phenomenon by approaching it from a Theory of Mind perspective. Based on the above accounts, we developed the hypothesis that power differentials may lead to an asymmetry in the understanding of others’ minds. On the one hand, those who are in power, might for various reasons not be motivated to understand the mental perspective of their victims, how they interpret reality which includes their interpretations of the oppressors’ actions. On the other hand, the suppressed might have a clearer understanding of the states of mind of their oppressors, which we argue would be strategically beneficial for them.

Hence, our concern in this second part of the thesis is to explore the questions of whether and how power affects differential theory of mind usage, and how the denial or

adoption of others' independent mental perspective may serve strategic functions for those who commit or experience discrimination.

8.1.2. Power

If the terms racism and prejudice are often used interchangeably, there is one important social factor that distinguishes between the two: power. As Reicher (2001) has argued, prejudice and ethnocentrism (the preference of the ingroup over other groups) only translates into racism when the ingroup is capable of exerting power over the outgroup.

Russell (1938) considered power as "the fundamental concept in social science in the same sense in which energy is the fundamental concept in physics" (p. 10). For Dahrendorf (1968), a core feature of society is the unequal partition of power between its members. Nietzsche (1888/ 1968) saw 'the will to power' as a fundamental human drive, and Hobbes argued that only through the formation of societies was it possible to limit the exploitative consequences of unequal power division.

Even if power is one of the most important factors that define social relations, a number of commentators have lamented that on the whole, power differentials remain a neglected issue in modern social psychology in general, as well as in studies of intergroup phenomena in particular (e.g. Ng, 1980; Fiske & Dépret, 1996; Haslam, 2001; Reicher, 2001). However, more recently, researchers have converged on a working definition of power that includes a notion of the degree of control that a person or group has over their own outcomes and over those of others (see Jones, 1972; Dépret

& Fiske, 1996; Rodríguez-Bailón, Moya & Yzerbyt, 2000; Haslam, 2001). In other words, those who are in a position of power are not only in control over their own outcomes, but also in control of the outcomes of those they dominate. Conversely, those who are in the dominated position lack control over their own outcomes, as those are largely determined by powerful others. The advantage of such a definition of power is that it allows one to contrast power with other constructs. For example, in contrast to manifestations of social influence, it is implied that the power user is in a position to impose his will against the wishes of those he attempts to control. Moreover, such a definition of power contrasts with status, as one may be of higher status but without control over the other's outcomes. The royal family may be of high status but without real governmental power, whereas a low status governmental employee may in actual fact have substantial control over the outcome of others.

8.1.3 Outline of part II of this thesis

To give more substance to the proposal that power, or social contextual variables more generally, may affect how Theory of Mind is used in practice, in the first part of this chapter, we discuss a number of research strands within social psychology that are concerned with different facets of the issue at hand. First, as an exception from the lacuna of power research, an active programme of research that continues with the mainstream social cognition tradition will be reviewed. In the second part, several problems of this direction as identified by a second influential research strand, the Social Identity approach will be discussed. These include the critique on an

individualistic and static concept of social groups, and the assumption that 'faults' in cognitive processes are the consequences of limited cognitive resources. By contrast, we will see that Social Identity Theory (Tajfel, 1978, 1979) proposes a multi-levelled concept of the self and a process-oriented approach to intergroup behaviour. However, with only a few exceptions (Ng, 1980, Reicher, 2001), research within the Social Identity approach has not systematically considered the role of power for intergroup processes, although the theory implies that power differentials between groups are flexible depending upon the social context. Moreover, its current limitations include a neglect of cognitive processes in their account of intergroup behaviour. In the third part, we present our proposal, which consists of a synthesis between these two lines of research by importing a Theory of Mind perspective to the study of intergroup phenomena. The final part of this chapter gives an overview and the rationale of the empirical research presented in subsequent chapters.

8.2. SOCIAL PSYCHOLOGICAL ACCOUNTS OF POWER AND INTERGROUP DISCRIMINATION

8.2.1. Individualistic accounts

In the aftermath of the horrors of World War II, Adorno *et al* (1950) developed an influential theory positing that the Nazis' success in recruiting large parts of the German population for their ethnocentric and discriminatory cause was grounded in a stable personality trait common to many Germans: authoritarianism. In other words, individual difference factors, anchored in German parental style, were argued to

predispose Germans to prejudice. Those traits, as established on the basis of a range of psychometric tests, included, for example, rigidity, over-generalisation, intolerance of ambiguity, and a predisposition to an egocentric perspective. However, as commentators have pointed out, locating extreme racism in the psychological characteristics of individuals may be more informative in situations where racist attitudes and ideologies are in the minority (Billig, 1976). In these circumstances, it may well be a certain type of person who joins extremist groups. By contrast, where those views and attitudes become part of the dominant ideology, individualistic accounts may lose a great deal of their explanatory power (Billig, 1976). Billig also pointed to a second problem of individualistic accounts. This relates to the prediction of relatively stable and unchangeable intergroup relations, which contradicts sudden rises and falls in prejudice as witnessed throughout history.

Nonetheless, individualistic accounts have dominated the mainstream American social psychological scene, notably the social cognition tradition. Insights derived from them are reviewed first.

8.2.1.1. The effect of power on impression formation and stereotyping

In keeping with Allport's (1924) individualist social psychology, social cognition research has since been driven by an individualistic orientation, as it searches within the cognitive processes of individuals for the causes of behaviour (see for a critique, Augoustinos & Walker, 1995). Fiske and Taylor (1984) originally portrayed perceivers as 'cognitive misers' who are motivated to economise their limited cognitive resources (Fiske & Taylor, 1984). More recently, this metaphor has given way to the

portrayal of perceivers as 'motivated tacticians' (Fiske & Taylor, 1991) who 'invest' in forming detailed, individuated impressions of others in situations in which the achievement of own goals is highly (inter-) dependent on others. Otherwise, he or she will be inclined to go for the easier option: to fall back on handy stereotypes (see, for example, Fiske & Neuberg, 1989; Fiske & Taylor, 1984; Erber & Fiske, 1984). As a further elaboration, this argument has been specifically tailored onto the relation between power and stereotyping. The 'Power-as-Control' model (Fiske, 1993; Fiske & Dépret, 1996) predicts an asymmetry in impression formation between those who are powerful and those who are powerless. The model is composed of two parts: the first part suggests that power holders are more likely to stereotype their subordinates since they pay less attention to individuating information, because they do not *need to, are not able to and do not want to* do so. In other words, powerful people stereotype both by default (not being able to do otherwise) and by design (not wanting to do otherwise). As the second part of the model, Fiske and Dépret (1996) have argued that people in subordinate positions are motivated to acquire diagnostic individualistic information about their superiors and are consequentially less prone to stereotyping. The model is based on the assumption that individualistic, stereotype-inconsistent information is the most diagnostic kind, as from such information inferences about the person's dispositions and in turn, about his or her behaviour, can be made. "They [the powerless] in effect construct personality profiles of the person on whom they depend, perhaps in an attempt to see the other person (and therefore their own fate) as predictable. If they know the other person's individual personality, they think they know what the other person will do and can infer how it will affect themselves" (Fiske, 1993: 625).

Fiske and Dépret (1996) tested the first part of the model using two paradigms. In the 'Springfield Evaluation Paradigm', participants were either assigned to a high power or low power group. In the high power group, participants believed that their evaluations of a number of student profiles had real consequences as to whether or not a student candidate was hired for an internship programme. The student's identity was either clearly Anglo-American or Latino-American. Half of the descriptions fulfilled a Latino stereotype, half of them an Anglo-American stereotype. A think-aloud procedure served as the dependent variable. It was found that only in the high-power condition, participants paid less attention to information that disconfirmed the stereotype. This was interpreted such that "[...] the powerful people's attention by default potentially reinforced their stereotypes" (Fiske & Dépret, 1996). Moreover, attention to stereotype-confirming information increased, which, as the authors suggested, confirmed the stereotype by design prediction.

In the workgroup paradigm, participants believed that they were participating in a study of task allocation in work groups. Participants were either assigned to a group of powerful 'allocators' or powerless 'executors'. They were first given self-descriptive information about other 'allocators', 'executors', or neutral 'observers' whom they expected to meet in the final phase of the experiment. The time spent reading this information on a computer screen provided the attention measure. It was found that relative to the high-power 'allocators', both the low-power executors and the neutral observers paid more attention to stereotype-disconfirming information. However, in the condition in which the perceiver was a high power 'allocator' and the target a low power executor, most attention was paid to stereotype-confirming information. This

research has shown that power differentials affect cognitive processes, i.e. the amount of attention paid to different types of information.

However, on a meta-theoretical level, this theory retains the assumption that individualistic information is intrinsically better than group information. Arguably, for a Jew in a concentration camp, it may not be most diagnostic to obtain individuating information about the KZ commandant, if his actions may primarily be determined by the group norms associated to his SS identity. Strategically, it would be more relevant to know what he as a commandant thinks about himself, as a Jewish prisoner (for a similar argument, see also Oakes, Haslam & Turner, 1990). The next section gives a brief review of Social Identity Theory, which at its core challenges the very assumption that people are only characterised on the basis of personal characteristics.

8.2.2. Social Identity Theory

In a seminal series of experiments, Tajfel and his colleagues (Tajfel, 1972; Tajfel & Turner, 1979) set out to systematically investigate the 'minimal' conditions for intergroup discrimination. The robust finding of these studies, now famously referred to as the 'minimal group studies', was that boys who were on a random basis assigned to two groups and asked to allocate points to anonymous members of their own group (ingroup) and of the other group (outgroup) - but critically never themselves - consistently favoured the ingroup member. This finding implied that mere group division, however empty or trivial those groups were, was a sufficient condition for

intergroup differentiation. To provide a theoretical account for this finding Tajfel (1972) argued that adopting a group identity was the only way to impute meaning to this otherwise meaningless situation. It was suggested that the differentiation effect in this minimal intergroup scenario reflected a competition for a positive social identity. Through social identification with the randomly imposed groups, these categories contributed to the participants' self-concept. Their desire to obtain a positive social identity motivated them to achieve a favourable social comparison between the ingroup and outgroup.

Most relevant for the present purposes are two key concepts of Social Identity Theory. Firstly, Social Identity Theory re-conceptualised the relationship between the individual and the group, and offered a new theory of how intergroup behaviour can emerge from individual cognition. Central to this theory is the cognitive definition of a social group or category. Whereas previously, such as in the social cognition tradition just discussed, groups were regarded as an aggregate of individuals and individuals were defined in terms of their 'unitary' personal attributes, Tajfel suggested that people construe themselves on different levels. On the 'subordinate' personal level, people define themselves in terms of personal attributes (e.g. as intelligent, pretty), on the intermediate level in terms of their membership of social categories (e.g. as white, middle-class, male) or on the superordinate level as a human being. The part of one's self-definition, which is derived from the membership of a particular social group, was called 'social identity'. In his own words, Social Identity is "[...] the part of the individual's self concept which derives from his or her knowledge of his or her membership of a social group (or groups) together with the value and emotional

significance attached to that membership' (Tajfel, 1978: p.63). From this flows a second key concept, specified by the subsequently developed Self Categorisation Theory (Turner, Hoggs, Oakes, Reicher, & Wetherell, 1987). Identity is not seen as a stable factor, but as highly flexible depending on the social situation or context. For example, I may perceive myself as a professional capacity in one situation, act in accordance with the group norms associated with this social identity, and expect to be perceived and treated as such by others. However, in another situation, another Social Identity, say, gender, or Manchester United supporter becomes relevant which may then influence my behaviour. An important implication of the concept of Social Identity, not only for our understanding of group processes, but also for our understanding of the self, is that groups cannot be divorced from, or reduced to individuals.

8.2.2.1. A Social Identity Theory perspective on power

As noted earlier, the Social Identity approach has – despite its central status in the study of intergroup behaviour - largely failed to consider power. This neglect was first recognised by Ng (1980, 1982) who addressed the role of power for the instigation of discrimination. He pointed out that for group members to overtly express their ingroup favouritism in action, they must be in a position to do so independent of possible objections of others. This necessitates taking the power relation between the two groups into account. For the powerful group it is possible to translate ethnocentric tendencies into action without having to fear resistance or subsequent retaliation. For the powerless, on the other hand, the overt expression of discrimination may not be

possible, however strongly they may hold negative views of the outgroup, because for them, subsequent retaliation by a more powerful outgroup poses a serious threat.

Sachdev & Bourhis (1985) investigated the effect of power on overt expression of group differentiation using the classic minimal group paradigm. Whilst the original design could be regarded as implicitly involving equal bilateral power relations, in this study, levels of power (from 0%, over 30%, 50%, 70% to 100%) and levels of group membership salience were systematically manipulated. The authors reported that dominant group members used more discriminatory strategies on the Tajfel allocation matrices than subordinate group members, and dominant group members also felt more comfortable than subordinates. This result suggests that power constitutes an important condition for group discrimination, as without power, social categorisation does not lead to this differentiation effect.

How do people attain more or less power than others? Although often left implicit, Social Identity Theory predicts that relative group power may be flexible, varying as a function of the comparative context. It entails a view of power as a social phenomenon that is located in the relation between different groups and group members. One can think of the relation between different social groups within a larger context (e.g. society) as being akin to the positioning within a co-ordinate system in which social groups are in the process of social comparison. Power differentials (or else, power equality) emerge from social comparison between, say, group A and B at a particular moment in time. If, for example, social comparison established that group A is more powerful than group B, then to the extent to which group membership to groups

A or B are 'salient' in a particular social context, *any* member of group A (irrespective of his or her personal attributes, or memberships to other groups) will be more powerful than *any member* of group B. However, this does not imply that the power of group A is absolute. Let us compare group A with another group C on the same or any other relevant social dimension. At the same moment in history, group C may now emerge as more powerful. In this situation, then, any member of group C will be more powerful than any member of group A.

This view implies that someone's self-perception as either powerful or powerless cannot be totally absolute and general, but it must be relative and relates to specific and direct comparisons with some other agent. It further implies that power is not stable and intra-psychic, but located in the relation *between* people or groups of people and it is to some degree flexible. More specifically, someone's degree of power should be flexible in as much as he or she either defines him or herself in terms of his or her personal identity or in terms of any of the social identities $\{SI_1, SI_2, SI_3, \dots, SI_x\}$ that form part of his or her self, crossed with the number of possible comparison groups.

In real life, this flexibility, however, will be constrained by parameters of the social structure that renders some social groups simply more often 'salient' than others. Let us illustrate what was said before with an admittedly somewhat stereotypical example. Up until the mid 1920s, a male Jewish banker in Germany may have held considerable power over others in various different ways. In his identity as a banker, he would have had control over his employees, clients or applicants for a credit. In that time, as a man, father and husband, he may have had some power over his wife and children. He could have been a member of different societies, which may or may not

have given him power in particular situations. However, when the Nazis came to power, many of these social groups that formed part of his identity became less relevant. What started to count as the only relevant social category, what became 'salient' within the social context of the Third Reich, was his identity as a Jew. Even if we attributed to him 'a need of power' or an 'authoritarian personality', such an individualistic striving for power could not counteract his powerlessness derived from his group membership. A concept of power derived from social identity theory therefore implies that power differentials are at the same time rooted in socio-structural differences between groups and present in specific interactions between individuals.

In this way, the Social Identity account of power is more one of situational power and does not accommodate dispositional dominance orientation (i.e. power associated with personal characteristics). Even if such a conceptualisation of power may be incomplete, it is a suitable tool to address questions of intergroup relations. In this context, group power may be the critical source of power differentials. As Haslam (2001) pointed out, the difference between *personal* and *group* power is that power on the personal level cannot work for anybody else than this person. On the group level, however, power can act in the service of the interest of peers, and is thus more likely to affect social change. Moreover, power differentials are seen as dynamic processes, which contrasts the static view of power posited by the social cognition paradigm or other individualistic accounts.

Taking the argument that power enables enactment of discrimination further, Reicher and Levine (1994, 1998) pointed out that for one group to impose its views on another group depends upon the ability to identify and hence make accountable

outgroup members who oppose ingroup views. The authors predicted that when faced with a more powerful outgroup to whom they are visible and individually identifiable, ingroup members should decrease their expression of behaviours that express ingroup identity but are unacceptable for outgroup members. By contrast, identifiability amongst ingroup members should have a rather different impact, since it will empower them by increasing the possibility of mutual support. It will therefore facilitate full expression of ingroup norms. In one study (Reicher & Levine, 1994) that investigated these predictions, science students were recruited to participate in a study allegedly aimed at exploring their attitudes to work and leisure. Either their group identity as 'students' or as 'scientists' were stressed. This was crossed with a 'visibility' manipulation; so that each half of the 'students' and 'scientists' were made identifiable to a powerful outgroup (members of staff) whilst the other half knew that their individual names could not be traced. Before an alleged group discussion, participants were asked to complete a questionnaire that comprised 'punishable' items (assessing their academic commitment) and 'unpunishable' (their views on the controversial topic of animal experimentation) items.

Whilst it was assumed that the scientist norm values high academic commitment and the benefit of experimentation, a student norm implies a more 'laid back' attitude towards transgressions, such as copying essays, as well as humane values. As predicted, to the extent that participants in the 'student' condition were anonymous to the powerful staff, they admitted more freely to transgressions on the 'punishable items' than when they believed themselves to be 'visible', and hence identifiable, to staff. The scientists' responses, on the other hand, varied little over the visibility conditions, as their ingroup

norm was already close to that of the outgroup and hence did not need adjustment in expression in the face of possible accountability.

As most research within the social identity tradition, the study did not explicitly investigate the cognitive processes underlying participants' responses.

However, implicitly, the results of the study were also indicative for the psychological processes underlying their strategy to either express or suppress ingroup norms. Firstly, the powerless students must have had some 'cultural knowledge' of the differing group norms and values towards 'work ethics'. This involves contrasting 'our beliefs' (e.g. "It's okay to copy a friend's responses in an exam") from 'their beliefs' (e.g. "They think it is unacceptable to cheat during an exam"). Furthermore, students may have reasoned that "if they, i.e. the powerful outgroup, believe [cheating] is negative and if they know that I do [cheat], they will punish me for this". The students in the visibility condition must therefore have been aware of the likely mental attitude of powerful outgroup members. Not expressing their ingroup beliefs served as a strategy to avoid possible punishment.

8.2.3. Current research: towards a reconciliation between a social identity approach and consideration of cognitive processes

Recently, a number of researchers have begun to work towards reconciliation between the North American Social Cognition tradition and the European Social Identity/ Self Categorisation approaches. As outlined in the previous section, on a meta-theoretical level, the Social Identity account criticises the assumption of a unitary self,

solely defined on the basis of individualistic characteristics. Instead, at the heart of Social Identity Theory is the proposal of a multi-levelled concept of the self. This challenges two assumptions of the social cognition paradigm with respect to the relation between power and social cognition.

1. Only under the assumption of a unitary self does it make sense to argue that individualistic, stereotype-inconsistent information is in all circumstances most diagnostic in understanding the powerful/ powerless other and in predicting his or her actions.
2. Remember that the 'power-as-control' model proposed that the powerful stereotype their subordinates both by default and by design. Researchers within the Social Identity tradition have criticised the *stereotype by default* argument, i.e. the suggestion that selective attention to categorical information were primarily in the service of saving limited attention resources (e.g. Oakes & Haslam, 2001; Spears, Haslam & Jansen, 1999; Spears & Haslam, 1997). Instead, and corresponding with Fiske's *stereotype by design argument*, it has been argued that the driving force behind social stereotyping and prejudice may consist of the attempt to perpetuate and justify existing power positions.

For example, Fiske (1993) reported the case of Ann Hopkins, a successful manager at Price Waterhouse, to illustrate how the powerful and busy top management did not need to, did not want to, and could not attend to individuating characteristics of their relatively powerless female employee. Mrs Hopkins went to court, because despite her impressive performance, she was denied partnership on the grounds of being 'not feminine enough'. In Fiske's view, the outcome was the result of the busy managers'

cognitive overload. Challenging this interpretation, Oakes *et al* (1994, cf. Haslam, 2001) argued that this outcome may have been the result of rather different processes. Rather than reflecting that the managers 'could not care less', their discrimination might have instead been the result that they 'couldn't care more'; an intergroup strategy which served the purpose of maintaining women's low status in the company.

In response to these criticisms, more recent work by Fiske and others (e.g. Fiske, 1998, Goodwin, Gubin, Fiske, & Yzerbyt, 2001; Georgesen & Harris, 2000) has placed more emphasis on the argument that the powerful stereotype by design, in other words, as a motivational strategy. For example, Rodríguez-Bailón, Moya and Yzerbyt (2000) argued that if the powerful seek to maintain and justify their position, they should pay particular attention to negative stereotype-consistent information about their subordinates as this served the justification of one's own position (independent of how legitimate or illegitimate this may be). Ellemers, van Rijswijk, Bruins, and De Gilder (1998) investigated how subordinates explained their superiors' power usage in a stock-trading task. It was found that frequent power usage by an outgroup member was more often attributed to the superior's group membership, whilst frequent power use of an ingroup member was 'explained away' by external circumstances. As a consequence of these discrepant attributions, the authors reported decreased co-operation on the part of the subordinates in the outgroup-condition, whereas subordinates remained committed to the ingroup superior. As far as we are aware, this research is exceptional in considering how group constellations affected cognitive attribution processes that

influenced subsequent social interaction – the willingness to further co-operate with powerful others versus attempts to challenge such power usage.

However, taken together, the work presented so far did not actually investigate Theory of Mind deployment as such. The work concentrated on impression formation, as it was argued that by forming a detailed impression about the other, one can anticipate others' future actions and make plans accordingly (Fiske & Dépret, 1996; Ródriguez-Bailón et al., 2000). But is a general impression of the other person sufficient? For example, if you find yourself in a dark alleyway, and see a figure stretching out his hands, more crucial than having a general impression about the other may be to have an understanding of his specific intentions towards you. Is he in need, asking you for help, or is he pretending to be in need and really seeks to maliciously rob or attack you?

Isolated studies coming from different backgrounds in social psychology, whilst not explicitly framed within the Theory of Mind tradition, have investigated related phenomena. Snodgrass (1985, 1992) studied the separate and combined effect(s) of gender and subordinate role on 'interpersonal sensitivity'. She defined high interpersonal sensitivity as occurring when two interacting people are accurately tuned to one another's feelings and thoughts. In her original study (Snodgrass, 1985), two hypotheses were pitted against each other. A common stereotype suggests that women have greater interpersonal sensitivity than men. On the other hand, Snodgrass reasoned that this female advantage might be related to women's historically subordinate role in society, which is often perpetuated in the hierarchy of organisations. Her argument was:

“This sensitivity is quite variable. An individual experiences interpersonal sensitivity more at times than at others and more in some contexts than others. What causes us to be more or less sensitive to other persons? If it were primarily a personal trait or skill, there would be more consistency in this ability. However, because there seems to be great variability, even within individuals, this ability must be affected by the social context” (Snodgrass, 1985: p.146). Snodgrass also recognised the necessity to acknowledge the interactional character of social perception. She randomly assigned one member of an interacting dyad to a teacher (leader) and the other one to the student (subordinate) role and engaged them in a series of tasks. Between each task, both members were asked to fill in questionnaires, which involved ratings of how they felt about themselves (e.g. “I was a good teacher”), and how they thought the partner felt about himself and the participant (e.g. “She felt I/ she was the dominant one”). Snodgrass (1985) reported that – contrary to the common stereotype – women were no more intuitive to the thoughts and feelings of their partners than men. By contrast, her results lent strong support for the subordinate role explanation for the female advantage as those in a subordinate role, regardless of their gender, were more sensitive to the feelings of the dominant dyad member.

Whereas the impression formation research discussed beforehand was only concerned with perceptions of the kind of “I think the powerful or powerless is [x]”, the advantage of Snodgrass’ argument is that she considers more complex and recursive mental state inferences, such as: “I think the powerful or powerless *thinks* s/he is” and “I think the powerful/ less *thinks* I am”. Whereas Snodgrass required her participants to

make Theory of Mind inferences, the social perceptions measured in the impression formation research did not. Knowing whether a powerful person is reflectively aware of his or her position, and knowing what he or she thinks about oneself, may be more diagnostic than simply forming one's own impression about the other.

A further research avenue that implicitly studied Theory of Mind usage can be traced in the notion of 'stereotype threat', coined by Steele and his colleagues (1999, 1992).

'Stereotype threat' describes "the threat of being viewed through the lens of a negative stereotype, or the fear of doing something that would inadvertently confirm that stereotype" (Steele, 1999: p. 3). This requires one to take the mental perspective of an outgroup member. In other words, the threat does not emerge because of a certain performance (how negative it may be) *per se*, but because of the inference of how own actions may be perceived by –arguably more powerful – white others. To support their claim that a 'sociological' construct, such as stereotype threat, may indeed influence something as 'individualistic' as intelligence, Steele and Aronson (1995) conducted a series of experiments. One experiment involved black and white Stanford

Undergraduates to complete a highly advanced verbal test. Although the groups were statistically matched in terms of their level of abilities, the black students performed dramatically worse than the white students. In order to rule out the possibility that some other factor, such as motivation, may have hampered the black students' performance, a second condition was added. Here, the task was explicitly presented as measuring 'how certain problems are generally solved', and it was stressed that intellectual ability was not at issue. Now the black students performed just as well as the white students. The

authors suggested that in the first condition, the poorer performance of the black students might have been the result of the difficult test triggering awareness of a negative ingroup stereotype, i.e. as to be likely seen by others as having limited intellectual ability. The black students seemed to have succumbed under the weight of a negative outgroup view of oneself. As an informant stated in Maya Angelou's television programme 'Race in Britain': "I am black, because people see me as black and nothing else". In another study in which preferences in sport and music were assessed just prior to the difficult test, black students reported less interest in things commonly viewed as African-American (e.g. jazz, hip hop, basketball), whilst when the test was supposedly unrelated to intellectual ability, they strongly manifested typical African-American interests. It appeared, that at the brink of taking a difficult test, the black students were strategic in their attempt to impute in powerful others the belief that they differed individually from a negative ingroup stereotype.

The theoretical framework and empirical approach we put forward in the next section were derived from marrying the process perspective of the Social Identity/ Self Categorisation Theory traditions that account for contextualised variability of social positions with considerations of mentalistic inferencing processes. This provides an alternative, and as we argue, more complete account of intergroup processes than the one suggested by the social cognition tradition.

In summary, different research avenues in social psychology lent support to our intuitive impression from real-life anecdotes that social-contextual variables may

influence cognitive processes that are part of or related to Theory of Mind processes. These different accounts addressed part of the phenomenon that interest us. In the next section we put forward a theoretical framework that was derived from marrying the process perspective of the Social Identity/ Self Categorisation traditions with considerations of mental inferencing processes to study how Theory of Mind is used in practice in different social conditions.

8.3. POWER AND INTERGROUP BEHAVIOUR FROM A CONTEXTUALISED PERSPECTIVE ON THEORY OF MIND IN PRACTICE

Our proposal shall be specified as we address three questions. Firstly, who is the mindreader? Secondly, why might instigation of Theory of Mind depend on the social context? And thirdly, how are differences in Theory of Mind usage manifested?

8.3.1. Who is the mindreader?

Following the Social identity Theory approach, the mindreader is seen as someone whose self is multi-dimensional, composed of a personal and several social identities. His or her power is at least partially derived from and related to the social group(s) he or she belongs to. The extent to which the mindreader is relatively powerful or powerless is considered to be variable as a function of the social context, so that one and the same person can be powerful in one situation, vis-à-vis person A, but powerless in another situation, vis-à-vis another person B.

8.3.2. Why should theory of mind usage be affected by social conditions?

A matter of relevance?

Our first argument is that Theory of Mind deployment may be dependent upon the degree to which the other is perceived as relevant to oneself. Two different types of relevance (which in real life can be combined in varying degrees) come to mind:

Relevance in the first sense refers to the genuine desire to understand the other, or, as it is often expressed colloquially: a concern with 'what is going on in someone's mind'. This may be typical for all sorts of close interpersonal relations.

However, in addition, we consider relevance in the second sense: when one is not necessarily directly concerned with others' thoughts and feelings, but with the behaviour that results from these mental states. By coining the notion of 'Machiavellian Intelligence', the primatologists Byrne and Whiten (1988) emphasized the strategic benefit of having (or using) a Theory of Mind: the ability to forecast and manipulate other's behaviour, and in anticipation of others' action, to adjust one's own behaviour.

