PRESCHOOLERS USING NARRATIVE TO EVIDENCE AN UNDERSTANDING OF MIND

by

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ABSTRACT

Children's theories of mind have been researched extensively over the past two decades (e.g., Astington, 1991; Wimmer & Perner, 1983). Generally, studies concerning this understanding have focused on children between three and five years of age because it is believed that an understanding of mind develops during this period. However, evidence from naturalistic contexts suggests that many younger children can demonstrate an understanding of the mind (e.g., Degotardi & Cross, 1999; Dunn, 1988). Despite this, the focus in many studies has been the age at which children are able to demonstrate a representational understanding of mind (e.g., Wimmer & Perner, 1983). Less interest has been directed towards how children use their understanding during their everyday interactions (Degotardi & Cross, 1999). Evidence suggests further investigations need to consider the social nature of a theory of mind. For example, a growing amount of research indicates that social contexts are important in facilitating an understanding of mind. Relationships have been reported between a theory of mind and the following: Peer popularity (Dockett, Szarkowicz, Petrovski, Degotardi & Rovers, 1999), family size (Perner, Ruffman & Leekham, 1994) and level of fantasy play (Taylor & Carlson, 1997). Given these, it appears necessary for research to address the social implications of an understanding of mind as well as the cognitive. The current study aimed to investigate an understanding of mind in 3- to 5-year-olds (N = 110). Interview and observation methods were adopted for data collection. The interview phase of this study investigated whether or not selected characteristics of narrative influenced children’s performance on four non-traditional literature based false belief tasks. Results indicated that narrative style, active participation and narrative
detail were significant predictors of children's ability to demonstrate an understanding of false belief. Age was not identified as a significant variable.

Using the data gathered through observational methods, 24 individual case studies were formed to identify characteristics of an understanding of mind during everyday interactions. The case study data were analysed in three ways. Firstly, using principles of grounded theory (Woods, 1986) six themes were identified: Positive perspective taking; sharing humours; mediating action; distinguishing appearance from reality; talk about self, other and mind; and acts of deception. The type of interactions characterising each theme were then analysed using the Continuum of Teaching Behaviours (Bredekamp & Rosegrant, 1995). Results indicated that the themes of positive perspective taking and sharing humour were both characterised by facilitating interactions; mediating action and distinguishing appearance from reality by co-constructive interactions; and the themes of talk about self, other and mind and acts of deception by directive behaviour. Finally, the case study data were analysed using the Functional Meaning in Conversation Scale (Shatz et al., 1983). Children were identified using a range of mental state references during their everyday interactions. The results from the case study phase indicated that children were able to use their understanding of mind in a variety of ways during everyday interactions.

The results from both phases in this study suggest that 3- to 5-year-olds can demonstrate an understanding of mind during non-traditional false belief tasks and everyday interactions. It is argued that an understanding of mind is characterised by a range of behaviours and that not all of these are addressed in the traditional paradigm.
STATEMENT OF AUTHENTICATION

I Diane Louise Szarkowicz certify that I am the author of the thesis titled *Preschoolers using narrative to evidence an understanding of mind* which is submitted to the university for assessment on this day. The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in whole or in part, for a degree at this or any other institution.

Diane Louise Szarkowicz
"What I've kept with me
and what I've thrown away
and where the hell I've ended up
on this glary, random day
were the things I really cared about
just left along the way
for being too pent up and proud...

I poured my heart out
I poured my heart out
it evaporated...see?"

(Folds, 1997, track 12)

For Mitch.
ACKNOWLEDGMENTS

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A special thank you to the staff and students who participated in this study, particular Ms Shayne Gledhill for her continued friendship. Also thank you to Ms Nicole Beaver, Ms Sheila Degotardi and Ms Kathrin Lockl for your positive perspective taking and shared humour. Finally, I am deeply in debt to my family who have helped me take advantage of every opportunity which has come my way.
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CHAPTER 1

INTRODUCTION

Chapter 1 provides a background for the study presented in this thesis. An introduction to the research area, definition of key terms, significance of the current study are discussed. The research questions for this investigation are also outlined.

INTRODUCTION TO THE RESEARCH AREA

The Role of the Mind

Our Everyday Understanding of Mind

All adults have a mind which enables them to experience their milieu and express reactions to this based on their unique beliefs and desires. Adults also have an understanding of how the mind works which enables them to comprehend the behaviour of others. They understand that the "mind represents the world and that in turn these representations determine action" (Wellman & Bartsch, 1994, p. 332). This understanding is not scientific in the dictionary definition of the word (Flavell, Miller & Miller, 1993), but rather is a commonsense understanding or folk psychology which "provides explanations of behaviour and makes predictions about people's actions by appealing to their beliefs and desires, to what people think, know, expect, want..." (Astington & Gopnik, 1991, p. 8).

For most adults, the ability to understand how these mental states influence action occurs without much conscious thought. Adults accept that other individuals act based on their unique interpretations of situations, and understand that no one can interpret the same experience in exactly the same manner. This uniqueness occurs because all individuals have difference experiences, knowledge and
emotions which influence their interpretations. However, research indicates that children under five years of age may have difficulty understanding the unique nature of mental states (e.g., Wimmer & Perner, 1983). It appears that in experimental contexts many children under this age attribute their own mental states to others and do not account for the interpretative nature of the mind (e.g., Perner, 1991; Wellman, 1990). Such evidence has led to many suggestions that children do not have a representational understanding of mind (Perner, 1991).

**Defining an Understanding of Mind for the Current Study**

The research area focusing on an understanding of mind is most often referred to as "theory of mind". The term theory of mind was initially used by Premack and Woodruff (1978) to explain how chimpanzees could impute mental states to themselves and others, but has since been used frequently to describe similar understandings in humans. By having a theory of mind children can understand mental states such as beliefs and desires in themselves and in others, and in accordance with this, make decisions about what actions to take. More importantly, without a theory of mind this understanding cannot happen. Hence, many suggest that children's understandings of the mind provide them with "a coherent conceptual system that functions in distinctly theory-like fashions, analogical to, but distinguishable from, scientific theories" (Wellman & Bartsch, 1994, p. 350; see also Wellman, 1990).

A theory of mind is characterised as having a "relational structure" whereby mental states and physical entities are correlated (Moore, 1996). Thus, a theory of mind allows individuals to associate specific mental states with physical entities in a manner which enables the interpretation of others' behaviour. For example, two four year old boys, Leroy and Josh, were playing in the sandpit. Leroy had just
made a pretend cake (physical entity) and was showing it proudly to others. Josh picked up a cup of sand and threw it all over Leroy's cake. "No! We don't want it all over our cake Josh," Leroy said (Szarkowicz, 1995, p. 54). By observing Josh's behaviour, assumptions can be made about his mental state. Josh for instance may have felt jealous about Leroy's attention and thus, acted in a manner so as to draw attention to himself. Therefore, Josh's external behaviour is a manifestation of his internal states.

A further characteristic of a theory of mind is that such understanding is applicable to both the self and others. In order to function with a representational understanding of the mind, an individual needs to acknowledge that others can have different interpretations of the same reality (Moore, 1996). Hence, one needs to acknowledge that reality is interpreted in unique ways based on the knowledge, experience and perspective that each individual has at any given time. When these characteristics are combined into a theory of mind they provide a framework of understandings which individuals can use to interpret and predict the behaviour of others, and then use to inform their own actions. Such interpretative and predictive behaviour is necessary for success in social interactions. Therefore, a theory of mind is an important indicator of children's social and cognitive development (Meadows, 1993; Wellman, 1990).

While for many researchers the reference to "theory" in the term theory of mind does not refer to a theoretical construct in the scientific definition of the word, it does describe a common sense or folk psychological understanding of mind (Astington, 1996). In the current study, theory of mind is used because it is the most widely accepted terminology for this area of understanding (Nelson, 1996). However, this use does not imply any particular theoretical position and is often
interchanged with other terms such as an understanding of mind or understanding of mental states.

The theory of mind which children up to the age of five years hold has been investigated through a variety of methods. In the following section the general development of an understanding of mind is discussed before the focus of the current study is introduced.

AN OVERVIEW OF THEORY OF MIND DEVELOPMENT

Background to Theory of Mind Research

Most research concerning a theory of mind has focused on children between three and five years of age because it is believed that a theory of mind develops during this period. However, interest in the development of such competency is not a recent phenomena. Piaget first investigated children's understanding of mind in the earlier part of the 19th century (Piaget, 1929; Piaget & Inhelder, 1956). Piaget proposed that it was not until approximately seven years of age that children developed an understanding of the mind. Prior to this period, Piaget believed children's thoughts were limited by egocentrism; a situation where children believed the way they saw the world was the same way others also saw it, irrespective of differences in physical perspective and cognitive experience.

Since the work of Piaget numerous approaches have been devised for investigating an understanding of mind. Some of these have focused on the mental state language children use (e.g., Shatz, Wellman & Silber, 1983), while others have analysed children's ability to understand mistaken beliefs (e.g., Wimmer & Perner, 1983). Despite a large number of studies having been undertaken to investigate the development of a theory of mind, no single conclusion has been
widely accepted due to "differences in who is being studied, what they are doing, and where" (Raver & Leadbeater, 1993, p. 351). While some researchers may agree on one aspect of theory of mind development, other researchers report contrasting findings as a result of adopting different methodologies. Those who have used interview methods have often focused on the presence or absence of particular forms of understanding, while studies using observational methods have mostly concentrated on the social nature and consequences of an understanding of the mind. The following overview of theory of mind development presents evidence from both quantitative and qualitative paradigms under three broad headings: Mental phenomena, pretense, and language.

Mental Phenomena

Prior to children developing understandings which are defined as a theory of mind, they exhibit what Moore (1996) terms "social sensitivities". From two months of age infants engage in interactions with an adult (Brazelton, Koslowski & Main, 1974). These interactions include smiling and responding to speech. From twelve months of age infants' interactions become triadic, involving not just the infant and another individual, but also an object such as a toy (Bakeman & Adamson, 1984). These older infants are not only able to react to adults' speech but also can follow the gaze of an adult to an object so as to participate in an act of joint attention. However, most researchers do not credit children as having any understanding of mind before approximately four years of age because it is most often around this time when children are first reported to use their understanding to manipulate the mental states of others through actions such as deception (e.g., Astington & Gopnik, 1988; Mitchell, 1996; Wellman, 1990). The development which precedes these initial understandings has been investigated through
numerous tasks, each designed to identify particular aspects of a theory of mind. The following sections broadly categorise these aspects under the headings of perspective taking, appearance and reality, intention, and beliefs and desires.

**Perspective Taking**

While children engage in joint attention from an early age, it appears they may adopt a passive view of the mind, and assume that knowledge only comes from seeing (Chandler, 1988). It is suggested that prior to approximately four years of age children have difficulty understanding that individuals need to actively interpret reality. Indeed, some evidence indicates that children under approximately five years of age have difficulty understanding that reality can be interpreted in a manner which is different from their own. For example, in Taylor's series of conceptual perspective taking studies, children were shown a picture which was easily identifiable (Taylor, 1988; Taylor, Cartwright & Bowden, 1991). The picture was then covered so that only a small, non-identifiable section was revealed. Each child was then asked if other people would recognise the picture if they only saw the small section. The 4-year-olds in the samples had difficulty with this task and attributed their knowledge to others by responding that an individual would know what the picture was by looking at the small unidentifiable section. Older children in the studies were able to indicate that the limited view made identification of the picture difficult.

Further evidence of a difficulty with perspective taking tasks has indicated that children do not always understand that perception can be a source of knowledge when taking the perspective of another individual (Ruffman & Olson, 1989; Pillow, 1989; Pratt & Bryant, 1990). For instance, a closed box was placed on a table between two 3-year-old children. Amy was able to look in the box but
John was only able to touch it (Ruffman & Olson, 1989). Based on her perceptual knowledge, Amy should have understood that John would not know what was in the box. However, in such tasks children of this age have often attributed their knowledge or ignorance to others. Thus, Amy would say John did know what was in the box because she herself knew. Wellman (1990) suggests that before four years of age children, have a copy theory of mind which enables them to only understand true beliefs. Thus, many children have difficulties with theory of mind tasks which present beliefs which are inconsistent with reality because they perceive the mind as a passive recorder of reality, rather than as an interpreter.

It has been suggested that perspective taking abilities progress through two levels of development (Flavell, 1978; Taylor, 1988; Szarkowicz, 1995). Initially children understand if another individual is able to see or not see an object. However, these children at Level 1 do not understand that individuals interpret perceptual information differently, and thus, would assume two people saw exactly the same view of a piece of art even if they were looking from different ends of a room. Hence, Level 1 children do not consider differences in perceptual access when taking another perspective. In contrast, Level 2 children do understand that individuals make their own unique interpretations of reality, and that the piece of art may appear visually and conceptually different to each of the people viewing it. Evidence indicates that 4- and 5-year-olds are generally able to demonstrate an understanding of Level 2 perspective taking, but that 3-year-olds have difficulties with this level (Pratt & Bryant, 1990). Therefore, it appears 3-year-olds do not demonstrate the same competencies that older children present when tested with formal perspective taking tasks. It is possible that these children are at a transitional phase in their abilities, being successful on basic perspective taking...
questioning, but not being as successful when questioning requires representational understanding (Astington & Gopnik, 1991). For example, most children can indicate if another individual does or does not see the contents of a box, but may have difficulties when questioning refers directly to the knowledge state of another.

**Appearance and Reality**

While Piaget identified a number of limitations in children's understanding of mentality and reality (Piaget, 1929), Flavell and his colleagues reported that even 3-year-olds had an understanding about mental life (Flavell, 1986; Flavell, Green & Flavell, 1986; Flavell, Flavell & Green, 1987). For example, children of this age understood that thoughts were different from reality, and that thinking was not the same as sensory experiences such as seeing or touching (Flavell et al., 1986). A similar ability was identified by Wellman and Estes (1986) when they presented children with two boxes, labelled as the "real box" and the "not real box". Children were required to classify items, such as a cookie and a thought about a cookie, into the correct boxes. Over three quarters of 3-year-olds had no difficulties demonstrating an understanding of the difference between objects and thoughts.

The ability to distinguish between what something appears to be and what it really is, was explored further through a series of studies using appearance-reality tasks. One such task involved looking through coloured glasses at white shapes (Flavell et al., 1987). Children were asked to determine the real colour of the shapes with and without the glasses. Hence, children were provided with conflicting visual information and needed to use their perspective-taking abilities to respond correctly. While 3- and 4-year-olds had difficulty responding correctly on such tasks, most 5-year-olds were able to demonstrate their understanding that an item could appear to be one thing, but really be something else; just as the shapes
were really white but appeared to be different colours when viewed through the glasses. Numerous variations of the appearance-reality task have been undertaken utilising materials such as fake foods which appeared real, and candles which looked like different foods (e.g., Krause & Saarnio, 1993; Szarkowicz, 1999). Similar results have been identified in these variations, confirming that an understanding of the difference between appearance and reality can be observed in much younger children than was suggested by Piaget (1929).

**Intention**

Children’s understanding of intention is another marker of their developing theory of mind. Children as young as three years of age appear to understand that actions are intentional if they match a person’s statements, and are unintentional if the actions are not consistent with the statements (Alistington, 1991). These statements are most often accompanied by visible emotions such as surprise and disappointment. Evidence indicates that even young children understand the link between such emotions and mental states. For example, in one study children were presented with a story about Lisa who believed it was going to rain or not going to rain (Wellman & Bartsch, 1988). The story indicated that when the weather state was in contrast with her belief, Lisa was surprised. Findings indicated that even 3-year-olds could match states such as belief with emotions like surprise. Furthermore, the link between belief and surprise was further strengthened by evidence which indicated that those children who are unable to anticipate surprise in others also demonstrated difficulty understanding belief (Hadwin & Perner, 1991).
Beliefs and Desires

While research appears to be identifying a tentative link between the understanding of emotions and mental states, a clearer link has been evidenced between actions and thoughts (e.g., Bartsch & Wellman, 1989; Wellman & Bartsch, 1988). In one notable study of this linkage, children were told a story about Sam who had lost his puppy. Participating children were told the puppy was either under the porch or in the garage, but that Sam thought the puppy was in the garage (Wellman & Bartsch, 1988). Children were asked where Sam wanted to look for his puppy. Over three quarters of 3-year-olds responded that Sam wanted to look for the puppy where he believed it was. Hence, these children demonstrated their understanding of how Sam's actions were linked to his beliefs and desires, and consequently, indicated an ability to consider mental states when predicting the behaviour of others.

The understanding of beliefs and desires has been investigated in depth with normal and autistic populations. Evidence indicates there may be a lag between an understanding of beliefs and of desires. Children between two and three years of age appear to: talk about desires but rarely beliefs (Tager-Flusberg, 1992); take account of any differences in desires before beliefs (Harris, 1989); use desire terms more often than belief terms when explaining why an action was unsuccessful (Bartsch & Wellman, 1989). For instance, in the previous example of Sam and the puppy, younger children used desire terms such as liked or wanted to explain Sam's actions rather than belief terms like believes or thinks. The possibility of a lag between the understanding of desires and beliefs has been strengthened by evidence indicating that autistic children have difficulties on belief based tasks but not on desire tasks (Baron-Cohen, 1991).
An understanding of belief is critical to the development of a theory of mind, not only because beliefs are representational in nature, but also because they also combine with desires to influence behaviour. However, testing an understanding of belief is difficult as any responses children make cannot always be distinguished from a true understanding of belief or a report on reality. Thus, investigations have been forced to present beliefs which are false to enable children's interpretations of beliefs, rather than their reflections on reality, to be studied. Investigations of this understanding have become known as false belief tasks. These tasks study the ability to appreciate that the mind can misrepresent reality.

Humans use false belief reasoning to make sense of people's actions when they are inconsistent with their goals and as a justification for their own actions (Riggs & Robinson, 1995). Thus, false belief understanding relies on the ability to comprehend a "causal relationship between informational conditions on the one hand and resulting epistemic states on the other" (Wimmer & Hartl, 1991, p. 56). For example, in one study a 5-year-old child was shown a candle which looked like a cake. The child was asked what the item was, and responded that it was a cake. However when she was given the chance to hold the item she realised that it was really a candle. After holding the candle she was asked what she thought the item was when she first saw it. The child responded that she thought it was a cake and acknowledged her initially held false belief. However, research indicates if this child was younger, say three years old, she would be more inclined to say that she thought it was a candle when she first saw it, thereby ignoring her previous false belief (Flavell et al., 1987). While children generally have been unable to demonstrate their understanding of false belief in such contexts, a range of less
formal tasks have identified an understanding of false belief in 3-year-olds (e.g., Mitchell & Lacohee, 1991; Siegal & Beattie, 1991; Szarkowicz, 1998). In these less formal tasks the broader social contexts of participants are considered. For example, consideration is given to the types of materials, physical location and structure presented in a task so that these offer some familiarity and consistency with participants’ everyday experiences. Less formal tasks are discussed in detail in the following chapter. Given the importance of understanding belief in a child’s theory of mind, the focus researchers have placed on the false belief task appears warranted and is the focus of the current study. The nature of false belief tasks is discussed in detail in Chapter 2.

To summarise, various studies of mental phenomena have identified an awareness of the mind in children. The picture which is developing suggests even 3-year-olds are able to distinguish between mental and physical states, link actions and mental states, and relate mental states to associated emotions. However, these same children appear to have difficulty taking the perspectives of others and understanding the interpretational nature of the mind in many clinical contexts. Therefore, it appears that younger children’s understanding of mind in experimental contexts is not as sophisticated as that of 5- and 6-year-olds, but that undoubtedly some level of understanding is present in 3-year-olds.

**Pretense**

From approximately eighteen months of age children begin to engage in joint pretense with peers (Dunn & Dale, 1984). However, there is dispute amongst researchers as to whether this is evidence of an understanding of mind. For example, Harris (1991) suggests that children use pretense to simulate how they would feel in a situation and then use the information they gain from simulating to
make judgements about others. Leslie (1987; 1988) advances the view that children are able to demonstrate their understanding of the mind in pretense before other contexts. Leslie’s proposal has been supported by the work of Hickling, Wellman and Gottfried (1997) who reported that 3-year-olds could assess the thoughts of another individual regarding an episode of pretense and understand that pretense was subjective. However, other investigators emphasise that children’s understanding of pretense is not evidence of an understanding of mentality because it does not require representational thought (e.g., Lillard, 1993; Jarrod, Carruthers, Smith & Boucher, 1994). Instead, some propose that children understand pretense as action only, a state of "acting-as-if", rather than as a physical exhibition of a mental state (Lillard, 1993; Perner, Baker & Hutton, 1994).

Despite these conflicting interpretations, evidence suggests that engagement in pretense can heighten sensitivity to the mind. For example, those children who engage in role-enactment during pretense are more competent at judging the mental states of others (Dunn, 1994), children who have imaginary companions are more likely to participate in fantasy play (Taylor, Cartwright & Carlson, 1993), and performances on traditional theory of mind tasks have been found to correlate with pretend play in 4-year-olds (Taylor & Carlson, 1997). Furthermore, a relationship has been found between pretense training and preschool aged children’s performance on theory of mind tasks (Dockett, 1994). Thus, what appears to be emerging from the literature is an awareness of the mind during pretense. While this awareness is not the same as the mature understandings adults hold, it would seem that it is not only an understanding of the physical components, but illustrates an awareness of a relationship between the mind and action.
Language

Investigations of language usage can provide much insight into children's understandings of the mind. Not only do such studies highlight the contexts in which children use particular types of language, but also their degree of pragmatic understanding, and possibly, any changes in usage over time. By observing when and how children use references to mental states, a picture can be created of their understanding in both naturalistic and established settings (Furrow, Moore, Davidge & Chiasson, 1992). While formal and informal contexts are available to researchers of mental state language, the predominant amount of research comes from naturalistic and observational studies, rather than experimental contexts. This bias may be due to the greater range of responses that can be obtained in naturalistic contexts (Tager-Flusberg, 1993), and the child directed nature of such environments (Dunn, 1991; Raver & Leadbeater, 1993). Furthermore, it has been suggested that children are able to interact with greater maturity in familiar contexts than in contrived environments, indicating that it may be in familiar settings that children will first demonstrate their understanding of the mind (Dunn, 1991).

Children as young as 24 months have been described using mental terms in their everyday interactions which express feelings and desires (Bretherton & Beeghly, 1982; Brown & Dunn, 1992). However, it is suggested this usage does not make references to mental states; rather that the use of mental terms is conversational. For example, children may use the mental term know to indicate the end of their utterance through statements such as "you know." Generally, mental state terms at this age refer to feelings and desires and are aimed at satisfying needs rather than expressing thoughts and understandings. It is not until approximately 30 months of age that children make references to mental states in self and others
(Bretherton & Beegly, 1982; Shatz et al., 1983). This progression from using desire terms to using belief terms is consistent with the belief-desire psychology theory proposed by Wellman (1990). Children tend to justify and explain actions using desire terms, such as want, until about three years of age when they begin to use belief terms, including know. Even when children are in dispute with peers, their usage of mental terms appears to follow the desires then beliefs pattern (Bartsch & Wellman, 1995). Indeed, conflict with peers may heighten children’s use of mental terms (Dunn, Brown & Beardsall, 1991; Dunn & Munn, 1986). It is possible that conflict situations expose children to points of view which are different from their own, thereby facilitating their understanding of different perspectives.

While it has been suggested that children use belief terms by 30 months of age, evidence indicates that it is not until about four years of age that they can distinguish between such terms as know and think (Moore & Furrow, 1991). This finding is in accord with many studies of mental phenomena which imply that children do not demonstrate an understanding of mentality until about their fourth year (e.g., Astington & Gopnik, 1988; Pratt & Bryant, 1990; Wimmer & Perner, 1983). Furthermore, children under four years of age appear to have difficulties distinguishing the degree of certainty of some mental terms (Moore & Furrow, 1991; Moore, Bryant & Furrow, 1989). Moore et al. (1989) reported that most 4-year-olds were able to distinguish between the terms know and think, and between know and guess. However, 3-year-olds had difficulties with the same distinctions. It is possible that the understanding necessary to make such distinctions is similar to the understanding needed for distinguishing appearance from reality. In order for children to make a distinction between mental terms, they need to understand that
individuals can think about mental terms with varying degrees of certainty, and that an experience for one individual, can be interpreted differently by another.

Despite such difficulties being identified in children’s understanding of mental terms, research indicates that they do understand the need to consider the mental states of others during discussions. For example, in one study 4-year-olds were reported as using different levels of language for different audiences (Gelman & Shatz, 1977). When they talked to 2-year-olds they used a smaller vocabulary and shorter sentences than when they were talking to same aged peers or adults. Hence, these children appeared to be sensitive to the presence or absence of information in their audience and adjusted their actions to accommodate what they believed about the mental states of these individuals. Indeed, it appears that children are very aware of the language used by other individuals, particularly primary caregivers. A significant relationship has been identified between the maternal use of belief terms at two years of age, and children’s use of these terms one and two years later (Moore, Furrow, Chiasson & Patriquin, 1994). Furthermore, the use of belief terms by primary caregivers with 2-year-old children was reported by the same researchers to predict children’s comprehension of such terms at four years of age. Hence, children appear to be very aware of the mental state language which surrounds them in their everyday interactions and may be experiencing a form of linguistic scaffolding from their caregiver.

In summary, investigating the language children use in everyday contexts can provide an early insight into their understanding of the mind. Evidence suggests that children begin to make mental state references at approximately 30 months of age, but are using references to desires before they refer to beliefs.
Furthermore, their usage and comprehension of belief terms appears to be related to
the usage caregivers exemplify in the first few years of life.

Mental Phenomena, Pretense, Language and Theory of Mind

To summarise, during the early years of life children develop
understandings which assist them to engage in interactions with others. A critical
understanding which develops during this period is their theory of mind. Evidence
suggests that many facets of this understanding are developed by three years of age
with children being able to distinguish between mentality and reality (Flavell,
Green & Flavell, 1995), using mental state terms during their everyday interactions
(Shatz et al., 1983) and engaging in joint pretense (Dunn & Dale, 1984). Between
four and five years of age these understandings become more complex and explicit
with children engaging in conceptual perspective taking (Taylor, 1988),
Demonstrating an Understanding of False Belief (Wimmer & Perner, 1983), and
evidencing an increasing use of belief and desire terms to explain actions (Bartsch
& Wellman, 1995).

While a range of methods have been used to investigate an understanding of
mind in children, the most common task used has been the false belief. This is
because an understanding of belief is critical to a theory of mind, given beliefs are
representational and combine with desires to influence action. However, there has
been a range of results reported for false belief studies. While 3-year-olds have
demonstrated an understanding of false belief in some studies (e.g., Mitchell &
Lacohee, 1991; Sullivan & Winner, 1993), they have been reported as having
difficulties on others (e.g., Gopnik & Wellman, 1992; Wimmer & Perner, 1983).
One reason posited for these differing results has been the contexts used. Some
studies have adopted experimental paradigms where children observe dolls participating in false belief actions (e.g., Wimmer & Perner, 1983), while other studies have engaged children in the task (e.g., Chandler & Hala, 1994) or tried to use games which were part of children's everyday interactions (Szarkowicz, 1999). Studies which have enabled children to participate in the task or used materials which were familiar to the participants have reported earlier understandings of false belief.

Moses (1993) suggests that some researchers have been interpreting the results from false belief studies in a "reductive" manner (p. 4). Often researchers appear to dismiss evidence of an understanding of mind because the results do not pass the conservative criteria established for many false belief tasks. It is possible that an understanding of mind is characterised by many behaviours and not all of these are addressed in the theory of mind paradigm which is traditionally used with children. Different tasks and different contexts for investigations may yield very different results to those commonly reported about preschool aged children's understanding of mind.

Given the varying results on false belief tasks, the phenomena warrant further investigation. It appears that context is important in studies of false belief, and that children may be more competent in familiar contexts such as during their everyday interactions in the home rather than in experimental situations. In experimental contexts children are often presented with traditional false belief tasks which can confound their performance. In the current study, traditional false belief tasks are defined as being most variants of the deceptive box or unexpected transfer tasks. These tasks are discussed in depth in Chapter 2. The candle which looked like a cake task (Flavell et al., 1987) presented in this chapter is also an example of
a traditional false belief task. Traditional false belief tasks are experimental, most often do not actively involve children in the presentation, and may present children with questions which can cause confusion. In the current study, alternatives to the traditional false belief task are referred to as non-traditional tasks. Non-traditional false belief tasks tend to actively involve children, use materials, such as literature, which are familiar to participants, and can occur in contexts selected by participating children (e.g., Hinchcliffe, 1996; Sullivan & Winner, 1993; Szarkowicz, 1999). There may be particular characteristics of the narrative used in non-traditional contexts which assists children in their attempts to demonstrate an understanding of mind. The current study aimed to investigate the characteristics of active participation, narrative detail, and narrative style. In the following section the current study is outlined.

THE CURRENT STUDY

Research Questions

The current study aimed to investigate whether or not children could demonstrate an understanding of mind during non-traditional false belief tasks and everyday interactions. This investigation was guided by the following five research questions.

1. Can children demonstrate an understanding of false belief when presented with non-traditional false belief tasks?

2. Can more children exhibit an understanding of false belief if they actively participate in the narrative of tasks?
3 Are more children able to demonstrate an understanding of false belief if they are presented with more detailed episodes of a false belief narrative?