We have seen that in a relation to others, the degree to which one person can act upon his or her own desires is constrained by the degree of power and resulting dependence *versus* independence from the other. The actions of the powerless are not only governed by their own wishes, but also directed by the wishes of the powerful. Knowing what the powerful think, want or do not want would provide a strategic benefit, as such knowledge can be used instrumentally for the adjustment of one's own actions and thus ultimately for the avoidance of punishment. It was suggested that the participants' in Reicher and Levine's (1995) study, as well as the black students in

Steele and Aronson's studies might have used Theory of Mind for such strategic purposes.

By contrast, the powerful can act upon their own will (and based upon their own, often hegemonic belief system) and can also make the powerless act upon their will (even where this might oppose the will, beliefs or belief system of the other). From the vantage point of the powerful, understanding the mind of the powerless is less relevant, because what they think or feel can by definition not constrain the achievement of their own goals. This idea is implicit in Essed's (1991) comment: "Whitecentrism prevents whites, in everyday life, from being systematically confronted with the way blacks perceive reality, with what they feel, and with what their purposes in life are" (p. 194).

By considering some of the intrinsic properties of mental states, two further reasons for the powerful not to deploy Theory of Mind more than necessary are suggested.

Self-reflexivity leads to the acknowledgement of own beliefs (belief systems) as only a representation of reality (but not reality as such).

Not taking the mental perspective of the powerless allows the powerful to maintain their own beliefs, especially beliefs that are part of a (hegemonic) belief system. On the other hand, taking the other's mental perspective may necessitate dominant group members acknowledging that their own beliefs of reality may only be a *representation of reality*, and not reality as such. As was discussed in Chapter 1, beliefs – in contrast to transparent states - have the property of 'referential opacity'. For

example, if I believe 'Bill Clinton is the current president of the United states', my *belief* can be true even if it does not match reality (George W. Bush is the current president of the United states) and you do not share it. To acknowledge this property of 'my belief' requires self-reflexivity (I believe that 'I believe' [x]). Perhaps people in a powerful position may not wish to confront this property of their beliefs and thus do not engage in such reflective awareness. This may be the case particularly where cultural beliefs are concerned that do not only have epistemic but also normative character (see Bruner, 1993). In other words, cultural beliefs do not only describe states in the world, but also prescribe how they should be. If powerful people hold a hegemonic belief system, they may not be interested in alternatives that may provoke social change.

We do not make any predictions as to whether or not people in a powerless position may be more *intrinsically* motivated to acknowledge alternative beliefs. However, the notion of 'double consciousness' (Solomos, 1989) suggests that the powerless may be forced to view the world through two different lenses: through their own eyes and through the eyes of the powerful.

Taking the mental perspective of the other influences the view of oneself and own behaviour towards them.

An additional reason for the powerful may not to take the mental perspective of the powerless may be that they wish to maintain a 'positive distinctiveness' that Social Identity Theory suggests to be the central force behind differentiation (including discrimination) processes. Taking the independent mental perspective of the powerless may lead one to modify the view of oneself. Inferences of how someone sees you also

tells you also something about who you are, and the impact you have on (the life of) others. In other words, seeing the world from the perspective of others could force you to reconsider your own actions and justifications for those. It may affect changes of what you believe and want to do. The inverse of the same argument is suggested by Kiernan (1996): "By thinking the worst of their subjects they [the colonisers] avoided having to think badly of themselves" (p. 36). Hence, it is suggested that the powerful may not be motivated to acknowledge alternative perspectives of reality because by doing so, they may undermine the legitimacy of their own goals and actions (which often have negative consequences for the powerless) and could possibly force them to reconsider their own actions.

It is important to keep in mind that we do not expect the powerful (notably where power is derived from group membership) to show an across-the-board unawareness of others' mental states, as would a global deficit or personality style suggest. As Snodgrass (1985) has pointed out and anecdotes remind us, it is important to account for considerable variability to which people are sensitive or insensitive to others' states of the mind. The reported phenomenon that several SS commandants, as ruthlessly and brutally they may have behaved during their day's work, yet returned to their families in the evening as caring husbands and fathers, is an extreme example (Staub, 1989).

8.3.3. How is differential theory of mind usage manifested?

We shall postpone concrete predictions until the end of Chapter 9, when we will have presented a taxonomy of differential Theory of Mind usage, which considers the components of mental state inferences. For now, it shall suffice to speculate about two broad forms of how differential Theory of Mind usage could be manifested.

1. The powerful may not use Theory of Mind in order to account for the behaviour of the powerless.

This most strong prediction, although perhaps involved in those extreme situations, were the other was dehumanised, seems to be unlikely to apply to less severe situations. However, a relative lack of Theory of Mind usage could be expressed in terms of a deontic assessment than mentalistic interpretations of behaviour. Explaining someone's actions in terms of what s/he should or should not have done does not necessarily entail mental perspective taking, since such an interpretation can be made from one's own mental perspective.

2. Inaccuracies in Theory of Mind.

- a. A first form of inaccuracies could consist of misperceiving different mental attitudes, such as mistaking an embarrassed smile for genuine agreement.
- b. Another variant could consist of explaining others' behaviour formally by imputing mental states but nonetheless retaining one's own mental perspective. This may include ignoring *that* others have a different mental perspective because of different information access or different (cultural) value systems, or to focus on the outcome of an event and not the processes leading up to it.

8.4. OVERVIEW OF STUDY 5

The framework sketched out above has motivated two studies, which are presented in the remainder of this thesis. Study 5 was an exploratory ethnographic interview study that studied how ordinary adults use Theory of Mind in the account of different social experiences and across different social relations. In Study 6 we sought to investigate the effect of power on theory of mind usage experimentally. In doing so, we imported an existing theory of mind paradigm, the 'Reading the Mind in the Eyes Task' (Baron-Cohen et al. 2001) to a work group scenario in which ordinary students were assigned to either the role of powerful supervisors or powerless workers. The remainder of this chapter, however, concentrates on an overview of Study 5, with full details about the development of a new methodology presented in Chapters 9 and the results of the analysis in Chapter 10.

Although we started off with a consideration of extreme expressions of discrimination, the argument, as outlined in the previous section, is of more general nature so that we would expect less extreme power differentials also to modulate Theory of Mind usage. One area in which we expected to find 'natural' power differentials in contemporary Britain are race relations. The social actions in which power is instigated are forms of racism and discrimination.

In civil rights law, discrimination is defined as the unfavourable or unfair treatment of a person or class of persons in comparison to others who are not members of the protected class because of, for example, race, gender, religion, age, or physical or

mental handicap (The Office of Equal Employment Opportunity, 2002). Racism or racial discrimination presents the situation in which people are treated differently than others because they are members of a specific race.

There is substantial evidence that in contemporary Britain, members of ethnic minority groups still experience racism and discrimination in their every-day life (e.g. Solomos, 1989), although forms, and hence definitions of racism, have undergone substantial change. Whereas traditional definitions (e.g. Jones, 1972) stressed essentialist beliefs in the superiority of one's own race over another one, contemporary racism may be less about beliefs in the biological inferiority of particular groups and more about certain groups' transgression from beliefs about cultural values (Augustinous & Reynolds, 2001).

However, despite a substantial amount of research on stereotypes, prejudice, and attitudes on ethnic minority groups, studies that look at race relations from the perspective of the subordinate groups concerned are in fact relatively rare. One exception is a comparative study by Essed (1991), which consisted of in-depth interviews with black women in the Netherlands and North America. Essed has emphasised the need to recognise how racism is transmitted in apparently 'normal' routine practices that she called 'everyday racism'. Her study suggested that racial conflict is maintained through three central processes. The first is marginalisation, a form of oppression that includes whitecentrism (i.e. Whites are seen as the normative group), cognitive detachment and obstacles impeding equal participation. The second major process is containment, which includes practices such as the denial of racism, the overemphasis on difference, patronising behaviour, denial of dignity, and intimidation.

The third process is problematisation that works by legitimising repression, and which includes cultural denigration and denigration of personality through pathologising non-white group members.

The main aim of Study 5 was to explore the hypothesised effect of power differentials on Theory of Mind usage in naturalistic situations. Arguing from a Social Identity perspective on power, as discussed in earlier sections, not only inter-individual differences between people in Theory of Mind usage, but moreover intra-individual differences across accounts of different relations, were expected. Categories were not predefined in the sense that it was not assumed that somebody of say, Nigerian or Pakistani background would inevitably be powerless. By contrast, depending upon participants' own construction of the relationship between self and others across different encounters, we expected that race or ethnic origin would not be at issue in all encounters and that race would not mean in all social contexts that those who are white are powerful and those who are of African or Asian origin would be powerless. Rather, it was expected that where race was at issue, this could in some circumstances play a role in the definition of power differentials.

8.5. METHODS

8.5.1. Participant recruitment

The study targeted both white British people and people of African-Caribbean and Asian ethnic backgrounds. The project was advertised in a leaflet which asked:

“What is it like to live in a multi-ethnic, multi-cultural community?” It was subtitled as “a project studying day-to-day experiences in London”. The leaflet explained that we aimed to explore the reality behind the notion of a ‘multicultural’, ‘multi-ethnic’ society by gathering and comparing the kind of experiences English people and people from other ethnic backgrounds made in their day-to-day lives (see Appendix 8.1.). We were interested, for example, in what areas of their daily life (personal, professional) informants got in contact with members of their own and other ethnic groups, and in the kinds of experiences that participants perceived as enriching, problematic or otherwise. It was sketched out that participation would involve going through a number of experiences – mundane encounters as well as encounters subjectively perceived as significant. Thus, we hoped to capture a variety of different kinds of experiences, and hence possibly different kinds of Theory of Mind usage. Deliberately, no direct allusions to issues such as discrimination, racism or eurothocentrism were made.

Leaflets were distributed in various places in London, for instance, cafes, bookshops and the Lambeth Council office in Brixton, South London; an area with a relatively large Jamaican population. Leaflets were also slipped through letterboxes in various areas in London (Brixton, Clapham). In addition, the study was advertised at the Vietnamese and Cambodian refugees centre, University College London, Goldsmith College, and at the Stephen Lawrence Conference (2000). Using the ‘snowballing-technique’, over the course of the study, a number of participants were helpful in recommending the study to friends and colleagues.

8.5.2. Interview procedure

Each participant was interviewed alone; according to his or her own preference either at their homes, in a café or at their work place. All participants gave their consent to record the interview on audiotape. The interviews were semi-structured, open-ended and in large parts non-directive, simulating a natural conversation. The advantage of this approach was that it allowed participants to reveal their own priorities.

Diary form Participants were first asked to fill in a diary form, describing for the past three days prior to the interview the person(s) the participant had met, the situation in which the encounter took place and what had happened. These notes were intended to provide a starting point for the interview by eliciting accounts of interactions that participants may otherwise have felt were too mundane. However, it became apparent that some participants did not take part in the study in a 'neutral way'. Rather, they perceived the interview as a platform for voicing views and experiences that were very much at the heart of their own concern. In this light, we felt it would be more informative to adapt a relatively non-directional stance, rather than pressing participants to go through each encounter of the 3-day diary for the sake of comparability.

Apart from the diary, the interview schedule consisted of a list of topics that provided a facilitating context for informants to talk about mundane and significant experiences. These included, for example: "In what sort of situations do you meet English people?" "In what sort of situations do you meet people from different ethnic backgrounds?" "Can you think, for example, of your professional [private] life?"

The interviewer was particularly interested in eliciting narratives about specific events, rather than general descriptions and summaries. In order to prompt the participant to talk about more concrete experiences, open-ended questions were asked, for example: "Can you tell me what happened?" "Would you like to tell me about your experience with...?" "What happened to you?" "Can you give me an example?" In order to probe for Theory of Mind, 'Why-questions' were asked, such as "Why do you think did that happen?", "why did he do/ say that?". (see for the full interview schedule, Appendix 8.2.)

In describing the purpose of the study, as well as throughout the interview, it was emphasised that the main interest of the study was to compare and contrast informants' subjective experiences. Taking explicitly a non-judgemental stance, the interviewer sought to create an atmosphere in which participants felt their point of views to be fully respected. This included conveying the feeling that participants' experiences and accounts were not judged or criticised, that accounts of racism were taken seriously rather than questioned and that the interviewer also showed genuine interest in apparently mundane or ordinary events (see Essed, 1991). With this attitude it was hoped to prevent interviewees from reacting defensively, which could influence the way accounts were presented. Interviews lasted between one and three hours.

8.5.3. Participants

Thirteen interviews comprise the material of the present analyses. Interviewees came from a variety of different ethnic backgrounds. Eight interviewees were of black

or Asian ethnicity, five interviewees were white. More specifically, three interviewees were African, two Jamaican, one Indo-Caribbean, one Chinese, one Vietnamese, one Italian, three English, and one Welsh. Of the black and Asian group, four participants (PB4, PB7, PB9, PB16) were born and raised in Britain. At the time of the interview, four interviewees were students at University while the others were professionals. Only one interviewee did not go through further education. All interviews were transcribed in full. (Symbols employed in the interview transcripts are summarised in Appendix 8.3.)

8.5.4. Overview of analysis

The analysis of this interview material will be presented over Chapters 9 and 10. The distinct analytical steps comprising the methodology used in this study are schematised in Table 8.1. A qualitative and quantitative analyses of the interview material comprised four steps.

Step 1: Identification of narrative themes, narrative episodes and general talk

For each interview transcript, each 'narrative theme', 'episode', 'example', as well as 'general talk' is chronologically marked. A definition of these terms is given below. Each episode, example or general talk was treated as one analytical unit.

Narrative theme - We regard a narrative theme as a statement or utterance that expresses a gist or central topic. Following Labov's paradigmatic structural approach (Labov, 1972; Labov & Waletzky, 1967), in our usage a narrative theme can contain

Table 8.1. Overview of method used to study Theory of Mind in narratives

1. Hypotheses	Chapter 8
2. Developing a methodology a. how to track ToM in naturalistic talk? b. a taxonomy to categorise ToM on the local level c. embedding ToM talk in the context of episodes and themes	Chapter 9
3. Analysis -Dividing interviews into analytical units -Reconstructing the character of each analytical unit: racism or not? Power differentials: self as powerful, powerless or 'neutral' -Investigating ToM talk for each analytical unit	Chapter 10
4. Results a. Qualitative results: Comparing ToM usage in everyday-situations and ToM usage in accounts of experiences with discrimination b. Quantitative Results: Comparing frequencies of theory of mind usage	Chapter 10

elements of his 'coda', in that with a theme the perspective can be turned to the present. (e.g. 'I have experienced discrimination all my life'). It may also share similarities to Labov's 'abstract' as a narrative theme may not be formulated in one sentence or utterance, but in form of a short summary of a participant's experiences, views or concerns. As stated before, in some cases, participants approached the interview with very specific concerns; for example, they read the question "What are your experiences in relation to the notion of a 'multi-cultural society?'" as a platform to communicate their experiences with racism, or to describe experiences with a different culture through a relationship with someone from a different culture. This may have then constituted the central narrative theme throughout large parts of the interview. Other participants approached the interview with a less concrete idea of what to expect. In those cases, the interview comprised usually a string of narrative themes. For example, the narrative themes of the interview with PB7 can be summarised as: 'my professional career', 'daily routines: I do live in a multiracial environment', 'family background, cultural traditions', 'there are differences between a white society and black experiences', 'own marriage ideals', 'how religion influences my perception', 'discrimination'.

Narrative episode - Freely following Burke's (1969) classic method of analysing dramatism (see Lucariello, 1990), a narrative episode shall be defined on the basis of the elements comprising his famous pentad: an act, scene, agent, agency, and purpose. In other words, in order to be coded as a narrative episode, the participants will have said something about what was done, when or where it was done, who did it, how it was

done and why. Following Essed (1991), an episode includes not only events the participant had personally experienced or witnessed, but also vicarious and reported events.

Example - We call 'example' incidents in which the participant talked about a specific event, albeit in a more summarised way, leaving out information about the time or place of the encounter.

General talk - General talk shall be seen as an umbrella term for instances in which participants talked, for example, about topics, such as their personal details and history, personal habits, cultural practices, preferences, or voiced their opinions about different issues. Apart from descriptions, general discussions of issues also involved mental state talk. However, in these instances, it is not always possible to trace back the relation between what happened, the explanation and the outcome. Examples also include hypothetical scenarios. #

Step 2: Re-constructing the relationship between participant and other(s) and the character of the encounter

A second step consisted of reconstructing the character of each episode, example and general talk. We coded the nature of the power relation between participant (speaker, S) and others and whether or not the encounter involved an incident of discrimination. In the language of quantitative research, this would represent the 'independent variable'. By using episodes and not interviews as the analytical unit, we

aimed to explore both inter-individual (between different participants) and intra-individual (variances from one account to the next) differences.

Step 3: Tracking theory of mind usage in each narrative episode and categorisation of such theory of mind usage

In the process of tackling these phenomena, we encountered a number of problems: firstly, how can we track Theory of Mind usage in everyday language? And secondly, how can we systematically categorise and classify Theory of Mind usage? It became apparent that neither the developmental Theory of Mind literature nor the diverse strands in social psychology reviewed before could provide adequate answers. It was therefore required to develop a method that would allow us to track Theory of Mind usage in everyday language and to establish a taxonomy that differentiates between different 'types' of Theory of Mind usage and distinguishes mentalistic from other kinds of 'non-mentalistic' explanations.

Step 4: assessing differential Theory of Mind usage

As the 'dependent variable', we were interested in how people explained and interpreted their experiences in each episode. A fourth step consists of a qualitative analysis in which we sought to relate different forms of situated Theory of Mind usage to different kinds of experiences – those that involved discrimination or dealt with the accusation of discrimination, in contrast to those in which discrimination was not at issue.

Step 5: comparing frequencies of different types of Theory of Mind usage.

Based on the qualitative analysis of distinct patterns of Theory of Mind usage, in a final step we were then in a position to address questions of frequencies. How often did participants infer others' independent mental perspective, or inferred that others took an independent mental perspective of either, recursively, the participant him or herself or other third parties? How often and in what conditions were participants unaware of others' independent mental perspective or inferred that others were unaware or denied oneself (or a third party) an independent mental perspective?

In the next chapter, we will be concerned with step 3, and present a method that enables us to track and categorise Theory of Mind usage in naturalistic language.

A METHOD FOR TRACKING AND CATEGORISING THEORY OF MIND IN NATURALISTIC LANGUAGE

9.1. INTRODUCTION

Studying Theory of Mind deployment in narratives poses different challenges than studying Theory of Mind in direct behaviour. In order to investigate whether and how Theory of Mind deployment might vary as a function of social relationships, we saw ourselves faced with an immediate problem. How can we track Theory of Mind usage in everyday language and how can we categorise and quantify different 'types' of Theory of Mind usage and contrast those from other kinds of interpretations?

This enterprise involved three steps. As a first step, we propose a method that enables us to track Theory Mind usage in narrative language. The second step consists of a taxonomy that allows us to categorise different types of mentalistic and non-mentalistic explanations on the local level; or in other words, within the context of individual utterances. Since our main interest was to compare differential Theory of Mind usage across different kinds of experiences, we then add a third step in which we take together and analyse all explanations found in the account of one experience, or narrative episode, as we call it.

9.2. HOW TO TRACK THEORY OF MIND USAGE IN EVERYDAY TALK?

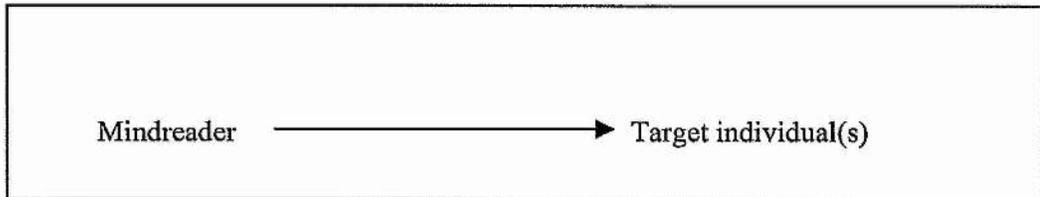
Mental representations and mentalistic inferences are covert and need to be inferred. When we talk about our encounters and experiences, they become public in the process of explaining, interpreting and justifying what happened. Before going ahead, it is therefore necessary to first discuss what characteristic narratives, or any kind of everyday talk for that matter, present. Let us first consider the 'simpler' case of reading the mind of others in direct interactions. In this situation we have two parties that Whiten and Perner (1991) termed the mindreader and the target individual (see Figure 9.1a).

In contrast to direct interactions, narratives require one to deal with two landscapes: the one 'inside' the story in which the mindreader is the narrator (speaker, self) and related to one or several other agents. This landscape inside the story is of primary interest to us. How and to what extent did the narrator use Theory of Mind in order to explain and interpret others' and his own actions across separate encounters? However, superimposed is a second landscape, the present one, in which the narrator (self) is communicating with the interviewer (see Figure 9.1.b).

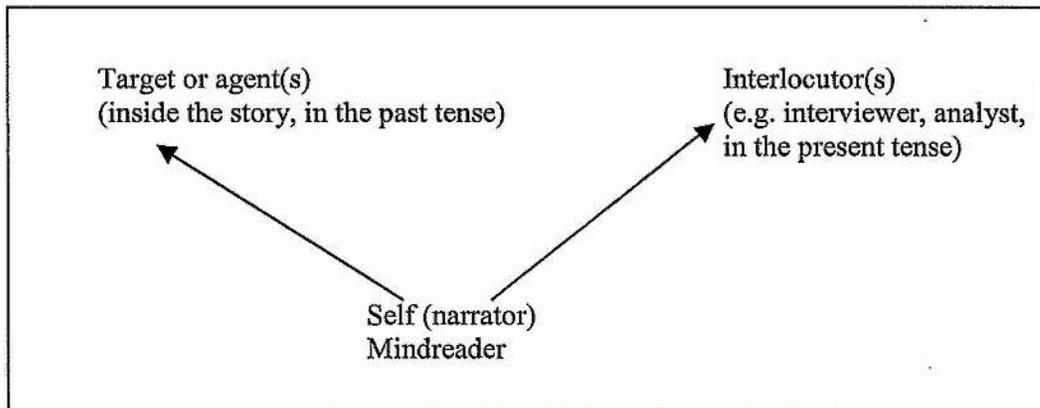
As noted in Chapter 1, studies of pragmatic verbal (as well as non-verbal) communication suggest that an essential feature of human communication is the expression and recognition of intentions (Grice, 1957; 1969; Sperber & Wilson, 1986, 2002). In other words, communication is seen as a collaborative effort in which speaker

Figure 9.1. The dyadic relation between mindreader and target in behaviour, versus the triadic relations between mindreader, target and interlocutor/ interviewer in communication

a) Behaviour



b) Communication



and listener(s) share certain assumptions, such as the maxims of truthfulness and relevance. The benefit is great and includes the fact that the speaker does not need to spell out every minute detail, which would otherwise lead to lengthy repetitions. For example, having introduced a chair once, the speaker can confidently assume that the listener will understand what he means when referring to 'it'. Something similar can be expected for speakers' mentalistic inferences and explanations; i.e. that they are not always explicitly spelled out, but remain at times implicit and need to be inferred from the listener.

For analysts, having to account for this second landscape and this characteristic feature of communication is more than unwelcome, as it renders the task of tracking of Theory of Mind in language more difficult. In fact, it is due to this feature of communication that we have to introduce a method of *tracking* ToM in language, rather than being able to just 'pick up' mentalistic inferences from the text. Developmental research studying Theory of Mind in language has typically used mental state terms as an indicator for an emerging understanding of mental states, such as 'want', 'think', 'know', 'hope' and so forth (Bartsch & Wellman, 1988; Dunn & Brown, 1993; Shatz, 1994; Tager-Flusber, 1992). This research has found, for example, that children tend to use volitional mental state terms (desire, wanting) a little earlier in their language than they use epistemic mental state terms (believing, knowing). However, as will be shown in more detail below, using mental state terms as markers bears a number of problems if one wants to capture *true* Theory of Mind usage. On the one hand, there is a danger of including instances in which mental state terms are used but do not denote that the speaker truly deployed representational Theory of Mind. Moreover, because of the

nature of the communication landscape, Theory of Mind usage can be hidden in the text without being denoted by a mental state term. If mental state terms were used as the sole criterion for tracking theory of mind usage, such instances of *implicit Theory of Mind* would be missed. How then, can we decide whether or not a specific utterance involves true Theory of Mind usage? On the basis of the argument just discussed, we formulated the following test rule:

A test rule

Any utterance will be counted as reflecting deployment of a representational Theory of Mind if and only if

- 1) it explicitly involves a mental state term related to a second or third person referent or can be formally transformed as to reflect the recursive attribution of a mental state to self or other **and if**
- 2) without the inference that the speaker attributed a mental state to another person the utterance can not be understood as meaningful.

By the same token, any utterance that *does* involve a mental state term but in which this mental state term does not add to the meaningful understanding of the utterance will not be counted as Theory of Mind.

We have systematically applied this test rule to a part of the interview material. This process, in conjunction with considerations of previous arguments, resulted in the elaboration of distinct categories of implicit Theory of Mind usage, as well as in a list of non-mentalistic types of explanations or interpretations. Table 9.1 summarises different

Table 9.1. Instances in which speakers' usage of mental state terms does not evidence representational ToM, explicit mental and public representations and implicit ToM usage

No-ToM/ ToM	Category	Example
Instances in which speakers' usage of mental state terms does not evidence representational ToM	First order intentionality	"I want to go to the cinema"
	Conversational phrases	"Because I'm not like this, you know"
	Non-epistemic 'knowing someone'	"He knows some people who are very friendly..."
Speakers' explicit representational ToM	Mental representations using second or third person mental state verbs	"The girl thought she saw the pink frog"
	Public representations	"The girl said she saw the pink frog"
Speakers' implicit representational ToM in pragmatic language	Mentalistic traits and stereotypes	"He is narrow-minded"
	Non-literal speech: jokes, lies and irony	"It was just a joke." "She said I was lying"
	Mental states implied in verbs, adjectives and expressions	"He shoved her" "He treats me as if..." "Taking serious "
	Mental state inferences indicated in 'pronoun reversal'	"You can't do that because you're black." (= they think I can't do that because I'm black)
	Mental state inferences indicated in grammatical sentence constructions	"So that" -> intention "In order to" -> intention "As if" -> pretence
	Implicatures in the local the sentence context	"People are good at hiding [their true thoughts and feelings]"
	Implicatures in the global context of a narrative episode	"it's a strange thing here." (= they think it's a strange thing here)
	Descriptions of behaviour as acts of ostensive-inferential communicationand he (teacher) slapped him (brother) in the face. (= Teacher did not understand why brother was still in the corridor)

types of instances in which a mental state term is used but does not denote usage of Theory of Mind, as well as the opposite case of implicit Theory of Mind – where we as readers can infer that the speaker used Theory of Mind even without deploying a mental state term. In subsequent sections these categories are explained in more detail.

9.2.1. Speakers' usage of mental state terms without deployment of ToM

9.2.1.1. First order intentionality

As the philosopher Dennett (1987) has convincingly argued (see Table 9.2.), there is a fundamental difference between own beliefs and inferred beliefs of others. Own beliefs (or by the same token own desires or any other mental states) can be computed on the level of first order intentionality. In utterances, they are expressed, for example as: "I believe it is cold outside", "I don't want to go out", "I hope you come to visit me this evening" etc. These expressions manifest intentionality or 'aboutness', my mental attitude(s) about something or someone. However, crucially, they do not require representational Theory of Mind. By contrast, inferred beliefs of others (my belief embedding someone else's belief) do. Consider the sentences (1a) and (1b) in Example 9.1. which - on the surface - look very similar.

Example 9.1.

- (1a) "I believe it is raining."
- (1b) "He believes it is raining."
- (1c) "I believe he believes it is raining."

Table 9.2. Relation between 'levels of intentionality' and Theory of Mind.

Levels of intentionality (Dennett, 1987)	Levels of Theory of Mind	Example
1 st order intentionality	0-order Theory of mind	I believe [...]
2 nd order intentionality	1 st order Theory of mind	I believe he believes [...]
3 rd order intentionality	2 nd order Theory of mind	I believe he thinks she thinks [...]
x-order intentionality	(x-1) order theory of mind	

Computationally, however, they are of quite different complexity. The first sentence merely describes my own mental attitude towards something, whereas the second one, which can be formally transformed into (1c), describes my attitude about someone else's attitude about something, in other words, a belief that is recursively embedded in another belief. Hence, by applying our test rule we find that only sentences 1b and 1c, but not the one in 1a, involve Theory of Mind. Therefore, participants' utterances about their own mental states, which although they involve a linguistic mental state marker can be understood without assuming that s/he made a mental state inference, are excluded as a first class of 'false positives'.

The exceptions are, of course, utterances revealing a reflective awareness of own beliefs (my belief about my belief or desire) either in the present or the past. Examples for such self-reflective utterances are "I thought there were Smarties in the box but now I know there's just a pencil inside", or "I want to think that I can take a day off". Application of the test rule shows that these utterances can only be understood by reference to a recursively embedded mentalistic attribution, where the agent is the same as the speaker.

9.2.2. Speakers' explicit representational Theory of Mind: mental and public representations

Every utterance that uses a mental state term in relation to a second or third person target is counted (he thinks, wants, believes, doubts etc.). We decided to include mental as well as public representations, a choice that shall be explained in more detail below. Whether or not language truthfully represents internal thought is an old philosophical problem, and still object of vivid debate, notably in the discursive literature (e.g. Edwards & Potter, 1992) that cannot be discussed here. However, amongst philosophers of mind, there is more agreement that in terms of their structure, mental and public representations are both representations that are insulated from other representations (Recanati, 1997). As such, they share some fundamental properties, as for example, the non-entailment of truth. In other words, I can believe that the girl either said or thought that she saw a pink frog, without believing the proposition (i.e. that indeed she saw a pink frog) myself.

For either sentence to be true, it is immaterial whether or not the girl really saw a pink frog, so that the truth-value of the proposition (she saw a pink frog) does not affect the truth-value of the sentence as a whole. Moreover, Example 9.4., taken from the interview material, shows that participants often used mental and public representations interchangeably. Note that in sentence a) in contrast to the transparent 'seeing something', 'seeing something or someone as something or someone else' implies referential opacity, (see Dretske, 1969, cf. Whiten & Perner, 1991).

9.2.1.2. *Conversational phrases*

A second class of ‘false positives’ includes conversational phrases, such as those starting or ending a sentence with “you know”.

Example 9.2.

“And you hear people shouting accusations at other people. ‘Ah, you’re just one of these people who moved in’, on the back of the Fridge bar, the Dock Star, and you know, all these kind of white trendies. But I want to try and distance myself from that, because I’m not, you know.” (PW12)

Applying our test rule, we find that the ‘affix’ ‘you know’, does not add to the interpretation of the meaning of the sentence, as we cannot assume that starting or ending a sentence with ‘you know’ implies that the speaker made any inference about ‘my’ (i.e. the listener’s) state of mind.

9.1.2.3 *Non-epistemic ‘knowing someone’*

The term knowing can also be employed in a different way which does not have epistemic character, but as a synonym for “being familiar with”, “being acquainted with”.

Example 9.3.

[...]” the kind of people they know....”

Application of the test rule suggests that the sentence can be understood without ascribing to the participant an inference of the agents’ mental states.

Example 9.4.

- (a) "She sees me as a problem."
 (b) " She said I was a problem. And that would have been it."

(PB9)

9.2.3. Speakers' implicit representational Theory of Mind in pragmatic language

As indicated earlier, inferences about someone's propositional attitudes can be expressed or hidden in language without using mental state terms. Below are listed five classes of phenomena that could be called 'implicit Theory of Mind usage in pragmatic language' (but it should be pointed out that this list may by no means be exhaustive!). Following our test rule, what defines them as implying Theory of Mind is that a formal analysis of the utterances would allow us to add a mental state term in such a way that without such an addition it would not be possible to interpret the utterance as meaningful.

9.2.3.1. Mentalistic traits and stereotypes

Most mentalistic inferences discussed in the developmental literature were of transient nature. Sally transfers the marble from basket to box; hence the child infers that Sally *now* believes the marble is in the box. But beliefs and desires can be more or less stable over time, as for example John's belief in god or Sarah's like of chocolates. Wellman (1990) suggested that traits and dispositions are beliefs and desires transformed into stable properties of a person rather than transient mental states. A curious class of what could be termed *apparent* mentalistic attributions are, in our understanding, attributions of *some* traits or stereotypes (see Example 9.5.a + b).

Example 9.5.

- (a) "I find...many people are quite narrow-mind(ed)." (PW17)
- (b) "The English are reserved." (PW17)
- (c) "The Chinese are hard-working." (PA8)

However, as Example 9.5.c shows, this claim does not hold for all traits and stereotypes, and needs to be restricted to a subset of those only (a + b). Whilst descriptions, such as narrow-minded, reserved, refer to a state of mind, some traits, such as 'hard-working', 'lazy', or 'punctual' describe behaviours. Others, such as 'disciplined' seem to be at the border between the description of a mental state or behaviour. What the speaker intended by using this term may become disambiguated through the context in which it is used. Hence, 'mentalistic traits or stereotypes' require the listener to appreciate that the speaker made an inference about an agent's state of mind.

Malle, Knobe, O'Laughlin, Pearce and Nelson (2000) suggested to treat mentalistic traits or stereotypes differently to belief-desire attributions. For them, a trait or stereotype explanation is part of a 'causal history of reason' (CHR) explanation, whilst belief-desire attributions are part of 'causal reason' (CR) explanations. The authors pointed out that the difference between these two types of explanations is that CHR explanations operate outside a character's subjective awareness whereas CR explanations require an agent's subjective awareness. This can be seen by comparing sentences a) and b) in Example 9.6. The idea of being good-natured may have been outside Jarron's awareness and might not have motivated his behaviour, whereas the

agents' belief that they were out of rice has motivated the agents' behaviour in the second example.

Example 9.6.

a) "Jarron gave in because he is good-natured."

b) "We went to the store because he thought they were out of rice."

(from Malle et al., 2000)

9.2.3.2. Non-literal speech: jokes, lies and irony

As was discussed in Chapter 2, previous research on pragmatics has shown that for the comprehension of the communicative intention underlying lies, jokes, sarcasm etc. it is necessary to infer first or second order mental states. (see Sullivan *et al.*, 1995, Winner & Leekam, 1991; Winner *et al.*, 1998).

Example 9.7.

"She said I was lying." (PB9)

If we assume that speakers use terms such as lying, cheating, joking etc. competently, then for the listener to understand the communicative intention behind the utterance, it is required to translate this sentence into "Speaker believes that an agent thought that the speaker tried to instil a belief in her that the speaker thought was not true."

9.2.3.3. *Mental states implied in verbs, adjectives and expressions*

Conversation analysts have pointed out how intentions can be descriptively produced (Sacks, 1992). Consider the following extract from one of Sack's early lectures, in which a man had called a telephone help-line (reprinted by Edwards, 1997).

Example 9.8.

B: ...Well, she (wife of B) stepped between me and the child, I got up to walk out of the door. When she stepped between me and the child, I went *to move her* out of the way. And then about that time her sister had called the police. I don't know how she...what she..

A: Didn't you *smack* her one?

B: No

A: You're not telling me the story, Mr B.

B: Well, when you say smack you mean *hit*.

A: Yeah, you *shoved* her. Is that it?

B: I shoved her.

(From Sacks, 1992: vol. 1, own italics)

The extract did not involve a mental state terms. However, as both parties' attempts to clarify or 'repair' the conversation shows, the description of the episode as *move away/ hit/ smack/ shove* was essential to attribute B's intention behind the act. Hence, calling something a *shove* as opposed to 'move away' goes a long way from a mere behavioural description, as it implies an agent's underlying intention.

9.2.3.4. *Mental state inferences indicated in 'pronoun reversal'*

Initial readings of the text revealed that participants sometimes talked from the perspective of someone else.

Example 9.9.

“Only now, when I became a mature woman, it’s the more qualification I’ve acquired in my life...I can see the barriers put up and say ‘you can’t do that, because you’re black’.” (PB16)

As a listener, we will read this utterance as “the speaker thinks that white people think that she is incompetent or not in a position to pursue certain ambitions because she is black.”

Example 9.10.

“Straight away, straight away I understood what what this...cause I’ve seen that kind of behaviour before when you know...talk down to you, be very offhand with you, and you let accept it, you can talk to the young (.) young black person like that (.) because you don’t need to interact with them day to day, and you have whatever perception you have of them...” (PB7)

In the first part of Example 9.10, the speaker talks of himself as ‘you’, which then changes in the phrase ‘you can talk to the young black person like that’. In this part, ‘you’ refers to ‘they’ or more specifically ‘white people’. To attain a coherent understanding of these utterances, the listener must be translate them into “the speaker thinks that white people think they can talk to him (as a young black person) without respect.”

9.2.3.5. Mental state inferences indicated in grammatical sentence constructions

Malle et al (1999) noted that desire inferences can be marked within sentences through characteristic grammatical forms. The authors pointed to the role of the purposive infinitive (“then I went to the beach, just to be away”) and the purposive *so that* or *so* statement (e.g. “I’m going to stay away from Ariel *so I can spend some time with my friends*”) (p. 311). Applying our test rule to these examples shows that *so that* phrases can only be meaningfully understood if the listener invokes a desire or intention state to the speaker. Of course, as with explicit mental state markers, ‘so that’ phrases will only be coded as implicit ToM inferences, if they are related to somebody other than the speaker him or herself. In addition, from the interview material, two further grammatical markers were identified.

Example 9.11

“Youth are like that, causing trouble for fun.” (PA8)

Doing something ‘for’ something denotes a purpose. The sentence can thus be transformed into the speaker believes that youth cause trouble with the intent to have fun.

Example 9.12

“She now smiles at me as if nothing had happened.” (PB7)

As discussed in the developmental literature, ‘as if’-phrases mark the inference of pretence. Hence, the sentence must be understood as “she now smiles at me pretending that nothing had happened”.

9.2.3.6. *Implicatures in the local sentence context*

Following Sperber and Wilson (1986), we understand an implicature to be “[...] a contextual assumption or implication which a speaker, intending her utterance to be manifestly relevant, manifestly intended to make manifest to the hearer” (pp. 194/95). The next set of examples represent sentences that can only be meaningfully understood if the listener adds a mental state inference to them. The sentences given in Example 9.13 were taken from Malle et al (2000).

Example 9.13.

- (a) Jeremy greeted his uncle emphatically because his uncle looked depressed
- (b) Carey watered the plants because the leaves were wilting.

Sentence a) must be understood as “Jeremy greeted his uncle emphatically because he thought his uncle looked depressed”, just as sentence b) needs to be read as “Carey watered the plants because she thought/ felt the leaves were wilting. If only the speaker believed that the uncle looked depressed, then this would not provide the speaker with a plausible explanation for the agent’s, Jeremy’s, behaviour (empathic greeting). To further illuminate the character of this category, next is given an extract from the interview material in which a Nigerian woman recounted her experiences with discrimination when trying to apply for a job.

Example 9.14.

The thing is...people are very good at hiding, especially when you are in front of them, talking to them.

The utterance was made as part of the participant's description of a job interview. She accused the interviewers of discrimination as the true motive for not offering her the job. In this context it is obvious that the speaker's informative intention was not to convey the impression that people, or, more specifically, the interviewers, were literally good at hiding. Rather, within the context of the utterance it is unambiguous that PB16 intended to express that people were being very good at hiding their 'true motives', or their 'true thoughts and feelings'.

9.2.3.7. Implicatures in the global context of an episode or narrative theme.

This category describes instances in which an utterance can only be understood as meaningful if it is read within the more global context of the wider episode or of a particular narrative theme made explicit elsewhere in the text.

Example 9.15 was taken from the same interview as the previously discussed example. Here, the participant talked about a Nigerian greeting custom. The utterances were embedded in the narrative theme "white people don't understand my background and our traditions". She explains how in the morning, she usually greets her mother in her native tongue and that this tradition also involves her in kneeling.

Example 9.15.

PB16: yeah, when I wake up in the morning..when I see my mother, I don't say 'hello' or 'good morning', I would say it in my language. I would say [Nigerian language] and...sometimes in the morning I have to kneel. It's a strange thing here, but that's the way we've been brought up. It was something that to do, that's to do with our way of life. And somehow (we want to) express it in our language, and I know it's something very meaningful, so I would think, I wouldn't treat it as a joke."

The comment "it's a strange thing here" would stand out as meaningless, a possible though unlikely contradiction to her preceding description of the kneeling tradition. However, the utterance becomes meaningful if the listener replaces the "it's" with "they see it as a strange thing here" or "they think it is strange", which implies Theory of Mind. Likewise, her further addition I wouldn't treat it as a joke", would violate the maxim of relevance if one does not read it as implying that other people would treat it as a joke. Treating something as something has to be regarded as a shorthand for the underlying inference of mentalistic perception "I would not see it as [strange, a joke], or I would not think of it as a joke. Hence the explicit transformation would be that the speaker infers that "they perceive the kneeling tradition as a joke".

9.2.3.8. Descriptions of behaviour as acts of ostensive-inferential communication

The final category includes descriptions of behaviour that require from the listener to trace the speaker's inference about the agent's' mental states in order to infer the speaker's ostensive-communicative intention. Theorists have previously argued how actions (e.g. leaning backwards on the park bench so that you, who are sitting next to

me, can now see your son being engaged in some obnoxious behaviour, Sperber & Wilson, 1986) and speech acts (you saying 'gosh' and look at me while pointing at the snake crawling along the garden, Gómez, 1998) can have the purpose of ostensive (i.e. showing that someone wants to show something) communicative acts. In a similar vein, it appears that behavioural descriptions without an explicit or implicit interpretation offered by the speaker can in themselves denote such an ostensive component, inviting the listener to infer the meaning of the act himself. As long as we, the listeners, cannot understand the meaning of the speaker's description without attributing to him/ her mental state inferences of the agent(s) these instances shall also be coded as 'implicit theory of mind'. The next example shall illustrate this argument. To support her claim that 'my mum has experienced racism all her life' (425), one of our interviewees offered the example of her parents being turned down on the basis of their colour when applying for rental accommodation.

Example 9.16.

[...] "the racism she and my father experienced when they came to England, that's why they bought this house because she said when they originally arrived in Brixton there was no room, and my father used to (call up), and yeah, 'come over the room is there' and as they turned up and suddenly they saw they were black, the room was gone."

The speaker did not offer an interpretation of the episode herself. How can we as the listeners understand the sudden unavailability of the room as an example for an act of racism? If, meanwhile, the rooms had *truly* gone, the episode could hardly be called

for as evidence of racism, but perhaps more an incident of bad luck. To understand this experience as an incident of racism, we (the listeners) have to infer that the speaker intended to say that the white landlords *pretended* the room was gone, because they did not *want* to let it to a black person.

9.2.4. Summary

In the application to the text material, our test rule has proved to be a useful tool in tracking speakers' inferences of others' mental states. In support of our initial argument, the analysis showed that it is necessary to go beyond the linguistic surface of mental state term deployment in order to distinguish between instances in which participants made mentalistic inferences and those in which they explained their own and others' actions merely by taking an 'intentional stance'. Moreover, by importing insights from previous research, a number of categories of implicit Theory of Mind usage in language, were identified. Although these categories are by no means seen to be exhaustive, it is hoped that their usage may be of use to others concerned with Theory of Mind usage in naturalistic talk. It was shown that in certain instances it is necessary for the listener or analyst not only to consider the 'local' context of a sentence or utterance, but beyond this, the more global context of a whole episode in order to trace the speaker's intended meaning. The analysis therefore also lends support to previous suggestions put forward by theorists of pragmatic communication (Grice, 1957; Sperber & Wilson, 1986) that in narratives a collaborative effort is required from the listener in inferring the speaker's communicative intentions.

9.3. A TAXONOMY OF THEORY OF MIND TALK

As we are now able to track Theory of Mind usage in the text, the next question is how can we organise different kinds of mentalistic inferences? In principle, there are, of course, numerous ways of categorising Theory of Mind talk. As analysts, we had to make a choice as to how coarse or fine-grained a system of coding categories would best serve our purposes. The simplest way to distinguish between different explanations would be to only differentiate 'true' Theory of Mind explanations from other kinds of explanations, of which some types were previously discussed as 'false positives'. However, by only attending to this one dimension, we might miss other potentially interesting patterns of Theory of Mind usage. The other extreme would be to minutely code for each possible kind and combination of Theory of Mind inference. For example, one could draw a fine-grained distinction between different types of 'intentional states', such as 'knowing', 'remembering', 'meaning to', 'forgetting', and other psychological states that are more overtly expressed, such as emotions and feelings (see Dunn, 1991). Whilst this may allow us to account for the full diversity and richness of Theory of Mind talk, paradoxically, a highly fine tuned approach may equally risk to lead us to miss patterns of interest. The taxonomy presented below can be seen as reflecting an intermediate stance, one that was guided by our main research questions. In this section, we first turn to the consideration of speakers' individual mental state inference tracked in the text. The taxonomy was built on a consideration of the major components of mental state inferences; speaker, mental attitude, agent, referent, and propositional content. Together, they can be seen as constituting the grammar of theory of mind inferences. In order to delineate different utterances, we notate them in formal terms.

For abbreviations of the individual components needed for the grammar of Theory of Mind inferences see Table 9.3.

In Chapter 8, we also argued for a distinction between Theory of Mind and mental perspective taking. Having specified different forms that each component can take, we will then 'reassemble' those components on the zero-order, first order and second order levels.

9.3.1. The grammar of theory of mind inferences

9.3.1.1. Speaker (S)

The speaker (S) is the only constant within mentalistic inferences, taking the first person form 'I'.

9.3.1.2. Mental attitudes (epistemic and volitional, 'positive' and 'negative')

Mental attitudes include epistemic and volitional states, together forming the class of intentional states, which are complemented by a set of 'psychological or emotional states'. Moreover, inferences of others' mental states can be either asserted or negated. Examples of assertions are attributions, such as he believes x, he wants x,

Table 9.3. Abbreviations of components comprising the grammar of mental state inferences

S =	Speaker
() =	brackets denote a mental attitude, for example
	(bel) = belief or other epistemic state,
	(perc as) = perceive as
	(des) = desire, e.g. 'want'
	(int) = intention
	(exp) = expectation
	(pubrep) = public representation, e.g. 'saying'
A	= Agent,
	if more than 1 other agent, then $\{A_1, A_2, \dots, A_x\}$. If not further denoted, A stands for one individual other
A_{general}	= Agent in general, e.g. 'people'
A_{outgroup}	= Agent being an outgroup member, e.g. 'white people' if participant is black
A_{ingroup}	= Agent being an ingroup member, e.g. 'black people' if participant is black, also denotes 'we'
[]	= propositional content, including, for example, an external object or event (without subject), agents' behaviour, trait
->	= mental attitude towards something or someone
=>	= implies
≈	= corresponds to in this particular situation, is equivalent to, e.g. surprise is equivalent to a negative expectation
{ }	= as something, symbolic meaning
$\{A_x\}$	= representation of someone as something or someone else in symbolic terms, for example, $S \rightarrow A \{A_{\text{outgroup}}\}$ = Speaker represents agent as an outgroup member

formally expressed as $S(\text{bel}) \rightarrow A(\text{bel}) \rightarrow [x]$. Negation of mental attitudes are, “I think he would not see it as a problem”, formally expressed as $S(\text{bel}) \rightarrow A(\text{neg. bel}) \rightarrow [\text{it} = A\text{'s behaviour}\{\text{problem}\}]$.

For reasons of simplifications, expressions, such as “I don't think he would see it as a problem” will also be coded as ‘negative ToM’, they can be transformed into “I think he would not see it as a problem”.

In instances in which mental states are positively asserted, as for example, in utterances, such as ‘he believes x’, he wants x’, he intends x’, the reader cannot infer from the local utterance context whether the speaker and the agent hold the same mental perspective. However, using a negation – he doesn't want/ believe x - seems to imply the speaker's awareness of different mental perspectives towards that same thing or event.

9.3.1.3. *Agent(s) whose mental states are inferred*

The agent is the person or persons whose mental states are inferred. In conversations and direct interactions, the agent can include ‘you’ (e.g. I think you think). However, in most narratives and in particular in the interview situation, in which a speaker tells a listener about some encounter in the past, the agent can only refer to he, she, we, or they. In instances of reflexive awareness, the agent is recursively the speaker (e.g. ‘I think I want’ or ‘I think he thinks I think...’). Of specific interest to us is the identity of the agent or agents in relation to the speaker, notably whether the agent is

Table 9.4. Characteristics of mental attitudes

valence	Epistemic mental states	Volitional mental states	Emotions and feelings
positive	Believe Think Guess Suppose Expect Understand	Want Desire intent	Fear Hope Embarrassed
negative	Don't/ doesn't believe Don't/ doesn't think Don't/ doesn't realise Don't/ doesn't understand Unaware Deny ...	Don't/ doesn't want Don't doesn't intend	Surprised = doesn't expect

dominant or subordinate, someone who commits or experiences discrimination. As unspecified generalised others, 'they' and 'we' can refer to either ingroup or outgroup members. We will be particularly interested in mentalistic inferences dubbed here 'second-person-second-order ToM' inference. This describes the situation in which a speaker reflects upon what an agent thinks, wants, feels etc about the speaker him or herself. Note that this kind of inference can not only be made on the inter-personal level ("he thinks about me as an individual person") but also on the intergroup level, such as "they think about us...".

9.3.1.4. *The propositional content [] – what mental attitudes are about*

Mental states are always about something. Philosophers of mind refer to this content as the 'propositional content'. In other words, the propositional content is that which is explained. For our purposes, a rough distinction between three types of 'propositional content' is made: 1) about [x], an external object or event, 2) about an individual agent or a group of agents [e.g. A₁, A_{ingroup}, A_{outgroup}, etc.) or 3) recursively, about [S], the speaker.

A peculiar feature of intentional states or mentalistic inferences found in the interview material is 'thick description': representations of something or someone *as standing for, meaning or signifying* something or someone else. Since, to our awareness, this property has received little attention in the literature, it shall be illustrated with an example from the interview material. PB4 recounted how his parents first came from Jamaica on "a sort of promise" that England, the mother country "would be wonderful", and in the hope "that they would better themselves".

Example 9.17

“When they first arrived, they saw a lot of chimney smoke, on the chimneys, and they went ‘wow’, they thought all the chimneys were factories, they didn’t realise that everyone (..) who owned a home in England, or had chimneys, they thought all these chimneys were factories.” (PB4)

The account implies that PB4 attributed a ‘false belief’ to his parents. In contrast to the Sally-Ann scenario, this mistaken belief did not concern the whereabouts of something, but it concerned the *meaning* of something – the chimneys. Based on a lack of cultural knowledge, the parents thought of chimneys *as* indicators for factories (and hence prospective work) and not *as* a sign for houses in general.

9.3.3. Putting the components together within levels of Theory of Mind

A summary of different types of intentional and mentalistic explanations, their composition and emerging character is given in Table 9.5. The table does not list all possible combinations, but it includes those that were theoretically perceived as most relevant. Let us start with those kinds of explanations that do not strictly reflect usage of a representational Theory of Mind on behalf of the speaker. With reference to previous arguments (see Table 9.1), these shall be dubbed zero-order Theory of Mind explanations.

9.3.3.1. *Zero-order Theory of Mind explanations*

As was discussed in the first section of this chapter, explanations of behaviour do not necessitate Theory of Mind, as they can rest on the level of first order intentionality (although these may include mental state terms).

In general terms, this kind of explanation involves a speaker (S), and his or her own mental attitude (MentAtt) about something, the propositional content. This can be formally expressed as: S (MentAtt) -> [propcont]

As shown in the last column of Table 9.5, three classes of zero order Theory of Mind explanations were identified.

1. Speaker's attitudes about an object or external event (e.g. "[I think] London is a very difficult city").
2. Speaker's inferences of an agent's non-mentalist trait, or where there is more than one agent (i.e groups), non-mentalist stereotypes, for example ("that's how they are")
3. Speaker's (deontic) explanations relying on his or her norms (e.g. "he should have been less noisy").

9.3.3.2 *First-order theory of mind*

When investigating the development of Theory of Mind competence, researchers have primarily focused on the level of mentalistic interpretations. Formally, they can be expressed as:

S (mental attitude) -> A (mental attitude) -> [Propositional content]

For example, (I think) Sally thinks [the marble is in the basket].

In other words, on the first order level, a person makes an inference about another person's mental state about something or someone.

As can be seen in Table 9.5, from the combination of the four components speaker, mental attitude (positive, negative), agent, and propositional content, different characters of mental inferences emerged.

1. *Mentalistic trait or stereotypes* - The class of 'mentalistic traits' was already discussed in the first part of this chapter. As can be seen from our taxonomy, a speaker's attribution of these kinds of inferences (e.g. 'the English are reserved') falls into the category of the first-order Theory of Mind inferences.

2. *Self reflexivity*

a. Speaker's recursive inference of his/ her mental state(s):

"I believe I want", formally expressed as $S(\text{bel}) \rightarrow S(\text{des}, \text{bel}) [x]$, for example, "My attitude definitely changes...how I interpret, or want to represent myself" (PW11).

b. Reflexivity of how others view my behaviour or me.

I believe he thinks I am/ I do, formally expressed as $S(\text{bel}) \rightarrow A(\text{bel}) \rightarrow S[\text{behaviour}]$,

"I think he might perceive my behaviour as threatening" (fictitious example).

These can be denied:

c. "I believe he does not understand...", formally expressed as $S(\text{bel}) \rightarrow (\text{neg bel}) \rightarrow S$, or $S[\text{behaviour}]$, for example, "He does not understand me".

3. *Seeing me/ him/her/ them as...*- This class describes inferences of others' 'thick' or stereotypic representation of self (speaker) or a third agent: I think he sees me *as* something or someone else, formally expressed as S (bel) -> A (perc as)-> S {as X}. For example: "My father has a certain view that he sees me as someone at this level of intelligence..." (PW11), or " they see me as a teacher type of person, and they don't have good experience with education..." (PW6).

9.3.3.3. *Second-order mentalistic inferences*

On the second-order level, we have the inference of the mental state of an agent A_2 embedded in the inference of agent A_1 (first order level). Therefore, the number of different combinations becomes exponentially greater. Second order mental state inferences can be formally expressed as: S (bel) -> A_1 (mental attitude) -> A_2 (mental attitude) -> [propositional content]. For our analysis, not only the relation between speaker and agents, but also between the agent on the first order level and the agent on the second order level will be of interest - for example, a speaker's inference of whether or not the outgroup appreciates the mental perspective of the ingroup. Of the various different possible combinations between speaker, mental attitudes, agents, and propositional content, we shall consider the following emergent characters.