4 Can children demonstrate an understanding of false belief in a literature based task with no trickery?

5 What characteristics of an understanding of mind do children demonstrate during their everyday interactions?

Aims of the Current Study

This study was divided into two phases-interview and case study. During the interview phase a series of false belief tasks were presented to children to identify which characteristics of narrative were significant. Three characteristics of narrative (the structure used for presenting understandings of the mind)-narrative style, active participation and detail of the narrative landscape-were identified as being important for children when demonstrating an understanding of false belief. Observations were completed for the case study phase. Based on the analysis of these observations characteristics of an understanding of mind, which ranged from subtle to overt actions, were identified in children’s everyday interactions.

Significance of the Problem

The current investigation is important for a number of reasons. Firstly, the significance of this problem at a theoretical level lies in its attempts to identify children’s understanding of mind on non-traditional tasks. Many studies have indicated that 3-year-olds fail traditional false belief tasks (e.g., Gopnik & Wellman, 1992; Wimmer & Perner, 1983). However, this does not indicate that
these children do not have an understanding of mind. A theory of mind is characterised by numerous behaviours and it is possible that not all of these have been addressed in the traditional paradigm. In the current investigation it was assumed that 3-year-olds did have an understanding of mind, but that they could not demonstrate this understanding in all contexts. Similarly it was assumed that not all 5-year-olds would be able to demonstrate their understanding in all contexts. Rather than focusing on the age at which children could demonstrate their understanding of mind, in the current study the contexts in which children demonstrated a theory of mind were more important. Studies which have focused on the contexts in which children demonstrate their understanding of mind, rather than age, are underrepresented in the theory of mind literature (e.g., Degotardi & Cross, 1999). This research aimed to identify contexts where children could demonstrate a theory of mind, thereby adding to the limited related literature. While age was not the main concern in this study, references to age were made to address the different theoretical positions of theory of mind development.

While there is evidence that many 4-year-olds are able to respond correctly on false belief tasks (e.g., Wimmer & Perner, 1983), studies have often involved presenting children with tasks contrived for investigations. Materials which children engage with during their everyday experiences have not generally been adopted in traditional studies. Moreover, there have been few investigations about the ways preschool aged children use their theory of mind during their everyday interactions. While some theory of mind studies have focused on the everyday interactions of children under three years of age (e.g., Bretherton & Beeghly, 1982), there is limited evidence from everyday contexts for preschool aged children (e.g., Degotardi & Cross, 1999). The understandings which many 4- and 5-year-olds
have evidenced during traditional investigations may not be the same as those
demanded in everyday experiences. Similarly, the difficulties that many 3-year-
olds have demonstrating an understanding of mind during traditional tasks (e.g.,
Gopnik & Wellman, 1992; Wimmer & Perner, 1983), may not be encountered on
tasks which use everyday materials or during everyday interactions. The sample
used in this study aims to reflect the age composition of a preschool in the country
where this research was undertaken. In such settings educators often work with
children from three to five years of age within one classroom. However, because
few theory of mind studies have focused on preschoolers during everyday
interactions many educators are not aware of how children use an understanding of
mind within educational settings. Consequently, educators can find it difficult to
develop learning activities which facilitate preschool aged children’s
understandings about the mind.

This study is also significant at a theoretical level because it consisted of
two different phases-interview and case study. In each of these phases, different
evidence of an understanding of mind was sought. In the interview phase children
could demonstrate their theory of mind by answering the interview questions
correctly. In the case study phase, children needed to evidence their understanding
of mind during everyday interactions. Hence, both the processes and products of a
theory of mind were important in this study. While specific understandings were
elicited from children during the interview phase, children determined how and
what understandings were demonstrated during their everyday interactions. While
some studies have addressed either the process or product of an understanding of
mind, fewer studies have investigated both (e.g., Degotardi & Cross, 1999). The
current research aimed to contribute to the literature in this area.
Another significant contribution of the current study concerns the relationship between an understanding of mind and social development. Given that relationships have been identified between theory of mind and numerous social understandings such as peer popularity (Dockett, Szarkowicz, Petrovski, Degotardi & Rovers, 1999), it is possible that an understanding of mind is an important prerequisite for social development. A theory of mind enables children to partake in their culture by providing them with understandings which make social interactions possible. Without these understandings, social interaction would be difficult, if not impossible. In the current study a relationship was proposed between specific types of interaction and understandings of the mind. By creating situations which are conducive to specific types of interaction, it may be possible to facilitate different understandings of the mind. For example, children might be encouraged to use more acknowledging and modelling interactions when sharing humour. By developing specific understandings about the mind children may become more competent in their social interactions.

An understanding of mind defines humans and enables individuals to interact within a culture. However, a theory of mind is not only necessary for success in social interactions. It is also needed for making meaning from literature. Few studies have investigated the relationship between understanding literature and a theory of mind (e.g., Hinchcliffe, 1996). Without a theory of mind many stories would be meaningless because they require individuals to understand how mentality influences action. For example, without an understanding of belief, stories involving trickery would be meaningless. The use of literature in the current study had the potential to identify specific ways of sharing stories which could help children develop an understanding of mind in the context of literature. For
example, active participation in the sharing of a story may be more meaningful for children than merely reading a story word for word. The results from this study have implications for the way adults interact with children when sharing literature and for the ways children are encouraged to interact with books. Similar implications are also evident for the way video is used with children. These findings are important for all who spend time with children and are not restricted to only educational contexts.

In summary, this study is significant at theoretical and social levels. The study aimed to identify children's understanding of mind during non-traditional literature based tasks and everyday interactions. Rather than focusing on the age at which children demonstrated their understanding, in this study context was more important. The results have implications for the social and cognitive development of children.

SUMMARY

This chapter has provided an introduction to the current study. A background to the research area and definition of key terms were presented. The research questions were outlined and the significance of the investigation was discussed. In the following chapter literature relevant to this study is discussed.
CHAPTER 2

REVIEW OF THE LITERATURE

This chapter presents an overview of research related to an understanding of false belief in 3- to 5-year-old children. It is organised into five sections: Understanding the mind; narratives and the mind; the interaction of narrative, theory of mind and culture; the current study; and summary of this chapter.

UNDERSTANDING THE MIND

The Role of the Mind

An important development which occurs in the early years of childhood is an understanding about the role of the mind. This understanding is most often referred to as a theory of mind. Without this understanding, social interactions would be impossible because it enables humans to interpret the actions of others in terms of their mental states. Research indicates that adults hold a very different understanding of the mind from children. In particular, many contemporary studies have focused on children under five years of age because results suggest that these children have difficulty understanding the representational nature of the mind (e.g., Astington & Gopnik, 1991; Perner, 1991; Wellman, 1990). While an awareness of the mind has been reported in 2-year-olds, many researchers do not believe that children develop a representational understanding of the mind, which resembles that of adults, until at least four years of age (e.g., Perner, 1991; Wellman, 1990). In the following section the theoretical perspectives for the development of a theory of mind are discussed. Following this discussion the theoretical perspective for the current study is presented.
Theoretical Perspectives for an Understanding of Mind

Like the conflicting views which have been expressed concerning the exact time an understanding of the mind emerges, a consensus has not been reached about the theoretical nature of this development. The most often cited approaches for the development of a theory of mind are theory theory (e.g., Gopnik & Meltzoff, 1997; Wellman, 1990), modulation (e.g., Fodor, 1992; Leslie, 1994), simulation (e.g., Harris, 1996), and enculturation (e.g., Astington, 1996; Feldman, 1992). The first three perspectives suggest that development occurs on an individual, autonomous basis, while the enculturation perspective proposes that development is an interdependent, social activity (Astington, 1996). Hence, from an enculturation perspective development occurs within, and is facilitated by, social contexts, while the other perspectives place their focus on development within the individual.

Theory-Theory

Numerous researchers have explained their findings from the theory theory perspective (e.g., Gopnik & Wellman, 1992; Perner, 1991; Wellman, 1990). In this account, theory of mind development is presented in terms of theory construction and modification. These theories, which are likened in structure to scientific theories, are used to explain and predict behaviour in the self and others. Moreover, individuals’ own experiences inform and are informed by their theories. From this perspective children’s understanding is constructed of concepts which are coherent, interdependent, and dynamic (Wellman, 1990). These concepts at times undergo fundamental changes. It is such a change that theory theorists advocate occurs around four years of age (e.g., Perner, 1991; Wellman, 1990). Prior to this age it is proposed that many children have difficulties demonstrating their understanding during traditional theory of mind tasks. However, after four years of age few
children have difficulties evidencing their representational understandings. Thus, using the theory theory perspective this age based change in understanding can be interpreted as evidence of a shift in the way children use and understand representation.

Modularity

As with the theory theory approach, the modularity perspective also assumes that children develop a theory-like understanding. However, rather than this understanding developing through experience and a process of theorising, modularity theorists suggest that it is innate (e.g., Fodor, 1992; Leslie, 1994). Leslie (1994) proposes that from approximately two years of age a domain-specific theory of mind mechanism develops, and refers to this as ToMM. The innate perspective is supported by evidence indicating that many understandings of the mind can be observed in different cultural contexts (e.g., Avis & Harris, 1991; Vinden, 1999). Because modularity assumes that a basic understanding of the mind is not influenced by different experiences or culture, modularists assume that a basic theory of mind is a universal phenomenon.

Simulation

In contrast to modularity and theory theory, simulation theory does not suggest that children engage in theorising. Rather, simulation theorists indicate that children use their own experiences of mental states as a basis for imagining how they would feel in the position of another (Harris, 1991). Hence, because children are aware of their own mental states they do not need to construct theoretical notions to understand the actions of others. In an act of simulation, children use their ability to imagine in a way similar to when they engage in pretense. Harris (1991, 1996) suggests that children have difficulty demonstrating understanding during false belief
tasks because they are unable to ignore the information which is current, and consequently, cannot engage in simulation. Because there are limits on the complexity of information which children can simulate, evidence which indicates that children slowly develop understandings about the mind supports simulation accounts.

**Enculturation**

The final perspective for consideration here is enculturation. Drawn from the sociocultural views of development, this perspective has a firm basis in the work of Vygotsky (1978). Unlike the other perspectives, supporters of enculturation do not advocate that children develop a theoretical construct of mind (e.g., Astington, 1996; Bruner, 1990; Hobson, 1991). Instead they suggest children "come to share their culture's way of regarding and talking about people's relations to one another and to the world" (Astington, 1996, p. 188). Given this tie between individuals and culture, enculturation theorists indicate that development cannot be explored outside of the social context in which it occurs. Hence, to explore an understanding of false belief it is best to look within a context which naturally lends itself to such understanding. For example, many children have been successful on false belief tasks which have included deception (e.g., Chandler, Fritz & Hala, 1989; Sullivan & Winner, 1993). It is possible that this success has occurred because situations involving deception are familiar to children and enable them to participate in a context where they understand the expectations (Astington, 1996). Thus, the context scaffolds (supports) the children by providing a recognised framework. A central premise for the enculturation perspective is the zone of proximal development. Vygotsky (1978) suggested this zone was the distance between what children could achieve independently, and what they could complete with guidance from more experienced
individuals. Hence, understanding can occur between a child and another individual before it can be observed within a child.

Theoretical Perspective of this Study

It is the perspective of enculturation which has most influenced the current study. The social nature of an understanding of mind suggests its development is embedded in the sociocultural context. It is probable that without social interactions such an understanding would not develop, and indeed, would not be necessary. Hence, in the present research it is assumed that an understanding of the mind cannot be considered in isolation from the social context in which it is evidenced.

The Theory of Mind Evidenced by Children

Despite evidence from a range of domains indicating that children do understand that the mind has a role in determining human action, there are still contradictions about what constitutes understanding and at what age this develops. It seems customary that investigations about children’s theories of mind refer to the age when this understanding is first demonstrated. Even when age is not the focus of a study, to enable the various theoretical accounts to be addressed, a reference to age is necessary. However, there is a lack of consensus about what developmental elements constitute a theory of mind. While some suggest an awareness of mind should be accepted as evidence of a developing theory of mind (e.g., Dunn, 1988), others indicate that children need to demonstrate an understanding of representation before they can be credited as having a theory of mind (e.g., Perner, 1991). Therefore, inconsistencies in the age at which an understanding of mind is evidenced are as much a result of different task demands as they are of the definition of theory of mind adopted. While joint attention may be evidence for a developing understanding of
mind in one context, success on traditional false belief tasks may be necessary in others.

Much research has focused on the false belief task as a measure of representational understanding (e.g., Mitchell & Lacohee, 1991; Wimmer & Perner, 1983). While studies in experimental contexts have produced less evidence for 3-year-olds understanding false beliefs, evidence from naturalistic situations indicates that children of this age do have an understanding which they are able to use in everyday contexts. These inconsistencies between research paradigms have motivated investigators to seek alternative formal approaches for exploring an understanding of false belief. While some researchers suggest the complex questioning in tasks is masking children’s understanding (Siegal, 1991), others indicate that the unfamiliar nature of many tasks is confounding their performance (e.g., Hinchcliffe, 1996; Sullivan & Winner, 1993). What emerges from the literature is a need to create an experimental context which is familiar to children, yet enables researchers to maintain control over key variables.

Evidence for a Theory of Mind in the Current Study

In the current study, the false belief task was selected for investigating an understanding of mind with children. If children were able to respond correctly on any of the tasks presented in the current study they were accepted as evidencing an understanding of mind. However, success on one task did not suggest these children would be successful on other tasks, or imply that they had a representational understanding of mind. Rather, it indicated that these children were able to understand the role of the mind in the given context. Just as adults sometimes have trouble demonstrating their understanding when they encounter a situation which is not familiar, or when they do not understanding the procedure, children may
experience similar difficulties. It is possible that such difficulties occur when children are confronted with a false belief task.

It is proposed that it is not a single characteristic of traditional false belief tasks which is causing children difficulties when they attempt to demonstrate understanding. Rather the current study argues that it is a combination of active participation, detail of the story, and presentation style which is confounding children's performance on false belief tasks. Each of these characteristics is encapsulated in the narrative of a task, and it is proposed that a manipulation of the narrative presented in false belief tasks may assist children. For example, more children may be able to demonstrate their understanding when actively participating in the narrative of a task. The nature of narrative and its role in false belief tasks are discussed in the following sections.

NARRATIVES AND THE MIND

Narrative as a Structure

The mind requires particular types of information to function effectively. When individuals attempt to make meaning of reality they need information such as setting, time, background events, identities and feelings of characters (Chafe, 1990). Hence, individuals require information about the physical and mental aspects of any given situation. This information is presented through the general structure of narrative. This structure forms a medium between the mind and action by being "a natural, reflective, uncritical form of discourse" (Olson, 1990, p. 99). Whether in an oral or written form, individuals use narrative as a construction to entwine experience and knowledge with their physical reality. Events structured through narrative become conscious and can be readily reflected upon, thereby becoming "forms of
thought-devices for interpreting experience and informing action" (Olson, 1990, p. 101).

Individuals use narratives as tools for ordering their experiences. Through narrative, people can create a conception of self which is sensitive to both the events and the characters in life (Hermans, 1997). In this way, it has been suggested that narrative is an important vehicle for making meaning within everyday interactions (Nicolopoulou, 1997), be these interactions in written or oral form. Hence, narrative is not merely a plot structure, but rather, a symbolic account used to shape reality, situate individuals within cultural practices, and provide meaning for experiences (Bamberg, 1997; Nicolopoulou, 1997). "Narratives are tellings, not simple windows on memory" (McCabe, 1997, p. 141), they provide us with "a map of possible roles and of possible worlds in which action, thought, and self-definition are permissible (or desirable)" (Bruner, 1986, p. 66). Narrative is therefore sociocultural in nature, developing from the interactions between people and culture (Nicolopoulou, 1997).

Both literate and oral cultures engage in some form of narrative construction and interpretation (Olson, 1990). While literate cultures engage in a narrative prose, oral cultures use a versified narrative form (Feldman, Bruner, Renderer & Spitzer, 1990; Olson, 1990). Indeed, it has been suggested that children spontaneously use the narrative form valued by their culture from an early age (McCabe, 1997). As children develop linguistic competence they "learn how to recognise, anticipate, tell, read, and respond to narratives" (Heath, 1986, p. 85). For children in literate cultures, experience with oral narratives assists in gaining control over written forms (McCabe, 1997). Irrespective of cultural context, narrative appears to be a structure used for understanding self and others in literature, talking and storying (Feldman, Bruner, Renderer & Spitzer, 1990).
Development of Narrative

The use of narrative has been identified in children as young as two years of age (Sachs, 1979). While these children use one event narratives, by three years of age they are able to use two events or two propositions in a narrative, as well as connectives to maintain coherence (McCabe, 1997). These early narratives tend to focus on people and their actions rather than the thoughts and feelings people may have (Nelson, Plesa & Henseler, 1998). However, with experience and practice children learn to incorporate mentality into their narratives. By five years of age children can generally use a "goal-action-outcome" structure for each narrative episode (Stein & Albro, 1997). While these children are able to incorporate action and mentality in their narratives, there remains a tendency for them to end their narratives abruptly, often without presenting a resolution for the events (Peterson & McCabe, 1983). It is not until approximately six years of age that children engage in what is referred to as a "classic" narrative, where they include an orientation statement, a sequence of events which conclude with a high point, and an evaluative statement which indicates how the events were resolved (McCabe, 1997). The narratives used by children continue to develop through the middle childhood years, with 9-year-olds engaging in significantly longer narratives than 3-year-olds (Peterson & McCabe, 1983).

In summary, narratives are culturally based structures used for presenting interpretations of reality. These structures are used to combine mind and action so as to make these interpretations conscious. Irrespective of culture, narratives are constructed and interpreted by children at an early age. Most importantly, narrative is not merely a plot structure imposed on experiences, but rather, is a structure which develops through the interaction of individuals with their culture.
Understandings of the Mind and Narrative

Several researchers have emphasised the relationship between narrative and an understanding of the mind. For example, Bruner (1996) refers to narrative as an instrument of the mind: "As a mode of thought and as a vehicle of meaning making" (p. 39). Olson (1990) also proposes that narrative is a form of thought used for "interpreting experience and informing action" (p. 101). Further support for a relationship has been offered by Chafe (1990) who suggests that narratives are "overt manifestations of the mind in action: As windows to both the content of the mind and its ongoing operations" (p. 79). Hence, it appears that narratives are an important medium for expressing representational understandings, evidencing humans’ ability to understand the mind’s role as an interpreter of reality. Without this ability individuals would merely recorded reality without any interpretation. Bruner (1990) describes narrative as a "natural vehicle for folk psychology" (p. 52), thereby providing meaning to action through the consciousness of the mind. Thus, with respect to a written narrative, reading without a theory of mind is merely decoding. While a written text is the same on every reading if only decoding, it is the engagement of interpretation by a reader which makes the narrative a mode of thought rather than just a tool for information storage (Olson, 1990). For example, reading a passage of information in a language which is not understood would only be decoding the written text. However, if the reading was done by someone who was learning the language, the reading would more likely involve meaning, which they could then use as background knowledge to gain further meaning when rereading the piece of text.
The Landscapes of Narrative

Important in the relationship between narrative and an understanding of the mind is the way narrative is structured. A narrative generally includes a clear beginning, middle and conclusion (Olson, 1990). Within this structure individuals are orientated to the context of the narrative and the narrator's voice (Felman et al., 1990; Olson, 1990). By learning about the context of a narrative individuals are able to situate the action. By hearing the narrator's voice individuals are able to access the mentality of the participants. A good narrative focuses on the action and mentality of a situation and the participants, conveying the action of a situation and presenting the participants as actors in the external world (Feldman et al., 1990).

Initially children focus on the action in a narrative (Nelson et al., 1998). However, through experience and practice with narrative form they begin to include mentality in their narratives between two and four years of age. According to Bruner (1986) these children move from focusing just on the landscape of action, to including the landscape of consciousness. The landscape of action is primarily concerned with context, agent and purpose. It is distinct from the landscape of consciousness which reflects the mental states of those involved in the action and includes states of knowledge, belief and emotion (Bruner, 1986, 1990). By incorporating voice (mentality) and action, a narrative "simultaneously recounts reality", weaving the action of reality with the actors' perceptions of such (Astington, 1990, p. 152). Narratives which use both landscapes are said to be dual landscape narratives (Bruner, 1986, 1990).

There are indications that not only formal narratives, such as literature, are patterned into a dual landscape, but also the interpretations children make of stories (Feldman et al., 1990). When different ratios of the two landscapes were used in a
story, different degrees of the two landscapes were evident in the interpretations. For example, when more action is presented than mentality, interpretations will be based mainly on action rather than the psychology of the characters. When neither landscape is present in depth, interpretations will be thin for both landscapes. Therefore, the coherence of a narrative, and consequently the interpretation of such, is influenced by the structure, and the depth of presentation of both landscapes.

It has been claimed that children are unable to appreciate the dual landscape of narrative before approximately four years of age (Astington, 1990). Feldman et al. (1990) suggest this difficulty may be due to the representational nature of the landscape of consciousness, which cannot be interpreted with only an understanding of action:

Whereas interpretation of the landscape of action may require only the use of the familiar cognitive processes that are used to explain the physical world, the landscape of consciousness may call into play cognitive processes not familiar from studies of our understanding of that world. (p. 2)

From this it appears that an understanding of how the mind influences action is necessary for individuals to make meaning from the landscape of consciousness. While an understanding of mentality appears necessary for individuals to make meaning from narrative, evidence suggests that 2- to 3-year-olds have difficulties focusing on both mentality and actions. These children tend to focus mainly on actions and consequently are unable to coherently present causality in a narrative (Kemper & Edwards, 1986).

In literate cultures it is possible that early understandings of narrative are shaped by those individuals who share stories with children. Evidence indicates that
exposure to stories increases children's knowledge about narrative (Lehr, 1990), but that parents often only describe the pictures with 2-year-olds rather than reading the text of stories (Trabasso, Stein, Rodkin, Munger & Baughn, 1992). It is possible that this process focuses children more on the action of a narrative than the consciousness, as action is easier to depict in illustrations. However, even when children are read the text, the presence of illustrations may hinder their ability to entwine the landscapes of narrative. Zazanis (1991) found that 3-year-olds were often distracted by pictures when being read a story, and had difficulty simultaneously coordinating the information received from the illustrations and verbal narrative. When the same children were presented with only the verbal narrative, they had no difficulty retelling the events. Given this, it may be that more action than consciousness was presented in the illustrations which confounded children's attempts at linking the information into a coherent narrative.

When literature is shared with children, it is often related to their experiences through questions and informal comments with the aim of making the narrative more meaningful (Lehr, 1990). Through these informal interactions a "shared context" can be created between the speaker/reader and listener (Sperber & Wilson, 1986). Shared contexts enable communicators to share their interpretations, thereby ensuring that the narrative remains relevant to all. These sharings entwine the communicators' interpretations from both landscapes. However, if a narrative is not made relevant to the experiences and understandings of children through a shared context, it is possible that they will misinterpret the narrative, or even ignore it. For example, Lewis, Freeman, Hagestad and Douglas (1994) suggest that the events of a narrative are combined into episodes which can be interpreted at different levels, but that sometimes these levels can be contradictory. This contradiction may be amplified if
there is an imbalance in the presentation of the landscapes of narrative. If a shared context is not provided for children, it is possible that their interpretation will be very different from that of the researcher. One conclusion to draw from this is that children need to be actively involved in the sharing of narrative so that their interpretations resemble what was intended by the more experienced communicator. The nature of active participation will be discussed in greater depth in later sections of this chapter.

In summary, narrative consists of two landscapes which present information about the action and mentality of a story. When one or both landscapes lack detail, it can be difficult for individuals to make inferences about the story. Evidence suggests that some false belief tasks may not present a balance of information from each landscape, resulting in an underestimation of children’s understanding. For example, if more detail is presented about the action than the mentality in a false belief task, children may rely on the action to provide them with answers. In the situation of a false belief, reliance on action alone would result in the wrong conclusions being made about the mentality of the characters. In the following section a definition of narrative, as it relates to the current study, is provided. Following this definition, the narrative of false belief is discussed.

Defining Narrative for the Current Study

The term narrative in this research refers to a structure which is used for presenting interpretations of reality. This structure combines Bruner’s (1986, 1990) notion of the dual landscape, where the landscapes of consciousness and action enable interpretations to be made of both the physical and mental elements in an event. Hence, irrespective of the medium, a narrative is the interpretation individuals assign to actions and events (Bruner, 1990). In the current study, a cohesive narrative
can be defined by the following characteristics. Firstly, the narrative should illustrate a causal relationship between events in the action and conscious landscapes through the use of connectives (Kemper & Edwards, 1986). Secondly, the narrative needs to be logical, sequentially ordering the events and consequences of the physical and mental events. Finally, the narrative needs to present sufficient information from each landscape so as to enable meaning to be made (Bruner, 1990). Therefore, in this study, a coherent narrative needs to explain what happened, and why it happened (Kemper & Edwards, 1986), and it needs to consist of "an Agent who Acts to achieve a Goal in a recognizable Setting by the use of certain Means" (Bruner, 1996, p. 94).

The Narrative of False Belief

If narrative is a foundation for communicative behaviour through its characteristic integration of mind and action, it may be an appropriate means for investigating children's understanding of mind. More specifically, the structure of narrative may be an important variable in tasks which aim to investigate the ability of children to attribute a false belief to self and others. Despite the extensive research which has been undertaken with preschool aged children into false belief understanding, no one conclusion has been accepted concerning the capabilities of children under five years of age. The interview phase of this current study aimed to investigate if children were able to demonstrate an understanding of mind during non-traditional false belief tasks. It was proposed that characteristics of the narrative in these tasks influenced children's ability to demonstrate an understanding. The characteristics of narrative investigated in the current study were active participation, narrative style and the detail presented in the narrative.
As noted previously, much empirical evidence indicates that children develop an understanding of the representational nature of false belief after the age of four years (e.g., Wellman, 1990; Wimmer & Perner, 1983). Differing results have been reported using naturalistic methods (e.g., Dunn, 1988, 1991). For example, in an investigation of ignorance, false belief and representational change, clear discrepancies were identified between the spontaneous comments of children and their performance on the experimental tasks (Sullivan & Winner, 1993). Children who expressed a clear understanding of false belief through their naturalistic comments often failed on traditional tasks, despite these tasks being designed to investigate similar understandings. It is possible that children's understanding is masked during experimental tasks due to the contextual differences between these and naturalistic situations. For example, children may not have the opportunity to actively participate in the narrative of experimental tasks. Despite the identified difficulties with traditional tasks, they have been the predominant method for investigating false belief. Generally traditional false belief tasks have been of two types: unexpected transfer or deceptive box. Both of these task types are discussed in the proceeding section.

The Traditional False Belief Task

The Unexpected Transfer Task

The impetus for studying false belief was generated by the now classic unexpected transfer task of Wimmer and Perner (1983). Their task involved a doll (Maxi) to whom participants attributed a mistaken belief. Maxi placed some chocolate in a coloured cupboard and left the room. While he was absent his mother moved the chocolate to a different coloured cupboard without Maxi knowing. Children were questioned as to where Maxi would look for the chocolate when he
returned to the room. Most 3-year-olds said he would look in the cupboard where his mother placed it, attributing their knowledge to Maxi rather than acknowledging his ignorance in the situation. It has been suggested that children may not understand that Maxi's behaviour is determined by his interpretative mental states rather than reality alone, and it may not be until they understand the representational nature of the mind that children will acknowledge Maxi's false belief. Numerous researchers support the view that children have difficulties with false belief because they do not understand the representational nature of the mind (Flavell, 1988; Perner, 1991).

An extensive range of studies has investigated children's abilities to demonstrate an understanding of false belief using variants of the unexpected transfer task. Despite the findings of Wimmer and Perner (1983), 3-year-olds have been reported to accurately predict actions in another when provided with information about that individual's beliefs and desires concerning the location of an object (Wellman & Bartsch, 1988). For example, using picture cards and an oral narration, children were told the story of Sam who was looking for his puppy. Children were told that the puppy could be in the garage or under the porch, but Sam thought the puppy was in the garage. When asked where Sam would look for the puppy, over three quarters of the 3-year-olds studied were able to respond correctly by saying Sam would look in the garage. In Wellman and Bartsch's study, children were presented with four different belief-desire tasks. Each task manipulated different aspects of the original procedure adopted by Wimmer and Perner (1983) to minimise confounding caused by the nature and language of the task. Even the youngest 3-year-old children performed well on most tasks, suggesting that performance was not an artefact of only one aspect of the task, but was influenced by multiple characteristics. Further evidence for an early competence on the unexpected
transfer task was presented by Siegal and Beattie (1991) who reported that children could complete a similar task if the language was adjusted so that the subjects had to predict the initial behaviour of the character holding a false belief. These researchers suggested that many traditional false belief tasks underestimated children's abilities because tasks often involved contexts which were unfamiliar. Furthermore, such tasks can present conversational rules which are not used by children. For instance, questioning can be prolonged, and the purpose of the activity is rarely made explicit for children (Siegal, 1991). Hence, many children may be uncertain about what they are required to do on these tasks, and, as a result answer questions in a manner which they think is desired by an experimenter.

Further adaptations of the unexpected transfer task have enabled it to be used with children with autism and Down Syndrome (e.g., Baron-Cohen, Leslie & Frith, 1985; Leslie & Frith, 1988). Baron-Cohen et al. (1985) developed a task where Sally placed a marble in a basket and, while she was absent, Anne moved the marble from the basket to a box. Irrespective of whether children were asked where Sally would look for the marble or where Sally thought the marble was, most of the children with autism had difficulty acknowledging Sally's false belief. In contrast, the two control groups-normal children and children with Down Syndrome-had little difficulty with the task. Once again, results indicated that most children without autism can demonstrate their understanding of false belief in some, but not all contexts.

Glenn, Johnson and Parry (1993) adapted the unexpected transfer task used by Baron-Cohen et al. (1985) to investigate the influence of context on performance. The story was presented in one of three conditions: The Sally-Anne form, the same task with adult actors, or with the subjects participating in the story with other children. Results indicated that children performed poorly in the doll condition,
slightly better in the adult actors condition, and best in the active participation condition. When children participated with other children in the task, they were creating a deception which they had probably experienced during their everyday interactions. For example, most children engage in games of hide and seek. Indeed, many children found the task amusing, suggesting they understood the consequences of their actions. Similar responses were reported for children when a game of hide and seek was used to explore an understanding of mind (Szarkowicz, 1999). As in Glenn et al. (1993), more children were able to demonstrate their understanding of false belief when participating in a game of hide and seek than when partaking in traditional false belief tasks.

The focus in many studies of false belief has been on the age at which children succeed on false belief tasks (e.g., Gopnik & Wellman, 1992; Perner, Leekam & Wimmer, 1987; Wimmer & Perner, 1983). Numerous studies with this focus have concluded that children have a conceptual deficit with the result that they are unable to demonstrate an understanding of false belief because they do not yet have the ability to create mental representations (e.g., Perner, 1991; Perner & Howes, 1992). However, more recently some researchers have focused on the relationship that domain general processes such as language and memory have with children’s ability to demonstrate an understanding of mind. For example, using a similar unexpected transfer task to that of Wimmer and Perner (1983), Jenkins and Astington (1996) identified a threshold effect for performance, where children generally did not pass the task until they had achieved a specific level of linguistic competence. Working memory (Keenan, 1999) and inhibitory control (Hughes, 1998) have also been found to be significant predictors of performance on false belief tasks. These abilities form part of a larger group of skills known as executive functions (Hala,
An executive functioning account of development does not suggest children’s difficulty with false belief tasks is due to conceptual deficits, but rather, that it is due to their difficulty in translating "knowledge into successful action" (Keenan, 1999, p. 2). Hence, some researchers are focusing on predictors other than age when investigating an understanding of mind using tasks such as the unexpected transfer. Despite this, inconsistent results have been reported when variants of the unexpected transfer task have been used. These inconsistencies are not confined to studies using the unexpected transfer task, but have also been identified using other tasks such as the deceptive box (e.g., Perner et al., 1987). The deceptive box task is described in the following section.

**The Deceptive Box Task**

Perner et al., (1987) developed the deceptive box task as an alternative to the unexpected transfer task for investigating children's understanding of false belief. The deceptive box task involved children being shown a Smarties box which, when opened, contained pencils. When the pencils were replaced in the box, children were asked what they believed was in the box when they first saw it. A majority of 3-year-olds had difficulties with this task and said they thought the box had contained pencils when they first saw it. Thus, their responses suggested a failure to recognise their previously held false beliefs. Fewer 4-year-olds demonstrated the same difficulty acknowledging false belief.

In contrast, more recent work using the deceptive box task found age was not important with younger children performing as well as older children (Dalke, 1995). Rather, it has been suggested that children do understand false belief, but that if the research environment does not provide sufficient cues to activate their false belief
schemas, alternative schemas will be used resulting in incorrect responses. This argument can be linked back to that of the dual landscapes of narrative. If children are presented with insufficient cues about the mentality of a situation, they will have to either rely on the information they receive from the landscape of action, or create their own version of the mentality based on the information they have received. Without sufficient information about the mentality, children may not even realise the situation is one of false belief. It is possible many studies of false belief, which have relied on the traditional style of task, have underestimated children’s understanding by not distinctively presenting the task context as a situation requiring false belief reasoning.

Numerous studies have used the deceptive box task to investigate children’s ability to attribute ignorance to another (e.g., Hogrefe, Wimmer & Perner, 1986; Perner & Davies, 1991). Hogrefe et al. (1986) reported that 3- and 4-year-olds could attribute ignorance to another when they did not have access to the knowledge of the box contents. However, these children were unsuccessful on false belief questions about the contents of the same box. Further evidence against an early understanding of mind presented one sample with three standard tasks: a deceptive box task, an unexpected transfer task, and an appearance-reality task. Even when children were provided with more than one opportunity for success, 3-year-olds had great difficulty demonstrating an understanding (Gopnik & Astington, 1988). At variance with these results, Perner and Davies (1991) found that 4-year-olds could understand the role of prior knowledge in developing beliefs. Most 4-year-olds were successful on a deceptive box task and on a "droodle" task. The droodle task was similar to the restricted view perspective taking task of Taylor (1988). A picture was shown to children which was partially hidden so that identification of the object was inhibited.
This droodle was then shown to another individual who did not have the background knowledge of the picture. Both 4- and 5-year-olds understood that the droodle was meaningless to another without prior knowledge. Hence, these children were able to demonstrate an understanding that individuals can have different knowledge states based on their unique interpretations of a reality.

More recently the deceptive box task was modified so that children were required to make judgements concerning the mental states of puppets and themselves (Saltmarsh, Mitchell & Robinson, 1995). A puppet and the child were questioned about the contents of a Smarties box. After both responded that the box contained Smarties, the puppet left the room, and in his absence the contents of the box were changed from Smarties to a pencil. When the puppet returned children were initially asked what they believed was in the box, and then what the puppet believed was in the box. Overwhelmingly, more children were able to respond correctly to this questioning than the standard deceptive box task. Understanding was explored further by changing the true belief into a false belief. Rather than asking children what the puppet had thought was in the box, they were asked what the puppet thought was in the box now. The children in this study found this change in questioning no harder than the earlier task which required them to acknowledge true beliefs, with many stating the puppet would think there were Smarties in the box. With a small modification to the standard task younger children were more successful in demonstrating their understanding of false belief.

Further evidence of 3-year-olds demonstrating an understanding of false belief during deceptive box tasks was presented by Mitchell and Lacohee (1991) who modified the Perner et al. (1987) task and encouraged children to consider physical and mental states simultaneously. Subjects were shown a Smarties box which
contained pencils as in the Perner et al. (1987) task, but mailed a picture of what they thought was in the box before the contents were revealed. After the pencils were revealed and then replaced, children were asked what they thought was in the box when they mailed their picture. Performance on this task was significantly better than on the traditional task, suggesting that children may feel biased in such tasks to make judgements about mental states based on a known reality (Mitchell & Lacohee, 1991). It is also possible that the involvement children had in this task through mailing a picture enabled the investigation to be more meaningful for them, and thus may have enabled them to understand the purpose of the task at a more implicit level (Siegal, 1991). In addition, it could be argued that mailing the picture reinforced the false belief actions for the children which assisted their later recall by providing a physical prompt for memory.

Despite the findings for an understanding of false belief by 3-year-olds in some modified deceptive box tasks, other modifications have not identified the same competence. For example, when children were asked to draw what was in the box, or saw another individual draw the contents of the Smarties box, their recall of beliefs was not improved (Robinson, Riggs & Samuel, 1996). Children were questioned as to what the drawing was and what they or the other person thought was in the box. Children were able to recall the drawings better than the beliefs, with the recall for beliefs being no better in the group with drawings than in the control group. Even though this study provided children with the opportunity to be actively involved in the false belief task, performance was no better than on previous deceptive box tasks without participation.

The use of pictures, rather than drawings, has been found to facilitate performance in children (Freeman & Lacohee, 1995). Simply reminding children
they had held a picture of the object in question appeared to improve performance more than reminders about holding the object itself. More importantly, in their study Freeman and Lacohee (1995) found that children did have the memory trace necessary for false belief reasoning, but that this trace was not accessed under traditional tasks. Therefore, these results can be categorised with a number of other studies which have suggested that traditional false belief tasks are masking children's understanding (Hinchcliffe, 1996; Lewis et al., 1994). An overview of some alternative approaches to the traditional tasks are presented in the following section.

Alternatives to Traditional False Belief Tasks

It appears that particular conditions need to be present in a false belief task if children are to demonstrate their full understanding. A possibility suggested by Mitchell (1996) is that the false belief needs to "have a physical counterpart in current reality" (p. 149). Younger children have been more successful on tasks which have provided them a tangible connection with the circumstances surrounding the belief (e.g., Glenn et al., 1993; Mitchell & Lacohee, 1991). Further investigations which enable children to participate in the tasks appear warranted. It also appears necessary for studies to focus on the type of narrative which is presented to children to ensure that sufficient detail from each of the landscapes is available. Furthermore, the familiarity of the narrative needs to be considered. It is possible that more children will be able to demonstrate an understanding of mind when presented with a familiar narrative rather than one they do not know the procedure. The following section considers several alternatives to the traditional false belief task, described as: Deception and the false belief task, media and the false belief task, and informal studies of false belief.
Deception and the False Belief Task

A number of false belief studies have used deception as a context for tasks (e.g., Chandler et al., 1989; Sullivan & Winner, 1993). It has been suggested that children may first demonstrate their understanding in this context because instilling a false belief is the purpose of deception (Dalke, 1995). When lying and deceiving, an individual aims to mislead another and needs to be aware of the other's ignorance in a situation. Indeed, the concept of deception can not exist without belief (Peskin, 1996). To deceive another, one must be convincing and present as if what was said was reality. When children were confronted with such a situation and were required to deceive an adult by lying, over three quarters of the sample were successful (Lewis, Stanger & Sullivan, 1989). In the Lewis et al. (1989) study, a group of children were each shown a toy zoo which was then covered by a cloth. The experimenter told the children they could play with the zoo when she returned to the room, but until then they were not allowed to look under the cloth. When the experimenter left the room, children were filmed by a hidden camera, which captured most of them looking under the cloth. However, when the experimenter returned and asked children if they had peeped, nearly all said they had not. Most interestingly, when the video of each child replying to the question was shown to adult raters without sound, raters were unable to discriminate between children telling the truth and those lying. Those children who lied were able to do so in a convincing manner and appeared to consider the mental state of the experimenter by assuming she was ignorant to the fact they had peeped. Given many children in this study were not yet 3-years-old, it seems children have the ability to deceive another at a very early age.

Other studies also have illustrated an early understanding of false belief by involving deception in the task (e.g., Chandler et al., 1989; Samuels, Brooks & Frye,
1996; Sullivan & Winner, 1993). In one study a more complex task than that of Lewis et al. (1989) was completed with a group of 2-, 3- and 4-year-olds using dolls (Chandler et al., 1989) where children were told that the doll had treasure in her basket and was going to hide it in one of four rubbish bins so that the second experimenter, who was not in the room, would not find it. The doll left ink footprints as she walked to one of the bins, thwarting her attempt to conceal where the treasure was. Children were then shown that the footprints could be wiped away with a cloth, thereby removing the physical evidence indicating in which bin the treasure was hidden. After children were provided with this explanation of the task, they were reminded that the doll wanted to hide the treasure from the second experimenter and their attention was drawn to the footprints. When asked what they could do to help, many children took the cloth and rubbed away the footprints. With further prompting some children walked the doll to an empty bin, and consequently left footprints to this bin rather than the real location of the treasure. Upon the return of the second experimenter, children were asked where the treasure was. Most children did not respond to this questioning or indicated the bin with the false tracks and no treasure. The authors of this study concluded that children could account for the mental states of others and use this information to deceive another. However, when the study was replicated by a different research team, children were found to need much prompting, and did not always remove the footprints to deceive the adult participant (Sodian, Taylor, Harris & Perner, 1991). Based on this second study it was suggested that Chandler et al. (1989) had evidenced a behavioural example of an understanding of mind rather than an explicit theory of mind. Despite this criticism, the original results were replicated with similar controls to those implemented by Sodian et al. (1991) (Hala, Chandler & Fritz, 1991). While there are no obvious explanations for
the discrepancies between these studies, it is possible that the interaction style of the researcher may have been an influential variable (Mitchell, 1996), suggesting that it is not only the nature of the task which needs to be considered when designing an investigation, but also the context in which it is being presented, and by whom.

A different approach to investigating an understanding of mind by using deception has involved adapting the traditional deceptive box task (Chandler & Hala, 1994; Sullivan & Winner, 1993; Winner & Sullivan, 1993). In the deceptive version of this task, children were encouraged to change the contents of the box to trick another individual. While 3-year-olds had difficulty with the traditional version of this task, they were able to demonstrate their understanding during the deceptive condition either when participating in, or witnessing, the action (Sullivan & Winner, 1993; Winner & Sullivan, 1993). Even though these studies indicate that children could demonstrate an understanding if they witnessed the action, Chandler and Hala (1994) found active participation was important, with fewer children being successful when they did not participate in the task. It has been suggested that tasks which involve deception are more motivational and naturalistic for children, particularly when the opportunity for active participation is provided (Sullivan & Winner, 1993). Furthermore, tasks based on deception can provide a sense of familiarity for children who know the routine of tricking. It is possible that contexts which present deception highlight the beliefs in another and allow children to overcome their tendency to respond with reality based answers (Fodor, 1992).

In summary, tasks involving deception, rather than traditional tasks, have identified an understanding of mind at an earlier age. Tasks involving deception have encouraged children to become a part of the action, while explicitly displaying the instilling of a false belief in another. This, coupled with the familiarity children
have with trickery, may create a context which is more conducive to theory of mind reasoning than traditional situations. The use of different forms of media in false belief tasks is discussed in the following section.

**Media and the False Belief Task**

Many modified traditional tasks have not always been embedded in a context which is familiar for children. Despite attempts to increase children’s participation in a task (e.g., Mitchell & Lacohee, 1991), or the use of materials which are familiar to participants (Freeman & Lacohee, 1995), many of these studies still have not resembled the theory of mind experiences which children encounter during everyday activities (Nelson, 1996). Examples of suitable activities would be playing games, watching television, and sharing story books. These are potential contexts for investigating an understanding of mind because most children regularly engage in such activities. This regular engagement enables children to become familiar with the routines associated with these activities. Given this, interesting results have been obtained when film or video (hereafter referred to as video unless specifically referring to the use of film in other research) has been used as a task medium (e.g., Glenn et al., 1993; Moses, 1993). Video has been found to be more facilitative for false belief understanding than story books (Szarkowicz, 1998), and when compared with the use of dolls, significantly more children demonstrated an understanding of second order beliefs (beliefs about beliefs) after watching action on a video rather than observing a re-enactment involving dolls (Glenn et al., 1993). In his research, Moses (1993) asked children to watch a film which illustrated a number of actors participating in actions that resulted in surprise or happiness. After watching the film, children were questioned about the action and characters’ mental states. Moses
found that 3-year-olds had an excellent understanding of unfulfilled intentions, and that they understood false belief better on the film task than on traditional tasks.

Moses (1993) was hesitant to suggest his results were due only to the "visually engaging video format" (p. 19). This hesitancy may have been based on results from other studies using film which have not found evidence of an early understanding of mind. For example, mixed results were also reported when the use of humour in a deception based false belief task was explored (Mayes, Klin & Cohen, 1994). In this task children watched a video which displayed actions and had a verbal narration. Humour was conveyed through a deception where one character was blindfolded and asked to feed what he thought was the baby, but the baby had been moved after the character was blindfolded and a man took the baby’s place in the scene. This task was perceived as emphasising social context because humour was more likely to be something children encountered on a daily basis. However, the results indicated that 3-year-olds performed less competently on this task than traditional false belief tasks. In contrast, older children performed better in the humorous condition. It is possible that the narrative adopted in this task was too complex for the younger children, requiring them to attend to both the complex physical actions of people changing places with the displaced object, and the associated mental states of the characters. Thus, despite a familiar context of deception and film, the narrative of the task may have failed to provide adequate information from each landscape so as to enable children the opportunity to entwine the action with the mentality.

An alternative to video in tasks has been children’s literature (e.g., Clancy, Kay, Lambert & Williams, 1998; Hinchcliffe, 1996; Szarkowicz, 1998). There are a number of advantages for using literature in theory of mind investigations. Firstly,
the activity of sharing literature is social, informal and familiar, given most children from an early age regularly share books with significant others, such as parents and teachers. Secondly, literature has a familiar structure and a sense of purpose, generally creating a non-threatening context for children (Clancy et al., 1998; Hinchcliffe, 1996). Thirdly, the stories presented in literature are often natural, rather than being contrived for the purpose of investigation, and generate an interest from children. This is particularly important as many traditional theory of mind tasks have been criticised for being contrived to meet the needs of an investigation rather than to entertain children (Hinchcliffe, 1996). An example of a theory of mind study which has used children’s literature is Clancy et al. (1998), who used the picture book *John Brown, Rose and the Midnight Cat* (Wagner, 1977). A strength of this study was that children were asked questions after they heard the whole story, rather than having to predict the actions of characters, as is often the situation in traditional tasks. For example, children were asked what the character had thought about an episode, rather than predicting how the character might think in the future. The cohesive nature of most story books lends them to retrospective thinking, which has been found to assist children in their attempts to demonstrate an understanding of the mind (Lewis et al., 1994). Results from Clancy et al. (1998) indicate that understandings about the mind including false belief, inferences using mental terms, and logical inferences, occur simultaneously rather than in isolation from each other. This being so, it would seem appropriate to create tasks which provide a variety of cues related to understanding the mind to enable children to draw on their broader conceptual knowledge in this area. It appears that if designed appropriately, literature based tasks can reflect broader understandings.
Further evidence from literature based tasks has focused on the importance of narrative in investigations (e.g., Lewis et al., 1994; Szarkowicz, 1998). It has been suggested that the narrative presented in traditional false belief tasks does not address all aspects of behaviour associated with children's understanding of mind, and hence may lead to an underestimation of their ability (Moses, 1993). However, by modifying the narrative of tasks to account for the needs of children, 3-year-olds may be able to demonstrate competence with false belief understanding. Lewis et al. (1994) modified an unexpected transfer task and presented it to children in picture book format. Results indicated that 3-year-olds were able to respond correctly to false belief questioning when they were able to recall the important events in the story. That is, when they were able to entwine the action and mentality of the dual landscapes into a coherent whole. Those who had failed a traditional false belief task were successful on the new picture book task. The researchers concluded "that the structure of 3-year-olds' event memories is central to their poor performance in the traditional false belief task" (p. 397). These event memories are influenced by narrative, with the possibility that performance can be further improved when children are given opportunities to link events into a cohesive narrative. Children appear to have difficulty in "reconstructing the protagonist's mental state from memory" (p. 417). Thus, in a false belief task children may have problems entwining the action they have observed with the mentality they have been informed about. As Lewis et al. (1994) stated, children who had difficulty recalling the facts were excluded from tasks, thereby minimising basic recall as an explanation for failure. Hence, the observed difficulties appear to be specific to the way the narrative was structured.
In summary, when designing experimental false belief tasks there are many aspects of the presentation which need consideration. The nature of the narrative, context and children's participation are important facets of a task. Each needs to be presented so as to meet the developmental and social requirements of all participants. It would appear that false belief tasks need to be better matched to the cognitive style of younger thinkers in that their ability to reason tends to be of a more domain general nature where conceptual networks develop simultaneously rather than in isolation (Cole, 1985; Gelman & Greeno, 1989).

**Qualitative Studies of False Belief**

An alternative to experimental investigations of false belief are qualitative studies. Such studies often involve observations in naturalistic contexts, thereby illustrating children's theories of mind in everyday interactions. The majority of naturalistic studies have focused on the use of mental state language. In contrast to experimental studies, they have presented evidence of an early understanding of mind (e.g., Dunn, 1988; Shatz et al., 1983). There are a number of benefits to be availed through the use of qualitative methods. Firstly, qualitative approaches to data collection are more sensitive to the needs of children, often occurring in familiar settings with significant others (Dunn, 1991). Secondly, these approaches provide for a range of responses rather than only a correct or incorrect answer (Tager-Flusberg, 1993). This is particularly important because it may not be possible to observe implicit understandings of the mind during interviews alone (Dockett, 1995). Moreover, qualitative methods allow for "the processes underlying the development of mentalistic understanding" to be observed (Hughes & Dunn, 1997, p. 382). Hence, individual differences in understanding can be investigated. Thirdly, qualitative studies allow children to retain a degree of control in the research context.
By allowing children to direct the action it is possible to observe more mature interactions than if the action was controlled by an adult, because children are engaging in actions they determine as important (Dunn, 1991). Finally, qualitative methods can be used in collaboration with quantitative methods to provide a check for external validity (Dunn, 1991; Szarkowicz, 1995). Thus, by using both qualitative and quantitative methods in a single study, one can achieve a degree of triangulation; the process of utilising multiple methods and source of data to increase validity (Mathison, 1988).

Using a combination of qualitative and quantitative methods has identified a number of relationships between theory of mind measures and other variables. For example, relationships have been indicated between mental state talk and engagement in pretend play (Hughes & Dunn, 1997), peer popularity and performance on theory of mind measures (Dockett et al., 1999), and the use of mental state language and performance on standard theory of mind tasks (Brown, Donelan-McCall & Dunn, 1996). Moreover, the results from qualitative studies have the potential to be used as a measure for external validity when similar results are reported from experimental and naturalistic contexts. When there is consistency between results from these different contexts it could be suggested that the experimental context is in fact reflecting aspects of children's everyday contexts rather than understandings which are specific to the quantitative situation.

**Summary of False Belief Narratives**

While consistency in results can be found in each research paradigm, fewer similarities can be identified across the different methods. Given these inconsistent findings, there appears to be much advantage in using both qualitative and quantitative methods. Qualitative procedures can act as a test for the external validity
of quantitative results, and provide triangulation to a study. Furthermore, children may demonstrate greater maturity within naturalistic contexts and illustrate understanding which may not be observable during experimental tasks. A central concern for both research paradigms is the way narrative is structured. Evidence suggests narratives need to be presented in a cohesive manner, thereby enabling children to entwine action with mentality. It appears that when children are provided with a cohesive narrative and opportunities to participate, they are able to demonstrate understandings earlier than when such a situation is not made available.

THE INTERACTION OF NARRATIVE, THEORY OF MIND AND CULTURE

The False Belief Task and Sociocultural Contexts

To appreciate the understandings which children demonstrate, it is necessary to view activities as a whole and relative to the cultural and social contexts in which the understandings are used and facilitated (Gauvain, 1995). Thus, rather than focusing on how an understanding of mind develops, researchers should be more concerned with how and what children understand about the mind at specific points in time (Gauvain, 1998). From a sociocultural perspective, development involves children working with other people and society at levels which are often beyond what they are capable of achieving alone (Litowitz, 1993). According to this view children first experience new cognitive processes socially before they are able to use these processes in isolation. This area of shared understanding between children and more experienced individuals is referred to as the zone of proximal development (Vygotsky, 1978). It has been suggested that culture and cognition create each other in the zone of proximal development in such a way that the development of each depends on this interaction (Cole, 1985). Thus, it appears appropriate to investigate
an understanding of mind within this zone. Indeed, Astington (1996) suggests that the performances of children on false belief tasks can be influenced by how many opportunities they have for "shared mental activity within the zone" (p.191). For example, in a modified deceptive box task children were able to post a picture of what they thought was in the container before the unusual contents were revealed (Mitchell & Lachoe, 1991). Children were able to use this picture as a reminder, or scaffold, for recalling their mistaken belief. By sharing the picture and responding to the researcher's questioning, children engaged in a socially shared situation with the adult. For some children it is possible that this sharing occurred in the zone of proximal development, and without such scaffolding they may not have been as successful in demonstrating their understanding of false belief.

It appears that scaffolding is an important variable for facilitating understanding. Within a false belief task scaffolding may involve providing children with reminders, controlling their attention, reducing the executive functioning demands, and enabling children to participate actively (Astington, 1996; Raver & Leadbeater, 1993). However, scaffolding does not only facilitate children's attempts to demonstrate an understanding of mind, it also "is the mechanism whereby change comes about" (Astington, 1996, p. 194). Astington cites numerous informal studies (e.g., Brown & Dunn, 1992; Dunn, 1988) as evidence for a link between the language children experience in their everyday activities and their developing understanding of the mind. Such evidence suggests that children's understandings initially come from their social and cultural contexts before being internalised. Indeed, the "materials, tasks, interactions, and people represent and derive meaning from the culture from which they come" (Gauvain, 1995, p. 26). Hence, development appears to be a product of the reciprocal interaction of a child and the sociocultural context; children
learn from the sociocultural context while also becoming participants in it. So it appears necessary to embed any false belief task in children’s social and cultural experiences if they are to demonstrate and broaden their understandings.

**Narrative and the Sociocultural Context**

Based on the discussion so far, a number of characteristics appear to be necessary for children, under approximately five years of age, if they are to be successful on false belief tasks. Firstly, active participation is important. Secondly, the social context needs to reflect children’s everyday experiences. Finally, the task needs to present a cohesive narrative comprised of sufficient references from both the landscape of action and the landscape of consciousness. Therefore, an understanding of mind is most likely to be demonstrated when children are participating in an everyday context which serves their needs for references to both action and mentality. When the difficulties some children have with false belief tasks are viewed from an enculturation perspective, the tendency for their responses to be biased by reality is not perceived as a conceptual deficit. Rather, it is because their interpretation of events may have been restricted by characteristics of the narrative which did not offer sufficient scaffolding (Lewis et al., 1994). For example, in the Wimmer and Perner (1983) unexpected transfer task, the colour of the cupboards is not the central idea of the narrative. However, the false belief questioning demands children focus on the colour of the cupboards. More children may have demonstrated an understanding if their attention had been repeatedly drawn to the colour of the cupboards when the narrative was shared. Indeed, the central concern of any narrative should be repeated as research indicates that children tend to make repeated items the centre of their interpretations (Kintsch & van Dijk, 1978).
The arguments presented in this chapter imply an interaction between narrative and the sociocultural context which can facilitate or arrest children's performance on a false belief task. This proposed interaction is presented graphically in Figure 2.1.

Figure 2.1

**Narrative and Sociocultural Contexts Interaction Model**

\[
y = \text{narrative landscape}
\]

\[
x = \text{sociocultural context}
\]

The aim of any interaction is to achieve meaning. This meaning is represented as the intersection of each axis in Figure 2.1. This graphic is referred to as the Narrative and Sociocultural Contexts Interaction Model. It is proposed that meaning is shared between a researcher and children during a false belief task when children are able to demonstrate their understanding. However, as discussed in this
chapter, there are a number of variables which can confound children’s attempts to demonstrate understanding. The manner in which the narrative is presented can be one of these confounding variables. To heighten the chance that shared meaning will be achieved between a child and a researcher, a research situation should provide a balance of each narrative landscape (the x axis) and include aspects of the child’s sociocultural experiences (the y axis). Thus, the narrative of a task should present children with a balance of information about the action and consciousness of the events. These events should reflect parts of the social and cultural experiences of the child.

In the current study the landscapes of narrative are not always perceived as being qualitatively different. When making meaning individuals need to reference back and forth between the landscapes. For example, in Figure 2.1 individuals would draw information from both ends of the x axis to create meaning. The detail from each landscape would vary at different points on this axis. At the far left of the x axis mentality would be detailed, while in the centre of the model similar amounts of detail would be provided from each landscape. However, irrespective of where the information comes from on the model, individuals create meaning by using information from both landscapes of narrative. If there is insufficient information from one landscape individuals will compensate by adding their understandings. Hence, to make meaning individuals are always drawing inferences and making interpretations about the narratives they engage with. On occasion the landscapes of narrative can be confused in these interpretations. For instance, in the Maxi task (Wimmer & Perner, 1983) children are required to focus on the colour of the cupboard where the chocolate is hidden. If a child was not attending to the colour of the cupboard he/she might compensate for the missing information by referring to a
previous experience. An example of such a compensation could involve the child using memories of hiding chocolate to inform his/her interpretation of the task. Thus, the memories of a previous action become evidence for interpreting the current action. It is interplays between action and mentality such as this which prevent the landscapes of narrative from being perceived as two separate entities. Rather, in the current study each landscape is interpreted as interacting along an axis where action can be interpreted as mentality and mentality as action. These interactions are influenced by the evidence presented from each landscape and how it is interpreted.