Table 9.5 Taxonomy of theory of mind inferences at the 0-order, 1-order and 2-order levels

Zero-order Theory of Mind			
Relation between components	Formal description	Example	Emerging character
Mental attitude: belief; Prop. Content: object, external event, state (without agent)	S (bel) -> [x]	We don't want to go to the cinema	Speaker's attitudes
Prop. Content: description agent: individual	S (bel) -> [individual agent: he is]	Because he is always late.	Non-mentalistic Trait
Prop. Content: description agent: group	S (bel) - [group: they are]	That 's how they are.	Non-mentalistic stereotype
Mental attitude: deontic states	S (bel) -> [Agent should be, should do]	He should have been there on time.	norm
First-order Theory of Mind			
Mental attitude: belief; Agent: individual/ group Prop content: object, external event, state	S (bel)-> A (bel) -> [x]	He thinks/ they think it's raining	-
Mental attitude: belief Agent: individual Prop content: description agent	S (bel) -> A1 (bel) - A1 [is x= nonmentalistic]	He thinks he is in the right place	Attribution of agent's self-description
Mental attitude: belief Agent: individual, group Prop content: description agent	S (bel) -> A1 [is y=mentalistic]	He is thoughtful The English are reserved.	Mentalistic trait, Mentalistic stereotype
Mental attitude: belief Agent: individual, group Prop content: description, beh. Referent: Self (ingroup)	S (bel) -> A1 (bel) -> A2 [behaviour]	They think Black people (we) are loud, make lots of noise	Inference of other's stereotype if referent is self)

Table 9.5. continued

		First order theory of mind	
Mental attitude: belief Agent: individual, group Prop content: 'thick' description self/ agent2	S (bel) -> A1 (bel, perc as)-> S [is, as]	"He sees me as a black person"/	Self-referential or 'second person' symbolic representation through the eyes of a third person
Mental attitude: belief Agent: individual, group Prop content: behaviour agent	S (bel) -> A1 (bel, perc as)-> A1 [behaviour]	He thinks he does They think they do	Inference of agents' mental attitude about agent's behaviour
Mental attitude: belief Agent: self Prop content: external object	S (bel) -> S (think) -> [x]	I think I would know more about miscarriage of justice	Self reflexivity
Mental attitude: belief Agent: individual other Prop content: self behaviour	S (bel) -> A1 (bel) -> S	He thinks what I did was bad.	S's self-reflexivity involving inference of other about self
Mental attitude: negative belief Agent: individual, group Prop content: self	S (bel) -> A1 (neg bel) -> S	She dismisses me	Attribution of other's denial of self S's self-reflexivity

Continued overleaf

Table 9.5. continued

Second order theory of mind		
Mental attitude: belief Agent 1: individual Agent 2: individual, self	S (bel) → A1 (bel) → A2 [is y] "He thinks she is funny"/ "they accept me because I'm like-minded"	Attribution of mentalistic trait
Mental attitude 1 st order: negative belief: denial, unawareness Agent 1: individual, group Agent 2: self	S (bel) → A1 (neg bel) → S (mental state) [x]	Attribution of others' denial of self perspective
Mental attitude: 1 st and 2 nd order: positive Agent 1: individual, group Agent 2 = S	S (bel) → A1 (aware) – S → (bel) → A [behaviour]	Attribution of agent's self-reflexivity
Mental attitude: 1 st order pos, 2 nd order negative Agent 1: group Agent 2: self {as group member}	S (bel) → A1 (des) – (neg agree) → S, [where S (bel) → A1 (percas) S { expert}]	Inference of agents' negative mental attitude about self
Mental attitude: 1 st order pos, 2 nd order mentalistic trait Agent 1: outgroup Agent 2: ingroup	S (bel) → A _{outgroup} (bel) – S {ingroup} [is y = mentalistic]	Inference of (mentalistic) meta-stereotype

1. Inferences of agent(s)' attribution(s) of mentalistic traits or stereotypes

This includes a speaker's inference that an agent 1 attributes a trait or stereotype to an agent 2 (as an individual or group). Where the agent at the second order level refers recursively back to the speaker, this can be described as a mentalistic meta-stereotype (see, for example, Vorauer et al, 2000, for the concept of meta-stereotypes). This can be formally expressed as S (bel) → Aoutgroup (bel, perceive as) → Singroup {mental state}. This inference implies that the speaker infers that the agent views himself at the group or categorical level, hence S (bel) → A (perc as) → S {group}. An example for such a meta-stereotype is "They think we [black people] are unreliable."

2. Attributing to another agent 1 awareness of agent 2's mental perspective

This category consists of a speaker's inference of agent 1's awareness of a second agent 2's mental perspective, formally expressed as S (bel) → A (aware) → S/A2 (mental state) → []. An example for such an inference would be: "They know that she thinks it was unfair of them not to give her the job".

3. Attributing to unawareness of other's mental perspective –

This involves essentially the same structure as in (2), but with a negative mental state inference at the first order level, formally expressed as S (bel) → A (neg aware) → S/A2 (mental state) → [], for example "She is not aware of what he thought when he was not allowed to enter the staff room."

4. Higher-order theory of mind inferences

In principle, infinite recursive mentalistic inferences are possible. However, since in the text we rarely found Theory of Mind inferences at a higher-order than the second-order level, they are not explicitly discussed here. However, the same organisation as illustrated for the first- and second-order levels can be applied to these more complex higher-order mentalistic inferences.

9.4. PLACING TYPES OF TOM TALK (AND OTHER KINDS OF EXPLANATIONS) IN THE CONTEXT OF NARRATIVE EPISODES

So far, we have considered the different characters of mentalistic (and other) explanations on the local level tracked in the text. However, our main research question was whether people used Theory Mind differently depending upon social contextual variables. In order to address this question, our main interest was to compare Theory of Mind usage across different kinds of experiences and across different social relations. As outlined in Chapter 8, to study this, we used experiences - narrative episodes and examples - as analytic units.

Through the taxonomy we are now able to specify our predictions. Recall that our main hypothesis comprised two parts. The first part predicted that those in power might be relatively unaware of the mental perspective of the powerless. The second part predicted that by contrast, those who are powerless should be aware of the mental perspective of the powerful, and that they would use this awareness instrumentally to

adjust their own actions. The predictions remained when applied to experiences of racial discrimination, which involved the victim's situated powerlessness.

9.4.1. Predictions of differential Theory of Mind usage in different power relations

By considering the different types of Theory of Mind, as well as 'non-mentalistic' explanations, our predictions were as follows: If the speaker was in power or the one who was discriminating, he or she would explain or interpret the encounter more on the 0-order level, in terms of 1) his or her own attitudes or 2) group norms or 3) attributions to the victim of non-mentalistic and mentalistic traits or stereotypes.

Moreover, we predicted those in power to show little reflective awareness (on the first and particularly second order ToM level) of how their own actions were perceived by the powerless.

By contrast, we predicted that speakers in a powerless position (i.e. victims of discrimination) would show high degrees of awareness of how the powerful perceived them, which includes the class 'thick', or 'stereotypical' 'seeing-me-as' inferences. Moreover, indirect evidence of the first part of the hypothesis would also be given if the powerless inferred that the powerful does not take their (i.e. the powerless) mental perspective. Attributing to the perpetrator 'negative mental attitudes towards self or the ingroup' would manifest this.

9.5. SUMMARY

With the taxonomy outlined in this chapter we have generated a methodological tool that enables us to adequately address the questions that interest us. Firstly, the method suits the exploratory character of the study, as it allows us to capture the quality and richness of mentalistic explanations and how they are related to different kinds of experiences. Secondly, the method can also be objected to a quantitative analysis as it allows one to compare frequencies of distinct types of ToM talk. As such, methodologically, it represents an endeavour to overcome the qualitative-quantitative divide, which is often observed in social psychological research. The taxonomy has several advantages over previous coding schemes employed in social psychology. For example, compared to the mainstream person-situation dichotomy used within the Attribution Theory framework, it discriminates in a much more fine-grained way between different types of interpretations and explanations. It also enables us to distinguish between 'true' and 'false' Theory of Mind usage; a distinction that was often blurred in the coding schemes of developmental psychologists who studied young children's ToM competencies in narratives. However, a more detailed assessment of the usefulness of this taxonomy shall be postponed until the discussion of the results of the interview study, to which we shall now turn.

THEORY OF MIND USAGE IN ACCOUNTS OF DISCRIMINATION

10.1. INTRODUCTION

In this chapter, the results of a qualitative and quantitative analysis of the interview material are presented. It will be recalled from Chapter 8 that our initial hypothesis comprised two parts: the first part predicted that those in power might be relatively unaware of the mental states of the powerless. The second part predicted that those who are powerless may be more aware of the mental states of the powerful as knowledge of their states of mind might be strategically used for the adjustment of their own behaviour. However, as shown in Table 10.1, a fundamental constraint of the present data was that in the accounts of their experiences participants – irrespective of their ethnicity - tended to position themselves as powerless. Consequentially, for the intended comparison between powerful and powerless' individuals' explanations of others' mental states we lacked examples of people who subjectively perceived themselves as powerful. However, a large proportion of episodes dealt with experiences of discrimination. Paradoxically, this led us right back to our initial starting point, the anecdotes of extreme situations in which one group discriminated against members of another group. We could therefore explore a related issue; namely whether or not Theory of Mind usage differs between explanations of different kinds of social actions. Our working assumption was that discrimination entailed *situated power usage*, so that

those who are discriminated against are in this context positioned as relatively powerless, whereas those who enact discrimination are in a temporal state of power. The questions that emerged were to what extent were the victims aware of the states of mind of the agents of discrimination? And did they make any inferences as to whether or not the agent appreciated their own mental perspective?

Moreover, the material permitted us to investigate the argument underlying the first part of our initial power hypothesis, namely the extent to which participants who positioned themselves as powerless related inferences of the mental states of those in power to their own subsequent actions.

10.2. ANALYSIS

10.2.1. Coding system

In total, 150 analytical units were identified, of which 115 were coded as *episodes* or *examples*, and 35 as *general talk*. For further analyses, only episodes and examples were considered. For each episode, participants' subjective construction of the character of the relationship and of the encounter were assessed on the basis of the four following dimensions.

1. *Interpersonal versus intergroup level* – For each episode it was coded whether the participant construed the relationship between self and other(s) on the interpersonal or intergroup level.

2. *Power relation* - We distinguished between self as powerful -other as powerless and self as powerless -other as powerful. Incidents, in which participants did

not comment upon the perceived power relation, or in which power did not seem to be an issue, were coded as 'neutral'.

3. *Emotional valence of experiences* - Indices of the emotional valence of episodes were, for example, questions from the interview schedule that were asked to elicit accounts of 'positive-enriching' or 'negative-problematic' experiences. More often, however, participants spontaneously mentioned how they felt about a particular experience. For example, in one episode PW16 described that after an unsuccessful job interview in Brighton, youths were shouting racist abuse at the train station. She stated having felt 'awful' after this experience and only wanted to head back to London. Episodes which could not be unambiguously coded as either positive or negative, or that truly reflected an experience low in terms of emotional emphasis, were coded as neutral.

4. *Discrimination* - A categorical code was used to define whether or not an episode explicitly dealt with discrimination. We did not distinguish between different kinds of discrimination (i.e. racial discrimination, gender discrimination etc.). It was, however, distinguished between three different types of accounts dealing with discrimination: (1) the participant's experience as a victim or target of discrimination, which included accounts of vicarious experiences, directed against someone else, (2) accounts, in which the participant was the actor who committed an act of racism or discrimination, and (3) accounts in which the issue of racism/ discrimination were discussed in general. Numbers and percentages of episodes characterised in terms of these four categories are shown in Table 10.1.

Table 10.1. Numbers and percentages of episodes defined in terms of interpersonal versus intergroup relation, power relation, valence of experience and discrimination

Interpersonal versus intergroup relations							
Personal level	16 (14.3%)	Group level	94 (83.9%)	Not established	2 (1.7%)		
Power relation between S and A							
Self powerful	5 (4.5%)	Self powerless	44 (39.3%)	Mixed, unspecified	63 (56.3%)		
Valence of experience							
Positive	11 (9.8%)	Negative	69 (61.6%)	Neutral	32 (28.6%)		
Discrimination							
No Discrimination	61 (54.5%)	S's accusation of Discrimin.	40 (35.7%)	S as Discriminator	3 (2.7%)	Discrimination general	8 (7.1%)

10.3. RESULTS

The results are organised in two sections. The first section is concerned with the nature of ToM inferences participants made when accounting for an experience with discrimination. Two main and distinct patterns of Theory of Mind inferences were identified. Firstly, participants inferred that the agent perceived the victim (self or a third person) solely in racial terms to the exclusion of the appreciation of any other social or personal identity. Secondly, the content of the accusation of racism involved the inference that the other was unaware of or even denied the victim his or her own independent mental perspective. To illustrate the character of these findings, first a qualitative analysis is presented. This is followed by a quantitative analysis that shows the extent to which the patterns were representative for the total interview material.

Results presented in the second section were concerned with one aspect of our initial power hypothesis; how for those in a position of situated powerlessness, Theory of Mind usage was related to subsequent social actions.

10.3.1. Theory of Mind inferences in accounts of the accusations of racism

10.3.1.1. Qualitative results I: stereotypical 'seeing me as' ToM inferences as a precondition for the definition of a social act as an act of racism

With exception of incidents in which someone shouted racist abuse, in most episodes that dealt with discrimination, racism was 'covert' rather than 'overt'. What distinguishes the experience of racism from other kinds of 'negative' or 'bad' experiences? The following extract illustrates how a participant's particular type of Theory of Mind inference constituted the precondition for the interpretation of an experience as an act of discrimination.

PB9 was a woman in her mid-thirties who had been brought up in Britain by parents of Jamaican origins. The thematic thread throughout large parts of the interview was that "I have experienced racism all my life". The following extract was taken from amongst a string of episodes that illustrated this claim. Hence, the episode was subjectively construed as an experience with racism. In extract 10.1, PB9 recounted an episode in which "we [PB9 and a black friend] went to a white lady's house to view it". At issue was the landlady's behaviour in the moment PB9 turned up at her door. "I said, 'yeah [name of estate agent] sent me'(..) 'oh, okay, I suppose you'd better come in then'".

Extract 10.1 'you had better come in then'

PB9: [...] so my friend and I went to view a house , and a nice house, and ehm, detached four bedroom house, and it costs about (...) it costs two nine nine fifty actually, (.) two hundred ninety thousand it cost, ehm I don't think she expected black women to turn up at her door. Yeah, ehm, I think she was surprised seeing black women ..coming to view the house [...]

PB9: Yeah, I did think she expected us to come, right, that's what it was, cause people have a perception of a black community, and a perception of us as not being able to afford certain types of things, (.) ehm, not having the money, you know what I mean?

At issue was the landlady's communicative act, her phrasing "you'd better come in then". PB9's chain of inferences is summarised in Box 10.1. below. In this situation, racism was not directly 'overt', but PB9 was faced with the need to explain or interpret the landlady's unexpected, script deviant behaviour. How can we, as the listeners, understand PB9's utterance that the landlady did not expect black women to turn up at her door as evidence of racism on the part of the landlady? Firstly, this utterance only becomes a meaningful explanation if we draw the inference that the participant attributed to the agent a 'thick' or 'stereotypic' representation of herself as a black woman. To emphasise that her colour was at issue, she further elaborated, "I did think she expected us to come". As shown in steps 2a – 2c in the analysis box, in order to understand this utterance as not contradicting her previous statement, the listener needs to add the implicature that with 'us' she meant 'us as potential buyers'. Further implied is that whilst PB9 in this particular situation represented herself as a potential buyer, she inferred that the agent did not acknowledge her in that identity. This was justified by

drawing on meta-stereotypical knowledge (see step 3 in the analysis box) that involved a first order Theory of Mind inference.

Box 10.1.

Example	Formal notation	Emergent character
1. "I don't think she expected black women to turn up at her door."; "I think she was surprised seeing black women..."	S (bel) -> A (neg exp ≈ surp) -> S [{black women} behaviour: to turn up at her door]	Negative 1st order ToM 2nd person expectation
1a. Implicature: She perceived us as black women	S(bel) -> A (perc as) -> S [black]	Implicature Inference of agent's stereotypic representation of self (1st order ToM)
2. She expected us to come	S (bel) -> A (exp) -> S [behaviour]	Positive 1st order ToM expectation, apparent contradiction to (1)?
2a. Implicature: She expected potential buyers to come	S (bel) -> A1 (exp) -> [buyer]	Implicature 1st order ToM inference
2b. Implicature see myself as a potential buyers	S (perc as) -> {S as buyer}	0 order ToM symbolic representation of self
2c. Implicature: She did not perceive us as viewers	5. S (bel) -> A (neg perc as) -> S {as viewers}	Implicature 1st order neg ToM inference
3. (Explanation)'People have a perception of the black community...not being able to afford..."	S(bel) -> Aoutgroup (perc as) -> Singroup{ as not being able to afford...}	Metastereotype (1st order ToM)

For PB9, it was not so much a problem that the landlady perceived her as a black woman *per se*, but what was at issue was the inference that she saw her 'only' as black in a context in which she expected to be appreciated as a potential buyer. This inference also changed her construction of the character of the situation. From her own anticipated buyer-seller relation it became instantly a matter of race relations.

Interestingly, the account was also informative about the underlying mindreading process. Based on the wording of the landlady's initial statement "oh, I suppose you had better come in then", PB9 compared her own cultural expectations of a 'viewing-someone's-house' script with the landlady's deviation from an expected role behaviour. The outcome of the encounter was that PB9, although she liked the house, did not consider buying it from her.

The episode points to an important process underlying the accusation of racism. An act is not perceived as racist because "he or she did something bad", but the accusation seems to necessitate the inference that "s/he did something bad because s/he perceived me as black". In other words, it appeared that a necessary precondition for the attribution of an experience as racially motivated was this type of inference of the other's stereotypic 'thick' representation of oneself *as* a member of a particular social group. This means that the experience of covert discrimination requires the victim's co-construction of social reality and of the meaning of social actions. Hegel (1807) suggested in his famous master-slave dialectic that the powerful needs the powerless for the acknowledgement and validation of his own position of power. In a similar vein, it seems that for a victim to accuse a perpetrator of a *racist* action, his or her acknowledgement of the mental perspective of the one who discriminates is required.

10.3.1.2. Quantitative results I: Comparison between frequencies of stereotypical 'seeing me as' ToM inferences in accusations of racism and episodes not dealing with discrimination

In order to investigate whether this type of stereotypical second person mentalistic inference was characteristic for experiences with racism, in a first step we compared their occurrences in episodes that were and were not concerned with an accusation of racism. Table 10.2 shows that in 80.4% of participants' accusations of racism, this particular type of inference was made either explicitly, or could be tracked implicitly (as in example 10.1), compared to only 20.5% of incidents that did not deal with racism. However, as pointed out by Whiten (2003, personal communication), using episodes as analytic units carries the risk of committing a pseudo-replication error (e.g. Hurlburt, 1984). For a statistical analysis, we therefore calculated for each participant the proportions to which s/he made 'seeing-me-as-[social category]' inferences in accounts of episodes dealing with discrimination and non-discriminatory events. For example, PB9's interview involved seventeen narrative episodes, nine were coded as dealing with experiences with discrimination and eight as not dealing with discrimination. In this interview, the issue of discrimination was not discussed in general terms, nor did PB9 discuss any incident in which she herself acted in the role of the perpetrator of discrimination. These two latter categories were therefore coded as missing cases. Out of nine episodes that dealt with experiences with discrimination, in 8 cases it could be tracked explicitly or implicitly that she attributed to the perpetrator a perception of herself in racial terms. Therefore, we calculated the proportion of

Table 10.2. Number and percentage of stereotypical 'seeing as' inferences in episodes characterised as involving an accusation of discrimination, episodes in which discrimination was not at issue, episodes in which the participant acted in a discriminatory fashion or discrimination was discussed in general terms.

Character of account	Explicit or implicit Inference S(bel)-> A1 (perc. as) S/A2 {race}	No such inference	Total
S accusing A of racism	33 (80.4%)	8 (19.5%)	41
No direct reference to discrimination	3 (49.1%)	58 (95.1%)	61
S discriminating	0	-	3
Episode about discrimination in general	7 (70%)	3 (30%)	10
Total	43	72	115

Table 10.3. Proportions of inferences of stereotypic 'seeing-as' inferences in accounts of accusations of discrimination and in experiences not dealing with discrimination, means, standard deviations and ranges in brackets

	<i>N</i>	Mean	<i>SD</i>	Range
Proportion of stereotypical 'seeing me as' inferences in accusations of discrimination	11 ^a	.84	.20	(.33 – 1.0)
Proportion of stereotypical seeing me as inferences in episodes not dealing with discrimination	11 ^b	.12	.29	(0 – 1.0)

^a one missing case due to an interviewee not reporting an episode in which s/he made an accusation of discrimination.

^b one missing case due to an interviewee not reporting an episode in which s/he did not make an accusation of discrimination.

stereotypical 'seeing me as' inferences in accounts of discrimination ($8/9 = 0.88$). In none of the incidents that did not deal with discrimination was such an inference traced ($0/8 = 0$).

Since across participants, cell sizes of the categories 'episodes about discrimination in general' and 'self as discriminator' were small, these were excluded from the subsequent analysis. Proportions of stereotypical 'seeing me as' inferences in accusations of discrimination and in non-discriminatory episodes are shown in Table 10.3. When the data was subjected to a Wilcoxon signed rank test, a significant difference was found ($Z = -2.71$, $N = 11$, $p = .007$, two-tailed). This suggested that in the context of episodes in which participants made an accusation of discrimination, they made significantly more often stereotypical 'seeing me as' inferences than when they talked about episodes that did not relate to an experience with discrimination.

However, as can be obtained from Tables 10.2 and 10.3, results showed that attributions of this type were found in accounts that did not explicitly deal with accusations of racism ('false positives'). Moreover, we found instances of accusations of racism that did not involve this type of inference ('false negatives'). Closer inspection of the three cases of 'false positives' shows that these episodes were not counted as racism since the inferred stereotypical perception of self did not translate into any action. For example, although one of PB4's main narrative themes was that he did not experience racism in London, he recounted an experience in a pub in Stratford. Together with his mother and daughter he entered the pub because their car had broken down whilst they were travelling through the town. He recounted how 'nothing

happened', but "everything stopped, the way they looked at us... like aliens". Later he speculated that the situation might have been different if instead he had gone to that same pub in the company of his brothers. As a group of black men they might have been perceived as a threat. PA5 inferred that people in Scotland saw them – "Vietnamese boat people - as Eskimos, so strange", but he considered the Scots' curiosity upon this 'strangeness', and the treatment they received, as a positive experience.

Potentially more concerning for the claim that the accusation of racism involves the inference that the agent who commits a discriminatory act perceives oneself in racial terms were the false negatives; instances in which such an accusation was made but in which this particular type of inference was not found. Why these instances nonetheless represented experiences with racism shall be illustrated in the next section in which a second, more profound pattern of Theory of Mind inference will be discussed.

*10.3.1.3. Qualitative results II: Second order ToM inferences of others
unawareness or denial of own perspective as the essential content of an
accusation of racism*

Passive racism

The first extract is an example of 'passive racism', which refers to an action which was committed without the agent's intention to be racist but which effectively is racist. The episode, as told by PW15, was embedded in his global narrative theme, how through his wife and her family from the Punjab he had become involved with different

aspects of Indian culture and also more sensitive to racial issues. PW15 talked about his initial concern about his parents' reaction to his relationship. He described his parents as the "typical Daily Mail reader, middle Englisher, middle conservative, slightly racist personality", "not terribly liberal minded, they hold some views that I think a lot of English people hold". Through this description the relation between the agents was coded as on the intergroup rather than the interpersonal level. As a first example, he described how his parents would "[...] use words like Paki, not with the intention to offend, but because that seems the word that people use to describe Asian people, or that white people use to describe Asian people." The following episode related to an incident that occurred while he made preparations for the wedding banquet.

Extract 10.2. Steak at the Hindu wedding

PW15: I sort of rang them up and asked "what would you like? If you had the choice, whatever you like, what would you like?" And they said "steak"; which is obviously deeply *offensive to Hindus*, because of the position of the cow.

[...] I think *they would have liked to have a steak, and they didn't think past that [...]* No, I think when it was pointed out to them, *they sort of clicked, they understood*, why that couldn't happen, but *I don't think they thought past what they wanted. What that actually meant to people from another culture.*

The crucial inference was that ingroup members (white British people) lacked reflexive awareness of the way their own action would be perceived by outgroup members (his wife's Indian family). However, when it was brought to their attention, the outcome of the episode was that the ingroup members changed their behaviour. This

Box 10.2.

Sentence	Formal notation	Emergent character
1. "they said 'steak' which is obviously deeply offensive to Hindus"	S (bel) -> A _{Hindu} (perceive as) -> A _{2outgroup} (offensive) [behaviour]	S shows awareness of how a third agent's behaviour is perceived by another group
2. "I think they would have liked a steak, and they didn't think past that."	S (bel) -> A _{ingroup} (des) [steak] and A _{ingroup} (neg bel) [past A's desire]	2nd order negative ToM inference: attribution of ingroup's unawareness of outgroup's state of mind.
3. "they understood...what that actually meant to people from another culture."	S (bel) -> A _{ingroup} (understood) -> A _{outgroup} perc as [{meaning}ingroup behaviour]	Resolution: 2nd order inference of ingroup's appreciation of how outgroup perceives ingroup behaviour

episode constitutes one of the few exceptions in which the participant did not make the inference that the agent of discrimination saw the targets in racial terms. However, the content of the accusation related precisely to the 'Daily Mail readers'' neglect of taking into consideration the Indians' different cultural background. Consequentially, they ignored that the meaning of their own behaviour could be perceived differently from a different mental perspective.

Denial of different experiences

Commentators (e.g. Essed, 1991) have frequently highlighted that the emphasis or exaggeration of difference (e.g. cultural practices, cultural values) between the own white-Western group and non-white ethnic outgroups constitutes an important feature of racism. The next extract shows that the opposite – the denial of different experiences – may be an equally central feature of racism. It can be subsumed under the category 'denial of racism' (Essed, 1991). As will be shown with the next extract, this involves the denial or failure to recognise that different kinds of experiences emanate from

different mental perspectives, and that different experiences form different mental perspectives. The episode was told by PB7, a young Indo-Caribbean playwright who was born and brought up in North London. The narrative theme was that interacting between Black and Asian communities and white communities has shaped his experiences. His point was that “[..] they [white people] want to treat you (..) as if there were no differences, and I think there are a lot more differences than they realise or want to realise, or want to treating you as if there are no differences [...] between a kind of white society and a black experience.” The following episode was given amongst a string of encounters as “another example for not recognising culture” and was concerned with PB7’s confrontation with an Artistic Play Director. At issue was that PB7 had explicitly put black and Asian images into the stage directions, which he believed to be crucial for the understanding of the play as a black and Asian experience. Although this was pointed out to the director, these images were not seen. He described the director as “in the sense he had the power”, “he had the power to do that,” which subsequently led to a frustrating outcome for PB7 “I never had.., so he he got it his way, he got it his way”.

Extract 10.3. The Artistic Director: “This is not an Asian play”

PB7: [but he is still saying it’s NOT an Asian play, it’s not a black play, it’s just a play. I think by (.) the mere fact of not recognising that this is a play about the experience of kind of black British people

I: mhm

[...]

PB7: the script is so heavily about (.) ehm black and Asian experience, (.) yet he is not directing it in that way, he’s not seeing it in that way [....]

PB7: Yeah, not acknowledging my perspective, and a lack of cultural understanding, a lack of of of not understanding my perception and seeing black British people as the same as white British people and not saying that the experiences are different, and so the images we are showing back on ourselves.

Critical to his account was the artistic director's comment "this is not an Asian play, it's not a black play, it's just a play" which reflected his behaviour. i.e. he ignored the relevant stage recommendations. As can be seen in the analysis box, PB7's interpretation included both a negative second order ToM inference (2) and the inference that the agent perceived him as a black person (3). The participant subjectively felt that his choice of self definition and the definition of his experiences, were denied. This represents a sub-category of the denial of agency, which Reicher (2001) has highlighted as a central component of racism.

Box 10.3.

Sentence	Formal notation	Emergent character
1. "the mere fact of not recognising that this play is about the experience of kind of black British people	"S (bel) – A _{powerful white} (not recognising) – S (int/ meaning) [a play about the experience of kind of black British people]	2nd order ToM negative inference S' inference of A's lack of acknowledgement of S's intention
2. "not acknowledging my perspective, a lack of cultural understanding, a lack of not understanding my perception.."	S (bel) – A _{powerful white} – (not acknowledging) – S (my perspective)	2nd order ToM negative inference. S's inference of A's lack of acknowledgement of S's independent mental perspective 2nd order ToM
3. "...seeing black British people as the same as white British people..."	S (bel) -> A (seeing as) -> S _{ingroup} {as the same as outgroup}	S's inference of A's stereotypical 'thick' representation of self

Different to the previous extracts was that here, the agent's mental perspective was directly challenged in a confrontation. Hence, the 'strength' of the claim involving negative second order Theory of Mind inferences became more intense: "not being aware" turned into "not recognising" and then "not acknowledging my perspective".

Jokes and ridicule

The next extract describes a common practice of intimidation: racist jokes and ridicule. In this example, this practice was paired with the attribution that the agent did not reflect upon the way his own actions might be perceived by the victim. The episode was told by PB7 who we introduced in the previous episode. Here, he described how as a schoolboy, he felt intimidated by a white supply teacher.

Extract 10.4 "Sit down Sing, Shah, Patel, whatever your name is"

PB7 [...] my experiences with a white teacher is , there's a white teacher when I was at school, I was at the back of the class, standing up, maybe been a bit noisy, he said "sit down Sing Shah Petel, whatever your name is". He's a supply teacher, he doesn't know me. He said "sit down Sing Shah Patel" which is an experience [...]