Shared meaning cannot be achieved if events are based only on the experiences of the experimenter or if one landscape is emphasised more than the other. For example, when the researcher does not provide children with sufficient opportunities for participation (lower y axis), or when a narrative focuses on the action more than the mentality of a situation (far right of x axis). In such a situation there is no acknowledgment that children's understandings about the physical and object world are embedded in their understandings about the sociocultural world, and that each of these understandings guides the other (Nelson, 1996). In a false belief task the opportunity for shared meaning between a researcher and a child is increased when the experimental context is based on the social and cultural experiences of the child, and presents these experiences through a cohesive narrative that is characterised by a balance of action and consciousness. The characteristics of each quarter on the Narrative and Sociocultural Contexts Interaction Model are presented in Table 2.1.
Table 2.1

Characteristics of the Narrative and Sociocultural Contexts Interaction Model

<table>
<thead>
<tr>
<th>Area of Model</th>
<th>Characteristics</th>
</tr>
</thead>
</table>
| Upper right quarter  
y axis = individual  
x axis = action | -controlled by the individual more than researcher; the higher the task on the y axis the more control individuals have  
-focuses more on action than consciousness; the further right on the x axis, the greater the emphasis on action  
-most often in settings selected by participants  
-most common methodology is observation during everyday interactions  
-example of task: Hughes & Dunn (1997) |
| Lower right quarter  
y axis = researcher  
x axis = action | -controlled by the researcher more than the individual; the lower the task on the y axis, the more control the researcher has  
-focuses more on action than consciousness; the further right on the x axis, the greater the emphasis on action  
-in settings selected by the researcher  
-most common methodology is interview  
-example of task: Wimmer & Perner (1983) |
| Lower left quarter  
y axis = researcher  
x axis = consciousness | -controlled by the researcher more than the individual; the lower the task on the y axis the more control the researcher has  
-focuses more on consciousness than action; the further left on the x axis, the greater the emphasis on consciousness  
-in settings selected by the researcher  
-most common methodology is interview  
-no tasks of this nature have been completed |
| Upper left quarter  
y axis = individual  
x axis = consciousness | -controlled by the individual more than the researcher; the higher the task on the y axis the more control the individual has  
-focuses more on consciousness than action; the further left on the x axis, the greater the emphasis on consciousness  
-most often in settings selected by the individual  
-most common methodology is observation  
-example of task: Shatz et al., (1983) |
If the objective in false belief tasks is to achieve shared meaning, then it is possible to locate various studies of this understanding on the framework presented in Figure 2.1, and explore the degrees to which they have addressed the narrative and contextual needs of children. For example, the unexpected transfer task of Wimmer and Perner (1983) presents a narrative which is richer with information about action than mentality. It is also a task during which the researcher has full control over the presentation of the information. This procedure does not enable children to express their own experiences in the interaction, thereby relying only on the researcher's interpretation of what social and cultural experiences are important to express in the given context. This task would be placed in the lower right hand quarter of the model (see Figure 2.2) reflecting the stronger emphasis on the landscape of action than consciousness, and the researcher control over the task.

In contrast, the observational studies of Hughes and Dunn (1997) and Shatz et al. (1983) allowed children to direct the action they participated in without intervention from the researcher. These studies enabled children to interact through a narrative they selected, and for this reason, are located on the upper part of the y axis. Based on the notion that individuals aim to make meaning through their narratives, it could be suggested the children in these studies presented narratives which were balanced in each landscape because they were created by, and for, the participants.

While it could be perceived that shared meaning would be illustrated as the intersection of the x and y axes, the ideal research situation is not necessarily illustrated as the intersection of the x and y axes, but rather, moves up or down the y axis. This movement provides a balance of the narrative landscapes but varies the sociocultural context according to the needs of participants.
Figure 2.2

Examples of Tasks on the Narrative and Sociocultural Contexts Interaction Model

\[ y = \text{narrative landscape} \]
\[ x = \text{sociocultural context} \]

\[ \uparrow \]

\[ y \]

\[ \text{Individual} \]

\[ \text{Shatz et al., 1983} \]

\[ \text{* Hughes & Dunn, 1997} \]

\[ \downarrow \]

\[ x \]

\[ \text{Consciousness} \]

\[ \text{Action} \]

\[ \text{Researcher} \]

\[ \text{* Wimmer & Perner (1983)} \]

Placing the Current Study on the Model for Narrative and Sociocultural Context

In the current study, two distinct phases of data collection and analysis were included. Firstly, the interview phase aimed to investigate a number of characteristics of narrative which influenced children's ability to demonstrate an understanding of false belief. Because the structure of the narrative was manipulated in different interviews, these tasks could be placed at various positions along the x axis. By manipulating characteristics of the narratives, different positions along the x axis of the model could be tested. Similarly, the role children had in each interview
was manipulated enabling each task to be positioned at different places along the y axis. These interviews are discussed in detail in Chapter 3.

The second phase of the current study involved the collection of observational data to form individual case studies. The aim of this phase was to identify characteristics of an understanding of mind within naturalistic contexts. Because the approach used in the case study phase was similar to that of Hughes and Dunn (1997) it could be positioned in a similar position on the model.

**Overview of Narrative and the Mind**

The current study draws on a definition of narrative as a structure for presenting representational understandings. This structure consists of two landscapes, action and consciousness, which work together to make meaning. In every interaction individuals receive information about action and mentality. The action landscape details the physical occurrences while the consciousness landscape provides insights into the participants’ interpretations of this activity. For example, if a witness was presenting a statement about an accident he/she would describe the physical events and how the participants reacted to these. Without this mentalistic component the statement would provide no insight into how the participants reacted to the event. Information about the mentality of a situation enables individuals to make inferences which are based on the knowledge, emotions and understandings of participants. Without this conscious landscape individuals would need to make inferences about the participants’ mentality based only on action. Similarly, if the witness only focused on the mentality of the events and did not include sufficient details about the action the statement would have limited meaning. Individuals need information from both landscapes to make meaning.
It is the potential imbalance of the landscapes which is proposed as a problem for many children during false belief tasks. If children are not provided with sufficient information about the mentality of characters they may be forced to impute their own knowledge. While the ability to infer mentality is a characteristic of an understanding of the mind, such inferences cannot be made without some information concerning consciousness. Furthermore, if children are not made aware of the central issues in the narrative, they may focus on details which are irrelevant to the questioning of researchers.

However, the nature of the presentation of narrative is not the only concern in false belief tasks. The social contexts of tasks are also important variables for children. If children are presented with a sociocultural context which is unfamiliar, or does not offer opportunities for active participation and a degree of control, children may feel less comfortable and their actual understandings may be masked. It is possible that many traditional false belief tasks which have presented contexts of this nature may have underestimated the understandings of children. Therefore, when creating a context for the current investigation, both the sociocultural context and narrative landscapes were considered. Based on this position the research questions for the current study, presented in Chapter 1, are presented again in the following section.

THE CURRENT STUDY

Research Questions

The current study aimed to investigate whether or not children could demonstrate an understanding of mind during non-traditional false belief tasks and everyday interactions. The interview phase investigated whether or not children
could demonstrate an understanding of mind on non-traditional false belief tasks when specific aspects of the narrative were manipulated. The aspects of narrative focused on in the current study were: Narrative style, active participation, and detail from each landscape of narrative. In addition to the interview phase, observational data were gathered to identify evidence of children demonstrating an understanding of mind during everyday interactions. Through these investigations the study aimed to address the following five research questions.

1. *Can children demonstrate an understanding of false belief when presented with non-traditional false belief tasks?*

2. *Can more children exhibit an understanding of false belief if they actively participate in the narrative of tasks?*

3. *Are more children able to demonstrate an understanding of false belief if they are presented with more detailed episodes of a false belief narrative?*

4. *Can children demonstrate an understanding of false belief in a literature based task with no trickery?*

5. *What characteristics of an understanding of mind do children demonstrate during their everyday interactions?*

The evidence addressing each of these research questions aimed to identify the contexts in which children could demonstrate an understanding of mind. The nature of the narrative used in these contexts was also explored. In Chapter 3 the methods used for investigating each of these questions are presented.
SUMMARY OF THIS CHAPTER

In this chapter specific attention has been given to the understanding of false belief. This understanding has been reviewed in relation to narrative and sociocultural contexts. Based on the evidence presented, five research questions were developed for the current study. The current study proposed that the potential interaction between the landscapes of narrative and the sociocultural context could influence children's ability to demonstrate an understanding of false belief. In the following chapter the research methodology adopted in the current study is outlined.
CHAPTER 3

METHODS OF THE PRESENT STUDY

This chapter outlines the research methodology for the present study. Data were collected using two different procedures to investigate five research questions. Firstly, a series of structured interviews was conducted to investigate some of the characteristics of narrative which can influence children's ability to demonstrate an understanding of false belief. Secondly, observations of a subgroup of children were collected and compiled to form 24 individual case studies. These case study data were analysed to identify characteristics of an understanding of mind during everyday interactions. A discussion of the procedures used to collect the data and the methods employed to analyse and interpret such are described in this chapter.

INTERVIEW PHASE

Pilot Study

Approximately eight months prior to the main investigations reported in this thesis, a pilot study was undertaken. There were two reasons for undertaking this preliminary study. Firstly, one aim was to assess the suitability of the selected task materials. Secondly, the pilot study was used to assess the appropriateness of the proposed interview procedure.

Sample for the Pilot study

The sample for the pilot study consisted of 20 females and 30 males (N = 50), who attended a preschool in Western Sydney, Australia. Children ranged in age from 37 to 67 months (mean = 52), and attended the preschool for one or two days each week. The distribution of participants by age is presented in Appendix A. The
children were mainly from English speaking backgrounds, and had been attending preschool for at least six months at the time data collection was initiated. The pilot data were collected on two separate occasions, with approximately ten weeks separating each period of data collection.

**Materials and Procedure for the Pilot Study**

A range of results have been reported when videos and books have been used to explore an understanding of mind. For example, more 3-year-olds demonstrated an understanding of false belief on a video based false belief task than on a traditional task (Moses, 1993). However, when humour was included in a video based task, 3-year-olds performed worse than on the traditional task (Mayes et al., 1994). Similarly, when books have been used most 3-year-olds have been able to demonstrate their understanding in some conditions but not others (e.g., Lewis et al., 1994). While these studies have used books or videos, none have compared understanding in both a book and video context. It was an aim of the pilot study to explore children’s understanding of mind in both these contexts.

Another difference between the pilot investigation and previous research is that commercially available books and videos were used for this study. The books and videos used in many previous false belief tasks have most often been developed specifically for the purpose of investigating an understanding of false belief (e.g. Glenn et al., 1993; Lewis et al., 1994; Moses, 1993). Because the materials used in this study were designed for sharing with children during everyday interactions rather than for research purposes, they could be perceived as being less contrived and more reflective of the false belief contexts children encounter in their everyday experiences.
Books and videos from the Bananas in Pyjamas series were selected as materials for the pilot study. The Bananas in Pyjamas are human sized, banana shaped characters, who have three teddy bears and one rat as friends. The Bananas, who are identical, are called B1 and B2. The only feature which distinguishes them apart is either a B1 or B2 on the collar of their pyjamas. The Bananas in Pyjamas originated in Australia and are designed for children between two and six years of age. The Bananas in Pyjamas characters were familiar to all children in the sample. This familiarity was because the Bananas in Pyjamas were regularly seen on television, and because many consumer items aimed at preschool children; such as school bags, contained images of the Bananas.

Of particular interest for this research is the recurrent theme of trickery in many of the Bananas in Pyjamas stories, which results in false belief behaviours being presented in an explicit manner. Unlike some fairy tales, the Bananas in Pyjamas stories do not present the false belief behaviours through a complex recursive structure. Hence, the stories do not present incidents where Character A is thinking about Character B’s thoughts about Character A’s mental states. While the use of some traditional literature in tasks has been questioned due to the complex thought often demanded (Hinchcliffe, 1996), the same concerns cannot be applied to Bananas in Pyjamas stories as no narrative required children to consider more than two layers of recursion.

The Bananas in Pyjamas stories were available in book and video format, providing the opportunity to investigate children’s understanding through different methods of presentation. While the medium of presentation differed between each book and video, the story conveyed was essentially the same, with the illustrations in each book being photographs of the video action. It was important to use the
materials in their original form to reflect everyday usage of these stories as this study focused on the contexts which children could demonstrate their understandings of mind during everyday interactions. The only major difference between each book and video was the length of the narrative, with the video versions presenting more words than the book versions (see Table 3.5). Most additional language in the video versions resulted from direct speech or the narrator’s summary of events. The books and videos for the stories Magic Carpet (see Appendix B) and Monster Bananas (see Appendix C) were selected for the pilot study (see Main Study-Materials section for more details about these items). Both these stories presented multiple examples of explicit false belief behaviours.

First Data Collection Period in the Pilot Study

For the first data collection period, children were randomly assigned to watch either the video (N = 23) or share the book (N = 24) of Magic Carpet. Three children were had received permission to participate in the investigation were absent from the preschool during the data collection period and were not included in the study. The story was shared with each child twice. The first sharing was uninterrupted. During the second sharing, at the appropriate points, the researcher asked four questions (see Table 3.1). These questions referred to the characters’ knowledge states, and included a control question and three false belief questions. If children had failed the control question they would have been excluded from the study. However, no children were unable to correctly answer this question.

Each false belief question consisted of two parts. Both had to be answered correctly for the question to be coded as correct. For example, children had to answer both of the following correctly to be coded as right—“What does Morgan think the carpet is doing? What do you really know about the carpet?” Responses to
the three false belief questions were coded dichotomously and summed to form a total out of three. This total was used for all analyses.

Table 3.1

Questions for *Magic Carpet* task

<table>
<thead>
<tr>
<th>Question type</th>
<th>Question</th>
<th>Accepted answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>What was special about the carpet?</td>
<td>It was magic/Could fly</td>
</tr>
<tr>
<td>False belief</td>
<td>What does Morgan think the carpet is doing?</td>
<td>It is flying</td>
</tr>
<tr>
<td>False belief</td>
<td>What do you really know about the carpet?</td>
<td>It is not flying/The Bananas are moving it</td>
</tr>
<tr>
<td>False belief</td>
<td>What do the Bananas want Morgan to think the carpet is?</td>
<td>It is magic/It can fly</td>
</tr>
<tr>
<td>False belief</td>
<td>What do you really know about the carpet?</td>
<td>It is not magic/It can not fly/The Bananas are moving it</td>
</tr>
<tr>
<td>False belief</td>
<td>What does the Rat think is happening?</td>
<td>He is flying</td>
</tr>
<tr>
<td>False belief</td>
<td>What do you know is really happening?</td>
<td>He is not flying/The Bananas are moving it</td>
</tr>
</tbody>
</table>

The most common type of false belief question in previous research has been of the type: "What will x think this is? Will x think it is a or b?" (Gopnik & Astington, 1988). In this style of questioning children only have to respond to the second forced choice question. More recently a single question format was used in a false belief task (Miller, Holmes, Gitten & Danbury, 1997). This single question was: "When I showed Tammy the box yesterday, what did she think was inside the box before I took the top off?" (p. 28). By using such a question children were not prompted into an answer. For example, in the two part format children are forced to answer a or b. In the single question format children were left to devise their answer.
without receiving cues from the question. In the current study the single question format was strengthened by asking children three questions which all had to be answered correctly to be coded as correct on the task.

Second Data Collection Period in the Pilot Study

The second data collection period occurred ten weeks after the first. Those children who watched the video Magic Carpet in task one shared the book Monster Bananas in task two, while children who shared the book of Magic Carpet in task one watched the video of Monster Bananas in task two. The procedure for the Monster Bananas task was the same as for the Magic Carpet task. A control question and three false belief questions were asked of each child (see Table 3.2). Responses were scored and analysed the same way as for the first collection.

Table 3.2

Questions for Monster Bananas task

<table>
<thead>
<tr>
<th>Question type</th>
<th>Question</th>
<th>Accepted answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>What did the thing on the beach look like?</td>
<td>A monster</td>
</tr>
<tr>
<td></td>
<td>What was the thing really?</td>
<td>Seaweed/The Bananas</td>
</tr>
<tr>
<td>False belief</td>
<td>What does Morgan think is on the beach?</td>
<td>A monster</td>
</tr>
<tr>
<td></td>
<td>What do you know is really there?</td>
<td>The Bananas</td>
</tr>
<tr>
<td>False belief</td>
<td>What does Lulu think is on the beach?</td>
<td>A monster</td>
</tr>
<tr>
<td></td>
<td>What do you know is really there?</td>
<td>The Bananas</td>
</tr>
<tr>
<td>False belief</td>
<td>What do the Bananas want Army to think is on the beach?</td>
<td>A monster</td>
</tr>
<tr>
<td></td>
<td>Who do you know is really there?</td>
<td>The Bananas</td>
</tr>
</tbody>
</table>
Results of the Pilot Study

The frequency distributions for the false belief totals from collections one and two are presented in Appendix D. A significant difference was identified in results between the video and book groups for both stories (see Table 3.3). Significantly more children were able to demonstrate an understanding of false belief during the videos than the books for both Magic Carpet and Monster Bananas.

Table 3.3

Results from the Pilot Study Book and Video Comparison Tasks

<table>
<thead>
<tr>
<th>Story</th>
<th>Percentage of correct responses: book and video</th>
<th>T-test results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magic Carpet</td>
<td>video 74%</td>
<td>t(45)=3.71, p&lt;.0</td>
</tr>
<tr>
<td></td>
<td>book 21%</td>
<td></td>
</tr>
<tr>
<td>Monster Bananas</td>
<td>video 80%</td>
<td>t(55)=9.413, p&lt;.005</td>
</tr>
<tr>
<td></td>
<td>book 56%</td>
<td></td>
</tr>
</tbody>
</table>

Implications for the Main Study

Based on the results from the pilot study, no changes were made to the questions used for the Magic Carpet or Monster Bananas tasks for the main study. However, based on the results from the pilot study, only the story Magic Carpet was selected for the future book and video comparison task (Interview 1 in the main study). This decision was made because the higher proportion of correct responses on both forms of the Monster Bananas task made it less suitable for a comparison task than Magic Carpet. The difference identified between the video and book groups for Magic Carpet suggested the need for further investigation with a bigger
sample. One variable which may have contributed to this difference, but which was not controlled for in the pilot study, was verbal ability. Given language has been identified as an important variable in studies related to an understanding of mind (e.g., Jenkins & Astington, 1996), implementing some form of control for verbal ability differences in further investigations was deemed necessary.

A possible influence on the results for the Monster Bananas task was participation. Many children participated in the sharing of the Monster Bananas book by roaring at appropriate points in the story. This action was unprompted and was in response to the researcher's attempts to roar as was indicated in the text of Monster Bananas. While similar characters roared on the video, no children imitated this. It is possible that children's participation in the book condition contributed to their understanding which is illustrated in the smaller difference between the video and book groups for the Monster Bananas task. Based on children's willingness to participation in the sharing of the book Monster Bananas, an active participation task was developed for this story using only the book (Interview 3 in the main study).

During the pilot study each story was shared twice with children. However, it was decided to share stories only once during the main study because research indicates that sharing a story twice does not necessarily assist children in their attempts to demonstrate an understanding of false belief (Lewis et al., 1994). There were also a number of children during the pilot study who found it difficult to concentrate for two sharings of a story, and when questioned during the second sharing were not always focused on the task. For instance, some children would stand up or try and turn the pages of the book back to the beginning of the story. The two sharings may have confounded some children's ability to demonstrate their
understanding. It could also be suggested that sharing a story twice can reduce the
degree of inference children are required to engage in, and hence, may not be a true
test of false belief.

Based on the results from the pilot study a range of influences on children’s
attempts, other than receptive language ability and active participation, were
postulated. These included the detail of the stories and nature of the materials used.
These possible influences were investigated in the main study. Using evidence and
experiences from the pilot study, five interviews were designed for the main study.
In the next section information relating to each of the interviews is presented. The
interview section is followed by a discussion about the case study component of this
investigation.

Main Study

General Setting

The research setting for the current study was a preschool in a regional town
of New South Wales, Australia. The preschool catered for 3- to 5-year-olds, and
was licensed to accommodate twenty children in each of the two classrooms every
day. On Monday mornings, 3-year-olds attended for half a day, while 4- and 5-year-
olds attended on the remaining weekdays. Approximately half of this older group
attended for two full days each week, with the other half attending for only one full
day. The preschool day began at 9.00am and finished at 12.00pm for 3-year-olds,
and at 3.00pm for all other children.

In both classrooms two staff—a four year trained Early Childhood teacher (one
of whom was the Director) and an assistant—were always present. Both teachers and
one assistant were full-time staff, while the other two assistants worked part-time.
All staff were female. In addition to the permanent staff, two different parents were rostered to prepare morning tea and complete cleaning duties in each of the classrooms every day. Parents, usually mothers, participated in these duties on a voluntary basis.

The classrooms were separated by a glassed bathroom area and staff kitchen. Children did not generally move between the classrooms during teaching times. However, both groups did come together during outdoor times, sharing the one substantial outdoor area. Both classrooms were well equipped with a wide variety of resources, and different sporting equipment was programmed for use in the outdoor area each week. The outdoor area also included fixed climbing equipment, a digging patch, a sandpit and a pond.

In addition to the classrooms, an office was available for use by the researcher. This office was also used for administration, computer lessons, and housed the preschool library. The office adjoined the classroom in which the preschool Director taught. Children were able to see out of the office and into the classroom through a large glass window. All children either entered or looked into this room on a regular basis.

**Interview Setting**

All children were interviewed on an individual basis with each interview taking about twelve minutes. Approximately two minutes were spent at the beginning of each interview interacting informally with the participant before the set tasks were initiated. This informal interaction provided children with the opportunity to become comfortable in the setting and with the researcher. For four of the five interviews the setting was the preschool office. Data for Interview 4 was collected in a quiet part of the playground because teachers were undertaking
meetings with parents in the preschool office. Interviews in the office were either conducted at a small table where the child and researcher sat on chairs next to each other, or were completed sitting on cushions on the floor. The researcher and child sat next to each other on a bench for interviews in the playground. All interviews were completed by the same female researcher.

Prior to commencing data collection, the researcher spent two weeks in the preschool, enabling children to become familiar with her. During this time the researcher assisted the preschool teachers and spent time interacting informally with children as they participated in their programmed activities.

**Sample**

The interview sample consisted of 61 females and 49 males (N = 110) between the ages of 38 months and 63 months (mean = 54 months). The distribution of participants by age is presented in Figure 3.1. All children in the sample were from an English speaking background, and data was collected at a time when children had been attending the preschool for at least four months. Due to the age of the participants, written consent was sought and obtained from parents/guardians through a letter. Only two children for whom consent was received did not partake in the study: One child had special learning needs and another left the preschool during the collection of data for the first interview.

The ages of children in this sample aimed to reflect those encountered in preschool settings in the country where this research was undertaken. In such settings educators work with children who range in age from three to five years. By sampling from this range of ages, rather than focusing only on one age group, these results have the potential to be more applicable for educators in these settings.
For three of the five interviews children were randomly assigned into one of two groups. In each of these interviews one group was the control while the other group received the treatment. For each of these interviews a different randomised assignment was completed in an attempt to obtain representativeness and reduce bias. Hence, a child may have been in the control group for Interview 1 and in the treatment group for Interview 3 and Interview 4.

Figure 3.1

Distribution of Participants by Age

![Distribution of Participants by Age](image)

**Materials**

Based on the results from the pilot study, four books and one video were used for the interview tasks. Three of these books and the video were Bananas in Pyjamas stories. The schedule for all the interview tasks is presented in Table 3.4.
Only two interviews in the series did not use materials which presented the Bananas in Pyjamas. The second interview utilised the Peabody Picture Vocabulary Test-Revised (PPVT-R), and the final interview presented the story book *Harry the Dirty Dog*. Summary information for each story is presented in Table 3.5.

*Harry the Dirty Dog* was selected because it presents a number of explicit examples of false belief, but unlike the trickery in the Bananas in Pyjamas stories, the false belief actions in *Harry the Dirty Dog* were unintentional and presented less internal state language than the Bananas in Pyjamas stories. It is possible that this story was more demanding for children as they did not witness an intentional instilling of false belief. Rather, like Harry, they were slowly given clues about the false belief context.

### Table 3.4

**Schedule of Data Collection using Interviews**

<table>
<thead>
<tr>
<th>Interview order</th>
<th>Duration of collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 <em>Magic Carpet</em> (book or video), traditional task-candle/cake</td>
<td>2 weeks</td>
</tr>
<tr>
<td>2 PPVT-R, traditional task-ice cubes</td>
<td>2 weeks</td>
</tr>
<tr>
<td>3 <em>Monster Bananas</em> (non-participation or participation)</td>
<td>1.5 weeks</td>
</tr>
<tr>
<td>4 <em>King Rat</em> (book dialogue or video dialogue)</td>
<td>1.5 weeks</td>
</tr>
<tr>
<td>5 <em>Harry the Dirty Dog</em></td>
<td>1.5 weeks</td>
</tr>
<tr>
<td>Summary of story</td>
<td>Total words</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>Magic Carpet</strong> <em>(Harris, 1994; Tulloch, 1993)</em></td>
<td>video: 434</td>
</tr>
<tr>
<td>Morgan, a teddy bear, bought a carpet which he was told was magic and could fly. However, when Morgan took the carpet home he found it would not fly. Because the Bananas felt sorry for Morgan, they decided to trick him and make Morgan believe the carpet was magic and could fly. Morgan sat on the carpet and the Bananas blindfolded him. The Bananas then tipped the carpet from side to side to make Morgan think the carpet was really flying. Morgan’s reactions indicated that he believed the carpet was flying, and it was not until some time later, when he removed the blindfold, that he realised he had been tricked.</td>
<td>book: 371</td>
</tr>
<tr>
<td><strong>Monster Bananas</strong> <em>(Harris, 1994; Hopkinson, 1994)</em></td>
<td>book: 298</td>
</tr>
<tr>
<td>The Bananas in Pyjamas found some seaweed on the beach and placed it over their bodies to look like sea monsters. They decided that they could trick the teddies and make them believe there were sea monsters on the beach. Each of the three teddy bears came to the beach and was scared by what they believed were sea monsters. Only when Amy took a photograph of the &quot;monsters&quot; did the teddies realise they have been tricked.</td>
<td>book: 432</td>
</tr>
<tr>
<td><strong>King Rat</strong> <em>(Burnstock, 1995; Hopkinson, 1995)</em></td>
<td>video: 558</td>
</tr>
<tr>
<td>The Rat in a Hat makes the Bananas and three teddies believe he is King Rat. As King Rat, the Rat in a Hat wears a moustache, crown and robe to disguise himself. The Bananas are very excited about their visitor and say how lucky they are to have a king in their home. Lulu, the teddy, uncovers the trick when the Rat falls asleep after eating all the Bananas’ food.</td>
<td>book: 432</td>
</tr>
<tr>
<td><strong>Harry the Dirty Dog</strong> <em>(Zion, 1956)</em></td>
<td>book: 464</td>
</tr>
<tr>
<td>Harry is a dog who gets dirty and changes from a white dog with black spots to a black dog with white spots. When Harry returns home his family do not recognise him and he tries to convince them he is Harry. It is not until he has a bath and looks like a white dog with black spots again that the family realise it is Harry.</td>
<td>book: 464</td>
</tr>
</tbody>
</table>

* Internal state language as a percentage of total words *(Hinchcliffe, 1996)*

** Percentage of internal state words referring to metacognition, appearance-reality
All children in the study were familiar with the Bananas in Pyjamas stories. Two Bananas in Pyjamas books were held in the preschool library and had been shared with all children earlier in the year. While the characters were the same, neither of these books presented false belief behaviours. During the informal interaction which preceded the tasks in Interview 1, all children in the sample were able to discuss an episode or story involving the Bananas in Pyjamas, demonstrating their familiarity with the Bananas. If children had not been able to evidence some knowledge of the Bananas in Pyjamas they would have been excluded from the study.

The information relating to the internal state language for each book used in the interviews was assessed using categories identified by Hinchcliffe (1996) (see Table 3.6). By using these categories the different types of internal state language presented in each of the books could be identified. Only references identified under the categories of metacognitive language and truth-value-reality language were used to calculate percentages for references to cognition and appearance-reality distinctions. This selection was made because only these types of references include direct referrals to mental states such as belief and knowledge. While the other types of references included in Hinchcliffe’s categories refer to mentality, they are desires or emotional states which were not a focus in this study. This selection of categories for coding is consistent with the approach adopted by Hinchcliffe (1996).

In addition to the literature based tasks and the PPVT-R, two interviews included traditional false belief tasks. The first traditional task involved presenting children with a candle which looked like a cake. The wick on the candle was folded over when first shown to children so that the candle appeared to be a real cake. The wick was then straightened so what was perceived as a cake could be recognised as a
candle. Children who were hesitant to accept the cake as a candle were asked to feel the wick and hard wax. This tactile experience was sufficient to convince doubting children the candle was not a cake. The second traditional task utilised plastic ice cubes which appeared real but were identified as pretend when touched. The plastic ice cubes were presented to children in a transparent plastic tumbler because the children in the current study most commonly experienced ice cubes within drinks. Even without liquid in the tumbler, the plastic ice cubes were placed in a context which resembled a familiar experience for children.

Table 3.6

Categories for Analysing Internal State Language (Hinchcliffe, 1996)

<table>
<thead>
<tr>
<th>Language type</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude/emotion</td>
<td>Language which provides an insight into a character’s feelings and thoughts.</td>
</tr>
<tr>
<td></td>
<td>Example: The teddies were very scared.</td>
</tr>
<tr>
<td>Perceptual language</td>
<td>Language which illustrates sensory experiences.</td>
</tr>
<tr>
<td></td>
<td>Example: Everyone came to see the King.</td>
</tr>
<tr>
<td>Desire terms</td>
<td>References to internal needs and wants.</td>
</tr>
<tr>
<td></td>
<td>Example: I want to have an apple.</td>
</tr>
<tr>
<td>Metacognitive language</td>
<td>Language which refers to internal knowledge states.</td>
</tr>
<tr>
<td></td>
<td>Example: I forgot to get my hat.</td>
</tr>
<tr>
<td>Truth-value/reality language</td>
<td>References to pretending, tricking, distinguishing and appearance from a reality.</td>
</tr>
<tr>
<td></td>
<td>Example: We were just pretending.</td>
</tr>
</tbody>
</table>
Procedure

The entire orientation and data collection period took approximately ten weeks, with this process being interrupted midway for two weeks of school holidays. The interview data for the first two tasks, Magic Carpet and PPVT-R, were collected before any observations for the case study data were initiated. During the data collection period five interviews were completed with all children in the sample. Following this, observations were gathered from 24 children to form 24 individual case studies. The routines of the preschool often governed the type of data which would be collected at a given time during the day. Mornings were often best for gathering interview data because children were focused and engaged in activities within the classroom, and this ensured that the office or playground would be unoccupied. Afternoons were more appropriate for gathering observations or transcribing interview data as children had a period for outdoor play, then had a sleep before participating in class activities.

Children’s responses to each of the tasks were audio recorded. A small cassette recorder was placed near the researcher and child, and left running to record the entire session and to minimise any distraction from the recorder. These recordings were transcribed by the researcher after each collection session. At no point in any of the interviews were children given a direction that their responses were correct or incorrect. However, at the end of each interview all children were told that they were very clever, and that the researcher had enjoyed spending time with them. No concrete reinforcements such as stickers or food were given to children for participating, which was in keeping with the philosophy of the preschool. Based on the positive responses children made to their teachers after participating in each of the interviews, it appeared that spending time in a one-to-one
situation and sharing the selected stories was sufficient motivation for children to partake in the activities.

Each interview in the series aimed to explore a research question identified in the current study or to provide data which could be used to control the influence of particular variables. The five research questions for this study were discussed in the first two chapters of this thesis. Four of these questions are also presented in the following section where the interview tasks are described in relation to the research questions they address. Research question five is presented in the case study phase section of this chapter. No research question is provided for Interview 2 as this task was undertaken to gather data which could be used as a control in the analysis. The nature of this control is discussed within the description of the second interview.

Interview 1: Magic Carpet Task

Research question 1: Can children demonstrate their understanding of false belief when presented with non-traditional false belief tasks?

The aim of Interview 1 was to investigate children’s understanding of false belief in the context of a video or a book. Because this new task, the Bananas in Pyjamas book or video task, is different from the methods traditionally used for investigating an understanding of false belief it has been referred to as a non-traditional task. In addition to the non-traditional false belief task, children also participated in a traditional false belief task which provided a measure for comparison with the new task in Interview 1. This traditional task presented children with a candle which looked like a cake. The candle was the size of a cup cake and was set in real paper cake cup.

For this interview children were randomly assigned to watch either a video or share a book of the story Magic Carpet (Book N = 52, video N = 57). Details about
the characteristics of each group are presented in Table 3.7. It should be noted that
data for the PPVT-R was collected during Interview 2, but is reported in Table 3.7 to
show the similarities between the groups. Initially, 53 children had been assigned to
the book group, however, one child left the preschool during the data collection
period, and was removed from the sample. All interviews were completed in the
preschool office on an individual basis. A small television and video player were set
up in a corner of the preschool office to enable children to watch the video. This
equipment was removed for children in the book condition.

Table 3.7

Summary information for condition groups, Interview 1

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Book group</th>
<th>Video group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>55 months</td>
<td>52 months</td>
</tr>
<tr>
<td></td>
<td>range 38-62 months</td>
<td>range 41-63 months</td>
</tr>
<tr>
<td>Gender</td>
<td>28 female</td>
<td>29 female</td>
</tr>
<tr>
<td></td>
<td>22 male</td>
<td>26 male</td>
</tr>
<tr>
<td>Mean PPVT-R raw score</td>
<td>57</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>range 24-90</td>
<td>range 37-86</td>
</tr>
</tbody>
</table>

After a few minutes of allowing the child to become settled in the
surroundings, the traditional task was introduced. Children were shown the candle
which looked like a cake and asked the following questions: "What do you think
this is? (Correct response-cake. Child handles item and assesses the identity of the
object). What is it really? (Correct response-candle). When you first saw this, what
did you think it was? (Child should respond a cake). But what is it really?”
(Correct response-candle). The questioning for this traditional false belief task followed the standard format (e.g. Flavell et al., 1987).

Following the traditional task, and depending on the condition, the researcher asked children if they would like to watch a Bananas in Pyjamas video or hear a Bananas in Pyjamas story. This questioning was most often met with overwhelming enthusiasm. During the task the video was paused, or the researcher stopped reading at specific places and asked questions relating to the action. The placement of these questions was the same for both the book and the video versions. The same questions were asked for the Magic Carpet task in the pilot and main study (see Table 3.1). The first question for the non-traditional task was a control question, “What was special about the carpet?” A correct response indicated that the carpet was magic or that it could fly, and any child who failed this question was not asked any further questions. No children in the current study failed the control question. In addition to the control question children were asked three false belief questions. While the first two false belief questions were about the beliefs of the same character, Morgan, they referred to different episodes of action.

It is possible that children may have been able to answer the first question for the Magic Carpet task on the basis of pretense. While this strategy may have been successful for this question, children would have been unable to correctly respond to the three questions on the basis of pretense. Questions two and three were worded differently and required children to answer on the basis of false belief. Those children who did answer on the basis of pretense and were incorrect on question two and question three were coded as incorrect on the task.
Interview 2: Peabody Picture Vocabulary Test-Revised (PPVT-R)

Upon the completion of data collection for Interview 1, children's receptive language ability was tested using the PPVT-R. The data collected with the PPVT-R provided a control for receptive verbal ability. Evidence indicates that language can be an important variable in studies of an understanding of mind. For example, general linguistic competence and verbal memory have been identified as important predictors of performance on false belief tasks (Jenkins & Astington, 1996). Children have also been reported as being more likely to demonstrate their understanding on false belief tasks when they reach a particular level of syntactic ability (Browning, Holmes-Lonergan & Fearing, 1999). Given the linguistic demands of the narrative tasks included in this study, it was necessary to include a control for children's receptive language. The PPVT-R was selected for this purpose because it is suitable for use with 3- to 5-year-olds and has been used as a measure for verbal ability in previous research related to an understanding of mind (e.g., Taylor & Carlson, 1997).

As for Interview 1, the PPVT-R was completed in the preschool office with individual children. Children entered the office and sat opposite the researcher at a small table. Prior to initiating the PPVT-R, a traditional false belief task was completed. Children were shown a glass which contained three plastic ice cubes. The following questions were asked: "What do you think these are? (Correct response-ice cubes). Touch them; what are they really? (Correct response should indicate they are not really ice cubes). When you first saw these, what did you think they were? (Correct response-ice cubes). What do you think they are now: are they really ice cubes or just pretend ice cubes?" (Correct response-pretend ice cubes). Those children who were uncertain if the ice cubes were pretend received
encouragement to feel the cubes before answering the question. After the traditional task was completed, the PPVT-R was undertaken following the instructions suggested in the testing kit.

**Interview 3: Monster Bananas Task**

*Research question 2: Can more children exhibit an understanding of false belief if they actively participate in the narrative of tasks?*

An analysis of the data from Interview 1 was used to inform the designs for Interviews 3, 4 and 5. Because more children were able to demonstrate an understanding of false belief in the video context than the book context in both the pilot and Interview 1, Interviews 3, 4 and 5 aimed to investigate possible explanations for these differences. Interview 3 was designed to investigate the notion that participating in a task was important in assisting children to demonstrate their understanding of false belief within the context of a book. Participation was incorporated into the task through the use of hand puppets and vocalisations.

Prior to the commencement of data collection for Interview 3, two children left the preschool, reducing the sample to 107 (female N = 59, male N = 48). The remaining participants were randomly assigned to either a participation group or a non-participation group (non-participation N = 54, participation N = 53). This random allocation was not the same as in Interview 1 (see Table 3.8).

Children in both groups were read the story *Monster Bananas* on an individual basis. At specific points during the reading children were asked the questions as were asked for this story during the pilot study (see Table 3.2). All children, irrespective of the group, heard the same story and were asked identical questions at the same points during the sharing. The only difference between the groups was the degree of participation invited from children. At the beginning of the
book reading, children in the participation group were presented with two Bananas in Pyjamas hand puppets. These puppets looked like the characters in the story and were covered in pretend seaweed which could be removed. The pretend seaweed was a green cellophane which was cut into long, ragged strips to resemble the seaweed presented in the book. When the seaweed was in place the puppets looked like the monster bananas in the book. By removing the seaweed and replacing it on the puppets, children could see that the puppets were really the Bananas in Pyjamas but looked like monster bananas when they were covered in seaweed. Using the puppets provided children in the participation group with an explicit example of the appearance and reality distinction which occurred in the book as the Bananas tried to instil a false belief—that they were monsters—in the other characters.

Table 3.8

Summary information for condition groups. Interview 3

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Non-participation group</th>
<th>Participation group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>54 months range 38-62 months</td>
<td>53 months range 41-63 months</td>
</tr>
<tr>
<td>Gender</td>
<td>25 female 28 male</td>
<td>32 female 20 male</td>
</tr>
<tr>
<td>Mean PPVT-R raw score</td>
<td>58 range 24-73</td>
<td>57 range 35-90</td>
</tr>
</tbody>
</table>

In addition, children in the participation group were encouraged to make vocalisations at selected points during the story. In Monster Bananas the monster
characters roar when they are trying to scare another character. The children were
asked to make their puppets roar like the monster bananas in the story. These
vocalisations aimed to reinforce the fact that the Bananas in Pyjamas were not just
trying to look like monsters, but were also trying to act as such. The notion for the
vocalisations originated in the pilot study and was based on the reaction of some
children to the *Monster Bananas* book task, thereby contextualising the task.

In contrast, children in the non-participation group did not have puppets and
were not encouraged to roar like the characters in the story. Any interactions
children in the non-participation group experienced were limited to conveying the
text as presented in the book. Responses to children’s comments during the sharing
were kept to a minimum and were closed in nature to minimise interactions beyond
the text. The researcher, while reading the story in an enthusiastic manner, did not
attempt to highlight particular aspects of the action by reading vividly. While the
reading, for instance, did require the researcher to make the roaring sound like the
monster bananas, unlike in the participation group, children in the non-participation
group were not encouraged to make this sound. Any child who did attempt to do so
was discouraged.

**Interview 4: King Rat Task**

*Research question 3: Are more children able to demonstrate an understanding of false belief if they are presented with more detailed episodes of a false belief narrative?*

Interview 4 investigated whether or not the detailed narrative of the video,
which through a narrator, presented a summary of the action and mentality in each
episode, assisted children in their attempts to demonstrate an understanding of false
belief. This focus was adopted when evidence from the pilot study indicated that
more children were able to demonstrate their understanding of false belief within the context of the video than the book. Interview 3 investigated whether or not active participation was an important variable in literature based false belief tasks while in Interview 4 the structure of the narrative was investigated as a contributing variable. The book narrative of *King Rat* was replaced with the verbal narrative from the video of *King Rat*. The narratives for both the video and book versions of Bananas in Pyjamas story *King Rat* are presented in Appendix E. While the video presents over one hundred more words than the book, there is no difference in the percentage of internal state language between the two (see Table 3.5). The video version used more words to describe the same events as the book, but no more internal state language.

The sample for the *King Rat* interviews was 105 children, with two males leaving the preschool after participating in Interview 3. Children were randomly assigned into a book group (N = 51) or a video-in-book group (N = 54). This random assignment was not the same as for Interview 1 or 3 (see Table 3.9). The label video-in-book group refers to the book with video dialogue condition. This label was chosen because the material for this group was the same book of *King Rat* that the book group shared but with the narrative from the video version of the story in the place of the original book text.

When placing the video dialogue into the original book, all care was taken to try and make the new text appear authentic to avoid children being distracted by the changes to the book. The narrative from the video was typed in the same font and on the same colour paper as the original text, and was held into place with a removable glue. No children in the video-in-book group noticed the text had been changed.
Table 3.9

Summary information for condition groups, Interview 4

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Book group</th>
<th>Video-in book group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>47 months</td>
<td>61 months</td>
</tr>
<tr>
<td></td>
<td>range 43-63 months</td>
<td>range 38-62 months</td>
</tr>
<tr>
<td>Gender</td>
<td>30 female</td>
<td>17 female</td>
</tr>
<tr>
<td></td>
<td>24 male</td>
<td>34 male</td>
</tr>
<tr>
<td>Mean PPVT-R raw score</td>
<td>50</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>range 30-86</td>
<td>range 24-90</td>
</tr>
</tbody>
</table>

Data for children in the book group were collected first to enable the text to be changed for the video-in-book group. Children in the book group were read the story *King Rat* without any expansion on the text. If children made comments or asked questions the researcher was careful not to disclose answers or provide assistance to the subjects. Her responses to children were often very closed and of a yes, no or maybe nature. At specific points during the reading the questions in Table 3.10 were asked in the order listed.

The text for *King Rat* was shared in the same manner with children in the video-in-book group but the narrative in the book *King Rat* was replaced with the narrative from the video. Hence, both groups saw the same pictures and heard the same story events, but received the storyline through two differently structured narratives. Children in the video-in-book group were asked the same questions after the same events as children in the book group.
Table 3.10

Questions for *King Rat* task, Interview 4

<table>
<thead>
<tr>
<th>Question type</th>
<th>Question</th>
<th>Accepted answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Who does the Rat think he looks like?</td>
<td>King Rat</td>
</tr>
<tr>
<td>False belief</td>
<td>Who do the Bananas think this is?</td>
<td>King Rat/A king</td>
</tr>
<tr>
<td></td>
<td>(Pointing to King Rat)</td>
<td>The Rat</td>
</tr>
<tr>
<td>False belief</td>
<td>Who do you know this really is?</td>
<td></td>
</tr>
<tr>
<td>False belief</td>
<td>Who does Lulu think she is going to see?</td>
<td>The king</td>
</tr>
<tr>
<td></td>
<td>Who do you know she is really going to see?</td>
<td>The Rat</td>
</tr>
<tr>
<td>False belief</td>
<td>Who does the Rat think this is?</td>
<td>Prince</td>
</tr>
<tr>
<td></td>
<td>Who do you know this is?</td>
<td>Morgan</td>
</tr>
</tbody>
</table>

*Interview 5: Harry the Dirty Dog Task*

Research question 4: *Can children demonstrate an understanding of false belief in a literature based task with no trickery?*

Unlike the previous tasks, the task for Interview 5 was not a Bananas in Pyjamas story. The children’s picture book *Harry the Dirty Dog* was selected for this task to investigate children’s understanding of false belief using what could be considered more traditional literature. The format of *Harry the Dirty Dog* is very different from that of the Bananas in Pyjamas stories. *Harry the Dirty Dog* was first published in 1956 and presents hand drawn illustrations which are limited to shades of black, white, green and yellow. In contrast, all of the Bananas in Pyjamas stories have been written since 1993, and present illustrations which are glossy colour photographs of the action which is portrayed on the respective videos. Unlike the Bananas in Pyjamas stories where all the characters talk, the character of Harry in
*Harry the Dirty Dog* never talks. Hence, Harry is presented as a real dog, unable to speak or vocalise his thoughts. The only connection readers have with Harry’s thoughts and feelings is through the summaries provided by the narrator. By comparing the evidence from Interview 5 with that from the interviews where Bananas in Pyjamas material was used, potential differences in understanding due to the varying formats can be explored.

Another difference between Interview 5 and the Bananas in Pyjamas task was that no conditions were tested. Rather, all 105 children on an individual basis heard the same version of *Harry the Dirty Dog*. At selected points during the reading, the questions in Table 3.11 were asked. These questions were asked in the order presented in Table 3.11.

Table 3.11

**Questions for *Harry the Dirty Dog* task, Interview 5**

<table>
<thead>
<tr>
<th>Question type</th>
<th>Question</th>
<th>Accepted answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>What colour dog was Harry?</td>
<td>White</td>
</tr>
<tr>
<td>False belief</td>
<td>Who do the family think this is? (Pointing to Harry)</td>
<td>Harry</td>
</tr>
<tr>
<td></td>
<td>Who do you know it really is?</td>
<td>Not Harry</td>
</tr>
<tr>
<td>False belief</td>
<td>Who do the family think this is? (Pointing to Harry)</td>
<td>Harry</td>
</tr>
<tr>
<td></td>
<td>Who do you know it really is?</td>
<td>Not Harry</td>
</tr>
<tr>
<td>False belief</td>
<td>Who do they think they are giving a bath? Harry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Who do you know is really having a bath? Not Harry</td>
<td></td>
</tr>
</tbody>
</table>
*Harry the Dirty Dog* is about an accidental false belief rather than a false belief which is deliberately generated in another, as occurs in the Bananas in Pyjamas stories. Thus, there is no trickery presented in *Harry the Dirty Dog*. This has possible similarities to the false belief experience children encounter in traditional false belief tasks. It could be argued that children find themselves experiencing an accidental false belief in the traditional tasks, encountering items which they first believed to be one thing, but then realised are something else. The difference between the traditional tasks and reading the book is that children are the subject of the false belief in the traditional tasks, while they observe another experiencing a false belief in the story. However, unlike the Bananas in Pyjamas stories, in the story of *Harry the Dirty Dog* the false belief was unintentional.

A number of predictions were made about the evidence gathered during Interview 5. Firstly, when the data from this interview was compared to that from the traditional tasks in Interview 1 and 2, it was expected that more children would be able to demonstrate an understanding of false belief during the *Harry the Dirty Dog* task than during the traditional tasks. However, more children were predicted to demonstrate an understanding of false belief during the Bananas in Pyjamas tasks than the *Harry the Dirty Dog* task. This prediction was based on previous research which has indicated that children understand false belief earlier in contexts involving trickery like that presented in the Bananas in Pyjamas stories (e.g. Sullivan & Winner, 1993).

**Nature of the Variables**

**Scoring Procedures**

For each of the four literature based tasks a first order false belief variable was created. The responses for the false belief questions in the four literature based
interviews were summed and then coded as 0 for less than all correct, and 1 for all correct. For example, if a child got two out of the three false belief questions correct they were still scored as zero. Hence, children had to respond correctly to all false belief questions in an interview to be coded as 1. If children only got two of the three questions correct they were coded as 0. This was a conservative approach to coding.

**Dependent Variables**

There were seven dependent variables in this study (see Table 3.12). Dichotomous coding was also used for the responses from the traditional tasks.

**Table 3.12**

**Summary information for dependent variables**

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Interview</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magic Carpet false belief</td>
<td>Interview 1</td>
<td>Responses to three first order false belief questions</td>
</tr>
<tr>
<td>Monster Bananas false belief</td>
<td>Interview 3</td>
<td>Responses to three first order false belief questions</td>
</tr>
<tr>
<td>King Rat false belief total</td>
<td>Interview 4</td>
<td>Responses to three first order false belief questions</td>
</tr>
<tr>
<td>Harry false belief total</td>
<td>Interview 5</td>
<td>Responses to three first order false belief questions</td>
</tr>
<tr>
<td>Cake traditional</td>
<td>Interview 1</td>
<td>Total of first traditional task</td>
</tr>
<tr>
<td>Ice traditional</td>
<td>Interview 2</td>
<td>Total of second traditional task</td>
</tr>
<tr>
<td>Total traditional</td>
<td>Interviews 1 and 2</td>
<td>Sum of totals for the two traditional tasks</td>
</tr>
</tbody>
</table>
There were three totals created from the responses for these tasks. Firstly, a measure was created for each of the two traditional tasks. Therefore, there was a measure for the cake/candle traditional task and another for the ice cube task. In addition to these two measures a traditional total was also created. Responses to each of the traditional tasks were summed then coded dichotomously, so children responding correctly to both traditional tasks scored 1, while children not responding correctly on each task scored 0.

Independent Variables

There were five independent variables in this study. Age was measured in months, raw scores from the PPVT-R, and the conditions for each literature based interview: Either book or video in Interview 1; participation or non-participation in Interview 3; and video dialogue or book dialogue in Interview 4. Hence, three independent variables were created by the conditions.

Method of Analysis

Correlations

Prior to attempting any logistic regression analyses, a series of phi correlations (Guilford & Fruchter, 1973) were calculated using selected independent and dependent variables. The aim of this analysis was to identify any possible relationships between the variables used in the logistic regression analyses.

Logistic Regression Analyses

A number of logistic regression analyses were used to test the influence of age, verbal ability, and the corresponding conditions on the selected dependent variables. Logistic regression analysis was perceived as an appropriate means for predicting a discrete outcome given that the selected dependent variables were
categorical. Rather than using discriminant or multiple regression analysis, logistic regression analysis was selected because of the flexibility the method offers (Tabachnick & Fidell, 1996). For example, predictors do not have to be discrete or normally distributed. Moreover, logistic regression analysis not only enables the entry order of independent variables to be controlled, but it also allows for a mix of independent variable types, so discrete variables can be used with continuous measures (Hair, Anderson, Tatham & Black, 1998; Tabachnick & Fidell, 1996).

Logistic regression analysis as a variant of multiple regression analysis produces "regression-like coefficients that indicate the relative impact of each predictor variable" (Hair et al., 1998, p. 246). However, while logistic regression analysis is more flexible than multiple regression analysis, there are limitations. Firstly, when creating the exponent in logistic regression a linear combination of the predictors needs to be formed. The impact of this limitation can be minimised when there is linearity between predictors (Tabachnick & Fidell, 1996). While there are no formal tests for normality available, the histograms for age (see Figure 3.1) and verbal ability (see Figure 4.2) illustrate that the distribution of these variables did not appear to depart substantially from normality. Given the larger sample size used in the current study, using a graphic analysis for normality should not be problematic.

Secondly, if there are insufficient cases for the number of variables, overfitting (where groups becoming separated), very high parameter estimates, and standard errors can occur (Norusis, 1990; Tabachnick & Fidell, 1996). Hence, it is necessary to have sufficient cases relative to the number of predictor variables. In the current study, limitations due to insufficient cases were unlikely because 105 subjects constituted the smallest sample, and no more than three independent variables were used in a model at one time. A third limitation of logistic regression
analysis relates to multicollinearity. Extremely high standard errors for the parameter estimates can indicate a situation where there is very high correlation between predictor variables. Based on the correlation matrix presented in the following chapter, it can be assumed that the results in the current study have not be limited by conditions of multicollinearity as there were no extremely high correlations between the selected independent variables (Tabachnick & Fidell, 1996). A final consideration when using logistic regression analysis relates to outliers. Through an examination of the residuals presented in the Chapter 4, no extreme outlying results can be identified.

Summary

The methodology adopted for the interview phase of the current study has been presented in the previous sections. The interview phase consisted of five interviews with a sample of 105 children from a single preschool. These scores were used as the basis of the correlation and logistic regression analyses. In addition to the interviews, a case study phase was completed with 24 participants. The methodology adopted for the case study phase is presented in the following section.

CASE STUDY PHASE

Research question 5: What characteristics of an understanding of mind do children demonstrate during their everyday interactions?

Using Multiple Methods in the Current Study

In the current study, both interviews and observations were used as methods for gathering data. The case study phase aimed to identify some characteristics of an
understanding of mind during everyday interactions. While much research concerning an understanding of the mind has adopted interviews as the main method for data collection (e.g., Glenn et al., 1993), less research has focused on children's interactions in everyday contexts. Without evidence from naturalistic contexts there is the potential to view children in isolation from their environment, a criticism directed at many Piagetian tasks (Donaldson, 1978; Gelman & Baillargeon, 1983). This focus on the individual ignores the influence that social and cultural activities have on children's construction of knowledge (Nelson, 1996). In the current study, knowledge is believed to be constructed socially, through the interactions children have with more experienced others (Nelson, 1996; Rogoff, 1990). During these interactions children access the ways of thinking which are valued by their given culture and are then able to apply these understandings in the respective contexts. It is meaningless to view these understandings outside of the contexts in which they occur, as meaning is only achieved when it is shared with others (Wertsch, 1991). If meaning is to be observed it is best to investigate an understanding of the mind within the contexts where it naturally occurs.

While some studies have focused on children's everyday interactions, most of these have concentrated only on children's language as an indicator of development (e.g., Bretherton & Beeghly, 1982; Shatz et al., 1983), rather than as a facilitator (Nelson, 1996). Indeed, there is a tendency in most studies of the mind to focus only on actions or only on signs, thereby ignoring the interrelationship of cognition and language (Wertsch, 1991). Those studies which have attempted to explore this interrelationship have, most often, focused on children younger than three years of age (e.g., Dunn, 1988; Shatz, 1994). In extensive research with 3- to 5-year-olds concerning an understanding of mind, the interview has been a primary method for
data collection. The limited data for children of this age that has been gathered from everyday contexts indicates not only an awareness of the mind, but also an ability to use this understanding as a facilitator of further development (Degotardi & Cross, 1999). Given this, further investigations of this nature appear necessary.

It has been suggested that standardised interviews do not necessarily clearly identify children’s implicit understandings of mental states (Dockett, 1995), and that interviews are more suited for exploring normative development, while naturalistic approaches provide the scope for investigating individual differences (Hughes & Dunn, 1997). The use of interviews and observations in this study aimed to provide a degree of triangulation which is the action of using multiple methods and data sources to increase validity (Mathison, 1988). The interview and case study phases of this research can be interpreted as supportive and elaborative approaches where the case studies served to identify characteristics of a theory of mind in children’s actions and language within naturalistic contexts. Therefore, the case study phase of this investigation provided evidence of the extent to which the actions and language used and elicited in the interviews occurred during everyday interactions.

**Sample**

A group of 24 children (female N = 14, male N = 10) were randomly selected from the interview sample for observations. These children ranged in age from 44 to 63 months (mean = 55 months), with a raw PPVT-R mean of 60 (range 30-86). In Table 3.13 age, gender, the results from Interview 1, the raw PPVT-R, and the traditional tasks results are presented.
Table 3.13

Descriptive data and Interview 1 results for case study participants

<table>
<thead>
<tr>
<th>Name</th>
<th>Gender</th>
<th>Age (months)</th>
<th>PPVT-R (raw)</th>
<th>Interview 1*</th>
<th>Trad total**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angela</td>
<td>female</td>
<td>44</td>
<td>43</td>
<td>video</td>
<td>0</td>
</tr>
<tr>
<td>Narelle</td>
<td>female</td>
<td>46</td>
<td>48</td>
<td>video</td>
<td>1</td>
</tr>
<tr>
<td>Shaun</td>
<td>male</td>
<td>47</td>
<td>50</td>
<td>book</td>
<td>0</td>
</tr>
<tr>
<td>James</td>
<td>male</td>
<td>60</td>
<td>50</td>
<td>video</td>
<td>1</td>
</tr>
<tr>
<td>Katie</td>
<td>female</td>
<td>56</td>
<td>65</td>
<td>video</td>
<td>1</td>
</tr>
<tr>
<td>Tim</td>
<td>male</td>
<td>54</td>
<td>66</td>
<td>book</td>
<td>1</td>
</tr>
<tr>
<td>Helen</td>
<td>female</td>
<td>60</td>
<td>86</td>
<td>video</td>
<td>1</td>
</tr>
<tr>
<td>Gemma</td>
<td>female</td>
<td>56</td>
<td>62</td>
<td>video</td>
<td>1</td>
</tr>
<tr>
<td>Shelley</td>
<td>female</td>
<td>57</td>
<td>56</td>
<td>video</td>
<td>1</td>
</tr>
<tr>
<td>Chris</td>
<td>male</td>
<td>62</td>
<td>69</td>
<td>video</td>
<td>1</td>
</tr>
<tr>
<td>Harry</td>
<td>male</td>
<td>62</td>
<td>69</td>
<td>video</td>
<td>1</td>
</tr>
<tr>
<td>Charles</td>
<td>male</td>
<td>59</td>
<td>42</td>
<td>video</td>
<td>1</td>
</tr>
<tr>
<td>Elisa</td>
<td>female</td>
<td>59</td>
<td>56</td>
<td>book</td>
<td>0</td>
</tr>
<tr>
<td>Toby</td>
<td>male</td>
<td>53</td>
<td>56</td>
<td>book</td>
<td>0</td>
</tr>
<tr>
<td>Amber</td>
<td>female</td>
<td>60</td>
<td>72</td>
<td>book</td>
<td>1</td>
</tr>
<tr>
<td>Anne</td>
<td>female</td>
<td>54</td>
<td>62</td>
<td>book</td>
<td>0</td>
</tr>
<tr>
<td>Ruth</td>
<td>female</td>
<td>60</td>
<td>56</td>
<td>video</td>
<td>1</td>
</tr>
<tr>
<td>Keith</td>
<td>male</td>
<td>44</td>
<td>30</td>
<td>video</td>
<td>0</td>
</tr>
<tr>
<td>Shona</td>
<td>female</td>
<td>56</td>
<td>73</td>
<td>book</td>
<td>1</td>
</tr>
<tr>
<td>Karen</td>
<td>female</td>
<td>53</td>
<td>63</td>
<td>book</td>
<td>1</td>
</tr>
<tr>
<td>Gail</td>
<td>female</td>
<td>46</td>
<td>48</td>
<td>video</td>
<td>1</td>
</tr>
<tr>
<td>Rachel</td>
<td>female</td>
<td>63</td>
<td>65</td>
<td>video</td>
<td>1</td>
</tr>
<tr>
<td>Samuel</td>
<td>male</td>
<td>55</td>
<td>83</td>
<td>video</td>
<td>1</td>
</tr>
<tr>
<td>Hans</td>
<td>male</td>
<td>52</td>
<td>63</td>
<td>book</td>
<td>0</td>
</tr>
</tbody>
</table>

* 0=incorrect  1=correct  ** 0=both tasks incorrect  1=Both tasks correct

Pseudonyms were used for each participant to limit identification, but do not reflect the original gender of each participant, as changing the gender of a subject can be perceived as a form of deception (Burgess, 1985).