So that is about my interaction with white people, but he's at the front of the classroom, and I was shocked, I was only about..kind of eleven, twelve, maybe, (.) and I was shocked, and I I didn't react, and I haven't reacted up until now, he's probably still teaching somewhere, hope not, but maybe he is.

I: Why would you think he just did that?

PB7: Ehm..I haven't ...why did he say that? I (..) he he found it quite funny, saying "sit down Sing, Shah, Petel" and he had a little smile on his face, right, this was a funny thing to say so he didn't see it as being ...although it was racist and offensive, he didn't see it as that.

The analysis shows the contrast between the participant's own interpretation of the teacher's behaviour and his inference of how the agent perceived this same behaviour. PB7 inferred that the teacher intended to be funny or thought of his behaviour as being funny, unaware that others, specifically PB7 himself, could perceive his remark in a different way. Implicit in the remark "he didn't see it as offensive" was the inference that the teacher lacked reflexive awareness of his own behaviour, and the effect he produced on his pupil (being shocked).

Box 10.4.

Sentence	Formal notation	Emergent character
1. "I was shocked"	1. S- (shocked) [A'behaviour], and	S' mental state about A's behaviour 0-ToM
2. "it was racist and offensive.." implicature "I found his behaviour racist and offensive"	S-> A's behaviour {as offensive}	Attribution of a mentalistic trait, 1 st order ToM
3. "He found it quite funny.."	S-> A (think/ intend) -> A (funny)	1 st order ToM: S's inference of A's mental perspective about A's behaviour
4. "He didn't see it as [offensive]..."	S -> A (didn't see it as) -> {offensive}	2 nd order negative ToM inference: S's inference that A did not perceive A's behaviour from S's perspective

Denial of an outgroup's "privileged information" as a trustworthy source of knowledge"

In the following episode, PB9, the informant already introduced in extract 10.1., recounted two related experiences she made as a school girl. The episode was

introduced as her first realisation of discrimination. Of interest is that PB9 minutely detailed the origins of her own mental perspective about the two matters of dispute – her family’s housing situation in Jamaica in the first incident and the history of colonisation in the second one. Borrowing the term from the classic false belief scenario, her perspective was based on ‘privileged information’, that is information unshared by other agents. She explicitly detailed the source of her privileged information, which also served the purpose of rhetorically validating her account. This consisted of a recent personal trip to Jamaica with her mother. There, relevant information was communicated to her through an eyewitness, her great-grandmother who was born at the end of slavery but had still experienced life in bondage. PB9 declared the information she had as unshared by her comment that they “only ever learn British history here”. Against this background, she recounted how upon return from her holidays, a classmate provoked her with the comment “did you swing in the trees and live in mud huts?” When probed, PB9 suggested two parallel reasons for the girl’s comment, both of which involved first order ToM inferences: “as a joke to everybody”, and “because she really believed it”. PB9’s response that “the housing is much nicer than here” was dismissed as a lie, crucially not only by the schoolgirl but subsequently also by her class teacher. PB9’s central claim was that the value of her description, which challenged white people’s stereotypic perception of Jamaicans, was denied.

The character of the episode contrasts with previous ones in that here, it was not the *agent’s* behaviour that was at issue but the *speaker’s* behaviour. In a second related experience, PB9 recounted how she, as a child, stood up in school and directly challenged her teacher’s hegemonic beliefs about black people.

Extract 10.5. She said I was lying

PB9: [...] well, she [the teacher] said that White people were the first people who (were) on the Westindian Islands, and prior to that there were savages. And ehm, she said in Africa, there were savages, and ehm, in Asia, there were savages
[...]

I said in a child way I said to her 'oh no, they had factories before. We knew they had factories before and eh (.) the British people went over there and stopped them from having the factories, and the one thing is there were Indian people living there, and Christopher Columbus wiped them out, I think that's wrong (all in a fairly emotional loud voice).' (Then, in a low voice) I got suspended from school.

[...]

PB9: She said I was lying, she told me to get up, I never forget it, she GRABBED me out of my seat, and said "how dare you to be so rude, [name of participant]", and eh, she marched me to the headmaster, () and eh (.), he asked me what happened, and he told me he couldn't have that kind of behaviour in school.

[...] I said 'I was not lying, but I told him about my grandmother, and her mum, told him my great-grandmother was an African and my grandfather, my Great-grandfather, my grandfather was an African, my Great-grandfather was an ehm a plantation-owner, and..he said I was lying, anyway, they suspended me (..) and sent me home.

As in the previous part of the episodes, PB9 was consistently and by multiple parties, all of which were in a position of power over her, accused of lying. A lie involves the inference that a speaker intended to make someone else believe something to be *x* while at the same time *s/he* knows *x* not to be true (Winner & Leekam, 1991; Sullivan *et al.*, 1995). Whilst in previous episodes, participants' accusations of racism related to a negative second order ToM inference with the agent's behaviour as the propositional content, as shown in Box 10.5, here we find a negative second order ToM

inference related to the speaker's behaviour. In other words, PB9's own independent representation of reality was categorically denied and dismissed as a lie. Another interesting feature of this episode was that it shows the consequences of an attempt by a powerless person to challenge the hegemonic belief system of the powerful. The teachers swiftly implemented their power by suspending the black child from school. That the power relation was not only one between pupil and teacher, but between black and white was implied in the final part of the narrative episode in which her mother attempted to come to her defence. "[...] And he [the head teacher] told her to remove all her children from the school."

Box 10.5.

Sentence	Formal notation	Emergent character
1. "She said that white people..before that there were savages."	S (bel) -> A _{outgroup} -> (pub rep) -> A2.	S's recounting of the Outgroup's mental perspective (as public representation) about 3 rd agents (savages, White people). Contradicts⊥:
2. "I said to her 'no....'"	S (pubrep) -> [negating A's pubrep]	S's (public representation) about 3 rd agents (savages, white people)
3. She said/ he said I was lying	S (bel) -> A _{white outgroup} (say)-> S [lying], implies S (bel) -> A (neg. bel) -> S (bel x + S Int make bel_> A not x)	S's inference of A's dismissal of the truth value of her perspective, negative 2 nd order ToM

Problematization

Essed (1991) argued that problematization represents one of the main forces of racism. Locating the problem in the personal or cultural nature of the outgroup provides fuel for the dominant group to rationalise and legitimise marginalisation and differential treatment. One notorious form of problematization is to pathologise black people. This can be reflected in ideas of cultural pathology or the attribution to blacks of pathological personalities. By drawing on the idea that social deprivation causes black people to develop 'damaged personalities', reactions of Blacks to oppression and racism are often devaluated as 'oversensitive' or 'overemotional'.

In the next episode, PB9 recounted an experience at the Victoria and Albert museum. In the first part, she gave a detailed description of her enquiry about a particular post card in the museum shop, to which an employee gave her a series of rude responses. At issue was her inference that he behaved in such a rude manner because he did not want to serve her as a black woman. Her inference was explained as "this is a black woman's experience all the time, isn't it?", but upon probing she was more specific. She related her observation that she was the only black person in the queue with the impression that he was "being accommodating and polite to everyone else", until it came to her. When she confronted the employee with her interpretation of his behaviour, he denied having acted in a racist way: "He said 'I don't like you as a customer'". Most relevant is the second part of the episode in which PB9 recounted how she approached the manager, and asked her to call the employee and to get him to apologise to her, but the manager firmly refused to do so. The encounter took an unexpected turn through the intervention

of another customer, a “white very middle class woman” who had overheard the dispute and defended PB9’s position.

Extract 10.6. Experience at the museum: “she said I was a problem”

PB9: [imitating a white customer speaking to the manager] I THINK YOU’RE BEHAVIOUR IS UNACCEPTABLE AS WELL! I THINK YOU SHOULD CALL HIM! And she called him. And the only reason why she called that man was because a white woman batted in. () She said I was a problem. And that would have been it. But in the minute that white woman batted in, because she was a white woman and she was very middle-class as well, ..

I: right

PB9:..she had to take note that this was a problem. She had to take note that I wasn’t causing the problem in the store

[...]

[...] what I thought was she objected (...) to a black woman speaking to her in that manner, and she objected to me being articulate and being able to articulate myself very well,

I: right

PB9 : I think that was one of her objections, I think what she thought was because the media had quite often a negative, and for years, they had a very negative view of the black community, they are expected to be loud, and ...lots of noise, and..into drugs, and all that, with every community, cause it’s small..and so, because I was being articulate, because I wasn’t very raising my voice, because I was explaining in a very articulate way what had happened, I wasn’t accepting what she had said as a white woman, because a black woman () actually accept, because I thought that as black people , we are the least listened to in the society, and black women especially, black men are not listened to, but black women are the least listened to in society, and I thought she thought that you know, but you () I thought that she was totally dismissing me, my point of view and my views.

Box 10.6.

Sentence	Formal notation	Emergent character
1. "She said I was a problem."	S (bel) -> A1 (said) -> S [is a problem]	Inference of other's non-mentalistic explanation of S's behaviour
2. "What I thought was she objected to a black woman speaking to her in that manner..."	S (bel) -> A1 (object) -> S [behaviour: speaking articulate] -> A	S's 2 nd order negativeToM inference: inference of A's state of mind: objecting S
2a. Implicature: She saw me as a black woman	S (bel) -> A1 (perc as) -> S {as a black person}	=> S's inference of A's stereotypical representation of S as a black person
3. "They had a very negative view of the black community."	S (bel) -> A _{outgroup} (bel) -> S (neg view/ expectation) -> A _{ingroup = black people} [attribute: loud]	1 st order ToM awareness of Meta-stereotype, perception of outgroup representation of ingroup as
4. "I think what she thought was because the media..."	S (bel) -> A1 (bel) -> A _{black people}	PB perceives A as an outgroup member
5. "A black woman actually accepts"	S (bel)-> A _{outgroup} (exp) - ingroup (accept) [the view of outgroup?]	2 nd order ToM awareness of meta-stereotype which implies attribution of a state of mind
6. "I thought she was totally dismissing me, my point of view and my views."	S (bel) -> A (dismissing) -> S, and S (point of view)	2 nd order ToM inference of agent's dismissal of own perspective

Central to this episode is the relation between PB9 and the manager. At issue was PB9's attempt to complain about the shop assistant's allegedly racist behaviour towards her. Here, she did not need to *infer* how the manager evaluated herself and her account, as this was made public: "[the manager] *said* I was a problem". PB9 used meta-stereotypes to justify the inference that the agent dismissed her mental perspective. This inferred view, which pathologised PB9 provided the manager with a justification for "not responding". If PB9 herself constituted the problem, then the intrinsically coherent conclusion was that there was no other issue to be confronted.

And indeed, her account showed that her complaint in itself was to no avail. The acknowledgement of her perspective was only achieved through the unexpected support of a bystander, identified as a “white very middle class woman”. In this episode, the inferred denial of one’s own perspective was crucial for the participant’s subjective interpretation of why she was being pathologised.

Denial of racism

Some forms of pathologising that were previously discussed, such as alleged ‘oversensitivity’ or ‘paranoia’ on the part of minority groups, often overlap with another insidious feature of racism: the denial of racism. Particularly relevant in societies that ostensibly reject racism, the denial of racism serves the perpetuation of suppression by obscuring the experience of racism in the lives of minority groups (Essed, 1991). The following episode is extracted from an interview with PA8. Contact with PA8 was made at the Stephen Lawrence Conference where he acted as a translator for a Chinese victim of institutional racism. The character of this interview differed from the others in that the interviewee predominantly did not talk about personal experiences and instead about a wealth of experiences with racism accumulated over the past seventeen years as the Chinese communal worker. One of the narrative themes that incorporated a large part of the interview was that “the police is not taking serious the complaints by the Chinese”, as the police claims that there is no racism against the Chinese. “They have family, mind their own business, they don’t cause riots, so they are good people”.

PA8 described that white people, particularly youth offenders, regard Chinese people as easy targets (“they see the Chinese as vulnerable”). In his account, white people’s actions were enabled by their knowledge of the ‘the system’, which includes an awareness of institutional racism within the police. This perpetuated the Chinese’ vulnerability, who were already vulnerable through language difficulties, lacking knowledge of the system, and relative social isolation. He suggested that white youths become increasingly aware of their power over the Chinese through repeated offences that do not result in real consequences for them, such as charges by the police. PA8 suggested that the white youths reflect on the impact of their actions. However, in his account they do not consider the impact of their behaviour on the victims, the Chinese or Asian, but on the (more powerful) police.

In one episode, PA8 described how white youths attacked a Chinese fish and chips shop in Peckham on four subsequent days over the Christmas period. On the first day, about 20 youths came to the shop, tore apart the Christmas decoration, shouting racial abuse. The shop owner called the police; the police came while the youths were still there, spoke to the owner, but did not arrest anybody. Over the next three days, the attacks became increasingly more violent, and although the police came, the youths were not arrested, as the Chinese could not identify them. PA8 commented “they (the police) are aware of the pattern”. The worst incident occurred on New Year’s Eve. In anticipation of the youths’ return, the shop owners deliberately closed the shop earlier. Indeed, the youths came back, broke the window and the door, shouting racial abuse. PA8 described that the owners “inside the shop, just stood there, just stood and

cried". They then phoned PA8, who subsequently informed the police about the pattern. He phoned them on four consecutive days in the new year, but "they didn't even return my call". Only when he then contacted the head of the race and crime office of Scotland Yard, was the attack being taken seriously. As PA8 put it: "the following day they installed a pen alarm and ...within two weeks they arrested people." Most pertinent to PA8 were the reactions of the police.

Extract 10.7. Racism from the attackers and the police

So when they [the police] know that people who know that system intervene they start to take it serious. So what it really means is that they have the power, they can do things, but they, the police decided not because they know that these people, a lot of them don't know the English, and they don't know the system, they are likely to get into trouble

I: But who would be getting into trouble?

PA8: But I'm talking about the police. The police, the police you know, they don't take action, right, first, they're likely to get away with this as well. They have a duty to intervene and protect, but not carrying out their duty, it's against the law. So I say racism is both from the attacker and from the police.

His inference was phrased in conditional terms. "When they know that people who know the system intervene they start to take it seriously." The implication is made explicit subsequently. "[..] the police decided not [to take it serious] because they know that these people, a lot of them don't know the English (...)". Following the method discussed in Chapter 9, in order to meaningfully understand PA8's utterance "they start

Box 10.7.

Sentence	Formal notation	Description of character
1. "The police is not taking serious the complaints by the Chinese". => transformation: take it serious into 'acknowledge'	S (bel) -> A _{outgroup} (neg bel) -> A _{ingroup} [complaints]	Neg 1 st order ToM
2. "So when they know that people who know that system intervene they start to take it seriously." Transformation: take it serious ≈ acknowledge Implicature: when they know that there are no people who know the system, they do not take it serious	P (bel) -> IF A _{police} (know)-> A ^{"someone who knows the system"} (know) -> [attack], then A _{police} (acknowledge) A _(Chinese) or A _{Chinese} (mental attitude). Implicature P (bel) -> IF A _{police} (know)-> A ^{"someone who knows the system"} (neg know) -> [attack], then A _{police} (neg acknowledge) A _(Chinese) experience or A _{Chinese} (mental attitude).	Conditional 2 nd or 3 rd order ToM implies negative ToM

to take it seriously", as readers we need to infer his informative intention, they start to take seriously *their concerns*, or their *experiences*. Hence, for the accusation of this form of racism we found once again that the most pertinent inference was a negative second order mentalistic inference.

The content of examples of accusations of racism discussed in this section consisted of the inference that the perpetrator denied the speaker or the victim his or her independent mental perspective. As for the first pattern identified, a quantitative analysis was performed in order investigate the frequencies of this type of negative second order mental state inference in accusations of racism.

10.3.1.4. Quantitative results II: comparison between frequencies of second order ToM inferences of others' unawareness or denial of own perspective in accusations of racism and episodes not dealing with discrimination

As shown in Table 10.4., in 53.7% of accusations of racism, the participant inferred that the agent was unaware of or denied the speaker (or a third person victim's) his or her mental perspective, whereas this type of inference was only made in 13.1% cases that did not deal with discrimination. Following the procedure detailed in the previous quantitative analysis (see section 10.3.1.1.), for each participant proportions of negative ToM inferences were calculated separately for episodes in which an accusation of racism was made and other episodes in which discrimination was not at issue (see Table 10.5). A Wilcoxon signed rank test revealed that in the context of accusations of racism, participants inferred significantly more often that the perpetrator was unaware of or even denied them their independent mental perspective than when they accounted for experiences that did not deal with discrimination ($Z = 2.38$, $N = 11$, $p = .015$, two-tailed).

A summary of those 19 cases of experiences with racism that did not involve this attribution, given in Table 10.6., shows that 11 of these cases were concerned with forms of 'overt racism'; shouting racial abuse, or physical attacks combined with the shouting of racial abuse, as well as a half-serious threat in one case. In addition, eight cases of covert discrimination that did not involve the inference that the other denied the victim's mental perspective all involved the inference that the 'agent saw me as a black person', which constitutes the relevant mentalistic inference discussed in the first section.

Table 10.4. Numbers and percentages of inferences that agent denied own/ third person's mental perspective in accusations of discrimination and other kinds of experiences

Character of account	Explicit or implicit inference S(bel)-> A1 (neg bel) S/A2 (bel) [x]	No such inference	Total
S accusing A of racism	22 (53.7%)	19 (45.3%)	41
No direct reference to discrimination	8 (13.1%)	53 (86.7%)	61
S discriminating	0	3 (100%)	3
Discussion discrimination	1 (10.0%)	9 (90.0%)	10
Total	31	84	115

Table 10.5. Proportions of participants' negative first and second order ToM inferences in accounts of accusations of discrimination and in experiences not dealing with discrimination, means, standard deviations and ranges in brackets

	<i>N</i>	Mean	<i>SD</i>	Range
Proportion of negative ToM inferences in accusations of discrimination	11 ^a	.54	.41	(0 – 1.0)
Proportion of negative ToM inferences in episodes not dealing with discrimination	11 ^b	.15	.29	(0 – 1.0)

^a one missing case due to an interviewee not recounting an episode that dealt with an accusation of discrimination

^b one missing case due to an interviewee not recounting an episode that did not deal with an accusation of discrimination

Table 10.6. Quality of the 19 cases of accusations of racism in which the participant did not make the inference that the agent was unaware of/ denied own or the victim's mental perspective

Character of racism	Frequencies
Overt discrimination	11
Shouting (racist) abuse	6
PW6: stranger shouting abuse on the street when realising that the woman with whom she was walking along the street was her female partner.	
PW6: Witnessing a woman shouting racist abuse to a Turkish passenger on a bus	
PW6: Racist comment made by a 'friend'	
PB9: driver shouting racist abuse to her from car	
PW11: boy calling PW 11 as a boy 'bloody Jew'	
PB14: White students singing 'Hitler songs' in pub in Oxford	
Physical attack	4
PA8: physical attack on Chinese fish and chip show owner 1	
PA8: physical attack on Chinese fish and chip shop owner 2 (episode 'Identity parade')	
PA8: serious attack on Mr Wong, leading to him being permanently physically disabled	
PA8: being personally attacked in the Underground in the 80s	
Other	1
PW17: Half-serious threat: we could give your job to an English person	
'Covert discrimination'	8
PB16: job interview at Brighton	
PB16: job interview at Ammersham (and racist name calling by boys at train station)	
PB 16: job interview at Hampshire	
PB16: parents trying to rent a flat in the 70s: 'sorry, the flat is gone now'.	
PB 9: viewing the white lady's house	
PB9: Curtain shop: you might want to look over there, there are the cheaper ones.	
PB14: excuse for racism in employment: "you're too qualified".	
PB14: being accused of stealing by the manager at the wine shop	

In summary, this analysis suggests that with exception of overt forms of physical abuse, the accusation of racism implied either the inference that the perpetrator viewed the victim in racial categories (specifically in contexts in which another social or personal identity would be more appropriate) or involved negative second order Theory of Mind inferences. These involved on the first order level the inference that the outgroup member was unaware of, or more strongly, denied the victim his or her own differing mental perspective.

10.3.2. Powerlessness and acting upon the perspective of the powerful

As stated earlier, the first part of our initial power hypothesis predicted the powerless to have relatively good and accurate insights into the mind of the powerful since it was argued that they might use such understanding of the powerful for the strategic purpose of adjusting their own behaviour. This shall be explored in the next section.

10.3.2.1. Qualitative analysis III: situated adjustment of behaviour

As a narrative theme, PA8 described the attitude of the Chinese community as “suffering in silence”, as feeling “powerless, helplessness, fear of retaliation”.

Extract 10.8. Identity parade

PA8: I just had a case last Monday. Two white drunken guys went into a fish and chip shop, Chinese fish and chip shop, not buying anything, just shouting, throwing things, “() Chinese, burn the shop down.”

I: Burn the shop down?

PA8: were just shouting (...) the shop owner just sat there, did not answer a single word, just let them shout.

I: ehm

PA8: (this usually their attitude), they just let them shout and after a while they go away. They they just go away, but after a while, they came back with a big stick () the family, big stick, smashed everything in the shop.

I: really?

PA8: [hold the shop owner to the floor, and kicked him..on his bent..nothing. And the shop owner then rang me, told me what happened (and we) called the police. [He said] "And they asked me to do identity parade..what shall I do?" I say, "of course you go." He says 'if I do a parade, and they do a charge, they come back and beat me up.' That's the kind of vulnerability, of the isolation, fear of retaliation.

Box 10.8.

Sentence	Formal notation	Character
<p>"He says 'if I do a parade, and they do a charge, they come back and beat me up'."</p> <p>Transformation PA 8 thinks that the agent thinks that if he does the identity parade, he might cause the youth to get arrested which ultimately leads to their punishing him.</p>	<p>S (bel) -> A bel if A behaviour x, then x cause y in A2</p>	<p>First order ToM attribution of agents reflective awareness of the impact of his own behaviour on perpetrators.</p>
<p>PA8 thinks that the agent thinks that one day the youth will want to retaliate</p>	<p>S (bel) -> A_{ingroup} (bel) -> A_{outgroup} (des) [retaliate A_{ingroup}]</p>	<p>2nd order ToM attribution of ingroup's awareness of outgroup desire</p>

The episode did not involve any explicit mental state attribution of PA8.

However, as discussed in section 9.2.3.8., the participant's description of the shop owner's *behaviour*, his refusal to do the parade, can be seen as indicative for his underlying Theory of Mind usage. Why did he refuse to do the parade, when the arrest of the perpetrators would apparently been in his own interest? From the perspective of the youths, the arrest would be a negative outcome. However, since they would not be imprisoned forever, the shop owner inferred that they would want to retaliate, and he feared they might do so by beating him up. Even if the arrest in itself would be a desirable outcome for him, he already anticipated the attackers' next step and adjusted his own behaviour accordingly.

The following extract illustrates the context dependence of power differentials. PW12 was a white young professional male who described himself as "liberal middle class man, University education". One of his narrative themes were his experiences as a minority member in Brixton ("I definitely feel like a minority down here"), an area in South London which has housed a high Jamaican population for the past thirty years. More specifically, he was aware of being accused by black people for 'gentrifying the area' (as Brixton has become an attractive area for 'white trendies' which led to a sudden rise in house prices) and detailed how he wished to distance himself from that image. However, he assumed that for someone, who was driven out of the area because of mounting house prices, these subtle differences between himself and other white people would not have much meaning. The situated powerlessness that he discussed in the following episode arose from the possibility of immediate danger: being physically attacked.

Extract 10.9. 'getting banged-into' and 'staring-each-other' out scripts

...for instance if some white guy bash...passed me on the middle of a white area, I'd kind of feel, "what is your problem, what is that about?" whereas here, if a guy of another race did that, I'd just kind of.. head down and walk off.

I: right.

PW12: And there's a lot of that.

I: And why would you do that?

PW12: It's fear.

[...] Oh, no no I would always be apologetic if I had done that, what I'm saying, if it happens to you, if someone bashes into you, and..some guy sort of go...(makes some gestures), oh sorry, you'd apologise straight away.

I: even if it was the other guy who..?

PW12: yeah, yeah, yeah. Always always. [...] yeah, because of a lot of the times, to avoid conflict.

[...]

Here, there's a bit of a culture of oppression in young males, the whole kind of Jamaican thing about staring you out. Two men walking towards each other straight ...who wants longest staring at the other, before looking away. That is a real kind of tradition thing, it's a status thing, I mean, you know who glares the longest, who stares the longest, the first one who looks away has lost and you defer to the other, and he walks on and feels better then. And I can't risk any involvement in that, and it's pathetic.

[...] PW12: Well, first of all, that is a MASSIVE generalisation that I was making, but if we do isolate a particular moment, (), and a strong possibility would be that he was doing it on purpose, whereas I know I definitely wasn't doing it on purpose, and I would make every effort to get out of the way, whereas..I'm not so sure whether he would have done that..and given him the benefit of it now, but I also know that I've been through so many incidents like that on a daily basis, where I would just move out of the way for people, because you gonna get banged into..or whatever, and to even pretend that there would be a fifty-fifty element is nothing that these people would be interested in, you know.

Box 10.9.

Sentence	Formal notation	Character
1. "If some white guy...passed 1a. A strong possibility would be that he was doing it on purpose"	If S (perc as)- [A{as white}] then x, If S (per cas) – [A{as of another race}] then y. S (bel) A (intention) [A's behaviour towards S]	0-order ToM, description of hypothetical scenarios; 1 st order ToM inference of outgroup member's intention
1b. "To even pretend that there would be a 50/50 element is nothing that these people would be interested in..." Transformation "they are not interested in only pretending that [...]"	S (bel) A _{outgroup} (neg. interest) (pret) [x]	Awareness of outgroup's state of mind: negative second order ToM
1c. I know I definitely wasn't doing it on purpose	S (bel) S (neg intention) [S's behaviour towards A]	1 st order reflexive awareness of own actions
Implicature "I know that he knows that I know that he did it on purpose"	S (bel)-> A (bel) -> S (bel) A (intention) [A's behaviour]	3rd order 2 nd person ToM inference

The informant engaged in Geertz's (1973) 'thick description'. Just as Ryle's hypothetical boys could differentiate between a blink and a burlesque wink, so PW12 was aware of the cultural meaning associated with 'staring-each-other-out', a symbol of dominance. In the related 'banging into' scenario he showed awareness of the "strong possibility" that this behaviour was intended to be a provocation on the part of a hypothetical and stereotypical Jamaican male. The subsequent apology of PW12 was hypocritical, as he knew that in fact it was the Jamaican who had shoved him and not *vice versa* and that if anything it would have been up to the other one to apologise. He knew that the other knew that too. Still, he apologised, signalling to the other that he

ostensibly accepted his superiority at which he privately did not believe. In other words, he acted upon the inferred expectation of the other regarding his own behaviour.

10.3.2.2. Qualitative results IV: cultural assimilation as a strategy to avoid racial discrimination

The next extract shows that inferences of the states of mind of the powerful can affect own behaviour even to a more profound degree. The example involved PB9's account of her mother's not allowing PB9 and her siblings to speak their mother tongue.

Extract 10.10: Speaking English to assimilate into the system

PB9: She she was aware [of the problem of racism], but she wouldn't think that we would encounter them, she thought because that black children, cause we spoke the language,

I: right

PB9:...we would assimilate

I: right

PB9:...into the system.

[...]

PB9:...because like although we weren't allowed to speak our mother tongue at home, because she didn't want us to, because she thought if we learnt, if we spoke that way all the time, then we would be more discriminated against, like her [...]

It appeared that not allowing her children to speak their mother tongue was used as a measure intended to prevent them from becoming the target of white people's racism that she herself had experienced. It seems that she made the inference that by speaking a foreign language her children would be perceived as foreigners, but by

Box 10.10.