Setting

The same general setting as used for the interview phase was used for the case study phase. Observations were completed both inside the preschool.
classrooms and in the playground. The same researcher who collected the interview data collected the observations. A participant observer approach was adopted for data collection where the researcher sat on the edge of the action and did not participate unless children initiated interaction with her. The setting for data collection was dictated by the activities in which the children engaged and the teaching timetable. Children generally spent the morning inside, the mid morning and after lunch periods outside, and the afternoon inside. During the afternoon period children took a sleep, before engaging in group activities such as story sharing. At the request of the teachers data were not collected during this period.

**Materials**

Observations were collected through the use of an audio recorder and field notes. Due to excessive background noise, the audio recordings provided limited information and a reliance on the field notes was required. As it was necessary to recreate each scene mentally, it was imperative to transcribe notes on the same day as collection to avoid "crowding" from further interactions (Woods, 1986, p. 45).

**Procedure**

The data collection phase for the case studies occurred over a one month period, following the collection of data from Interview 2. Collection of data for Interview 3 and 4 occurred during the same period. A minimum of 30 minutes of observations was collected for each participant usually over several days, and from a number of episodes of interaction. A complete episode of action was characterised by a child or children beginning a new activity, and after engaging in the action, leaving the activity. Both the beginning and conclusion of the activity were included in the episode. An activity did not have to be a structured task and could include walking around the classroom and watching other children. Episodes were
determined by the actions of the participants. The only time constraint placed on the collection of data was that at least 30 minutes of data was collected for each participant. The setting of this minimum ensured the same baseline of data was gathered for all participants.

Observations were collected across six contexts: Pretend play (7 episodes) such as the kitchen area or the hospital corner; art and craft activities (17 episodes)-including the use of clay and playdough; outdoor activities (6 episodes)-including the climbing frames, playing with balls or the sandpit; playing with puzzles (5 episodes); and playing on the classroom computers (2 episodes). Only two episodes involved children walking around the classroom observing others. A total of 59 complete episodes was recorded. These ranged in duration from five minutes to one hour and six minutes. For 22 children, two or more episodes in different contexts were recorded to form their case study. However, for two children only one episode was recorded as the observed episode occurred for over one hour with the participant being a central character in the action. Because complete episodes were needed for the analysis, the length of episodes gathered for each child varied. Given the focus on social interactions in the current study, it was considered more important to use complete episodes in the analysis rather than constraining the data collection by time. By gathering complete episodes children's skills in initiating, sustaining and closing activities to be analysed. All records were transcribed noting both language and actions.

Method of Analysis

The Principles of Grounded Theory

An emphasis in the case study phase was on the description, rather than the testing, of theory. It was more important in this phase to describe the phenomena
under study and use this to create a "portrait of a culture" than to confirm or disconfirm a hypothesis (Wiersma, 1991, p. 243). Based on this theoretical perspective, the principles of grounded theory were adopted as the first form of analysis for the case study data. Through grounded theory a researcher aims to explain phenomena by linking concepts into a coherent framework of data and previous theory, thereby, grounding the theory in the data (Woods, 1986, 1992). In this way analysis guides, and is guided by, the data (Woods, 1986). However, it is important to accommodate all data, not just the majority of cases, when adopting a grounded theory approach (Woods, 1986, 1992). Therefore, all of the observational data collected in this phase were used.

An important principle in grounded theory is constant comparative analysis (Hammersley & Atkinson, 1983; Woods, 1986) whereby researchers compare their data in a variety of situations, at different times, with a number of participants and through various methods (Woods, 1992). In the current study, this criterion was addressed by: Observing numerous participants; where possible spreading the data collection over several days; only observing participants when engaged in interactions they selected; and ensuring observations were gathered from a variety of contexts. Furthermore, the researcher consulted the relevant literature throughout the collection procedure to help shape and strengthen the emerging theory. The data were also constantly compared with itself, and the relevant literature, until a number of themes emerged. These themes were characterised by common actions and language which evidenced an understanding of mind as identified in the theory of mind literature. Through further comparison, the number of themes was reduced until a point of saturation was reached where no more meaning could be gained from the data (Woods, 1992). While themes did emerge from the data, identifying what
was a valid theme, or what could be collapsed into other themes, was based on: Frequency, strength and source (Cocklin, 1992). A consistent theme appeared at least three times in the data, had more than one participant evidencing the action or language, and was initiated by a participant.

Continuum of Teaching Behaviours (Bredekamp & Rosegrant, 1995)

Despite evidence indicating a relationship between an understanding of the mind and social contexts (e.g., Degotardi & Cross, 1999; Dockett et al., 1999), the exact nature of this relationship is still unclear. Few studies have focused on the types of interactions 3- to 5-year-old children engage in when demonstrating their understanding of the mind during everyday activities with peers. An aim of the current study was to address this underrepresented area of theory of mind literature.

The second analysis focused on the type of interactions engaged in by participants, using the Continuum of Teaching Behaviours (Bredekamp & Rosegrant, 1995) (see Table 3.14). It was proposed that some forms of interaction could be associated with specific aspects of an understanding of mind more than others. For example, trickery and deception often require more directive actions to be successful, while perspective taking may require greater mediating than direction.

Originally, the Continuum of Teaching Behaviours (Bredekamp & Rosegrant, 1995) was designed to describe the action utilised during teaching, and therefore, was developed with a focus on teachers rather than students. As part of the documentation supporting Developmentally Appropriate Practice for early childhood professionals, the continuum is presented as a tool for informing curriculum planning. The philosophy behind the continuum is that all of the behaviours are appropriate at sometime, and that a reliance on only one or a small range of these would be ineffective. Moreover, it emphasises that learning is a
social activity and that any development needs to be interpreted within a
sociocultural context.

Table 3.14

Summary of Interactions on the Continuum of Teaching Behaviours (Bredekamp &
Rosegrant, 1995)

<table>
<thead>
<tr>
<th>Type of behaviour</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledge</td>
<td>Providing attention and encouragement to maintain participation.</td>
</tr>
<tr>
<td>Model</td>
<td>Displaying a skill of desired behaviours using only actions or verbal coaching through prompts and cues.</td>
</tr>
<tr>
<td>Facilitate</td>
<td>Offering temporary assistance to help children move to higher level of understanding, &quot;as an adult does in holding the back of a bicycle while a child pedals&quot; (p.210).</td>
</tr>
<tr>
<td>Support</td>
<td>Offering fixed assistance to help a child move to higher level of understanding. For example, training wheels on a bicycle.</td>
</tr>
<tr>
<td>Scaffold</td>
<td>Establish challenges so individuals work &quot;on the edge&quot;of their current abilities.</td>
</tr>
<tr>
<td>Co-construct</td>
<td>Collaborative participation in an activity.</td>
</tr>
<tr>
<td>Demonstrate</td>
<td>Actively display a behaviour, or participate in a task while others observe.</td>
</tr>
<tr>
<td>Direct</td>
<td>Provide explicit directions with a limited, defined error margin.</td>
</tr>
</tbody>
</table>

Teachers are the target audience for the Continuum of Teaching Behaviours
(Bredekkamp & Rosegrant, 1995) but this does not necessarily make this scale
inappropriate for use with children. If knowledge is socially constructed and
interactions with others are critical for development (Nelson, 1996; Rogoff, 1990;
Wertsch, 1991), then it is proposed that all individuals take on the role of "teacher" when needed. For example, if one child is reading a story to another and asking questions which focus the listening child on specific aspects of the narrative, it could be suggested the reader is being a "teacher". Indeed, for all teachers there are times when they are required to impart knowledge and other times when they must access it. Therefore, irrespective of age, all individuals can be teachers and engage in the actions presented on the continuum.

All of the data gathered during the case study phase were analysed. To aid the proceeding explanation it needs to be remembered that both raw data and evidence resulting from using the principles of grounded theory were utilised in the following analysis. Firstly, the raw data were assessed for the presence of the behaviours identified on the continuum according to the descriptions provided by Bredenkamp and Rosegrant (1995). All evidence resulting from this process was referred to as an "interaction". After the interactions had been coded, possible relationships between these and the themes generated from the grounded theory analysis were explored. For example, were directive behaviours more common with an understanding of the mind such as deception, then with the use of mental terms? Because the themes from the grounded theory analysis represented different understandings of the mind, it was decided that these would be the most suitable framework to use when exploring which types of interactions characterised different understandings. Because the themes were identified by grounding the theory into the data, they reflected both theory and understandings of mind specific to the current sample. Therefore, once the continuum had been used to identify the interactions, the data were grouped back into the themes. The frequency of each interaction was then recorded for each theme. This procedure aimed to identify the interactions
which were most frequently demonstrated under each theme. For example, one theme may have contained many nondirective interactions such as acknowledging or modeling, while another theme may have featured more interactions of a demonstrative and directive nature. The most frequent type of interaction under each theme was then identified. Thus, one theme may have had many examples of facilitative interactions while another contained predominantly co-constructive interactions.

Using the order of interactions presented by Bredekamp and Rosegrant (1995), which moves from nondirective to directive behaviour, weighted frequencies were coded (ranging from 1 to 7) for each interaction. For example, acknowledging was coded as 1, facilitating as 3, and directing as 7. Summed weighted frequencies were then calculated for the interactions gathered under each theme. These were used to identify any patterns between the distribution of the interactions and the themes. In particular, these frequencies were used to identify which types of interaction were most frequent in each of the themes. These frequencies were also used to test the statistical significance of the distribution of interactions within themes. Given the data being used included numerous cells of 0, the Kruskal-Wallis Test was selected because is more sensitive than other similar non-parametric tests to differences amongst the sample scores (Siegel, 1956).

Based on the most frequent type of interaction for each theme, themes were plotted on a model which ranged from non-directive to directive behaviours. For instance, the most frequent type of interaction for one theme may have been directing which would have resulted in this theme being plotted at the directive end of the model. For another theme, the most frequent type of interaction may have been scaffolding. Consequently, this theme would have been plotted under
mediating behaviours on the model. Therefore, this model was created based on the original *Continuum of Teaching Behaviours* (Bredekamp & Rosegrant, 1995). This new model contained the themes identified by using the principles of grounded theory and the related types of interactions. These themes were plotted on the model to reflect the most frequent type of interaction identified within each theme. The result was a visual representation of the relationship between specific types of interaction and the evidenced understandings of mind.

*Functional Meaning in Conversation Scale* (Shatz et al., 1983)

While this study endeavoured to focus on the interrelationship between language and action, it was necessary to analyse the mental state language children used during their everyday interactions in an attempt to validate the use of such terms during the interview phase. If children appropriately used the same mental terms in naturalistic contexts as were presented in the interviews, it could be argued that they had an understanding of these terms, and that their performance on the interview tasks was not confounded by a misunderstanding of mental state language. However, studies which have only attended to the mental state terms used by children have been criticised for focusing on language as an indicator, rather than as a facilitator, of development (Degotardi & Cross, 1999; Nelson, 1996). Therefore, in the current study the analysis of children's mental state language is not intended to be interpreted in isolation from the other findings. While the mental state language was analysed in isolation, it is intended that the results be interpreted with those from the grounded theory and *Continuum of Teaching Behaviours*. By focusing on all of the results from the case study phase a more holistic view of development is presented.
Children's verbal references to mental states were analysed using the *Functional Meaning in Conversation Scale* (Shatz et al., 1983). This scale presented eight functional categories related to the use of mental terms and provided a scale for identifying the types of mentalistic language children used in their everyday interactions (see Appendix F). In the current study, the scale was used in a manner similar to that adopted by Shatz et al. in that usage was analysed at a context level rather than word level. Thus, merely using a mental state term did not necessarily constitute appropriate mental usage. Rather, the usage of such terms had to indicate an understanding of the word and the implications of its usage. All data collected for the case studies were analysed for mental state language.

**Inter-Rater Reliability**

Since the analysis of the case study data required making subjective decisions, six episodes from each theme (or the maximum number of episodes included in the theme if less than six) were randomly selected for coding by an independent second rater in order to check for inter-rater reliability. Hence, the second rater received 36 episodes for coding. The second rater was the Director of the preschool where data was collected and was a qualified early childhood teacher. The exact procedure used to generate the themes, to identify the interaction types, and to code language were explained for the second rater by the researcher. Independent rating resulted in the agreement on the themes (88%), interactions (94%), and functions of language (94%). All differences in coding were discussed after all the data had been coded and these differences were resolved through discussion between the two raters.
Summary of the Methodology used in the Case Study Phase

Observational data were gathered for 24 children and used to form individual case studies. These case studies were analysed in three ways. Firstly, the data were analysed using principles of grounded theory. The aim in this analysis was to identify characteristics of an understanding of mind during everyday interactions. Secondly, the data were analysed to identify the types of interactions which were most frequently used when demonstrating an understanding of mind. Finally, the data were examined to identify children's use of mental state language during everyday interactions.

SUMMARY

This chapter has presented a description of the research methodologies used in the current study. The methods adopted in both the interview and case study phases of this research were presented in terms of the design, procedure and method of analysis (see Table 3.15 for a summary). The interview phase of this study aimed to investigate some characteristics which may influence children's abilities to demonstrate an understanding of false belief. The interview phase was complemented by 24 individual case studies which were analysed to identify some characteristics of an understanding of mind within naturalistic contexts. The results from the analysis of the interview data are presented in Chapter 4, and the results from the case study data are presented in Chapter 5.
### Table 3.15

**Summary of Methodology in the Current Study**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Subjects</th>
<th>Tasks</th>
<th>Methods of analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Individual tasks</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Magic Carpet: Internal state language*</td>
</tr>
<tr>
<td>Interview</td>
<td>n = 109</td>
<td><em>Magic Carpet</em> (book or video)</td>
<td>PPVT-R was used as independent variable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>traditional task-cake/candle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n = 109</td>
<td>PPVT-R Traditional tasks,冰 cubes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n = 107</td>
<td><em>Monster Bananas</em> (participation or no participation)</td>
<td>Internal state language*</td>
</tr>
<tr>
<td></td>
<td>n = 105</td>
<td><em>King Rat</em> (book or video dialogue)</td>
<td>Internal state language*</td>
</tr>
<tr>
<td></td>
<td>n = 105</td>
<td><em>Harry the Dirty Dog</em></td>
<td>Internal state language*</td>
</tr>
<tr>
<td>Case Studies</td>
<td>14 female</td>
<td>Minimum of 30 minutes of observations for each participant used to form 24 case studies</td>
<td>Principles of grounded theory, <em>Functional Meaning in Conversation Scale</em>**, <em>Continuum of Interactions and Support</em>**</td>
</tr>
<tr>
<td></td>
<td>10 male</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Hinchcliffe, 1996 ** Shatz et al., 1983 *** Bredekamp & Rosegrant, 1995
CHAPTER 4

ANALYSIS OF THE INTERVIEW DATA

In this chapter the results from the interview data are presented. The interview data were analysed to examine characteristics of narrative which may influence children’s ability to demonstrate an understanding of false belief. The results from the interview data are presented in three sections. In the first section, descriptive evidence is provided to create a general overview of the results. Correlation data is presented in section two. The results from a series of logistic regression analyses are presented in the final section.

DESCRIPTIVE DATA

Interview 1: Magic Carpet

Research question 1: Can children demonstrate an understanding of false belief when presented with non-traditional false belief tasks?

The aim in Interview 1 was to identify whether or not more children could demonstrate their understanding of false belief in the context of a commercially available video or book. In both of these contexts children were presented with non-traditional tasks. In the first interview 52 children were read the book, and 57 children watched the video, of Magic Carpet. In addition to these non-traditional tasks children also completed a traditional task using a candle which looked like a cake. The distribution of responses to the three literature based false belief questions, and traditional task is presented in Figure 4.1.

No children failed the control question for the literature based task in Interview 1. In the video group, 93% (N = 51) of children were able to correctly
answer all three false belief questions. In contrast, only 56% (N = 28) of children in the book group were able to correctly answer the same questions. Five children were able to answer only the first false belief question correctly. No children answered only two of the three false belief questions correctly. Hence, children tended to get all three questions correct or incorrect.

Of the 105 children who completed the traditional task, 32% (N = 34) were able to answer the false belief question correctly.

Figure 4.1

Distribution of Responses to the False Belief Questions for Interview 1

Interview 2: Peabody Picture Vocabulary Test-Revised

All children (N = 105) completed the PPVT-R during the second interview. A measure for receptive verbal ability was collected for use as a control variable. Raw scores for the PPVT-R ranged from 24-90 with a mean of 59.12 and standard
deviation of 12.67. A histogram of the results are presented in Figure 4.2. Only raw PPVT-R scores were used in this study because they represent an overall measure of verbal ability which has not been adjusted for age. A traditional task was also completed during Interview 2. The results for this are reported with those from Interview 5 because the traditional task results are discussed in relation to those from Interview 5.

Figure 4.2

Histogram of Raw PPVT-R Scores

Number of Children

Raw scores on PPVT-R

Interview 3: Monster Bananas

Research question 2: Can more children exhibit an understanding of false belief if they actively participate in the narrative of tasks?
Interview 3 investigated the role of active participation in a literature based false belief task. Children either participated in the sharing of the story through the use of puppets and vocalisations (N = 52), or heard the story without participating (N = 53).

No children failed the control question in Interview 3. The distribution of responses for the three false belief questions are presented in Figure 4.3.

Figure 4.3

**Distribution of Responses to the False Belief Questions for Interview 3**

Of those children who actively participated in the sharing, 92% (N = 48) were able to demonstrate their understanding of false belief on all three questions. Only 66% (N = 35) of children in the non-participation group were able to demonstrate their understanding. Two children correctly answered only one false belief question while no children only responded correctly to two of the three
questions. Those children correct on less than three questions were coded as incorrect on the total false belief variable.

**Interview 4: King Rat**

Research question 3: Are more children able to demonstrate an understanding of false belief if they are presented with more detailed episodes of a false belief narrative?

For Interview 4 children were either read the original story King Rat (N = 54) or read a version of the story which presented the narrative from the video version of the same story (N = 51). The later group were referred to as the video-in-book group. No children failed the control question for Interview 4. A total of 78% (N = 50) of children in the video-in-book group and 54% (N = 24) of children in the book group were able to demonstrate their understanding on the three literature based false belief questions (see Figure 4.4).

Figure 4.4

*Distribution of Responses to the False Belief Questions for Interview 4*
Only two children answered one of the three false belief questions correctly. One child answered two of the three questions correctly. These three children were coded as incorrect for the false belief total.

**Traditional Tasks and Interview 5: Harry the Dirty Dog**

Research question 4: Can children demonstrate an understanding of false belief in a literature based task with no trickery?

For Interview 5, children (N = 105) were read the book *Harry the Dirty Dog*. An aim in this interview was to identify whether or not children were able to demonstrate their understanding of false belief in the context of a literature based task without trickery. Unlike Interview 1, 3 and 4, Interview 5 was not an experimental design. All children completed the same task. Results for Interview 5 were compared with those from the traditional tasks to see if more children could respond correctly in the literature based task or traditional tasks (see Figure 4.5). A traditional task was completed during Interview 1 using a cake which looked like a candle. A second traditional task was completed during Interview 2 using ice cubes which appeared real but were really plastic.

No children failed the control question for the story *Harry the Dirty Dog*. 57% (N = 60) of children were able to answer all three false belief questions correctly during the *Harry the Dirty Dog* task. Four children answered only one question correctly while 18 children answered only two questions correctly. Fewer children answered the false belief questions correctly during the traditional tasks. During the first traditional task 30% (N= 32) of children were correct. For the second traditional task 32% (N = 34) of children were correct.
Figure 4.5

Distribution of Responses for Traditional Tasks and False Belief Questions for Interview 5

Comparison of Results for Non-Treatment Groups

The results for each of the book groups for Interviews 1, 3 and 4 were compared with those from the *Harry the Dirty Dog* task (see Appendix G). The book group was the non-treatment group in each interview. For Interview 1 there were 52 children who shared the book. In the third interview 54 children shared the book. For Interview 4 there were 51 children who shared the book. Because children were randomly assigned to different groups for each interview it was not possible to focus on the performance of individual children over the entire interview period. The data presented in Appendix G is only for children in the book groups from each interview. The non-treatment data is compared to that for the respective children in the *Harry the Dirty Dog* task.
More children were able to answer the three false belief questions correctly during each of the non-treatment tasks than during the *Harry the Dirty Dog* task. It appears more children were able to get both the non-treatment task and *Harry the Dirty Dog* task correct or only the non-treatment task correct, rather than only the *Harry the Dirty Dog* task. The evidence suggests that children were able to respond correctly in one context, such as a non-treatment condition, but not others like the *Harry the Dirty Dog* task. It is possible that children who were able to answer the false belief questions in the non-treatment context and Interview 5 had developed a representational understanding of mind which they could apply to a range of contexts. If these children had developed a representational theory of mind it would be expected that they could demonstrate this understanding during a traditional task. The results for children on the non-treatment groups and traditional tasks are presented in Appendix G.

Nearly all children who demonstrated their understanding during the non-treatment and *Harry the Dirty Dog* tasks did not answer both of the traditional false belief tasks correctly. While the numbers of children represented in this descriptive data are small, it appears that children were able to demonstrate their understanding in some contexts but not others. The results for the traditional tasks and Interview 5 will be discussed in more depth later in this chapter.

**Results for Children Aged Under 45 Months**

The theory of mind literature suggests that children go through a transition at approximately four years of age, and that after this age they develop a representational understanding of the mind (e.g., Perner, 1991). Given this apparent threshold, a focus on children under 45 months of age was completed. This focus aimed to identify whether or not some of the youngest children were able to
demonstrate an understanding of false belief during any of the tasks. The youngest ten children in the sample were selected. These children ranged in age from 38 to 44 months of age (Mean = 42 months, SD = 1.90) and achieved raw scores between 30 and 62 on the PPVT-R (Mean = 45, SD = 10.18). A summary of the results is presented in Table 4.1.

Table 4.1

Summary of Results for Children Aged Under 45 months

<table>
<thead>
<tr>
<th>Task</th>
<th>Number of Children in each Condition</th>
<th>Number of Children Coded as Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magic Carpet</td>
<td>Video (N = 5)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Book (N = 5)</td>
<td>1</td>
</tr>
<tr>
<td>Traditional-cake/candle</td>
<td>(N= 10)</td>
<td>2</td>
</tr>
<tr>
<td>Interview 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional-ice cubes</td>
<td>(N = 10)</td>
<td>1</td>
</tr>
<tr>
<td>Interview 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monster Bananas</td>
<td>Participation (N = 6)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Non-participation (N = 4)</td>
<td>2</td>
</tr>
<tr>
<td>Interview 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>King Rat</td>
<td>Video-in-book (N = 7)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Book (N = 3)</td>
<td>1</td>
</tr>
<tr>
<td>Interview 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harry the Dirty Dog</td>
<td>(N = 10)</td>
<td>2</td>
</tr>
</tbody>
</table>

The ten children aged under 45 months participated in all of the interviews. In each of the interviews more children who were assigned to a facilitative context (video, participation, video-in-book) than a control context were coded as correct on
the false belief questions. While the sample sizes are very small for each of the
groups and caution is needed when interpreting the results, the evidence indicates
that in each interview over half of the children in the facilitative contexts were able
to respond correctly to all the questions. Children’s performance on the traditional
tasks was poor with only one child responding correctly to both tasks.

Overall a number of the youngest children in the sample were able to
demonstrate an understanding of false belief in one or more of the tasks. While
some children were able to demonstrate their understanding during traditional tasks,
most could not. Those that did demonstrate their understanding tended to do so
during the non-traditional tasks, and in particular, in the facilitative contexts.

CORRELATION ANALYSIS

Prior to attempting the logistic regression analysis, a series of phi
correlations ( Guilford & Fruchter, 1973) were calculated for the selected variables.
The aim of this analysis was to identify any possible relationships between all the
variables used in the logistic regression analyses. The results from these correlations
are presented in Table 4.2.

A total of eight variables were analysed. The significance levels for the
correlations presented in Table 4.2 have been adjusted to account for the multiple
variables used in the analysis. The aim of this procedure was to reduce Type II error
( Guilford & Fruchter, 1973). Allowing for eight variables the significance levels
became 0.357 ( p < .05) and 0.405 ( p < .01).

The use of dichotomous variables in correlation analysis can restrict the
range of phi correlations ( Glass & Stanley, 1970). In the current analysis the
following variables were dichotomous: Magic Carpet, Monster Bananas, King Rat,
*Harry the Dirty Dog*, traditional, gender. Given the number of dichotomous variables in this analysis, this limitation of correlation analysis needs to be taken into account when interpreting the results.

Table 4.2

**Correlations Between all Variables used in the Logistic Regression Analyses**

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Verbal</th>
<th>Gender</th>
<th>Magic</th>
<th>Monster</th>
<th>King</th>
<th>Harry</th>
<th>Trads</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Magic</td>
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<td>.308</td>
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<tr>
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<td>-.091</td>
<td>.301</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>King</td>
<td>.132</td>
<td>.409**</td>
<td>-.077</td>
<td>.112</td>
<td>.385*</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Harry</td>
<td>.329</td>
<td>.387*</td>
<td>.061</td>
<td>.038</td>
<td>.385*</td>
<td>.326</td>
<td></td>
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<tr>
<td>Trads</td>
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<td>.067</td>
<td>.146</td>
<td>.053</td>
<td>.219</td>
<td>.245</td>
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</tr>
</tbody>
</table>

**Note.** ** Significance level .01 * Significance level .05

Significant relationships were identified between five sets of variables. The highest of these is the correlation between age and verbal ability. One reason for this higher correlation was the use of raw PPVT-R scores. If the scaled PPVT-R scores had been used, both age and verbal ability would have been required to assess receptive verbal ability, whereas the raw score, although obviously correlated with age, represents an independent measure of verbal competence. This is despite it not being a norm based measure of verbal ability. While a significant correlation has been reported between age and verbal ability, the magnitudes are not high enough to create problems of multicollinearity in the subsequent logistic regression analyses given all are below the critical value of 0.8 (Tabachnick & Fidell, 1996).
Significant correlations were also reported for a number of the literature based false belief tasks. A significant relationship was identified between verbal ability and both King Rat and Harry the Dirty Dog. Given narrative detail was the central focus in the King Rat task it was expected that a higher correlation would be identified between this task and verbal ability. Similarly, a correlation was expected between verbal ability and the task for Harry the Dirty Dog where narrative, while to a lesser degree than for King Rat, was also a focus. When compared to the other literature based tasks for this study Harry the Dirty Dog presented no trickery, less internal state language and did not present examples of the central characters discussing their mental states. Taken together these characteristics of the narrative may have contributed to the correlation with verbal ability.

A significant relationship was also identified between the Monster Bananas task and both the King Rat and Harry the Dirty Dog tasks. This correlation may be explained by the nature of these tasks when compared to the Magic Carpet task. Each of the related tasks involved the presentation of a book only to children, while children either experienced a book or video in the Magic Carpet task.

In summary, a number of significant correlations were identified between selected variables used in the current study. In the following section the results from a series of logistic regression analyses are reported.

LOGISTIC REGRESSION ANALYSES

Interpreting Logistic Regression Analysis

A series of logistic regression analyses was completed using data from the literature based tasks. Each model investigated the relationships between selected independent variables—either age, verbal ability, or task condition—with the dependent
variable, which was the respective false belief measure. The variables of age and verbal ability were always entered into the analyses because evidence indicates that both these variables are important for demonstrating an understanding about mental states (e.g., Jenkins & Astington, 1996; Wellman, 1990; Wimmer & Perner, 1983). Gender was not included as an independent variable because in both pilot testing (Szarkowicz, 1998) and preliminary analysis it was not found to be significant. This finding is consistent with other theory of mind research (e.g., Charman & Shmueli-Goetz, 1998; Jenkins & Astington, 1996; Szarkowicz, 1999). The different conditions for each interview were the primary focus in the analyses, and were therefore entered last into the models, after the effects of age and verbal ability were accounted for.

Logistic regression analysis is equivalent to multiple linear regression analysis for the measurement and interpretation of residuals (Hair et al., 1998; Tabachnick & Fidell, 1996), with similarities between some of the statistics produced by both methods of analysis. For example, the chi-square test for change in the -2 log likelihood produced by logistic regression analysis is comparable with the $F$ test in multiple linear regression. Furthermore, there are statistics produced in logistic regression analysis which are likened to the $R^2$ in multiple linear regression analysis. In the current study, the Cox and Snell $R^2$, and the Nagelkerke $R^2$ are reported (Norusis, 1990). While high values for the Cox and Snell $R^2$ indicates better fit for models, this statistic cannot achieve the maximum of 1. Therefore, an alternative $R^2$ statistic is also reported in the Nagelkerke which ranges from 0 to 1 (Hair et al., 1998).

There are also a number of other statistics produced by logistic regression analysis which merit attention. The $R$ statistic reports the partial correlations
between dependent variables and each independent variable within a range from -1 to +1 (Norusis, 1990). The Wald statistic assesses the significance of the independent variables. However, when the regression coefficient is large, the standard error will also be large, resulting in a small Wald statistic. If the Wald statistic is too small it can lead to Type II error (Hair et al., 1998; Norusis, 1990). In the current study no extremely large coefficients were identified.

The final statistic for focus is the exponential regression coefficient. This coefficient indicates the odds by which an event is likely to occur (Norusis, 1990). By considering a range of statistics in logistic regression analyses, inferential testing can be completed for both the model and individual predictors. In the following sections the results from the logistic regression analysis for each interview are presented. Results from each of the literature based interviews are presented individually with an overall summary at the end of the section. The results from a series of binominal tests to investigate consistency across tasks are presented in Appendix H.