Sentence	Formal notation	Emergent character
1. "she was aware of [the problem of racism]	1. S (bel) -> mother (aware)-> [problem of discrimination] (l.239), and	S's inference of mother's awareness of external problem
2. If we spoke that way [mother tongue] all the time, then we would be more discriminated against, like her	2. S (bel) -> mother (bel) -> [outgroup discriminate against her more because she did not speak English]	Conditional involves implicature: mother's self reflexivity upon the reasons for which she was being discriminated against
3. She thought because we spoke the language we would assimilate	3. S (bel) -> mother (neg bel) -> [problem for children, because children speak the language] (l. 239), and	S's inference of mother's desire to prevent that this problem affects her children
4. "If we learnt, if we spoke the language all the time, we wouldn't be discriminated against, like her"	4. S (bel) -> mother (bel) -> {if children speak mother tongue, then they'll be more discriminated against, and if children speak English, then they'll assimilate and experience less discrimination}, therefore	S's inference of mother entertaining alternatives
5. Implicature	5. S (bel) -> mother (bel) -> {if children speak mother tongue, then they'll be more discriminated against, and if children speak English, then they'll assimilate and experience less discrimination}, therefore	1 st order inference of mother's belief about hypothetical alternatives

speaking English as a first language, they would be perceived as 'Black British' and therefore more likely to be accepted. The example indicates that members of a powerless group act upon the perceived mental perspective of a more powerful

outgroup, and that this awareness of the powerful's mental perspective affects own behaviour at a persistent and profound level.

10.3.2.3. Quantitative analysis of the relation between power relations, ToM and social action

A quantitative analysis was conducted to explore the relation between power relations, participants' Theory of Mind inferences and the outcomes of social interaction. For this analysis, we first coded for each narrative episode the power relation between self (participant) and other according to the criteria presented in section 10.1. In a second step, for each participant the numbers of episodes in which s/he was defined as powerful/ less or in a neutral relation with other(s) was noted. As the dependent variables, we noted the frequencies to which participants acted upon own belief-desires, were obstructed in acting upon own belief-desires or acted upon the other(s) beliefs. A further category was reserved for episodes of which the outcome of an interaction was not discussed. To account for the varying numbers, to which participants were characterised in the three power relations across episodes comprising one interview, proportions were calculated. These are shown in Table 10.7. However, since only three participants talked in a total of six episodes about encounters in which they construed themselves as powerful, this category was excluded from the subsequent analysis. Using Wilcoxon signed rank tests, it was found that when being in a situation of powerlessness, the possibility to act upon one's own mental perspective was significantly more often obstructed than when the relation between self and other was defined as neutral ($Z = -2.20$, $N = 11$, $p = .027$, two-tailed). Moreover, compared to

Table 10.7. Proportions to which participants characterised as powerless, powerful or in neutral relations acted upon own belief-desires, were obstructed in acting upon their own belief-desires, acted upon others' belief desires or talked about experiences with undetermined outcomes.

	<i>N</i>	Acting upon own belief-desires	Acting upon own belief-desires obstructed	Acting upon others' belief-desires	Outcome not determined
Self powerless	12	.15 (.29)	.46 (.42)	.19 (.21)	(.31) (.28)
Self neutral	11	.28 (.26)	.04 (.09)	.06 (.10)	(.62) (.20)
Self powerful	3	.50 (.50)	0	.17 (.29)	.25 (.31)

participants in neutral relations, a trend was found for the predicted tendency of powerless participants to act upon the mental perspective of those in power ($Z = -1.57$, $N = 11$, $p = .07$)¹. However, unexpectedly, there were no differences in the extent to which under both conditions participants acted upon their own belief-desires ($Z = -9.71$, $N = 11$, $p = .33$).

¹ Since we predicted an effect of power on subsequent 'actions as from the perspective of the other', it seemed warranted to refer to the less conservative 1-tailed p value (Brace, Kemp & Snelgar, 2000).

10.4. DISCUSSION

With this study we set out to explore whether social contextual variables might affect Theory of Mind usage. Whilst our initial aim was to compare Theory of Mind usage in different power relations, the interview material allowed us to study mainly a related phenomenon: Theory of Mind usage in the accounts of discrimination. To what extent could a Theory of Mind approach contribute to our understanding of racism beyond what we had known before about this phenomenon? In summary, the study suggests that Theory of Mind usage constitutes a relevant cognitive process for participants' subjective understanding of experiences of discrimination. Two specific patterns of Theory of Mind usage were related to the accusation of discrimination. Firstly, Theory of Mind seemed to play a major role in the process of subjectively establishing an act as racist. Secondly, the content of a large proportion of accusations of racism involved participants' second order negative mentalistic inferences. This particular type of ToM inference involved an awareness of the perpetrator's (differing) mental perspective in which was embedded the inference that s/he in turn was unaware of, did not understand, did not recognise, or actively denied the victim's own mental perspective. This latter finding lent *indirect* support to the second part of our initial power hypothesis that predicted that those in power (the one who enacts discrimination) might have a diminished awareness of the mind of the powerless (his or her victim). It was shown that this same mechanism operated at different levels and across different forms of racism, including intimidation and problematization practices and the denial of racism.

We reasoned that *not* taking the victim's mental perspective would be of strategic use for the perpetrators, serving as a cognitive tool to rationalise existing inequalities and to justify own present and future actions. The qualitative analysis lent preliminary support to this suggestion. For example, problematizing PB9 served the museum manager as a justification for not engaging in any action. The schoolteachers were able to sustain their hegemonic beliefs about the "savages" in the West Indies by calling the pupil who attempted to challenge this view a liar. On an institutional level, proclaiming that racism against certain ethnic groups does not exist perpetuated the Chinese' vulnerability for racial attacks. The quantitative analysis showed that whilst in the context of accusations of racism, negative first and second order ToM attributions to the perpetrator were significantly more frequent than in the accounts of other kinds of experiences, they were only made in about half of all incidents. Does this challenge the suggestion that the inference of the other's denial of one's own perspective represents a substantial part of the experience of discrimination? A closer inspection of the character of these experiences revealed that all incidents in which such an inference was not found involved forms of overt racism (e.g. shouting racist abuse, or racially motivated physical abuse). By contrast, of the interview material in total, most of the incidents of discrimination discussed were 'covert', as for example, when a customer from a minority group is treated with less respect than a white customer or when a white job applicant receives preferential treatment. This high proportion of 'covert' cases is not surprising given that on the whole, Britain, like other European and American societies, has politically subscribed to 'cultural pluralism'. The point is that when we distinguish between episodes dealing with accusations of 'covert' and 'overt' forms of racism, and

only consider the 'covert' experiences, then the frequencies of negative second order ToM inferences augments to more than 75% of incidents. Possibly, when faced with a blatant physical attack, the action speaks for itself and requires little interpretative effort from the victim. True, episodes of covert discrimination also entail a negative, often unexpected outcome for the victim, yet the action *per se* does not seem to constitute the prime focus of the victim's accusation. Rather, at the centre of the accusation appear to be considerations of the perpetrator's states of mind that motivated his/ her actions.

Furthermore, the study explored one facet of our initial power hypothesis that predicted the powerless not only to be motivated to take the mental perspective of those in power, but also to use this information to adjust their own actions (for example, in order to avoid the powerful's punishment). The qualitative analysis showed that a number of participants used their understanding of those construed as powerful for such strategic purposes. For example, PW12's account suggested that in the context of situated powerlessness, he used his insights into the mind of the Jamaicans strategically and acted according to other's expectations from him. Further examples showed that people who were in broad areas of their lives members of a minority group employed this 'strategic component' at an even more profound level. For example, PB9's mother insisted on her children speaking English in order to assimilate and avoid discrimination. PB16 recounted that ageing, perceived from her personal and Nigerian cultural perspective as positive and associated with higher status, became a negative attribute for her mother who began to perceive it through the lense of the dominant Western perspective.

However, a subsequent quantitative analysis suggested that this strategic usage of the others' mind was overall not very frequent. Instead, the most common outcome for the powerless was the obstruction of own beliefs. This was to be expected, as power differentials entail by definition (see Dépret & Fiske, 1996; Rodriguez-Bailon et al., 2000 and Chapter 8) the extent to which one has control over the outcomes of the other. Moreover, we only found a trend for participants in powerless situations to act more often upon the mental perspective of those in power than when in 'power-neutral' conditions. Whilst this result does not lend support to our prediction, it cannot be seen as challenging it either. We simply lacked the relevant dimension of comparison, namely the extent to which those in power acted upon the mental perspective of the powerless. That also in 'neutral', mainly interpersonal relations, people are willing to take the other's mental perspective and act from that, is consistent with the more global 'relevance' hypothesis, as laid out in Chapter 8. This suggested that as soon as the other is perceived as relevant to oneself, he or she might be more inclined to attempt to understand the world through the other's eyes. However, it is possible that participants in the 'neutral' relations acted from others' perspectives for different reasons. The motivation might not have primarily been the strategic benefit, but rather a 'true' concern about the other.

Before turning to a discussion of implications of this study, it is necessary to note a number of limitations. Obviously, the material did not permit us to fully test our hypotheses – we simply lacked the 'powerful'. This might be partially related to the cover story and the context of the study. Initially, it was assumed that in the context of

ethnic relations, white people might be more often relatively powerful in relation to African Caribbean and Asians. Perhaps the 'cover story' was not suitable for attracting 'the powerful'. Firstly, the response of white English people was overall much poorer than the response from people of other ethnic backgrounds. Secondly, it appeared that we recruited only a certain type of white participant, namely those white English people who construed themselves as liberal-minded and found the issue of exploring the notion of a multi-cultural society interesting enough in order to devote 1-2 hours of their spare time for it. Perhaps related to the second argument, we found that thirdly, white participants did not construe themselves significantly more often as powerful than black and Asian participants. They either talked about experiences in which power was not at issue or construed as about equal, or even in the context of ethnic group relations, also positioned themselves as powerless. While these characteristics rendered it impossible to fully explore our initial aim with the present interview material, especially the latter finding supports the notion of the power construct as situated and flexible. Moreover, despite efforts to recruit participants from diverse socio-economic backgrounds, with the exception of one participant, all were in higher education or professionals. On the one hand, this restricts the generality of the results. On the other hand, it suggests that experiences with racial discrimination cannot be reduced to class differences.

The limitations just discussed do not affect the extent to which this approach has been informative about how adults use Theory of Mind in practice. Although due to space limitation, this was not discussed in great detail, the extracts presented in earlier sections suggested that adults' mentalistic inferences involved an appreciation of

relevant cues given in the immediate environment, especially those picked up from others' behaviour and prior knowledge. Participants were usually able to explain, particularly when being prompted, why they attributed to an agent a particular state of mind. 'Mindreading indices' included, for example, tone of voice (e.g. PB9 imitated the man's "harsh tone of voice" when dealing with her at the museum) or body language (e.g. PB16 accounting for discrimination at a job interview: 'she couldn't see me in the eyes'). This suggests that in addition to the requirement of having a representational Theory of Mind, the adults also had to be 'smart behaviour readers' (Whiten, 1996), sensitive and quick in catching behavioural clues in an ongoing interaction in order to account for their experiences. Beyond this, in various instances participants also drew on their cultural knowledge to make mentalistic inferences. For example, PB9 argued that the landlady's initial remark "you had better come in then" deviated from the canonical 'visiting-a-house-script', and PW11 could not have adjusted his behaviour, had he not had some knowledge of the 'staring-each-other-out' script. This supports the suggestion made in the first part of this thesis that cultural knowledge is necessary for appropriate Theory of Mind usage in practice.

In addition, the study suggested that 'inside' their narratives, participants rarely made ToM inferences computationally more complex than on the second order level. Instead, they often seemed to entertain different mentalistic inferences in parallel (e.g. PB9: "she said it as a joke and also because she believed it"). Furthermore, as shown notably in the categories 'general talk' and 'examples', Theory of Mind inferences were often embedded in hypothetical scenarios, including if-then constructions.

In summary, the study was exploratory in character, and the interview material posed an immediate constraint upon the initial aim of comparing Theory of Mind in different social relations. The initial question whether the powerful are really worse in taking and using the mental perspectives of the powerless than *vice versa* requires future research. Suggestions for possible ways to address this question and to overcome the limitations of the present study are postponed to Chapter 12. However, the interview material lent itself to study a related phenomenon, how Theory of Mind is used during the experience of social actions of discrimination. By deploying the method developed in Chapter 9, we could account for the richness of naturalistic talk and make comparisons of frequencies. The study showed that the quality and quantity of Theory of Mind talk differed when people consider episodes of situated powerlessness (that is, being discriminated against) from accounts of experiences in which they are equally powerful than the other. This suggests that Theory of Mind usage is flexible, depending upon the social relation between self and other. Moreover, mentalistic inferences seem to occupy a crucial role in the definition of social actions, such as experiences of racism.

DOES POWER AFFECT THEORY OF MIND USAGE?
THE 'READING THE MIND IN THE EYES TASK

1.1. INTRODUCTION

The aim of the study presented in this chapter was to investigate directly and experimentally whether power differentials influence situated theory of mind deployment. Recall from Chapter 8 that we were specifically interested in the influence of group power, i.e one's relative power derived from the membership of a discrete social group in relation to members from a specific outgroup. As opposed to individual differences in power motivation, it was argued that group power might be most relevant to explore issues of collective action and social change (see Haslam, 2001). As detailed earlier, we did not expect powerless people to show an across-the-board superiority in understanding others' mental states, but we expected those in a subordinate position to be specifically good at understanding the mental states of *powerful* others. In the same vein, those in power were expected to show only insensitivity in relation to the mental states of their subordinates.

The challenge for the operationalisation of this research question was to find a paradigm that required participants to infer mental states of others who were either more or less powerful than oneself. Within the Theory of Mind literature, most existing tasks were considered as unsuitable because they were either designed for testing Theory of Mind abilities at the level of preschoolers and/or used stories, in which the characters

were unrelated to the participants. There was, however, one exception: the 'Reading the Mind in the Eyes Task' or, more briefly, the 'Eyes Task' (Baron-Cohen et al., 1997; 2001). This task was designed specifically with the aim of exploring more subtle cognitive dysfunctions in individuals at the very high-functioning end of the autism spectrum, as well as it has been used to measure subtle gender differences in Theory of Mind within the normal population. We felt that this task could be adapted for the present purposes.

11.1.1. The Reading the Mind in the Eyes task

By taking the metaphor of the eyes as a 'windows to the mind' seriously (Baron-Cohen, 1995), the Eyes Task consists of a series of photographs showing the eye region only. Participants are given four mental state terms amongst which they are required to make a forced choice (e.g. concerned, *versus* playful, serious, friendly).

Some authors (e.g. Jarrold et al., 2000) have remarked that this task does not measure representational Theory of Mind in the narrower sense, as it does not require one to make inferences about the content of mental states. However, the task taps into one aspect of Theory of Mind, namely to accurately identify and distinguish between different mental attitudes on the basis of cues given by the eye region only. It is seen as a 'pure' Theory of Mind task as other cognitive requirements, including the usual executive function component, are kept to a minimum. Moreover, although only tapping into the first order Theory of Mind level only, the Eyes Task is considered as measuring Theory of Mind at an advanced level. Firstly, the task requires one to have a lexicon of complex mental states and knowledge of the semantics of these terms. (In contrast to

basic emotions, such as happy, sad, angry, complex mental states – for example, surprise - involve attribution of a cognitive state, such as a belief or intention to the person). Secondly, one needs to map the mental state terms onto fragments of facial expressions, and finally it is required to match the eyes in the picture to examples of expressions of eye-regions stored in memory and seen in the context of particular mental states.

The original version of the Eyes Task (Baron-Cohen et al., 1997) was validated against Happé's (1994) 'Strange Stories' Task, then the only other available more 'advanced' Theory of Mind task, pitched at the level of a normal 8-9 year old. However, several psychometric problems led the authors to revise the task (Baron-Cohen, Wheelwright, Hill, Raste & Plumb, 2001). The revised version of the test includes four modifications; (i) an increase in the number of test items, (ii) an increase in the number of forced-choice response options from two to four for each trial, (iii) usage of complex mental states only, and (iv) in most of the trials, the target and three foil terms have the same emotional valence (e.g. serious vs. ashamed, alarmed, bewildered). As reported by the authors, the new version has greater power, gives a broader range of scores, and decreases ceiling effects. Therefore, the test is assumed to be better able to distinguish between subtle 'grey shades' of mindreading differences.

11.1.2. Overview of study and predictions:

In this study we operationalised power by creating a simulated workplace environment (see also Rodríguez-Bailón *et al.*, 2000; Goodwin & Fiske, 1996, for similar paradigms) in which participants were allocated either to the position of

supervisor or worker. Participants were made to believe that the photographs depicted either powerful supervisors or powerless workers with whom they were going to directly interact during the course of the experiment that allegedly studied 'creativity in the work place'.

Our predictions were thus:

1. Powerless people will be better at reading the mental states of powerful outgroup members than of equally powerless ingroup members.
2. Powerful people will be better at reading the mental states of their ingroup members than of their powerless outgroup members.
3. There will be no difference between powerful and powerless people in identifying the mental states of their respective ingroup members of comparatively equal power.

Table 11.1. Schema of predicted group differences in identifying supervisors' and workers' mental states

Rater (Participant identity)	Target identity	
	Supervisor	Worker
Supervisor	+	-
Worker	++	+

+ = better performance

- = worse performance

11.2. METHODS

11.2.1. Participants

Thirty-seven students (eight male, twenty-nine female) of the University of St Andrews took part in this study. Gender was balanced between supervisor and worker conditions. Ages ranged from 17 to 56 years (mean age: 21.24 years).

11.2.2. Task material

11.2.2.1. Eyes Task

Twenty-two photographs of Baron-Cohen et al's (2001) revised version of the Eyes Task were used. On the basis of a pilot study with six students, fourteen eyes stimuli were excluded as especially the females either resembled models being professionally photographed for a magazine, or because students believed the photographs to represent famous personalities.

Several modifications to the original procedure were introduced:

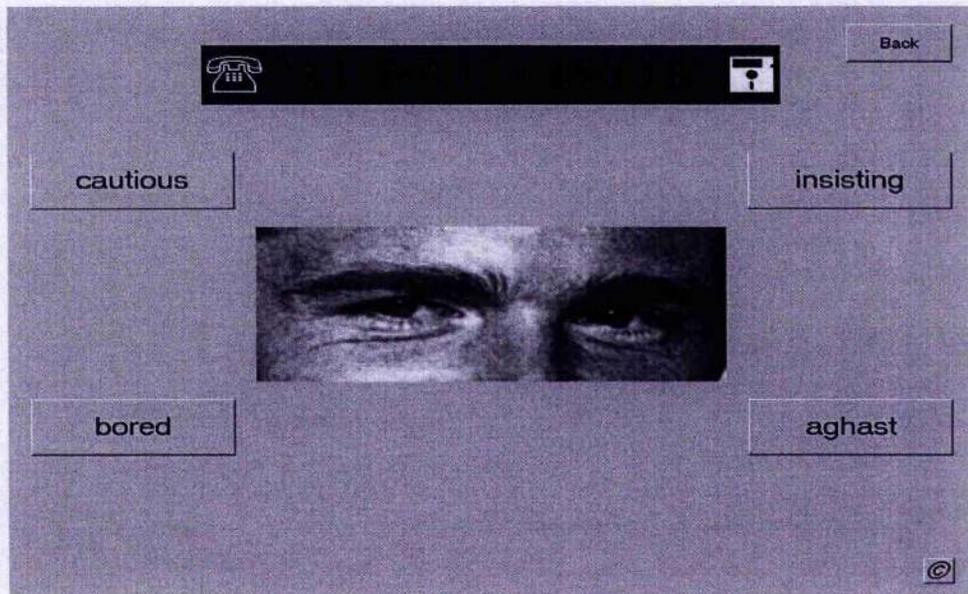
1. The eyes test was computerized.
2. Half of the photographs were labelled as *supervisors*, half of them were labelled as *workers*. Photographs of supervisor and worker eyes were presented in blocks. (Block 1 consisted of 11 supervisor stimuli, block 2 of 11 worker stimuli). The order of the blocks as well as the photographs labelled as supervisor and worker were counterbalanced.

3. Before each trial, a mask appeared on the computer screen, saying "You will now see the eyes of one of your [the other] supervisors [workers]. The participant was verbally instructed to press the space key for the photograph to appear.
4. Each photograph then appeared on the computer screen for 3 seconds only. In contrast to Baron-Cohen et al's original procedure, the time limit was introduced to further minimise possible ceiling effects. Above and below each photograph, Baron-Cohen et al's original target term and three foil terms were presented. An example of stimuli presentation is given in Figure 11.1.
5. Reaction time measure: The photograph then disappeared, leaving four buttons with one target and three foil terms. The participant was free to take as much time as s/he wished to choose the term that s/he thought best described the supervisor's [worker's] thoughts or feelings. The time that participants took to make their choice, however, was unobtrusively recorded by the computer, and provided a reaction time measure.

11.2.2.2. Attention measure

In order to explore whether potential group differences on the Eyes Task were related to attention processes, a separate attention measure was introduced. This consisted of self-descriptive questionnaires of supervisors and workers with whom participants were told to interact during the group session. Questionnaires were composed on the basis of a pilot study with 9 participants. Profiles included dominant, neutral and submissive person profiles, counterbalanced across supervisor and worker

Figure 11.1. Example of Eyes Task stimuli



The eyes picture was displayed in the middle of the screen and - together with the four mental state labels - was first presented for 3 seconds. The identity of the individual was clearly marked by the label 'supervisor' or 'worker', respectively. After 3 seconds, the photograph automatically disappeared, leaving the four labels only. Participants were instructed to click on the label that they felt best described the message displayed by the eyes of the target individual.

identities. The time taken to examine each questionnaire was automatically collected by the computer and constituted the attention measure.

11.2.3. Procedure

11.2.2.1. Cover story: "Creativity at work"

The experiment was advertised (via sign-up sheets or introduced at undergraduate tutorial classes) as a study investigating the "effect of social dynamics on creativity at work". Prospective participants were sent an initial e-mail in which they were told that the experiment involved two distinct parts: an 'individual briefing session' and the actual 'group experiment', comprising 6-8 group members. Students were told that the purpose of the individual briefing session was to explain in detail the procedure of the group experiment and his or her part in it, as well as to allow participants to exchange information about the other group members prior to the experiment. To this end, students were also asked to 1) complete a short self-descriptive questionnaire, and 2) to send the experimenters a photograph that 'describes well who you are'. Both tasks served solely the purpose of enhancing the plausibility of the procedure as students received similar information about allegedly other group members at a later stage. The appointment for the group session was to be scheduled after the first part of the experiment. In reality, the whole experiment only consisted of the 'individual briefing session', with the present participant being the only person who took part in it.

11.2.2.2. 'Individual briefing session' - main experiment

Upon arrival in the laboratory, the participant was greeted and seated opposite to the experimenter. Several props were displayed in the laboratory (arrangement of chairs labelled either 'supervisors' or 'workers', pictures of students' eyes and face parts hung up at the wall, tables of opaque group results, boxes with gear) to make participants believe that group experiments were actually taking place here.

The experimenter explained that the study aimed to look at whether social factors might impact on creativity in the workplace. To this end, it was sought to model a company in the laboratory. This company aimed to mimic two central features of real life organisations: firstly, it was pointed out that people hold different positions in companies (which referred to the power manipulation), secondly it was stressed that people at work know each other (which introduced the dependent measures). Participants were told that each mock company would be divided into 3 'supervisors' and 3 'workers'. Hereafter, the participant was given a sheet with his or her group identity as either a supervisor or worker. Instructions are summarised below and a full protocol is given in Appendix 11.1.

11.2.2.3. Power manipulation

Power was manipulated by telling participants in both groups that supervisors had the ability to control the workers' outcomes in two ways. During the first part of the group experiment, supervisors as a panel would interview each worker for their 'job aptitudes'. Supervisors' evaluations had real consequences for the assignment of workers to different types of tasks that varied in terms of their desirability and creative

demands. A creative job involved, for example, inventing a slogan for a new product whilst an uncreative job required the worker to cross out every 't' in a business letter. During the second part of the group experiment, workers were asked to carry out their respective tasks. The description highlighted that supervisors were in a position to enact their power by means of either rewarding a worker for particularly good performance or of penalising the worker for bad performance. At the end of these instructions, participants were encouraged to discuss any questions about the procedure of the group experiment.

11.2.2.4. Dependent measures

To introduce the dependent measures, participants were told that in real organisations, people are to a certain degree familiar with their supervisors and subordinates. In order to make the study more realistic they would therefore now receive some information about the other supervisors and workers. This information consisted of participants' self-description as well as photographs. The participant was then led to a computer.

1- Eyes task

Participants were told that people often form their first impression about others by looking at them and that the eye region had been found to be most diagnostic. Taking up these insights, photographs of supervisors and workers were cropped, leaving the eye-region only. However, as social norms usually do not permit us to stare at people endlessly, each photograph would be shown for three seconds. Participants were then

told that above and below each picture, four words were given. They were asked to click on the word that the participant thought best described what the supervisor or worker was thinking or feeling. A mask appeared before each stimulus that enhanced the salience of the identity of the target.

2- The attention measurement:

After completion of the Eyes task, participants were presented with the computerised questionnaires that they were told had been completed by other group members (three ingroup and three outgroup questionnaires). In addition to the reaction time measure, the attention measure was aimed to establish whether attention may serve as a 'co-cursor' (Gómez, 2002) for mental inferencing. The questionnaires omitted names and other personal demographic information, and only identified group members as worker 1,2,3 or supervisor 1,3,4 (participants were always identified as worker no 4 or supervisor no 2). Participants were only instructed to read through the six questionnaires in their own pace, and to click on a 'next' button once they had finished reading a questionnaire to go on to the next one.

3- Social identification and power manipulation checks

After completion of the two computerised tasks, participants were given a questionnaire assessing his or her social identification as a supervisor or worker. Three items were to be rated on 5-point Likert-type scales. The items were "How strongly do you identify yourself as a supervisor [worker] in this experiment" (1= identify- 5=not

identify), "I see myself as belonging to a group of supervisors [workers]", "I would rather not be a supervisor [worker]" (1= "strongly agree – 5 = "strongly disagree").

The following 5 items assessed the effect of the power manipulation.

"How much control do you feel you have over your own outcomes during the experiment?"; "How much control do you feel you have over the outcomes of the [other] supervisors during the experiment?"; "How much control do you feel you have over the outcomes of the [other] workers during the experiment?"; "How much control do you feel the [other] supervisors have over your outcomes in this experiment?"; and "How much control do you feel the [other] workers have over your outcomes in this experiment?" All items were to be rated on 7-point scales (ranging from 1= 'strong control' to 7 = 'strong lack of control').

4 - Check for suspicion

Upon completion of the questionnaires, the experimenter explained that – as in many social psychological studies – at the outset it was not possible to inform the participant in full about all research aims. Participants were asked whether they had any idea about what else the study might be looking at, and whether anything had struck the participant so far. Hereafter, participants were given a debriefing sheet that fully summarised the real intent of the study and were encouraged to discuss any remaining questions (see Appendix 11.2). All participants expressed understanding about the deception that the study involved. Finally, each participant was paid £4 and dismissed.

11.3. RESULTS

The results are organised in two main sections. First, the results of the manipulation checks are discussed, i.e. whether participants suspected the real intent of the study, the degree to which they identified with the assigned supervisor versus worker identities, and the extent to which the power manipulation had worked for both groups. Then, the results of the Eyes Task and the Attention measure will be presented.

11.3.1. Suspicion

Four participants voiced suspicion as to whether the group experiment was going to take place, or spontaneously voiced doubts that they were going to meet the people whose photographs they had seen. One person had language difficulties and did not know some of the mental state terms. These participants were subsequently excluded from the data analysis, leaving 33 participants (16 supervisors and 17 workers). Participants who only said in the final discussion, after having been informed about the real intent of the study, that they were unsure whether they would really meet the people in the photographs, were not excluded.

11.3.2. Social identification

To compute a total social identification score, the ratings on each of the three sub-scales were added up and divided by three. The third scale, which was negatively worded, was first reversed. If 1 represents strong identification and 5 strong disagreement with the assigned identity, group means show that the supervisor group

identified more strongly with their group (mean: 2.01) than the workers (mean: 2.67).

An independent t-test revealed that this difference was statistically significant ($t(31) = -2.69, p = .011$).

11.3.3. Power manipulation

To check whether our intended power manipulation was successful, participants' responses on the five scales were submitted to two separate analyses. Descriptive statistics are shown in Table 11.2.

11.3.3.1 Analysis of each of five sub-scales

a. Control over one's own fate - We expected supervisors to feel highly in control over their own outcomes in this experiment, whilst workers should feel being controlled by the decisions of the supervisors. Although group means went into the predicted direction, workers still felt on average 'slightly in control' over their own outcomes, which precluded a significant group difference ($t(31) = -1.48, p > .158$).

b. Own control over others' fate - As expected, workers felt that they had a slight lack of control over the fate of supervisors, whereas supervisors felt neutral to slightly in control over the outcomes of other supervisors. This difference was significant ($t(31) = -3.90, p < .001$) Likewise, supervisors felt they had control over the outcomes of workers, whereas workers indicated that they were neutral to slightly lacking control when it came to the outcomes of other workers ($t(31) = -5.52, p < .001$).

c. Others' control over own fate - Contrary to expectations, the groups did not differ in terms of the perceived degree of supervisors' control over their own fate, ($t(31) = 1.28, p = \text{n.s.}$). Inspection of the means showed that – as intended- supervisors felt neutral about the level of control that other supervisors had over themselves, whereas workers felt to a slight extent being controlled by supervisors. It appears that the power manipulation was to some extent successful for the workers, but weaker than intended, which seems to have precluded a significant difference from the supervisors. As far as the perceived impact of workers' control over one's outcome was concerned, supervisors perceived workers as slightly lacking control over themselves, whilst workers felt on average that the impact of fellow workers was neutral. Whilst this result is intuitively meaningful within the context of the experimental manipulations, the group differences remained once again non-significant ($t(31) = 1.5, p = \text{n.s.}$).

11.3.3.2 Within-item comparisons

A second set of analyses, using repeated measures ANOVAs, compared the perceptions of the amount of control that supervisors versus workers had over the participant, and the amount of control the participant had over other supervisors and workers in this experiment.

a. Supervisor vs. worker control over self - As expected, both groups felt that supervisors had more control over oneself than workers, $F(1, 31) = 13.09, p < .001$.

b. Self control over supervisor vs. worker - A significant main effect on target suggested that both groups felt that they had more control over other workers than other supervisors, $F(1, 31) = 25.66, p < .001$.

Table 11.2. Means of supervisor and workers' rating on the five power manipulation sub-scales (1= strong sense of control, 7= strong lack of control)

	Participant Identity	Mean	SD
Control over own fate	Supervisor	2.64	.996
	Worker	3.32	1.34
Self control over supervisors	Supervisor	3.70	1.04
	Worker	5.29	1.31
Self control over workers	Supervisor	2.23	.831
	Worker	4.70	1.69
Supervisors' control over self	Supervisor	3.00	.707
	Worker	2.58	1.12
Workers' control over self	Supervisor	4.11	1.36
	Worker	3.41	1.37

11.3.4. Eyes task

As expected, no order-of-presentation effects were found. Although our sample was strongly biased towards females, we also checked for possible gender differences. There were no group differences in terms of the number of correctly identified mental states of supervisors or workers.

11.3.4.1. Number of correct stimuli

Of our main interest was whether supervisors and workers differed from one another in terms of the number of correctly identified mental state expressions of other supervisors and workers. Group means for correctly identified worker stimuli, supervisor stimuli, and the total number of stimuli are shown in Table 11.3.

First, a set of between-group analyses was conducted to see whether the workers and supervisors differed in terms of the number of correctly identified mental states of supervisors, workers or in terms of the total number of correct mental state identifications. As it will be recalled from Table 11.1, two main effects, on participant identify and on target identity, were predicted. Repeated measures ANOVAs showed a significant main effect on target identity ($F(1, 31) = 3.89, p = .05$). By contrast, there was no significant interaction effect ($F(1, 31) = .80, p = .37$). This suggests that overall; participants were better at identifying the mental states of the powerful supervisors than the relatively powerless workers.

Table 11.3. Means of correctly identified supervisor, worker and total stimuli for the supervisor and worker groups (standard deviations in brackets)

Target Group identity	Supervisor stimuli (Max = 11)	Worker stimuli (Max = 11)	Total stimuli (Max = 22)
Supervisor	8.4 (1.6)	7.2 (1.6)	15.5 (2.7)
Worker	7.7 (1.7)	7.2 (1.5)	14.7 (2.9)
Total	8.0 (1.7)	7.2 (1.5)	15.3 (2.6)

Table 11.4. Reaction times (in seconds) for identifying supervisor stimuli, worker stimuli and in total for supervisor and worker groups (standard deviations in brackets)

Target Group identity	RT Supervisor stimuli	RT Worker stimuli	RT Total
Supervisor	81.42 (36.96)	85.82 (39.17)	167.27 (67.57)
Worker	74.22 (22.67)	67.65 (20.11)	141.87 (39.22)
Total	77.92 (30.63)	77.0 (32.29)	154.92 (56.32)

11.3.4.2. Reaction time on Eyes task

Reaction times are shown in Table 11.4. Repeated-measures ANOVAs showed that supervisors took significantly longer than the workers to identify the worker stimuli ($F(1, 31) = 6.5, p < .02$). There was no effect of group identity on the time needed to identify the supervisor stimuli, ($F(1,31) = .90, n.s.$).

11.3.5. Attention measure

Inspection of the means shows that supervisors and workers virtually did not differ in terms of the time they spent attending to the self-descriptive profiles, neither in total nor when supervisor and worker profiles were considered separately.

Consequently, a repeated measure ANOVA with the within-subject factor 'identity of attention stimuli' yielded non-significant results for both main effect ($F(1, 29) = .21, p = .65$) and interaction ($F(1, 29) = .931, p = .344$).

11.4. DISCUSSION

The present study represents the first attempt to explore experimentally the possibility that social conditions might modulate Theory of Mind usage in practice. To summarise the results for the eyes task measure first: in line with our initial hypothesis, overall, participants were better at identifying the messages displayed by the eyes of supervisors than of workers. However, contrary to expectations, workers performed altogether somewhat worse than supervisors, although this difference did not reach significance.

In the remaining part of this discussion we shall in turn discuss five factors that might have contributed to the results: 1) social identification (weaker for workers than for supervisors) 2) experimental power manipulation (weaker for workers than for supervisors), 3) potential problems associated to the procedure (i.e. artificiality, task presentation as detached from a real on-line interaction), 4) potential problems with the Eyes Task as a suitable ToM measurement, and 5) the need of further theoretical specification (i.e. the power construct).

Social identification. The workers behaved contrary to two predictions. On the one hand, as a group they did not perform better than the supervisors, but in fact worse. On the other hand they were also only marginally better at identifying the supervisor than the worker targets. One factor that might have contributed to both results could have been that students assigned to the worker condition identified themselves less with the worker identity than students assigned to the supervisor condition. From the perspective of Social identity Theory, this is not surprising, as 'workers' may be perceived as a less desirable group to belong to than 'supervisors', and people usually seek to enhance their self-evaluation by association to positive or desirable groups. This weaker identification might have also been related to the fact that no justifications for group assignments were given (although a few participants voiced the guess that group assignment might have been based on the self-descriptive questionnaire they had filled in earlier). What is more, being a member of a less desirable group may have contributed to the workers diminished self-esteem in this experiment. Independently or paired with a weaker social identification, lowered self-esteem might have led the

workers to lack motivation, which could be one interpretation for the faster reaction times on the eyes task and the slightly larger amount of mistakes made.

Power manipulation. Responses on the power manipulation check revealed that on average, the workers felt that their outcomes were only slightly controlled by the supervisors. Of the five components of the power construct that were measured, for our predictions, this component might have been most crucial (i.e. more relevant than the amount of control that workers felt they had over others' fate). Hence, while overall, the power manipulation was somewhat successful for the workers; it might have been too weak to produce the intended effect.

Procedure. Although by and large, participants found the cover plausible, the actual eyes task was presented somewhat detached from the rest of the cover story. And although there was a mask in front of each photograph, aimed at enhancing the salience of the target's identity, some participants verbally reported that they had not taken into consideration whether the person in the photograph was a supervisor or a worker. Therefore, there is a possibility that the study did not tap to the same extent into on-line usage as if participants were directly interacting with superior and subordinate others. In other words, the task material and its administration in the context of the cover story might have been too insensitive, which could have contributed to the negative findings. However, these criticisms seem unlikely to be able to account for the predicted results for the supervisors.

The Eyes task. In their discussion, Baron-Cohen et al. (2001) acknowledged a possible critique of the revised version of the eyes task, namely that stimuli are static and not dynamic, as are real world interactions. The usage of these stimuli, however,

seemed to be warranted in order to avoid especially the problem of controllability, which seems inevitable in 'real' interactions (and to some extent even in paradigms employing confederates). Moreover, even the revised version of the test might still contain some ambiguities. As the photographs were initially taken from magazines, the authors might not have been able to trace back whether the mental state the person was holding at the time the photograph was taken 'really' corresponds with the target term they suggested. Indeed, in the present study, some participants spontaneously criticised that none of the terms adequately described what they felt the person was thinking or feeling.

The power construct. Theoretically, we argued that power might lead to insensitivity in identifying the mental states of powerless others, as it was assumed that by virtue of the means to control others' fate, the powerful becomes more and the powerless less relevant. However, perhaps it might be necessary to differentiate between different forms of power. For example, in the present scenario, the supervisor identity might have led participants not only to adopt a sense of control over their workers, but also a sense of responsibility, for instance, as to make fair evaluations during the 'interviews'. Alternatively, power in and of itself might not be sufficient to produce the hypothesised negative effects on theory of mind usage. Perhaps high power differentials need to be paired with a low evaluation of the powerless outgroup, or must occur in the context of some (intergroup) conflict, to produce the predicted deleterious effect.

Concerning the attention measure, contrary to predictions, there were neither effects of target identity nor self-identity on the amount of attention paid to the self-descriptive questionnaires. These findings fail to replicate earlier results by Fiske and Dépret (1996), although the two studies are not directly comparable, as we did not distinguish between stereotype consistent and inconsistent information. Two of the factors already discussed in relation to the results of the Eyes Task, might have influenced this negative result. A first factor could have been the relative artificiality of the dependent measure as task presentation was abstracted from the actual power manipulation. Secondly, within the experimental context, participants might have interpreted the invitation to read the target profiles as a task proper that was to be completed in a faithful way. And finally, the task was presented in such a way that participants were not given room to do anything else but reading the profiles, whilst in real life, a lack of attention might be expressed in doing something else instead. Hence, further research is needed to determine whether attention might play a mediating role in accurate Theory of Mind inferences.

The results of this study need to be regarded as preliminary rather than conclusive. As discussed before, the study requires replication and for future research more sensitive and possibly 'realistic' instruments to test Theory of Mind performance in adults are needed. It will also be necessary to further specify the nature and valence of social factors. However, the results for the supervisors, who seemed to have been more engaged in the role play scenario than the workers, showing higher social identification with their assigned roles, suggests that power affected accuracy in Theory

of Mind usage as predicted. Supervisors were worse at identifying the mental states of the less powerful workers than at identifying the mental states of equally powerful ingroup members. Therefore, albeit preliminary, the intriguing finding of this study was that Theory of Mind performance can be modulated by social relations.

DISCUSSION PART II:
THEORY OF MIND AND INTERGROUP RELATIONS

12.1. SUMMARY OF STUDIES 5 AND 6.

The research presented in the second part of this thesis was motivated by a new theoretical framework that imported a Theory of Mind approach to the domain of intergroup relations. We departed from the assumption made by Social Identity Theory that the self is multi-levelled that can be defined on both the interpersonal and intergroup levels. This entailed a process-oriented view on power, in which power differentials are construed as flexible and as emerging in the process of intergroup comparison. Our main hypothesis was that power might affect Theory of Mind in two ways. We reasoned that the powerless might be motivated to understand the mental perspective of the powerful – even when the latter differed – as this would enable them to strategically adjust their own behaviour. By contrast, for those in power it was predicted that they might show relative unawareness of the differing mental perspective of the powerless, as the understanding of what their subordinates think or want has no direct relevance for their own outcomes.

Based on the material obtained from an exploratory interview study, the first part of this hypothesis was investigated; how for the powerless Theory of Mind usage related to their adjustment of social actions. Furthermore, the material allowed us to

explore the related issue of how Theory of Mind is used in the experience and accusation of social acts of racial discrimination.

In relation to this latter question, the main findings were that in accusations of acts of covert racism - that is, an act not overtly admitted by the perpetrator to be racially motivated - two characteristic types of Theory of Mind inferences were involved. First, relevant for the definition of an experience as an act of racism were participants' attributions that the agent viewed him or herself in terms of racial categories in a place in which they expected to be perceived and treated on the basis of another aspect of their identity. Such stereotypical 'seeing me as' ToM inferences provided the starting point of conflict development. Secondly, in a number of cases the content of an act of racism itself constituted the inference that the perpetrator was unaware of or even actively denied the victim's (mostly the participant's) independent mental perspective. This type of negative 1st and 2nd order ToM inferences was found to be prevalent across different forms of racism, including the denial of racism, pathologizing behaviours, intimidation practices etc. Although we cannot make any claims about whether or not the participants' inferences accurately reflected the mental states of these agents, this finding lent indirect support to the second part of our hypothesis, namely that those who are in a position of situated power neglect the independent mental perspective of their victims.

In addition, despite the lack of examples of participants positioned as powerful, the material permitted us to explore the first part of our initial hypothesis that predicted that people in a powerless situation deploy their inferences of the mental states of those in power strategically in order to adjust their own behaviour. A number of examples

were found that suggested that on various occasions, participants who positioned themselves as powerless did use these insights, or reported of others that they used their inferences about the states of mind of more powerful others, to adjust their behaviour. However, this tendency to act from the perspective of another person was not confined to power relations; a quantitative analysis revealed that also in other situations, mostly coded as on the interpersonal level, participants acted 'through the eyes of another person'. In summary, the approach of studying Theory of Mind usage in ordinary adults' naturalistic language has been useful to explore patterns of differential Theory of Mind usage in the interpretation of real life experiences with particular types of social actions, such as racism and discrimination.

Study 6, presented in Chapter 11, investigated experimentally whether power relations affect Theory of Mind usage in typical adults. Contrary to predictions, the study did not reveal a difference in performance between participants believed to take the role of powerless workers and those assigned to the role of relatively powerful supervisors. However, participants across self-identity manipulations were worse at identifying the mental states of powerless as opposed to equally powerful others. Hence, the interesting finding of this study was that it gives first empirical support to the notion that Theory of Mind usage may vary as a function of different social relations.

Taken together, the results obtained from these two studies can be seen as promising for the proposed approach to adopt a Theory of Mind perspective to study intergroup relations. By acknowledging the novel character of this research, as well as

the limitations of both studies, however, the findings must not be seen as conclusive. Rather, their main merit consists in mapping out questions that need to be addressed in future research. An outlook to this is given in the next section.

12.2. OUTLOOK TO THE FUTURE

The present research raises notably two broad issues. To address these, a systematic research programme is required. First it is necessary to refine and further specify theoretical predictions regarding the nature of social conditions that might affect Theory of Mind usage. A second issue relates to how and where Theory of Mind might be affected within the wider 'mindreading process'.

Let us first consider several aspects regarding the theoretical clarification of the power hypothesis. Study 6 pointed to the possibilities that the supervisors performed better and not worse than the workers because either power *alone* does not have the predicted deleterious effect on ToM usage, or because only some *forms* of power might lead to relative unawareness of others' mental states. The latter possibility was also indicated by the interview study, in which only three participants acknowledged their position of power in specific situations. In one of these cases (PW11), power was derived from the participant's position as an expert and University professor, and was related to master students coming from different cultures. In French and Raven's (1959) typology of different forms of power, this could be subsumed under 'expert power'. The participant showed awareness of the students' different cultural ideas of exam traditions and related expectations, and used deliberately his stereotypical understanding of their different cultural perspectives in order to prevent them from possible disappointments.

In this example, the participant – although aware of the control he had over the students' outcomes - mainly emphasised a sense of responsibility to help the students in their achievement of a desired goal. Perhaps other forms of power, such as 'coercive power', might be more likely candidates for the predicted detrimental influence on Theory of Mind usage. Another possibility could be that the crucial variable might not be power *per se*, but the actual *instigation* of power. If power is defined as the amount of control one has over the other's outcomes, then unawareness, neglect or denial of the other's desires might be most likely in conditions in which control is exerted against the will of the powerless. A third possibility could be that – contrary to our main hypotheses - the powerful are not unaware of the mental states of the powerless, but actively choose to ignore them in order to obtain their desired goals. Fourthly, power in itself may not be the sufficient factor. Possibly, for the predicted negative effect it needs to be paired with other factors, such as conflict, a history of hostility; factors that co-occurred with extreme power differentials in the examples from which we started. Finally, the suggestion that social conditions and relations might modulate Theory of Mind leaves of course the possibility that ToM variability is not confined to power relations. Perhaps other factors defining ingroup – outgroup relations without considerable power differentials or interpersonal relations might affect the mutual understanding of other minds.

The second big task to attack in the future consists of the need to further clarify which facets of the mindreading process might be affected; the level of attending to or ignoring relevant contextual information, or the actual computation of mental state inferences? Perhaps in situations as severe as the ones we departed from - instances in

which the other was seen almost literally as an object – his or her behaviour might be explained to a lesser extent in terms of *intentional* behaviour. In most other less severe situations, however, this strong claim seems untenable and subtler mindreading differences to be more likely. As argued earlier, it is possible to formally impute a mental state to another person but without actually acknowledging their different mental perspective. Other speculations could be generated from Tager-Flusberg and Sullivan's (2000) suggestion of a componential model of Theory of Mind that was discussed in Chapter 2. In this model, dissociation between a conceptual and a perceptual-emotional component is proposed. One possibility might be that social conditions might affect the perceptual-emotional component more than the cognitive component. It is obvious and as such almost trivial to note that people do not feel the same extent of happiness, sadness or pain about events happening to people to whom they are related in different ways. For example, you may be more concerned when your child or a friend is ill than when dozens of people suffer from a severe illness in Hong Kong. A more precise understanding of which factors trigger people's greater or lesser cognitive or emotional 'understanding' of others' feelings has important implications. From a cognitive perspective, exploring possible intra-individual differences in ordinary people's sensitivity to other minds may provide a test case for studying hypothesised dissociations of different components of such a Theory of Mind system. From a social psychological perspective, a Theory of Mind approach provides a new angle not only to address the issue of conflict development, but also that of conflict resolution in interpersonal and intergroup relations. Future research may explore these issues by adopting either an experimental or a naturalistic approach.

In general terms, the approach developed in Chapter 9 can be applied to study different types of intergroup and interpersonal relations. More concretely, this approach would be particularly suitable to compare accounts of different informants who participated in the same event. The question is, do we find that different parties interpret the same event differently? In the event that differences were found, this would allow us to further explore why people interpret the same event in a different way. What are the factors that let you interpret my behaviour in a different way than I do? On what kinds of information (behavioural cues, cultural knowledge) do people base their mentalistic inferences? Do people only consider the other's action or to what extent do they open up their perspective to reflect upon how the others see their own behaviour? Although acknowledging practical constraints in carrying out such research, in principle, this approach could be applied to compare eyewitness accounts of real life intergroup conflicts, for example, the ongoing conflict in Ireland, the relation between Palestinians and Israelis, or the accounts of a demonstrating crowd with those of the police etc.

The experimental approach, in contrast, has the benefit of studying Theory of Mind directly using as the dependent variable behavioural measures that could therefore account for or minimise potential 'distortions' in people's verbal accounts. A challenge for the experimental approach consists in the necessity to find or develop adequate experimental paradigms. For example, such a paradigm requires us to directly relate perceivers and targets, ideally in an ongoing interaction, but to keep the relevant Theory of Mind component constant across different interactions. It would furthermore be desirable to create a scenario that enables us to test the relation between the extent to which participants understand the other's mind and his or her subsequent social action.

One possibility could be to add a Theory of Mind component to the classic minimal group paradigm (see Chapter 8). This paradigm, which consists of different phases in which participants are required to allocate points to ingroup and outgroup members would have the additional benefit of investigating the relation between understanding of other minds and subsequent social action.

Another question that arose from the interview material and that could be studied using an experimental design relates to the episode in which the truth-value of PB9's account was being denied by more powerful others. This finding might be relevant to how beliefs are distributed. As discussed in the first part of this thesis, Sperber suggested that one route of the 'epidemiology' of beliefs is through communication with others whom we trust. It might be interesting to explore the extent to which participants acknowledge or reject the possibility that outgroup (compared to ingroup) members have independent 'privileged' sources of knowledge which form the basis of their differing mental perspectives.

In summary, the work conducted in the second part of this thesis suggests that Theory of Mind processes play a relevant role in participants' subjective construction of social relations and conflict development. At the same time, this work suggests that the social level in general, and intergroup relations in particular, provide a further route to attack – complementary to the ongoing lines of enquiry from a developmental perspective, from developmental psychopathology, comparative studies with nonhuman primates, and studies from social developmental neuroscience – the quest into how the mind works.

13

GENERAL DISCUSSION

The main proposal put forward in this thesis was to think of Theory of Mind not only in terms of a developing capacity, but beyond this, also in terms of how it is employed in practice. It is indisputable that having a representational Theory of Mind is a fundamental social tool, yet it is further necessary to know how to use it. From this perspective, it was argued that we need to place Theory of Mind in a social, cultural and cognitive context. We departed from a narrow definition of Theory of Mind as essentially a cognitive ability to compute metarepresentations. Two real life phenomena - social dysfunctions in high-functioning individuals with ASD with putative metarepresentation abilities and apparent discrepancies in the extent to which ordinary adults consider the thoughts and feelings of others - have led to the formulation of the two main hypotheses explored in this thesis. 1) In order to use Theory of Mind in practice, a cognitive metarepresentation capacity (ToMM mechanism) needs to be connected with input, which often consists of 'cultural knowledge'. The acquisition of cultural knowledge might rely on distinct cognitive abilities, including the ability to form metarepresentations or their developmental precursors. 2) Historical real-life phenomena seemed to suggest that Theory of Mind might not operate encapsulated from the mindreaders' social environment, but that ToM deployment might be modulated by social contextual variables.

These questions were built on insights obtained over twenty years of active research on Theory of Mind and should be seen as extending this research programme. The achievement of this work may consist of posing these novel questions, and in developing new methods (2 experimental paradigms, a new method to track ToM in language) to research them empirically. As a shadow side to such a new approach, however, it is necessary to bear in mind that the studies had exploratory character (e.g. we studied a relatively heterogeneous sample of individuals with ASD using the same tasks) and results must therefore be seen as preliminary.

A further merit of this work consists of the attempt to work towards cross-domain integration. The notion of a contextualised view of Theory of Mind in practice shall be seen in two related senses. In a first sense, the research tried to build bridges across three disparate areas of psychology, namely: cognitive developmental psychopathology (explanations of cognitive abnormalities in Autism Spectrum Disorders), social psychology (theories of power and intergroup relations) and cultural psychology (cultural knowledge as essential for the interpretation of the meaning of social experiences). In a second sense, the notion of 'contextualisation' refers to the interplay between social, cultural and cognitive processes within the mindreading process.

This final discussion is mainly devoted to a consideration of the extent to which the two research strands into autism and intergroup relations might inform each other and have contributed to further insights into how Theory of Mind works in practice.

Whilst research has begun to build bridges between social cognition and Theory of Mind paradigms (e.g. Malle et al., 1999, 2000, 2001; Ames et al., 2000; Klein & Hodges, 1998) the innovation suggested here was to extend a Theory of Mind approach to the study of intergroup relations. Obviously, the developmental Theory of Mind approach has influenced the research with adults. But does this influence only work in one direction? We suggest that the research with adults might also have implications for future research with people with autism. The puzzle that motivated the research presented in the first part of this thesis was that some people with high-functioning autism or Asperger's Syndrome appear to have difficulties in translating their Theory of Mind competencies into real life social adaptation. The work with adults required us to develop a new method to track and categorise Theory of Mind usage in narratives. This approach might be more sensitive to subtle ToM differences than experimental tests and could be used, for example, to study Theory of Mind usage in the accounts of personal experiences of high-functioning people with autism or Asperger's Syndrome. Furthermore, the adult research suggested that inferences of how others view oneself contributed to the construction of social relationships. It would be interesting to explore this facet of self-consciousness, i.e. the extent to which people with autism or Asperger's Syndrome are aware of, or reflect upon how they are perceived by others.

To what extent can the present research contribute to our understanding of how Theory of Mind works in practice? Previous research suggested that for Theory of Mind usage to 'kick in', individuals first distinguish between a stimulus as a self-propelled agent or as an object (see Premack & Premack, 1997). This has been argued to

determine whether a movement is perceived in terms of goal-directed agency or physical causality. Within the notion of *social contextualisation*, the present research suggests that beyond this, initial social-contextualised perceptions of 'who' someone is (and how this person is related to me) affect what I think this person thinks. The stereotypical perception of someone *as* someone of a particular social or ethnic identity might modulate whether one really takes the mental perspective of the other or retains an 'intentional stance' (Dennett, 1987). Moreover, 'what' someone thinks may be enabled by our cultural knowledge – we are thinking through culture(s), as Shweder (1984) put it. This brings us to the notion of *cultural contextualisation*. The work with adults suggested that participants drew on cultural knowledge in order to interpret the meaning of others' actions. The identification of deviance from culturally shared canonical expectations contributed to their interpretation of social actions, especially the accusation of racism. Complementing this, work with people with an Autism Spectrum Disorder suggested that the more severely affected individuals with this condition had profound impairments in their understanding of routine and canonical events, which might further impair them in their ability to make sense of others' behaviour and events. Whilst the older and more able individuals with autism and especially Asperger's Syndrome showed peculiarities but not global deficits in their judgements of events, it remains to be seen whether this high-functioning subgroup with ToM capacities is also able to effectively deploy such cultural knowledge in their interpretation of everyday experiences. Via the *cultural* level, we approached the question of *cognitive contextualisation* from a new and different angle. Given that scripts and schemas stand half-way between immediate perceptual experiences and conceptual, representational

knowledge structures, this work points to the need of further studying the exciting interface between perceptual and cognitive processes, i.e. event perception, event knowledge, (Weak) Central Coherence and Theory of Mind usage in practice. How are perceptual and representational processes integrated in the mind? The direction between these three cognitive abilities may not be uni-directional (i.e. using perceptual information to make conceptual ToM inferences), but perhaps specific inferences of what one thinks or schematised expectations may also affect lower level perceptual and attentional processes. Further work is needed to study how perceptual processes (including cognitive styles, such as WCC affecting perception) are involved in the development of representational structures (schemas, scripts), and vice versa, how representational structures guide immediate event perception. This is the way we construe the notion of cognitive contextualisation: how higher-level cognitive processes (schemas, scripts, Theory of Mind) are connected with lower-level perceptual processes.

To conclude, the maturity that the Theory of Mind approach as a research discipline has attained over the past twenty years, evidenced through the impressive bulk of replications and test refinements, must not lead us to forget that there are still further big and intriguing questions. In tandem with research into the nature of the mind, how it develops, we may also need to obtain a more complete understanding of how Theory of Mind is modulated and enabled by social-cultural variables and how it operates in action in the service of making sense of our social experiences. This thesis has not been able to provide conclusive answers. But the value of the results of a set of

exploratory studies may lie in the ability to point to a set of fresh questions for future research.

APPENDICES

APPENDIX 3.1.

FALSE BELIEF TASK SCRIPT

	Story plot.	Photograph details
(Scene 1)	Tony and Samantha behind a table. In front of them, boxes with open lids are displayed. <i>E: This is Tony, this is Samantha. Tony and Samantha have both received a present.</i>	Photograph showing Tony, Samantha + both boxes in front of them.
(Scene 2)	<i>E: Look, Tony has already eaten his chocolate. His box is empty.</i>	1. Close up on Tony's box - empty 2. Tony + empty box – neutral facial expression
(Scene 3)	<i>E: Let's see what Samantha has got inside her box: Look, Samantha has got some yummy chocolates in her box.</i>	1. Close-up on Samantha's box: chocolate 2. Samantha + box with chocolates- neutral facial expression
(Scene 4)	close-up on both boxes with both lids closed.	Close-up on both boxes with both lids <u>closed</u> .
(Scene 5)	Samantha leaving the room. <i>E: The telephone rings. Samantha goes next door to answer the phone.</i>	Photograph showing Samantha heading to the door.
(Scene 5a)	Samantha at the phone.	
(Scene 6)	Tony behind the table with the two boxes. <i>E: Now, Tony is alone. Samantha is next door on the phone. She cannot see or hear what Tony is doing. Look carefully what he is doing now.</i>	Photograph showing Tony behind the table with the two boxes, lids <u>closed</u> .
(Scene 7)	Tony opening Samantha's box , putting the chocolate in his empty box. <i>E: Look, Tony opens Samantha's box. He is taking out the chocolate and putting it inside his own box!</i>	Tony opening Samantha's box, reaching with his arm inside, holding the chocolate. (smiling) Tony putting the chocolate in his own box.