**Interview 1: Magic Carpet**

*Research question 1: Can children demonstrate an understanding of false belief when presented with non-traditional false belief tasks?*

In the first logistic regression analysis the false belief total from the Magic Carpet interview was used as a dependent variable, with verbal ability, age and type of sharing (either book or video) as the independent variables. The false belief total included only children who were correct on the three false belief questions. Children who only answered one or two questions correctly were coded as incorrect. Three models were tested using the false belief total, which was a dichotomous dependent
variable, and varying combinations of the independent variables. The results for these models are presented in Table 4.3.

Table 4.3

Logistic Regression Analysis Models for Interview 1

<table>
<thead>
<tr>
<th></th>
<th>b</th>
<th>S.E b</th>
<th>Wald</th>
<th>df</th>
<th>p</th>
<th>R</th>
<th>exp b</th>
<th>Cox</th>
<th>Nag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
<td>.062</td>
<td>.021</td>
<td>8.997</td>
<td>1</td>
<td>.003</td>
<td>.244</td>
<td>1.062</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
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<td>.641</td>
<td>.000</td>
<td>.978</td>
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<tr>
<td>Verbal</td>
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<td>1</td>
<td>.006</td>
<td>.216</td>
<td>1.070</td>
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<tr>
<td>Model 3</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
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<td>.028</td>
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<td>.002</td>
<td>.261</td>
<td>1.093</td>
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<tr>
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<td>16.632</td>
<td>1</td>
<td>.000</td>
<td>.353</td>
<td>15.944</td>
<td>.279</td>
<td>.414</td>
</tr>
</tbody>
</table>

The first model tested used verbal ability as an independent variable. This variable was found to be a significant predictor of the false belief total. Based on this result, Model 2 was a two stage model with age being entered as the first independent variable, followed by verbal ability. Model 2 indicates that age was not a significant predictor of performance but that verbal ability was significant even after controlling for age. Despite the significant relationship identified through the correlation analysis between age and verbal ability, these variables appear to be measuring different characteristics. According to the Wald statistic, verbal ability is over 20 times more influential than age as a predictor of performance on the false belief questions for Magic Carpet. Because age was not identified as a significant
predictor in Model 2, it was not included in subsequent analyses of data for Interview 1.

The final model tested using data from Interview 1 was also a two stage model. Verbal ability was entered first followed by type of sharing—either book or video. The type of sharing children experienced was the most important variable in this model as evidenced by the magnitude of the Wald statistic. This statistic for the type of sharing independent variable is approximately twice that of the other significant predictor, verbal ability. Further evidence of this highly significant relationship can be seen in the exponential of the regression coefficient which indicates that children in the video group were almost 16 times more likely to respond correctly to the false belief questioning than children in the book group. These results indicate that type of sharing was still a significant predictor of performance after controlling for verbal ability. The strength of these variables as predictors is reinforced by the relatively high Nagelkerke statistic for this model compared to that for the other models developed using data from Interview 1.

Unlike much theory of mind research which has indicated that age is an important predictor of performance, age was not found to be significant in Interview 1. Indeed, no correlation, as evidenced by R, was identified between the dependent variable and age. While verbal ability was important for performance, it was not as strong a predictor as the type of presentation. In particular, the evidence indicates that more children were able to demonstrate their understanding of false belief when sharing the video than when sharing the book. These results were irrespective of age. Thus, younger children had similar patterns of correct response when sharing the video to older children. The converse also appears applicable, with older
children experiencing similar difficulties to younger children in demonstrating their understanding during the sharing of the book.

While age is an important variable in any investigation of an understanding of mind, in the context of Interview 1 it did not appear to be a strong predictor of performance. Given the large proportion of children who were aged four years or older at the interview time and based on the literature which indicates that these older children are generally successful on false belief tasks (e.g., Wellman, 1990), it would be expected that many more children were successful. However, a correct response to the three false belief questions during Interview 1 depended the way the task was presented. It appears the characteristics children brought to the task, such as age and verbal ability, were not as important as the manner in which the task was presented to them.

Answering the research question for Interview 1, children were able to demonstrate their understanding of false belief when presented with non-traditional tasks. The ability to respond correctly to questioning was related to the manner in which the task was presented, with more children demonstrating an understanding of mind when watching the video than when being read the book of *Magic Carpet*. This result was consistent after controlling for receptive verbal ability.

**Interview 3: Monster Bananas**

*Research question 2: Can more children exhibit an understanding of false belief if they actively participate in the narrative of tasks?*

The logistic regression analyses for Interview 3 used the responses to the false belief questions for the story *Monster Bananas* (false belief total) as the dependent variable, with age, verbal ability and type of participation—either actively participating in the sharing or being read the story without active participation—as
independent variables. Three models were tested using a dichotomous dependent variable and varying combinations of the independent variables. The results for these models are presented in Table 4.4.

Table 4.4

**Logistic Regression Analysis Models for Interview 3**

<table>
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<tr>
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<th>b</th>
<th>S.E b</th>
<th>Wald</th>
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<th>p</th>
<th>R</th>
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<tbody>
<tr>
<td>Model 1</td>
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<td>.020</td>
<td>.177</td>
<td>1.049</td>
<td>.054</td>
<td>.084</td>
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<tr>
<td>Model 2</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
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<td>.053</td>
<td>2.066</td>
<td>1</td>
<td>.151</td>
<td>-.025</td>
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<td>.009</td>
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<td>1.070</td>
<td>.074</td>
<td>.115</td>
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<td>.001</td>
<td>.278</td>
<td>8.465</td>
<td>.170</td>
<td>.265</td>
</tr>
</tbody>
</table>

Model 1 tested the influence of verbal ability on the false belief total. This variable was significant at the 0.05 level and was included in subsequent analyses. The second model used a two stage logistic regression analysis. Age was entered into the model first, followed by verbal ability. Verbal ability was the most important predictor of performance in this model. The significance of verbal ability, rather than age, as a predictor was best evidenced through the Wald statistic. This statistic reports that the influence of verbal ability on the dependent variable was approximately three times greater than that of age. Consistent with the results from Interview 1, verbal ability was identified as a significant variable while age was not.
Based on these results, age was not included in the subsequent analyses for Interview 3.

The final model tested using data from the *Monster Bananas* task was Model 3. The analysis for Model 3 used two independent variables. Initially verbal ability was entered, followed by type of sharing—either active participation or no active participation. Results from this analysis indicate that both independent variables were significant predictors of performance. Verbal ability was significant at the 0.05 level while type of sharing was significant at the 0.01 level. However, the type of sharing was a stronger predictor of performance than verbal ability. Type of sharing had approximately one third more influence on the dependent variable than verbal ability as evidenced by the Wald statistic. The exponential of the regression coefficient indicates that children were eight times more likely to be correct if they actively participated in the task rather than did not participate even after controlling for verbal ability.

The analyses using data from Interview 3 indicated that, irrespective of age, children were more likely to demonstrate their understanding of false belief when actively participating in the sharing of the story. This chance was increased even further with higher verbal ability. Therefore, rather than performance being determined by age, as has been reported in many studies of false belief (e.g., Gopnik & Astington, 1988; Wimmer & Perner, 1983), in the current investigation verbal ability and the type of participation were identified as the most important predictors of performance. Moreover, even when controlling for verbal ability, type of participation was the most important variable, with children who were given the opportunity to actively participate in the task more likely to demonstrate their understanding of mind. Answering the research question for Interview 3, more
children did exhibit an understanding of false belief when they actively participated in the task.

**Interview 4: King Rat**

Research question 3: Are more children able to demonstrate an understanding of false belief if they are presented with more detailed episodes of a false belief narrative?

Three models were tested using the data gathered during Interview 4. These models used the responses to the three false belief questions as a dichotomous dependent variable, and combinations of the following independent variables: Age, verbal ability, and type of sharing-book or video-in-book (book with narrative from the video version). The results from analyses using these variables are presented in Table 4.5. The first model involved a single stage analysis with verbal ability being entered as the independent variable. Verbal ability was found to be a significant predictor of performance.

Table 4.5

**Logistic Regression Analysis Models for Interview 4**

<table>
<thead>
<tr>
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<th>S.E b</th>
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<th>R</th>
<th>exp b</th>
<th>Cox</th>
<th>Nag</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model 1</strong></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>14.693</td>
<td>1</td>
<td>.000</td>
<td>.316</td>
<td>1.088</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
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<td>1.482</td>
<td>1</td>
<td>.224</td>
<td>.000</td>
<td>.940</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
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<td>.029</td>
<td>13.038</td>
<td>1</td>
<td>.000</td>
<td>.294</td>
<td>1.110</td>
<td>.178</td>
<td>.253</td>
</tr>
<tr>
<td><strong>Model 3</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
<td>.087</td>
<td>.023</td>
<td>14.265</td>
<td>1</td>
<td>.000</td>
<td>.310</td>
<td>1.091</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>Sharing type</td>
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<td>.504</td>
<td>8.007</td>
<td>1</td>
<td>.005</td>
<td>.217</td>
<td>4.160</td>
<td>.231</td>
<td>.32</td>
</tr>
</tbody>
</table>
Based on the result from Model 1 a two stage analysis was completed for Model 2. Age was entered as the first independent variable, followed by verbal ability. While age was not significant, verbal ability was. As a consequence, age was not included in any further analyses for Interview 4. This result is consistent with those from Interview 1 and 3 where verbal ability was found to be a more important predictor than age.

The final model tested using data from Interview 4 was also a two stage analysis. Verbal ability was entered first into the model followed by the type of sharing. Even after controlling for verbal ability the type of sharing was found to be a significant predictor of performance. However, verbal ability was identified as the most important variable as evidenced by the Wald statistic. The Wald statistic for verbal ability had just under twice the influence of that for type of sharing. These results suggest that children with higher levels of verbal ability were more likely to demonstrate their understanding on the King Rat task. This was increased if they were presented with a more detailed narrative. The strength of these variables as predictors in Model 3 is reinforced by the Nagelkerke statistic. This statistic is relatively unchanged for Model 1 and 2, but is higher for the third model.

The influence of verbal ability in Interview 4 may reflect the strong focus placed on narrative in the task. In the King Rat task the narrative was manipulated so that children experienced more or less detail from each landscape of narrative. It is possible that children required a specific level of verbal ability to understand these detailed narratives because they were not assisted by other means such as participation or a video presentation as in Interviews 1 and 3. However, verbal ability was not the only important predictor in Interview 4. Consistent with the results from Interviews 1 and 3, the manipulated context was an important predictor.
of performance even after controlling for verbal ability. As argued within the results for Interview 1, given a large proportion of children in the current study were aged four years or older, and that the literature indicates these older children are generally able to evidence their understanding of false belief (e.g., Gopnik & Astington, 1988; Wellman, 1990), it would be predicted that these children would be able to respond correctly to the current false belief task. However, an ability to respond correctly to the false belief task presented in Interview 4 appears to have been more accurately predicted by the way the task was presented, as both younger and older children were incorrect. Rather than focusing on the characteristics which children bring to a task such as age, these results suggest it is more important to focus on the manner in which the task is structured.

In answering the research question, more children were able to respond correctly to the three false belief questions for Interview 4 when they were presented with a more detailed narrative. This result was consistent even when controlling for receptive verbal ability. Age was not a significant predictor in Interview 4. However, verbal ability was an important variable in the analyses, with more children being able to demonstrate their understanding of false belief when they possessed a higher verbal ability and participated in the video-in-book condition. It appears that 3-year-olds could perform as well as 5-year-olds if their verbal ability had reached a sufficient level and they experienced the video-in-book sharing.

Interview 5: *Harry the Dirty Dog*

*Research question 4: Can children demonstrate an understanding of false belief in a literature based task with no trickery?*

The dependent variable for the analyses of Interview 5 data was the responses to the three false belief questions for the text *Harry the Dirty Dog*. This
dichotomous variable was referred to as the false belief total. The independent variables were age, verbal ability and the total for both traditional tasks. The traditional total was a dichotomous variable. A total of three models were tested using logistic regression analyses. The results for these are presented in Table 4.6.

Table 4.6

<table>
<thead>
<tr>
<th>Logistic Regression Analysis Models for Interview 5</th>
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<tbody>
<tr>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>b          S.E. b     Wald     df     p       R      exp b     Cox     Nag</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>Model 1</td>
</tr>
<tr>
<td>Verbal  .073  .020     13.570   1   .000   .284   1.075   .149   .200</td>
</tr>
<tr>
<td>Model 2</td>
</tr>
<tr>
<td>Age       .068  .044     2.383   1   .123   .052   1.070</td>
</tr>
<tr>
<td>Verbal  .056  .022     6.727   1   .009   .182   1.057   .169   .226</td>
</tr>
<tr>
<td>Model 3</td>
</tr>
<tr>
<td>Verbal  .067  .020     11.719   1   .001   .260   1.070</td>
</tr>
<tr>
<td>Trads    .424  .301     1.986   1   .159   .000   1.529   .167   .224</td>
</tr>
</tbody>
</table>

Model 1 tested verbal ability as an independent variable with the selected dependent variable. Verbal ability was found to be a significant predictor of performance on the false belief questioning for *Harry the Dirty Dog*. Based on this result a two stage analysis was completed for Model 2. In Model 2 verbal ability was entered first with age being entered second. Age was not identified as being significant and was not included in the subsequent analyses. Verbal ability was a significant predictor even after controlling for age as indicated by the Wald statistic which is almost three times larger for verbal ability than age. Therefore, consistent with results from the previous interviews, age was not an important predictor of
performance on the false belief questioning. Irrespective of age, children responded differently in different contexts. While verbal ability was an important predictor of performance, the context in which an understanding was investigated was of equal or more importance. This notion was explored further in Model 3.

Model 3 was a two stage logistic regression analysis with verbal ability and the traditional total as independent variables. The traditional total was a dichotomous variable created from both of the traditional tasks. The first traditional task was completed during Interview 1 and the second during Interview 2. The traditional total was not found to be a significant predictor of performance on the *Harry the Dirty Dog* task. The traditional tasks were investigated further using logistic regression analyses. The results for these are presented in Table 4.7. Verbal ability was identified as a significant predictor for both traditional tasks. Age was not found to be significant. For the first traditional task, verbal ability had approximately ten times the influence of age as evidence through the Wald statistic. This influence was approximately five times for the second traditional task. Taking the results for all interview tasks in the current study, age was not identified as an important predictor of performance.

The results reported here concerning traditional tasks do not suggest age was an important predictor of performance. Unlike many theory of mind studies where age has been reported as an important variable (e.g., Wimmer & Perner, 1983) in the current investigation verbal ability was reported as the best predictor of performance. It is possible that this result has occurred because raw verbal ability scores were used. If scaled scores had been used, it would have been necessary to include both age and verbal ability when controlling for receptive verbal ability. By using only the raw scores an independent measure of verbal ability was available for use. The
results for these traditional tasks are not unlike those for the literature based narrative tasks in the current study. In each of the literature based tasks, verbal ability was identified as important while age was not found to be significant. Just as children of all ages were correct on different tasks, children of all ages were incorrect. It appears that children do need a specific level of receptive verbal ability before they can be successful on a false belief task, but that the context in which an understanding of false belief is investigated is more important.

Table 4.7

<table>
<thead>
<tr>
<th></th>
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<th>S.E</th>
<th>Wald</th>
<th>df</th>
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<th>Cox</th>
<th>Nag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional 1-cake/candle</td>
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<tr>
<td>Verbal</td>
<td>.078</td>
<td>.024</td>
<td>10.707</td>
<td>1</td>
<td>.001</td>
<td>.246</td>
<td>1.081</td>
<td></td>
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<tr>
<td>Age</td>
<td>-.049</td>
<td>.045</td>
<td>1.192</td>
<td>1</td>
<td>.275</td>
<td>.000</td>
<td>.952</td>
<td>.133</td>
<td>.178</td>
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<tr>
<td>Traditional 2-ice cubes</td>
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<tr>
<td>Verbal</td>
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<td>.021</td>
<td>5.619</td>
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<td>.018</td>
<td>.158</td>
<td>1.050</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
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<td>.042</td>
<td>.046</td>
<td>1</td>
<td>.831</td>
<td>.000</td>
<td>1.009</td>
<td>.086</td>
<td>.114</td>
</tr>
</tbody>
</table>

Answering the research question for Interview 5, some children were able to respond correctly during the *Harry the Dirty Dog* task. More children were able to respond correctly during the *Harry the Dirty Dog* task than each of the traditional tasks. Verbal ability was an important predictor for all tasks. Age was not a significant predictor for either of the traditional tasks or the *Harry the Dirty Dog* task. The context used for exploring an understanding of mind is important, with children being able to demonstrate their understanding in some contexts but not others.
SUMMARY OF RESULTS

Individual Interviews

The results from the interview phase were presented in this chapter. For most of the interviews a research question was posed and specific analyses were undertaken to answer each question. The focus in Interview 1 was whether or not children could demonstrate their understanding of false belief when presented with non-traditional false belief tasks. The results from this interview indicated that, irrespective of age, children could demonstrate an understanding of false belief in non-traditional tasks. Significantly more children demonstrated their understanding in the video context than the book context. This result was consistent even when controlling for receptive verbal ability. The number of children demonstrating their understanding of false belief in both these contexts was significantly higher than for either traditional task.

Interview 2 involved the gathering of data for use as a control for verbal ability and data for the second traditional task. Data for the second traditional task was reported with the data for Interview 5.

The aim in Interview 3 was to determine whether or not more children exhibited an understanding of false belief when they actively participated in the narrative of the tasks. Results from this interview indicated that significantly more children could demonstrate their understanding of false belief when they actively participated in the narrative based task. This result was irrespective of age, with 3-year-olds as likely to demonstrate their understanding when actively participating in the task as 5-year-olds, even when controlling for receptive verbal ability. Furthermore, more children were able to demonstrate their understanding of false
belief in the narrative based task even when not actively participating in the task than in either of the traditional tasks.

Interview 4 aimed to investigate if more children could demonstrate their understanding of false belief when they were presented with more detailed episodes of a false belief narrative. Results indicated that more children were able to demonstrate their understanding of false belief when presented with the more detailed narrative (video-in-book condition) than when presented with the less detailed narrative (book condition). These results were irrespective of age and after controlling for receptive verbal ability. Once again, more children were able to demonstrate their understanding in the narrative based task than in either of the traditional tasks.

The final interview in the series, Interview 5, aimed to investigate whether or not children could demonstrate an understanding of false belief in a literature based task with no trickery. Children were found to demonstrate their understanding of false belief in the literature based task. More children could demonstrate an understanding of mind on the task in Interview 5 than either traditional task. Verbal ability was identified as a significant predictor for both the literature and traditional tasks, while age was not found to be a significant predictor for any of the tasks. Furthermore, the literature based task in this interview was the only one out of the interviews which did not present children with the Bananas in Pyjamas characters engaged in trickery. Instead children were presented with unfamiliar characters and no trickery. Despite this difference, more children were able to demonstrate their understanding of false belief during the literature based task than either of the traditional tasks.
Interview Phase

The evidence reported for each of the interviews in this study suggests that even 5-year-olds, who are believed to have a representational understanding of the mind (Perner, 1991), respond incorrectly on some false belief tasks. Some of these older children were found to respond incorrectly on the literature based false belief tasks and traditional tasks, while some 3-year-olds were able to respond correctly on the same tasks. It appears most children between three and five years of age can demonstrate their understanding of mind in some but not all investigative contexts. In the current study, more children were able to demonstrate their understanding in the manipulated contexts where they watched videos, actively participated or heard detailed narratives. This result was consistent even after controlling for receptive verbal ability. Rather than focusing on age as the most important predictor of performance on false belief tasks, the current evidence suggests that verbal ability and characteristics of the task are more important predictors. Given a specific level of verbal ability and a task which addresses characteristics such as participation and narrative detail, children between three and five years of age can demonstrate their understanding of mind.

The results from this study challenge previous research which has focused on the age at which children demonstrate their theory of mind. It is proposed that even 3-year-old children do have an understanding of mind, but that this understanding is only demonstrated in specific contexts. If a context is not facilitative of this understanding, even 5-year-olds may have difficulty demonstrating their abilities. This does not suggest that 3-year-olds have a representational understanding of mind, but rather that they have an understanding which indicates more than an awareness of the mind. To be considered as having a representational understanding
of mind children need to demonstrate their understanding in a wide range of contexts. Most children did not do this in the current study. Rather, more children, irrespective of age, were able to evidence their understanding when a context included a video presentation, active participation, and a narrative which presented sufficient detail from both landscapes. Fewer children were able to demonstrate an understanding in contexts without such characteristics.

In summary, it appears that many studies which have used traditional tasks when focusing on an understanding of mind may have underestimated children’s abilities due to the nature of the tasks. In the current study, verbal ability and characteristics of the task narrative appear to be more important predictors of performance than age. However, the examples of an understanding of mind presented in the current chapter have only been observed during interview contexts. It is possible that these examples of understanding are artefacts of the experimental context and may not reflect the everyday understanding of mind used by children. To address this possibility, a case study phase was also completed. The results for this phase are presented in Chapter 5. The relationship between the results from the interview and case study phases are discussed in Chapter 6.
CHAPTER 5

ANALYSIS OF THE CASE STUDY DATA

In this chapter the results from the case study data are presented. Observational data was gathered from 24 participants and used to form individual case studies. Results for each participant from the interview phase are presented in Appendix I. The case study phase aimed to complement the findings from the interviews by addressing three objectives. Firstly, principles of grounded theory were used to identify characteristics of an understanding of mind within naturalistic contexts. Secondly, the case studies were analysed to identify the type of interactions which characterised the theory of mind actions identified by using the principles of grounded theory. Thirdly, the type of internal state language children used in their everyday interactions was identified using the Functional Meaning in Conversation Scale (Shatz et al., 1983). Together, the evidence from this phase aimed to answer research question five: What characteristics of an understanding of mind do children demonstrate during their everyday interactions?

CHARACTERISTICS OF AN UNDERSTANDING OF MIND WITHIN NATURALISTIC CONTEXTS

Principles of Grounded Theory

Using the principles of grounded theory outlined in Chapter 3, a number of themes became evident in the case study data. Weaker themes were collapsed into stronger themes based on identified similarities in the data source and content. After an initial comparison of the data, eight themes were identified. With further comparison and assessment using the criteria of frequency, source, and "spread of mention" (Cocklin, 1992, p. 14), the eight themes were collapsed into six themes.
The six themes were presented numerous times in most of the case studies, were initiated by the children, and were demonstrated by many participants. The frequency of examples for themes and contexts of usage are presented in Table 5.1.

Table 5.1

<table>
<thead>
<tr>
<th>Theme</th>
<th>Frequency of examples</th>
<th>Number of children who demonstrated</th>
<th>Contexts for usage (number of examples)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive perspective taking</td>
<td>29</td>
<td>15</td>
<td>art and craft (13) puzzles (7) pretend play (7) outside (2)</td>
</tr>
<tr>
<td>Acts of deception</td>
<td>5</td>
<td>6</td>
<td>pretend play (2) computer play (2) outside play (1)</td>
</tr>
<tr>
<td>Talk about self, other and mind</td>
<td>26</td>
<td>13</td>
<td>art and craft (14) puzzles (7) pretend play (3) outside (2)</td>
</tr>
<tr>
<td>Sharing humour</td>
<td>8</td>
<td>5</td>
<td>art and craft (6) puzzles (1) pretend play (1)</td>
</tr>
<tr>
<td>Distinguishing appearance from reality</td>
<td>20</td>
<td>19</td>
<td>pretend play (12) outside play (5) art and craft (4) puzzles (2)</td>
</tr>
<tr>
<td>Mediating action</td>
<td>31</td>
<td>21</td>
<td>pretend play (15) puzzles (5) outside play (5) art and craft (4) computer (2)</td>
</tr>
</tbody>
</table>
It can be argued that the methods used for generating the themes presented in this section were subjective. The researcher did make decisions which could be interpreted differently by others. However, these decisions were informed by the literature, the principles of grounded theory and the data. To heighten the internal validity of these results other forms of analysis were completed and cross references between the results were made. For example, the types of interactions children demonstrated were analysed using the *Continuum of Teaching Behaviours* (Bredekamp & Rosegrant, 1995), and an analysis of the language used by participants was completed with the *Functional Meaning in Conversation Scale* (Shatz et al., 1983). Nonparametric statistical analyses were also completed.

The six emerging themes were named by the researcher based on terminology used in the knowledge domain, and as a reference to the actions demonstrated by the participants. The six identified themes were: positive perspective taking; acts of deception; talk about self, other and mind; sharing humour; distinguishing appearance from reality; and mediating action. Each of the six themes are presented in the following sections under their respective titles. Case study participants’ pseudonyms are identified in bold font. The pseudonyms of children participating in the interactions who were not case study participants are presented in normal font.

**Themes Identified Through Grounded Theory Analysis**

**Positive Perspective Taking**

While language is an important means for expressing understandings and emotions, actions are also significant, either in collaboration with language or in isolation. Individuals share their thoughts and feelings with others by using
language and actions as tools for making meaning (Davydov & Radzikhovskii, 1985). In the data gathered under the theme of positive perspective taking, children used these tools to extend positive sentiments to their peers. While the term perspective taking is often used in theory of mind literature, it is generally employed to explain how individuals form their own unique interpretations of reality based on differences in perspective and background knowledge (e.g., Friend & Davis, 1993; Taylor, 1988). In the context of this study, the term is coupled with the word positive to emphasise not only how children considered differences in perspective, but also how through their verbal and non-verbal actions they generated a positive outcome for another. For instance, cooperating with peers to help them achieve an outcome was evident in numerous case studies as illustrated in the following:

Context: Home corner; Shaun 47 months, Joel 47 months
Shaun and Joel are sitting opposite each other at the kitchen table. Joel is cutting a plastic pie with a plastic knife. He pretends to taste the pie. Shaun watches him.
**Joel**
"Yuk."
Joel puts the pie down on the table.
**Shaun**
"Here have this. Here have this."
Shaun rolls a plastic orange to Joel. Joel pretends to taste the orange and smiles.

Context: Wooden blocks on block mat-Hans 52 months, Samuel 55 months
Both boys have been constructing with blocks for approximately ten minutes. They have been working on individual projects but Hans has stopped to watch Samuel as he tries to balance a block on top of two others.
**Hans**
"I'll help you."
Hans moves closer to Samuel. Samuel looks at Hans but then back to the blocks. Hans continues to try and balance the block, stopping each time the other blocks start to wobble.
**Samuel**
"No it's going to fall down. It's too big!"
The construction topples over. Both boys look at the pile of blocks.
**Samuel**
"Oh!"
Both boys are looking at each other with small smiles on their faces. Hans looks back at the pile of blocks.
Hans  "No!"
Samuel picks up a long block and starts to push all the blocks together by pushing them with the long block.
"I'll help."
Hans copies Samuel's actions.
Both look at each other, make eye contact, and make noises like "oh" and "ah" in a manner which sounds like they are physically straining themselves with the task. They smile at each other.

Context: Clay table-Shona 59 months, Amber 63 months
Both girls are sitting opposite each other at the clay table. Shona has a number of long pieces of clay. Both girls have been working on their own projects for approximately seven minutes.

Shona  "I'm making slugs...slugs...one little slug."
Shona moves the pieces of clay in front of her. Amber looks at Shona's work, then at the clay in front of them. Shona picks up a clump of clay and looks at it. Amber also looks at the clay.

Amber  "Roll it."
Amber is suggesting Shona rolls the clay.

Shona  "Roll it...there...mum mum... two slugs."
Shona rolls a piece of clay between the palms of her hands to form a long, thin strip of clay much like a snake. Shona then takes a second clump of clay and does the same with it.

In each of the examples above the children were trying to achieve a shared goal by expressing their needs and desires to each other. More importantly, the children in these examples appeared to understand that others could perceive things differently, and were making adjustments in their language and actions to account for this. As a consequence, it is likely that all participants were left feeling assured and capable in the interaction. These children appear to have engaged in episodes of guided participation where peers have been mutually involved in "communicating and coordinating their involvement" in collectively structured activities (Rogoff, 1995, pp. 146). By coordinating and communicating with peers, children were able to determine common understandings and extend others from a point in understanding which they shared. Moreover, children participate in a guided manner deliberately, taking advantage of any opportunities for learning which may arise. For example, in the first interaction between Shona and Amber,
Amber is very deliberate and motivated in her use of language and actions. Shona is making slugs with the clay. Amber observes then provides Shona with verbal guidance to help her be successful at the task. Shona’s repetition of the words “roll it” and her ability to roll the clay indicated that she understood that Amber was referring to how she should model the clay. In a similar manner Hans and Samuel participate together to achieve a goal which is not explicitly stated, but which is coordinated through their actions. Through their smiles and verbalising, each boy acknowledges the attempts of the other to achieve the shared goal. Thus, positive perspective taking appears to be characterised by interactions which are collaborative and reassuring for participants. More examples of such interactions are provided in the following excerpts.

Context: Home corner-Katie 56 months, Shelley 57 months
Shelley comes into the home corner and Katie smiles at her. Shelley smiles back.

**Katie**
“Where did you get that necklace from?”
Shelley touches the necklace she is wearing.

**Shelley**
“From the local show.”
Katie touches the necklace around Shelley’s neck.

**Katie**
“Oh its pretty.”
Katie smiles at Shelley.

**Shelley**
“Mmm.”
Both girls smile at each other again and then Shelley walks away.

Context: Puzzle corner-Charles 59 months, Max 57 months
Both boys are sitting on the floor next to each other. Max holds up a puzzle piece then tries to find where it belongs by placing it in a few positions and seeing if it fits.