- (Scene 8) Tony closing both boxes with lids. Tony IN THE MIDDLE between the two boxes with lids closed.
- (Scene 9) E: *Samantha has finished her phone call. She comes back to the room.* Samantha at the door.
- (Scene 10) E: *Now she is having a bit of chocolate.* Samantha behind the table BETWEEN the two boxes. NOT looking at any of them!

TQ1: Where will she look for her chocolates?

TQ2: Where does she think her chocolates are?

CQ: Where were the chocolates at the beginning?

CQ: Where are the chocolates now?

TQ3: Why does she think the chocolates are in the blue [red] box?

APPENDIX 3.2.

STRANGE STORIES TASK

Introduction:

E: " You will listen to a couple of very short stories that I'll play back to you on tape. Please listen carefully! If there is anything that you don't understand, please tell me immediately, and we can listen to the story again. After you have listened to each story, I will ask you two questions.

Let's listen to the first story/ Let's listen to the next story/ Let's see what happens in this story....."

Story 1: (Irony)

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

E: Is it true, what Ann's mother says?

E: Why does Ann's mother say this?

Story 2: (White lie)

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

E: Is it true what Helen said?

E: Why did she say that to her parents?

Story 3: (Lie)

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

E: Was it true, what Anna told her mother?

E: Why did she say this?

Story 4: (Double Bluff)

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

E: Is it true what the prisoner said?

E: Where will the other army look for his tanks?

E: Why did the prisoner say what he said?

Story 5: (Persuasion)

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

E: Was it true, what Mrs Smith said?

E: Why did Mrs Smith say this to Jane?

Story 6: (Figure of Speech)

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

E: Is it true, what Father says to Emma?

E: Why does he say that?

APPENDIX 3.3.
SENTENCE COMPLETION TASK
LOCAL - GLOBAL CONFLICT TASK

NAME ID:	AGE:	DATE:
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INSTRUCTIONS:

“I’m going to read you some sentences and I want you to tell me something to finish off each sentence. First we’ll do one for practice:

He cleaned up the mess with a brush and

Each item to be read aloud by the experimenter. Record all responses and time to respond (begin timing from end of sentence until response from subject). Completions may be single words or a phrase. Try to prevent subject from repeating entire sentence. Tape recording of entire task is recommended. Scoring is based on the subject’s first response.

1. I was given a pen and *		
2. The sea tastes of salt and ...		
3. Hens lay eggs and ...		
4. The woman took the cup and *		
5. You can get burnt by the sun and ...		
6. You can feed a child bread and ... *		
7. Little boys grow up to be men and ...		
8. In the sea there are fish and ...		
9. In a cave lived a bat and ...		
10. You can go hunting with a knife and...		
11. You can swallow apple ... *		
12. The old shoe-maker mended the shoes and		
13. The fireman carried the bucket and ...		
14. A vet cares for cats and ... *		
15. The night was black and ...		
	TOTAL SCORE	
	TOTAL NUMBER OF LOCAL COMPLETIONS (No. of 2's)	

*control items

Scoring System:

0	Correct global completion (not a local associate).
1	Repetition or local associate to another word in sentence.
2	Local completion to end of sentence.

APPENDIX 4.1. SOCIAL INFERENCE TASK

Instruction

Sometimes we can guess what people are going to do, even if we don't know them. Now we are going to read short stories about different people. For each story I will ask you one question. Then you will see four pictures on the computer. I would like you to judge for each picture whether it shows the right or likely answer or the wrong and unlikely answer. Sometimes, more than one picture can show a right or likely response!

Story 1 "Wedding"

1. John has received an invitation to his best friend's **wedding**. The wedding ceremony is going to take place in a beautiful chapel in the countryside. Eventually, the big day arrives. John is excited and gets up early in the morning. After breakfast, he is getting dressed for the wedding.

What is John going to wear?

What is wrong with....?/ Why is [x] unlikely...?

Control question: Where did John go?

Response items: Hiking jacket, wedding dress, **suit, (uniform)**¹

Story 2: "Friday evening"

It is **Friday evening**. After a long week of working, John is looking forward to go out to meet a friend. Chris arrives first. The place they are staying at **closes at 11 pm**.

Where did John go to?

What is wrong with....?/ Why is [x] unlikely...?

Control question: What time is it in the story? Is it morning, afternoon or evening?

¹ Items given in bold represent the correct response. Items in bold and in brackets are acceptable, but less common options which are only scored as correct in conjunction with the more acceptable item.

Response items:

Dentist, **cinema**, **pub**, hairdresser

Story 3 “TV football”

Bill is forty-years old . He is married to his wife Jane, and together they have two children. After work and on the weekends, he enjoys watching television. Now he is sitting in front of the television, watching a football match. During the break he gets up and gets himself a drink.

What drink is he going to have?

What is wrong with....?/ Why is [x] unlikely...?

Control question: How old is Bill? What is he doing?

Response items: **glass of beer**, (**glass of red wine**), (**orange juice**), (**cup of coffee**)

Story 4: “Park”

Mary and James are in the **park**. They are feeding the pigeons and watching the ducks in the pond. As it is very warm and sunny, James suggests to sit down in the grass for a rest. But Mary feels hungry, so she tells him: “Well, I am getting really hungry now. I would like to get something to eat first, and then we can come back and eat it while sitting on the grass.”

What is Mary going to get?

What is wrong with....?/ Why is [x] unlikely...?

Control question: Where are Mary and James?

Response items: ham’n eggs, turkey with roast potatoes, **hot dog**, (**her favourite Sushi Japanese food**)

Story 5: “After homework”

Peter is **12 years old**. When he comes home from school, he goes into the living room and switches on the television. His mother says: “Peter, you cannot watch the show now, you have to do your homework first”. Peter is a bit upset, because he will miss his favourite programme. He works hard, as he wants to watch the rest of the show. After

half an hour he has finished all his homework. His mother is impressed, and when he comes back into the living room to switch on the TV, his mother says: "Well done, Peter. Now you can watch the rest of the show. What would you like to drink?"

What drink is he most likely to have?

What is wrong with....?/ Why is [x] unlikely...?

How old is Peter? What is he doing?

Response items: Glass of beer, glass of red wine, **orange juice**, (cup of coffee)

Story 6: "Mountains"

Every year, Sarah spends her summer holidays with her family in the mountains. They enjoy going on long hikes and swimming in the cool lakes. Sarah and her parents are getting ready for a hike in the mountains.

What is she going to wear?

What is wrong with? Why is [x] unlikely....?

Control question: Where did Sarah go?

Response items:

Hiking jacket, wedding dress, suit, uniform

Story 7: "Paintings"

Paul had to cue for a long time in front of the ticket office, as many people were in front of him. Eventually, it was his turn. Paul bought a **ticket** and entered. Unfortunately, he didn't like the **paintings** very much, so he left after only 30 minutes.

Where did Paul go?

What is wrong with....?/ Why is [x] unlikely...?

Control question: What did Paul not like?

Response items: Department store, **museum**, train station, theatre

Story 8: "Christmas Day"

It is Christmas Day. In the morning, Lisa unwrapped many presents. Later on, all her family came round: Her grandparents, her auntie Caroline and her uncle Jack, and her cousins Sue and Martin. In the evening, they are having a big meal together that Mum had spent the whole day preparing.

What are they going to have?

What is wrong with....?/ Why is [x] unlikely...?

What day is it in the story?

Response items: **Turkey with roast potatoes**, ham and eggs, hot dogs, **(her favourite Japanese Sushi)**

Story 9: "in a rush"

As usual, Jackie is in a big rush. She enters the building and immediately heads for the **third floor**. She goes hastily from room to room but **cannot find what she is looking for**. So she leaves to try another place.

Where did Jackie go?

What is wrong with....?/ Why is [x] unlikely...?

Control question: What did Jackie do?

Response items: **Department store**, museum, train station, theatre

Story 10: Monday morning

It is a **Monday morning**. Before he goes to work, John has an appointment at **9 am**.

Where does John go?

What is wrong with....?/ Why is [x] unlikely...?

What time is it in the story? (Is it morning, afternoon or evening?)

Pub, **dentist, hairdresser**, cinema

APPENDIX 4.2. BASELINES FOR STORY PREDICTIONS

Story (Story titles are working titles, participants were not given a story title)	Combinations of correct solutions	Baseline of correct response by chance
Story 1: Wedding	suit; (uniform)	18.75%
Story 2: Friday Evening	Pub; (cinema)	18.75%
Story 3: TV football	Beer; beer +	50%
Story 4: park	Hot dog	6.25%
Story 5: after homework	Orange juice; (coffee)	18.75%
Story 6: mountains	Hiking jacket	6.25%
Story 7: paintings	Museum	6.25 %
Story 8: Christmas dinner	Turkey with roast potatoes; (sushi)	1875%
Story 9: in a rush	Department store	6.25%
Story 10: Monday morning	Dentist (hairdresser)	18.75%

APPENDIX 5.1. EVENT NARRATIVES SCRIPT

Introduction:

I: *Look, this is Toku. (Experimenter shows participant a photograph of an about twelve year old boy with Asian features, dressed in a traditional Buddhist monk outfit) Toku comes from a little village far far away from here, in East Asia.*

Toku has never been to Scotland/ England, or even Europe.

In the place where Toku was born and lives, many things are very different to the things here in Britain.

In order to help Toku to understand how things are here in this country, I ask many people to tell him what they know about how things are in Scotland.

So I would like to talk with you about things that people usually do in Britain. I mean, not only what you are doing, but what most of the people are usually doing.

Restaurant

I: *Toku has never been to a restaurant. Can you tell him what happens when people are going to a restaurant. Can you tell him what people are doing when they go to a restaurant?*

When people are going to a restaurant, what happens first? What happens next?

Neutral prompts: *Anything else? So you said [.....] what happens then? Is there anything else that happens when people go to a restaurant?*

Prompted questions: *What is the waiter doing? What are the guests doing? What else is the waiter doing? What are people eating in restaurants? What does a restaurant look like?*

Probing questions:

'Always-questions': *Do people always [relating to what the participant spontaneously said] when they go to restaurants?*

'Why-question': *Why are people going to a restaurant? (theory of mind)*

Check for personal experience (at the end of the interview): *Have you ever been to a restaurant? When did you last go to a restaurant.*

Christmas

I: *In the place where Toku lives, people do not celebrate Christmas. Toku has never been to a Christmas party, and he has not even heard about Christmas. Can you tell him what happens at Christmas?*

Neutral prompts:

What happens when people celebrate Christmas? What else happens usually? What happens then? Anything else? I'm sure you know much more about Christmas? What else do people do usually on Christmas?

Prompted questions:

I: *How do people prepare for Christmas? What happens first on Christmas day? Who is preparing the meal? What are people having for Christmas supper? Who is giving the presents? Who is receiving the presents?*

'Always questions': *When people are celebrating Christmas, do they always [repeat what participant spontaneously said just before]?*

'Why- question': *Why are people celebrating Christmas?*

Personal experience: *Are you/ is your family celebrating Christmas?*

APPENDIX 6.1.

FREQUENCY RATING TASK – TASK ITEMS

Doctor script

Introduction: A day in the life of a doctor

This is the story about a day in the life of Doctor Smith. Step by step, we will see what Dr Smith is doing in different situations, for example, when he is taking a train to go to work. Some of the things this doctor is doing, doctors always do when they are in this situation. Some of the things Dr Smith is doing, doctors do most of the time or sometimes. But this doctor is also doing things that doctors never do, or that happen only rarely!

On a train

In the morning, the doctor takes a train to go to work.
You will see different things that the doctor is doing when he is on a train.
Do doctors normally do what this doctor is doing?

- 1) The doctor has got a ticket for his train journey (central act)
- 2) The seats have a blue and green pattern on them. (slotfiller)
- 3) The doctor is carrying a bag. (optional act, not script defined)
- 4) The doctor is looking for his seat first (optional-slotfiller)
- 5) The doctor is sitting by the window. (slotfiller)
- 6) On the train, the doctor eats a sandwich. (optional act)
- 7) On the train, the doctor is reading a book. (optional act)
- 8) On the train, the doctor is reading a book about French history. (slotfiller)
- 9) The ticket inspector asks the doctor to show his ticket (central act)
- 10) The doctor asks a fellow passenger to take off her coat. (inappropriate act)

At work in the surgery

Monday through to Fridays, the doctor is at work in the surgery.

- 1) Patients are waiting in a separate room. (central act)
- 2) Patients are waiting for 45 minutes before being called into the consulting room (slotfiller).
- 3) In the waiting room, magazines are displayed on little tables. (prop)
- 4) The doctor examines the patient. (central act)
- 5) In the consulting room, the doctor asks a patient to take off her shirt. (optional act)
- 7) In the consulting room, the doctor prescribes medicine for a patient (central act).
- 8) While he is examining a patient, the doctor is eating a sandwich. (inappropriate act)
- 9) The doctor is wearing glasses (optional act).
- 10) In the waiting room there are encyclopaedias (inappropriate prop).

Shopping at the supermarket

- 1) The doctor is paying at the check-out (central act)
- 2) At the entrance of the supermarket, there are shopping trolleys and baskets (prop).
- 4) The doctor is taking a shopping trolley (optional act).
- 5) The doctor is going to the fruit and vegetable section first (optional act).
- 6) The doctor is putting milk, chocolate and orange-juice in his shopping trolley (slotfiller).
- 8) The doctor prescribes medicine for a shop-assistant (inappropriate act).
- 9) The doctor has to pay more than £20 for his shopping (slotfiller).

Cross-over items:

Eating a sandwich: train, consulting room => inappropriate at work

Prescribing medicine: work, supermarket => inappropriate at the supermarket

Wearing a white coat: work, supermarket => inappropriate at the supermarket

Asking to take off coat/shirt: train, work => inappropriate on the train.

Teacher script

Introduction: A Day in the Life of a Teacher

Now you will see what happens during the day of the teacher Mrs Jones. You will see what happens when the teacher is at breakfast, when she is at school, and when she is at the cinema in the evening.

Please rate for each sentence whether you think that this happens to a teacher in this situation always, almost always, most of the time, sometimes, rarely, almost never or never.

At breakfast

- 1) Before going to school, the teacher is having breakfast (central act).
- 2) The teacher is wearing a dressing gown (optional act).
- 3) The teacher is preparing coffee (central act).
- 6) The teacher has got a white coffee mug with blue stripes (slotfiller).
- 7) There is one fridge in the kitchen (central act)
- 9) The teacher is taking some medicine (optional act).
- 10) There are toys lying around in the kitchen (optional act).

At school

- 1) In the morning, pupils arrive at the school (central act).
- 3) Pupils are coming on the school bus. (optional act)
- 5) The teacher is wearing a skirt and a white blouse (slotfiller)
- 6) In the French class, the teacher corrects the vocabulary of a pupil (central act).
- 7) In the classroom, there are chairs and desks (central act)
- 8) During the break, the teacher is correcting maths tests (optional act).
- 9) The pupils are using yellow pencils (slotfiller).
- 10) The teacher prescribes medicine for a pupil (inappropriate act).

At the cinema

- 1) The teacher is watching a film. (central act)
- 2) The teacher is with a friend. (optional act)
- 3) The film starts at eight o'clock in the evening. (slotfiller)
- 4) There are chairs and tables in the cinema (inappropriate props)
- 5) At the cinema, the teacher is reading the newspaper. (inappropriate act)
- 6) The teacher is wearing glasses. (optional act)
- 7) The teacher corrects the vocabulary of a stranger sitting next to her.
(inappropriate act)
- 8) The teacher is drinking a cup of coffee. (inappropriate act)
- 9) The teacher is buying popcorn. (optional act)

Script Cross-over items:

The teacher is reading the newspaper: breakfast, cinema

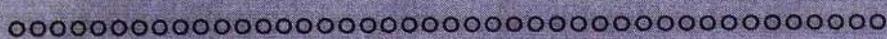
The teacher corrects a pupil/ a stranger: school, cinema.

Drinking/ preparing coffee: breakfast, cinema

**WHAT IS IT LIKE TO LIVE IN A
MULTI-ETHNIC
MULTI-CULTURAL
COMMUNITY?**

**A project on day-to-day experiences in
London**

VOLUNTEERS WANTED!!!



**Address for correspondence: Eva Loth
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continued overleaf

This project aims to explore the reality behind the notion of a 'multicultural' or 'multiethnic' society by gathering and comparing experiences from English people and people from different ethnic backgrounds in their day-to-day lives. What sort of experiences do people from Africa, the West-Indies, and Asia make in their daily lives? In what areas of daily life do English people and people from different origins and cultures meet? And what aspects of living in a mixed community are satisfying, enriching or problematic?

○○○○○○ **What does participation involve?** ○○○○○○

I would like to go with you through a variety of experiences, mundane encounters and encounters that have been – in a positive or negative sense – significant for you.

○○○○○ **Where and when does the interview take place?** ○○○○○

You are invited to come to the Bonnington Community Centre, 49, Bonnington Square, London SW8.

Alternatively, I would be happy to visit you in your home or we could meet in a café – wherever you would feel most comfortable. Convenient dates and times can be arranged in advance.

This is the first study of a larger project and part of my PhD-dissertation at the University of St Andrews, Scotland. All information given by you will be treated with utmost respect and confidentiality.

I look forward to hearing from you!

Eva Loth, BA (Hons) MA

APPENDIX 8.2. INTERVIEW SCHEDULE

Each interview is assumed to take a different course according to the interviewee's response on a previous question. The set of questions is therefore only meant to be a guideline for topics to be discussed during the interview.

In parts 1 and 2 the interviewer does not explicitly mention the issue or terms of "race", "ethnicity" or even "multi-culture". This allows the interviewee to construe categories freely, for example to speak about people in either personal or group terms.

1. Diary about everyday encounters

a. Prior to the interview, participants will be asked to complete a simple diary about their encounters during the past three days. The interviewer will begin discussing participant's entries in the diary

Interviewer: "Let's go through your notes. Let's start three days ago. (Don't worry if some of these events or actions appear trivial to you. In fact, I am not only interested in some "sensational" experiences, but rather, for now, would like to get an idea of your everyday routines and life)":

Can you tell me what you did onday in the morning?

Who did you meet?

What happened?

Why did he/ she do that?

And what did you do then?

How did you feel?

How (do you think) did s/he feel?

Let's move on to the afternoon/ evening/ next day: Did something extraordinary/ special happen or was it a fairly typical day?

Let's start again with the morning...

For each experience, the participant is asked to describe his or her relationship with the person s/he met (if this does not become obvious/ can be inferred from participants' spontaneous talk):

Who was that person?

Did you know him/ her before?

How would you describe your relationship with him or her?

After discussion about the three days in participant's life:

Were these typical days in your life? Or has something typical been left out?

What would be a more typical day for you then? Who would you meet? Can you recall a more typical day and tell me about it?

2. Significant events:

Can you recall a particularly satisfying or enriching experience during, say the last year/ since you came to London?

What happened?

(Why did he/ she do that?)

Who were the person/ the people involved?

How did you feel?

Can you recall a particularly problematic or negative experience during the last year?

What happened?

Who were the person/ the people involved?

Why did he/ she do that?

How did you feel?

3. Encounters with members from respective other ethnic groups:

(a) If the participant has not spontaneously talked about experiences with members of a different ethnic group (i.e. for English participants contacts with Asian/ Afro-Caribbean people, and for members of ethnic minority groups contacts with English people) during part 1 or 2, the interviewer asks:

In what sort of situations do you come in touch with people from Asia, for example from India, Pakistan or China?

In what sort of situations do you come in touch with people from Africa or the Westindies?

In what sort of situations do you come in touch with English people?

Can you recall one situation and tell me what happened?

Prompt: What about, for example, at work or in your private life...?

If participants responds with a class of situations (e.g. on the market, at work, other parents in nursery/ school):

Can you give me an example? Do you recall a specific encounter and can you describe what happened?

(b) If a participant had previously talked about contact with a person/ people from a different ethnic background:

You said before you met X...Is it fairly rare for you to meet people from Y, or can you give me an example of other types of situations in which you get in touch with people from...?

How about your private life?

How about people from Z?

4. Significant encounters

To what extent do you feel that living in a multi-cultural, multi-ethnic, mixed community is or has been satisfying for you?

Can you give me an example?

To what extent do you feel that living in a multi-cultural community has aspects that have been or are problematic for you?

Can you give me an example?

Can you describe that situation? What happened?

If a participant does not spontaneously give an example, the interviewer may prompt: what about X (e.g. housing, schooling, jobs ? Do you think [that] only concerns other people, or does it affect you too?

5. Forms of practice :

a.) questions about culture and more global belief-systems for ethnic minority participants:

What aspects of your culture/ or the culture of your parents do you keep and practice in your day-to-day life? (prompt: for example food-wise, or in terms of music, dressing, religion.

In what respects do you see differences between your (your parents') culture and British culture?

b) For English participants:

Do you, and if so, in what respects and to what extent do you feel being influenced by, say, Indian or African culture?

(e.g. foodwise, music, ...)

In what respects do you see differences between their culture and British culture?

Probing questions (always asked after the participant's spontaneous accounts):

Let's go back to what you said about your experience with [...]

How do you think would he/ she explain what happened?

Do you think he/ she experienced the situation similar to the way you did?

How did you come to believe that his/ her behaviour was motivated by...?/ How did you come to believe that he/ she did [this] because...?

Why do you think that he/ she didn't understand...?

Thank you for your time and for taking part in this project.

APPENDIX 8.3.

P Participant
PW White Participant, e.g. PW1 (numbers are continuous, and irrespective of the participant's ethnicity).
PB Black Participant
PA Asian Participant

[...] missing sentence or paragraph
italics my emphasis, usually concerning ToM:
underscored participant's emphasis in tone of voice
UPPER CASE participant's emphasis in tone of voice: very loud
: e.g. lou:d participant's intonation, stretching words
(.) pause
(...) longer pause
() missing word, sentence fragment or even paragraph due to unintelligible recording. The length of the blank indicates approximately the length of the missing part.
(maybe) words or phrases in brackets denote what the author understood the participant was likely to have said
= participant and interviewer speaking at the same time

APPENDIX 11.1. INSTRUCTIONS FOR SUPERVISORS AND WORKERS

ॐSॐ
THE SUPERVISORS ॐSॐ

BRIEFING FOR GROUP SESSION -

Name:

Participant title:

You were chosen to be a **SUPERVISOR**.

You will be working as a supervisor of a small group of workers. Together with two-three other supervisors, your task consists of directing and controlling whether or not the workers are doing a good job.

You will be in a position to decide for the workers what to do, and you will have to evaluate how they are doing it (in the best interest of the company). We believe that these processes also afford a particular facet of creativity, albeit perhaps not in the conventional sense.

1) Interview: At first, as a panel of supervisors, you will interview each worker about his job aptitudes.

2) Evaluation and assignment to jobs: Together with the other supervisors, your task will then consist of evaluating each worker and of allocating different jobs to them. It will be up to you as supervisors to establish criteria against which to measure their performance. On the basis of your evaluation, you will then assign different tasks to individual workers.

The tasks: As in real life companies, tasks differ greatly in creativity .

Creative I task: slogan task

Creative II task: computer 'design task'

Uncreative task: 'crossing out "t's" task

Uncreative II task: administration sorting task

3) Continuous control of workers' performance:

Throughout the remaining part of the experiment, your and the other supervisors' job consists of further supervising the work. Workers' good performance' can be rewarded by

i) entrusting the worker with a creative, responsible and enjoyable task

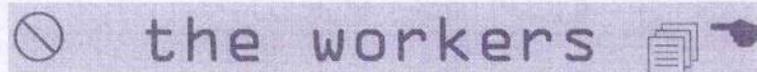
ii) give token points

Poor performance leads to negative consequences in which case you might have to give the worker

iii) less demanding uncreative tasks

iv) taking off points.

Note that as an experimenter I will not be in a position to influence your and the other supervisors decisions and evaluations.



Name:

Participant title:

BRIEFING FOR GROUP SESSION

You are chosen to be  a worker .

You will be working in a small group of four under the supervision of two-three supervisors. Together with the other workers, you will be asked to complete a number of different jobs that afford different degrees of creativity. These tasks will be allocated to you by the supervisors who will also be in a position of evaluating your performance (in the best interest of the company). Please note that these processes also afford creativity, albeit perhaps not in the most conventional sense.

1) Interview: At first, a panel of supervisors will interview you and the other workers' about your job aptitudes.

2) Evaluation and assignment to jobs: The supervisors will then evaluate your and the other workers' performance. As a panel, the supervisors will have established criteria against which to measure whether your performance is good or bad. On the basis of their evaluation, the supervisors will then allocate tasks to you and the other workers.

The tasks: As in real life companies, tasks differ greatly in creativity .

Creative I task: slogan task

Creative II task: computer 'design task'

Uncreative task: 'crossing out "t's" task

Uncreative II task: administration sorting task

3) Continuous control of workers' performance:

Throughout the remaining part of the experiment, you will be carrying out the tasks that you were assigned to under continuous supervision. If you perform well as a worker, supervisors may reward you by

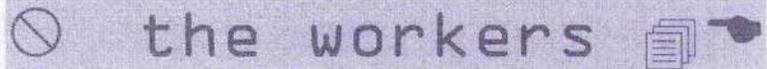
- i) entrusting you as a worker with a more creative, responsible and enjoyable task
- ii) give token points

Poor performance may lead to negative consequences in which case supervisors may decide to

- iii) assign you to less demanding, less creative tasks

- iv) take off points.

Note that as an experimenter I will not be in a position to influence supervisors decisions and evaluations.



BRIEFING FOR INDIVIDUAL INFORMATION SESSION

Previous research suggests that people's first impressions greatly influence the way they work together and may, as we believe, ultimately affect creativity at work.

In order to take this often neglected, yet important feature of work dynamics into consideration, the aim of this session is to provide group members with some preliminary information about each other.

The session involves two very short tasks:

- 1) We will show you photographs of the eye regions of the other group members.
- 2) We will exchange information that group members have provided about themselves, their likes and dislikes at work, in the brief questionnaire.

APPENDIX 11.2.

Debriefing of 'creativity at work place' experiment

As many psychological studies, this experiment involved what is called a 'cover story'. In this case the cover story consisted of making you believe that we are looking at 'creativity at the work place'.

In reality, the main aim of this study is to investigate the effect of different power relations on the way people read others' minds. In psychological terms, the ability to represent mental states, such as beliefs, intentions, desires etc. and to interpret and explain others' behaviour on this basis, is called a 'theory of mind'. It is an important facet of social cognition (imagine you were blind to others mental states!) that in the past years has extensively been researched with regard to children's development (when and how do children begin to understand that others have beliefs and desires) and a developmental disorder called autism.

Although as adults we are all principally able to understand that another person has a different mental perspective, anecdotes - for example from the relations between Nazi Germans and Jews in the Third Reich, 'Black' and 'White' people in South Africa or the US - let us to reason that in *some* social conditions, people may be more or less likely to use this ability. In other words, it appeared to us that in conditions in which some people have, on the basis of their group identity, strong power over people belonging to another, powerless group, they may be less likely to appreciate what the other thinks, intends or feels. With this study we set out to look at this issue experimentally.

The photographs that you have seen on the computer are actually taken from a task developed by another researcher, designed to provide a sensitive measure of how well people read mental states of others from cues given by the eye region only ('the eyes as a window to the mind'). These same pictures are given to all student participants, hence nobody will ever rate your own photograph. The 'group experiment' that I was so keen to outline to you in detail will in fact never take place, and the experiment ends here.

We apologise for the deception that our cover story involved, but I hope you will be able to appreciate that it would not be possible to investigate our research question adequately if I had told you and the other students about the real purpose of the study from the outset - as people would be likely to behave differently.

As the study will be run until end of January 2002, we would like to ask you for now not to discuss the experiment with friends and classmates who might perhaps take part in it as well.

Thank you very much for your participation!

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