**Max**
“Where’s it go?”
Max holds the piece up for Charles to see. Charles looks at the piece then at the puzzle on the floor. Max then tries the piece in another position on the puzzle. Charles watches Max.

**Charles**
“Yep there. Take that out or otherwise...nah it doesn’t go there.”
Charles takes a piece off the puzzle board and places it in a different position. Max then tries to place the puzzle piece in the new position.

“Oh no. Oh no. Oh no, guess what goes there?”
Charles points to a place on the puzzle, then looks at Max. Max
tries to place the puzzle piece in the position Charles is pointing at.
The piece fits. Both boys make eye contact and smile.

Context: Puzzle corner-Anne 57 months, Ruth 60 months
Both girls are sitting on the floor next to each other with the puzzle
placed on a seat. Ruth is trying to put a piece in the puzzle. Anne is
watching her.

Anne
"Oh that goes there...hey.
Anne points to a position on the puzzle board. Ruth tries to put the
piece in a different position.
"No no no!"
Ruth laughs. Anne picks up a puzzle piece and tries to put it on the
board. Ruth watches.

Ruth
"Noooo!"
Ruth is laughing and Anne smiles at her.

Anne
"I know its got to go here."
Anne puts the puzzle onto the puzzle board in the correct position.

Ruth
"Is that really it?"
Ruth smiles at Anne. Anne smiles back.

Anne
"Yes."

Context: Puzzle corner-Charles 59 months, Gemma 56 months
Charles and Gemma are sharing a puzzle on the floor. Both are
sitting next to each other with the puzzle board in front of them.

Charles
"This is so easy Gemma."
Charles puts a piece on the board. Gemma watches him. She then
places her piece in the puzzle.

Gemma
"Yeah now you..."
Gemma waits for Charles to place his piece in the puzzle. Charles
places his piece on the puzzle. It is the last piece in the puzzle.

Charles
"Yeah done."
Both children look at the completed puzzle. Charles stands up and
looks on the shelf at other puzzles. He lifts up a bee puzzle for
Gemma to see.

"Now which one do you want to do? The bee one?"

Gemma
"No we can’t do it."
Gemma joins Charles at the shelf. They look through a pile of
puzzles on the shelf. Gemma picks up a puzzle and shows it to
Charles. He nods and they sit down on the floor and both remove
all pieces.

While the previous examples illustrated children engaged in collaborations
which were not necessarily prompted, other data presents evidence of participants
making their goals explicit through requests for assistance. When presented with a
call for assistance children are faced with the choice of responding positively,
negatively or ignoring the request. Those children who respond positively to such requests could be perceived as considering the mental states of another. Because a response requires children to assess the needs of other individuals, positive responding necessitates children take the perspective of another individual to gain an insight into how his or her needs can be met. Three different responses to calls for assistance illustrate this point.

Context: Puzzle corner-Harry 59 months, Charles 59 months
Harry and Charles are sitting with their backs to each other and doing separate puzzles. They are twin brothers and have been playing parallel for approximately ten minutes in the puzzle corner.

**Harry**
"Help me do this. It's very tricky. Help me boy!"
Harry does not look at Charles but wants him to help locate where the puzzle piece fits. He is holding up the piece and Charles turns around to face Harry.

**Charles**
"I'll help you...I'll help you."
Charles leans over and points to a location. Charles then turns back to his own puzzle and Harry continues with his.

Context: Home corner-Damian 54 months, Tyron 54 months, James 60 months
A group of children are playing in the home corner. Two girls have taken the playdough and are playing with it in a different area of the home corner. Damian is sitting at a table and looks towards the girls with the playdough.

**Damian**
"You're not letting me have any playdough."
Damian looks at the girls as he speaks. Tyron looks at Damian and then towards the girls.

**Tyron**
"They're not giving me any playdough."
Tyron looks at Damian. James is at the opposite end of the table and looks at both boys.

**James**
"I'll see if I can find some."
James stands up and walks towards the girls and takes a piece of the playdough on their table. Nobody speaks. He returns to the table and breaks the piece into two and places these in front of Damian and Tyron.

**Tyron**
"Thanks."

Context: Craft corner-Amber 63 months, Shona 59 months, Ruth 60 months
Amber is trying to stick some materials together. Shona and Ruth are also working in the craft corner. The girls are sitting in a circle with the resources in the centre for all to reach.

**Amber**
"Can someone help me here?"
Amber does not look up from her work. Ruth looks at Amber but does not respond. However, Shona does respond but does not look up from her work.

Shona
"Not now...now a little puppy."
Shona continues to work on her item.

Amber
"So I'll get some snippies."
Amber looks at Shona and then turns to get a pair of scissors from the shelf. Shona is still working and does not look at Amber. Ruth watches Amber get the scissors.

Ruth
"I'll try to help you."
Ruth moves closer to Amber to offer her assistance. Ruth looks at what Amber has been making. Amber smiles.

Amber
"It's OK."
Amber continues with her work. Ruth looks at Amber then returns to her task.

An ability to consider the goals and motives of others has been evidenced in all of the previous positive perspective taking examples. This ability is consistent with that identified in research which has found 3-year-olds considering the needs and desires of others (Bretherton & Beeghly, 1982). Indeed, evidence suggests that children consider the mental states of others and use language manipulatively in an attempt to gain both positive and negative responses (Brown & Dunn, 1992). In the final example presented above, Amber asks for help with a direct question: "Can someone help me here?". Shona indicates she cannot help at that time and continues with her work. Rather than trying the same direct questioning again, Amber is more subtle in her second question, asking if she should get some scissors, and assuming these will be needed to solve her problem. This manipulation of language is successful for Amber with Ruth offering assistance. Hence, it appears that Amber is trying to take account of Shona's perspective in the situation and make changes in her actions to account for differences in perspective.

The ability to achieve specific responses from others by manipulating language is assisted by an increase in the use of internal state language at around
three years of age (e.g. Bretherton & Beeghly, 1982; Shatz et al., 1983). With this
growth in usage comes an ability to comfort, deceive and humour others (Brown &
Dunn, 1992). This growing ability is not limited to instances when other children
are present or participating in a shared activity. It appears that children are able to
think about possible mental states in others without necessarily having another
individual nearby. For example, Shona (59 months) and Amber (63 months)
decided to play at the clay table. Shona noticed a clay model on the table which
another child had completed. Rather than taking the model and using the clay,
Shona tells Amber not to touch it. As a result Amber asks the teacher if she can
use the clay. Hence, both girls are able to look beyond their immediate needs and
demonstrate their awareness that the item belongs to someone else who may come
back to play with it.

Context: Centre of classroom and clay table; Amber 63 months, Shona 59 months
Both girls are standing in the centre of the classroom. They look at
each other and then around the classroom. Children are busy in all
areas of the classroom and it is quite noisy. Shona looks at Amber.

Shona
"What can we do then?"
Amber and Shona make eye contact before looking around the
classroom.

Amber
"What can we do? What can we do Shona?"
Both girls continue to look around the room.

Shona
"I don't know."
Amber moves towards the clay table and Shona follows.

Amber
"This then?"
Amber gestures towards the table. Shona looks on the table.

Shona
"Oh, but I already washed my hands. Oh, look at that castle."
There is a castle made out of clay on the table. Shona takes a closer
look at it. Amber sits down at the table and Shona sits opposite.
Amber touches the castle.

Amber
"Oh it's a little wet the castle."
Shona leans closer to the castle and frowns.

Shona
"Don't touch it. It's somebody else's."
Amber looks towards the assistant, Mrs White, who is at the front of
the classroom.

Amber
"Mrs White can I wreck this?"
Amber points to the castle when Mrs White looks.

Teacher
"Yes."
Unlike the examples presented previously, Shona and Amber’s consideration of others was not promoted by the physical presence of the child who owned the castle. Hence, they had to take the perspective of others using only their experience for guidance. A similar ability was demonstrated by Helen (63 months) who appeared numerous times in the data thinking about the needs of other children, as illustrated in the following excerpts.

Context: Drawing easels-Helen 63 months

Helen is drawing at the easel. Helen sees Tara who is standing near the easels and looking at her. Helen walks towards Tara.

**Helen**

"Tara would you like to do one?"

Helen takes Tara by the arm and leads her to the easel. Helen clips a sheet of paper to the easel. Tara watches Helen. Helen gestures towards the easel and smiles at Tara.

"There you can do one."

Helen returns to the opposite side of the easel and continues to draw. Tara moves towards her paper and starts drawing.

Context: Drawing easels-Helen 63 months, Gemma 56 months

Gemma and Helen are standing next to each other at the easels.

Gemma has laid the texta next to her easel. Helen looks at the texta.

**Helen**

"Gemma are you finished with the red?"

Gemma and Helen make eye contact before Gemma looks back at her work.

**Gemma**

"Why?"

Gemma does not look at Helen. Helen takes the red texta and places the lid on the opposite end of the texta.

**Helen**

"Look where I put it."

Gemma looks up and Helen points to the texta. Gemma picks the texta up, uses it then replaces the lid and puts it down next to Helen.

**Gemma**

"There."

Gemma gestures towards the texta. Helen looks in the direction of the gesture.

**Helen**

"Thank you."

Context: Drawing easels-Frances 53 months, Helen 63 months

Helen is drawing at the easels. Frances is walking around the easels and looks at Helen.

**Frances**

"Helen do you need help?"

Helen looks at Frances. They make eye contact and Frances smiles.

**Helen**

"No."

**Frances**

(Spoken sadly) "No one wants help."

Helen looks at Frances then towards her drawing.

**Helen**

"OK. You can help Frances."
Helen continues to draw and Frances walks towards Helen. Frances stands next to Helen, looking at the drawing. After approximately a minute Frances questions Helen again. Frances is looking at the drawing as she asks.

Frances  
"Can I help?"

Helen stops drawing and looks at Frances.

Helen  
"I actually don't need any help."

Frances looks at Helen with a sad face.

Frances  
"Oh."

Frances walks away and Helen continues to draw.

In the final example above Helen appears to be developing an understanding of second order thinking, which generally does not develop until about six years of age (Perner & Wimmer, 1985). Perner and Wimmer indicate interactions are strengthened when individuals take into account what people are thinking about the thoughts of others. In her interaction with Frances, Helen considers how Frances felt when her offer to help was declined, and it appears that she thought Frances would feel better if able to help. The acceptance of help was made despite Helen not requiring assistance. Hence, Helen was more concerned with the feelings of Frances than her own requirements at that moment. Later Helen is honest with Frances and states that she does not need any help.

Furthermore, through the use of the word *actually* in this response, Helen makes a contrast between what appeared to be an acceptance of help and the reality of not requiring assistance. By using this distinction, Helen emphasises how she did not necessarily need assistance and how an individual can say one thing but really mean another.

Sociocultural views of development argue that understandings and skills are facilitated by participation in social activities where children access the tools of meaning by interacting with others (Bruner, 1990; Rogoff, 1990, 1995). Rogoff (1995) refers to this type of participation as a process of appropriation where
children become experienced with a particular situation and can use this experience for similar activities. Throughout this process individuals are interdependent, learning from their engagement with each other. Thoughts are not static within the definition of participatory appropriation, but rather, are dynamic processes which evolve through interactions. Hence, appropriation aims to help children prepare for similar future events. One possible way children are able to assist their peers is by providing compliments. Through the giving of compliments, children receive an acknowledgment that they are gaining skills and understandings which are appropriate for such interactions. Within the data for this study, a number of children offered compliments to their peers without prompting. The following examples provide evidence of such interactions.

Context: Craft corner-Amber 63 months, Shona 59 months, Ruth 60 months
The three girls are working in the craft corner, cutting and gluing paper.

**Amber**
"I did a bangle. I did a bangle."
Amber holds up her arm which she has placed a paper bangle around. The other girls all look at her bangle. Shona picks up her craft item.

**Shona**
"Look look look."
Shona wants the girls to look at the rubbish bin she has been making. They all look at Shona’s craft item. Amber and Ruth smile.

**Amber**
"That’s the best you could do."

**Ruth**
"And that’s the best you could do."
Shona smiles back and they all continue with their own tasks.

Context: Outdoor play; throwing a ball-Harry 59 months, Charles 59 months
Both boys are standing about five metres apart and have been throwing the ball to each other for about three minutes. Charles has thrown the ball and Harry has missed the catch. The ball has rolled near the fence. Harry runs to get it.

**Harry**
"Hey I’ll throw it from here."
Harry tries to throw the ball from near the fence which is about eight metres away from Charles. Charles catches the ball. Harry smiles.

**Charles**
"That was a good shot."
Charles gets ready to throw the ball back to Harry.

**Harry**
"Throw it from here. Throw me the ball."
Charles throws the ball back to Harry.
Context: Home corner-Kath 59 months, James 60 months
Kath and James are making cakes with playdough in the home corner. Kath has a plate full of small cakes. She holds the plate out to James.

Kath
"Have a patty cake."
James looks at the plate then Kath’s face.

James
"Can I have one?"
Kath takes one off the plate and places it on another plate in front of James. Kath smiles at James who is looking at the cake.

Kath
"You have to put it on a plate."
James leans forward and pretends to smell the cake.

James
"It’s too nice to put on a plate...mmm."

Context: Craft corner-Shona 59 months, Ruth 60 months, Amber 63 months
The girls are all working on individual projects but are sitting in a circle. Shona starts to talk but does not look up at the other girls.

Shona
"I’m making a lovely...look what I made...hey."
Shona holds up her creation for the other girls to see. They all look. Ruth nods her head.

Ruth
"That’s the best."
Amber holds her creation up for the girls to see.

Amber
"What about mine?"
The girls all look at Amber’s work.

Ruth
"That’s the best you can do."
They all begin working on their own tasks again.

Given that the tools for meaning are both verbal and non-verbal, it is interesting to note how the identified compliments were all verbal. Although actions, such as smiling, reinforced their compliments, the physical activity was secondary to the verbal. Despite this emphasis on verbal support, an example of consideration was presented by Keith (44 months) which relied on non-verbal actions. Keith was playing Batman and Robin in the home corner with Shaun (47 months). Keith was Batman while Shaun was Robin. Both were sitting on a bed nursing their dolls when they engaged in the following interaction.

Shaun
"Batman can she have a drink of milk?"
Shaun is looking concerned and Keith looks at Shaun’s doll. Keith strokes Shaun’s back three times. Keith looks at Shaun’s face.
Shaun  
"She needs milk."
Keith stands up and walks to the cupboard. He picks up a coathanger and pretends to feed the doll with it. They make eye contact and Keith nods his head.

The action of stroking Shaun's back is offered as a comfort by Keith. While this comfort is directed at Shaun, Shaun is more concerned with the needs of his doll. Firstly Shaun asks if the doll can have a drink of milk. When this need is not met, and Keith's support is directed to Shaun not the doll, Shaun states the doll needs milk. In his second statement, Shaun clearly states the needs he wants met. As a consequence of this more direct statement, Keith acts to meet the needs identified with the doll. Keith's action of stroking Shaun's back cannot be viewed as anything other than an offer of comfort. It is probable that Keith has experienced someone stroking his back when he has needed comfort and learned that it is an appropriate action for consoling another. While Keith's actions did not immediately meet the needs which most concerned Shaun, they were not inappropriate here.

To conclude, data gathered under the theme of positive perspective taking was characterised by attempts to acknowledge, model and facilitate the tools of meaning in others. For example, most participants demonstrated an ability to consider the needs of others by acknowledging the achievements of children, modelling behaviours for peers, and cooperating during activities. Moreover, children in this study seem to have engaged in a form of intersubjectivity, characterised by an ability to negotiate a "shared understanding" between all participants in an activity (Goncu, 1993, p. 99). This shared understanding often focused on the positive aspects of individuals and created a context where the contribution of all individuals was valued. Based on the evidence presented in this
section it appears that these children were able to acknowledge the different perspectives of others, and through this acknowledgment, scaffold and facilitate the actions of their peers on both a conscious and intuitive level.

Acts of Deception

Evidence in this study indicates that children naturally engage in deceptive behaviours. A number of participants evidenced deceptive acts in their everyday interactions with peers, indicating that these children were aware of the need to manipulate the mental states of others for their deception to be successful. Research indicates that an understanding of deception involves more than the ability to act deceptively—a mentalistic understanding of deception requires individuals to be conscious that they are instilling a false belief in another (Ruffman, Olson, Ash & Keenan, 1993). Moreover, the ability to intentionally deceive an individual cannot exist without an understanding of belief (Peskin, 1996). Hence, acts which were identified as deception in the current study illustrated a deliberate manipulation of another’s belief state. The following excerpts illustrate some deceptive actions during everyday interactions.

Context: Outdoor area-Hans 52 months, John 55 months

Hans has had a disagreement with his best friend John. John is playing by himself on the climbing equipment and Hans is walking around the playground alone. Hans comes over to John at the climbing frame and sits on a board which joins two pieces of climbing equipment. Hans looks up at John.

**Hans**

"John are you coming inside?... John are you coming inside?... John are you coming inside?"

**John**

"I've had enough of you."

John continues to climb on the frame and does not look at Hans.

**Hans**

"I'm your friend you know."

John glares at Hans.

**John**

"No. I've had enough."

**Hans**

"No I told Shayne (the teacher) you had to come inside... are you coming inside now?"
Hans has not spoken to the teacher, however John is not aware of this. John looks at Hans and climbs off the frame. John sits on the opposite end of the board to Hans. Both boys are facing each other. Hans starts to bounce up and down on the board and smiles at John. John smiles back.

"Yeah."
Both boys stand up and run towards the classroom.

Context: Computer corner-Gail 46 months, Noel 46 months, Andrew 46 months, Mark 48 months
Gail is standing in front of the computer. A number of other children are next to her.

Gail
"This is a TV. I'm going to push these buttons."
Gail points to the computer monitor and then to the keyboard. The other children watch her.

Noel
(With anxiety) "No it's Sarah's (the teacher) computer."
Noel is leaning closer to Gail and looking at the computer. He is frowning.

Andrew
"No that's Sarah's computer in there."
Andrew points to the computer in the office. They all look in the direction Andrew points. Mark comes closer to Gail and Noel.

Mark
(In a loud whisper) "Don't touch it. Don't touch it."
The teacher is nearby and looks at the group. They appear unaware she is near them.

Teacher
"I hope you're not touching any buttons."
The children turn to face the teacher with their back to the computer. They all look at her. They are all standing next to each other with the computer behind them.

Noel
"No we're not."
They all turn back to the computer and look at each other. Gail giggles.

Andrew
(Whispering) "I'm hiding it up."
Andrew picks up the cover and tries to cover the computer monitor.

Gail
"I'll help."
Gail and Noel both grab ends of the cover and try to help. When the computer is covered they walk away.

In each of these examples children were trying to manipulate others' mental states through their actions and language. The above examples of deception indicate that children were trying to make others believe information which was false, and were conscious of the implications of instilling a false belief. In the example involving Hans and John on the outdoor equipment, Hans is keen for John to come and play with him inside, but John is not interested in playing with Hans.
In an attempt to convince John to come inside, Hans deceives and says that he has told the teacher that John has to play inside. For Hans this has a positive result, with John deciding to go inside, being convinced by the argument Hans presents. An important element in an act of deception is be convincing and to present as if what is said is the truth. Empirical evidence suggests even 3-year-olds are capable of being convincing when they engage in deception (Lewis et al., 1989). However, not all deception is characterised by verbal deception. In the proceeding example James (60 months) aims to deceive by hiding an object. James was playing in the home corner, pretending to cook cakes. A number of children were playing in the area but engaged in their own activities. James’ interaction in the following example suggests he was thinking about the implications should another child find his cooking.

James has a tray filled with playdough. He holds it out for the researcher to see.

**James**

"Here’s some more jam tarts. Santa ones. Would you like one now?"

**Researcher**

"I’m a bit full. Can I eat it later?"

James looks around the room and then back at the researcher.

**James**

"I’ll have to hide it so no children take them.”

James takes the tray of jam tarts and places them in a cupboard. He looks at the children around him as he places the tray in the cupboard and makes sure the door is shut.

Based on James’ actions it appears he did not want to share his materials with other children and aimed to deceive about the location of the item. It is possible that James had experienced other children taking his materials and had developed a routine for deceiving others so he could keep the items. Sullivan and Winner (1993) suggest children are very familiar with the routine of deceiving others, and can understand the procedures for tricking and deceiving at an early age. Despite this, and the suggestion that children may first demonstrate their
understanding of false belief in the context of deception (Dalke, 1995), many experimental studies have indicated that 3-year-olds have difficulties with such thought (e.g. Ruffman et al., 1993; Sodian, 1991). It is possible that children may be able to engage naturally in acts of deception, but may not find meaning in experimental contexts where the deception is often contrived (Hinchcliffe, 1996). Indeed, there is mounting evidence that children can demonstrate an understanding of deception if provided with an appropriate context. For example, Winner and Sullivan (1993) found that 3-year-olds were able to demonstrate an understanding of deception both when participating in a task and when witnessing a deceptive action. Furthermore, using similar observational methods to the current study, Degotardi and Cross (1999) identified children deceiving others during their everyday interactions.

To summarise, a number of participants deliberately tried to deceive their peers. These observed acts of deception involved either lying or tricking, and illustrated an understanding of how the mind can be manipulated to influence actions. Participants appeared to be aware of the consequences of their actions on the minds of others. Indeed, the examples presented indicate that children were conscious of manipulating the mental states of another, and understood they would only be convincing if they hid their true intentions from the child being deceived.

**Talk about Self, Other and Mind**

Vygotsky viewed language as a tool for mediating action and understandings (Bruner, 1997). However, he also believed that meaning could not be achieved by focusing on language alone. Both Vygotsky and those who have been influenced by his work indicate that the cultural context is very important
when exploring children's developing understandings, and that the use of language cannot be analysed outside of the context in which it occurs (Bruner, 1997; Rogoff, 1990). Therefore, the language presented under the theme of talk about self, other and mind is interpreted within the contexts of usage, focusing on the language and actions. Evidence which was grouped in this theme made a reference to mental states as identified by Shatz et al. (1983), or discussed characteristics about self or others. The title of this theme was drawn from terms used in the theory of mind literature, and aims to reflect the sociocultural focus on action, either internally or externally (Wertsch, del Rio & Alvarez, 1995). The examples presented under this theme illustrate children sharing and developing understandings about themselves, others and the conscious realm, within social contexts.

Talk about self and others most often reveals information which cannot be accessed by merely observing the individual in question. For example, in the following interactions Tim (54 months) provides an insight into himself which could not be gained had he not offered the information.

Context: Playdough table
Tim is working at the playdough table with two other children. He has been talking to the researcher while he is working. The researcher has been sitting at the opposite end of the table observing children. Tim looks up occasionally as he talks but is focused on his construction.

Tim  "We got the sheep one day ... We got the sheep one day with Darren and Jim and Darren gets trouble with sheep. Darren gets trouble with sheep because they can't get in the gate. Silly old sheep. You know what I say?"

Tim looks at the researcher as he asks his question.

Researcher  "What?"

Tim  "Through sheep."

Tim waves his arm to imitate how he moved his arms when moving the sheep. He smiles at the researcher.

"You know what Pop did the other night?"

Researcher  "What?"
"Fixed the tyre on his ute and I went there too. I run like that."
Tim moves his arms to indicate a running movement.

Context: Playdough table
Tim is talking to the researcher while constructing with the playdough. He does not look up as he talks.

"I had marbles when I was big. I had marbles when I was little. Scott and Andrew bought them for me."

Talk about self, such as Tim illustrates in the examples above, provides an insight into what events he identifies as being significant in his life. He reflects on the past and maintains a check on the listener's understanding by asking if she knew what was said or done. This usage indicated that Tim was not only thinking about relating his memories, but also was focusing on the mental state of the listener. As children have been described as adapting their language to suit the needs of different audiences by about four years of age, it could be inferred that Tim was adjusting his speech to meet the needs of his listener (Gelman & Shatz, 1978). Furthermore, it is argued that children can achieve greater degrees of intersubjectivity by expressing their ideas and desires to others (Goncu, 1993), and it is possible that Tim was aiming to achieve this when talking about his memories with the researcher.

Children also provided insights about themselves by talking about their emotions. The use of terms to indicate feelings and desires has been identified in children as young as two years of age (e.g. Brown & Dunn, 1992). However, research indicates that the ability to use belief terms does not appear to develop until about 36 months of age (Brown & Dunn, 1992; Shatz et al., 1983). As all children in the current sample were older than this, it was expected they would use both belief and desire references in their everyday interactions. The following two
examples provide evidence of children talking about their reasons for specific actions.

Context: Block mat-Hans 52 months, Samuel 55 months
Both boys have been working on a joint project for over ten minutes. A group of girls begins to play on the nearby mini tramp. Hans looks at the girls while Samuel is building.

**Hans**
"Girls girls girls."
Hans is still looking at the girls. He has a big smile on his face and then giggles. He covers his mouth with his hand and looks at Samuel. Samuel does not look up.

**Samuel**
"Who needs girls?"
Samuel still does not look at Hans. Hans looks back at the girls then at Samuel.

**Hans**
"We do."
Samuel looks up at Hans

**Samuel**
"No we don’t."
Samuel smiles at Hans. They both begin building on their project again.

**Hans**
"No we’re working men."
Samuel stands up again and looks at the girls on the mini tramp.

**Samuel**
"There’s two girls there."
Samuel points to the girls and then looks at Hans. Hans does not look at Samuel.

**Hans**
(With emphasis) "We’re working men."
Samuel returns to the building and does not look at the girls again.

Context: Clay table-Shona 59 months, Amber 63 months
Both girls have been at the clay table for about ten minutes. They are sitting opposite each other and working on separate projects.

**Shona**
"I feel much better, shucks."
Neither girl looks up but keeps working on their project.

**Amber**
"I say that too. Shucks."
Shona looks at Amber.

**Shona**
"Why do you say shucks?"
Amber looks at Shona and then at Shona’s project.

**Amber**
"Because I feel much better. Shucks. Why did you take that clay?"
Amber points to a piece of clay Shona has in front of her.

**Shona**
"Because I want to make a nest."

**Amber**
"For the snail?"

**Shona**
"Yes."
Both girls look back at their own clay and continue working.

In the first example above, Samuel and Hans are engaged in cooperative play. Both boys are learning from each other in what could be identified as an
apprenticeship relationship (Rogoff, 1990). Each boy has a different belief at the beginning of the interaction, Samuel suggesting they don’t need girls, while Hans indicates that they do. However, when Samuel expresses his disinterest in the girls, Hans changes his statement and gives a reason for why they should not be interested in the girls. Despite this, Samuel becomes curious and looks at the girls, possibly challenged to explore further by Hans’ disinterest. It has been suggested that peers can provide challenges for each other and facilitate further exploration through their sharing of skills and understandings (Rogoff, 1995). Indeed, Hans is quick to adopt the thinking Samuel initially demonstrates about the girls, and ensures Samuel does not become too interested in the girls by directing his attention back to their play.

The second example involving Shona and Amber provides an insight into the way children can negotiate meaning. Not only did the word "shucks" have a conversational usage for Amber, being tagged onto sentences to indicate the end of a speech turn, but it was also functional, signalling a positive emotional state. However, while both girls used the word in their everyday interactions, Shona questioned Amber about the meaning she placed on the word, to ensure both shared the same meaning in the current context. It is claimed that children are motivated to become actively involved in learning opportunities, such as seeking a word definition, because they wish to make their experiences culturally relevant (Rogoff, 1990). Thus, children can take responsibility for gathering understandings which will make their participation with peers more meaningful.

In the current study, 21 participants used mental state terms in their everyday interactions with peers. However, not all of these examples were gathered under the theme of talk about self, other and mind because they were
often used while children were demonstrating another understanding such as
deception or distinguishing an appearance from a reality. Shatz et al. (1983)
indicate that the earliest use of mental state terms is for conversational means rather
than as a reference to mentality. For this reason, any use of mental state terms
which occurred during an activity identified in another theme was classified under
that theme rather than this one. A detailed analysis of the type of mental terms
used by participants is provided in a later section of this chapter (see Table 5.3).
The examples gathered under the theme of talk about self, other and mind can be
broadly classified as references to having thoughts, forgetting thoughts, trying to
remember, and the nature of thoughts. In each example the mental state terms are
presented in bold. The first set of examples contain references to having thoughts.

Context: Building with clever sticks; Helen 63 months, Charles 59 months
Helen watches Charles as he is building. She leans closer.

**Helen**

"I think you might be having a bit of trouble."
Helen points to a different shaped clever stick which Charles picks
up and uses.

Context: Playdough table; Shaun 47 months, Keith 44 months
Keith and Shaun are working on separate projects at the playdough
table. They are sitting opposite each other. Keith looks up.

**Keith**

"It's a fish."
Keith places the items he has made from playdough to one side of
the table. Shaun looks at Keith's project.

**Shaun**

"Look at the space ship I made."
Shaun holds up a star shaped piece of dough. Keith looks at it then
looks back at his work.

"Do you know if there's another one? I thought there was one."
Shaun is referring to the cutter which created the star shape in the
dough. Keith shakes his head.

Context: Writing on computer; Katie 56 months, Rachel 63 months
Rachel is sitting in front of the computer while Katie stands next to
her and looks at the monitor. Rachel has been typing on the
keyboard.

**Katie**

"Can I play now?"
Katie moves closer to the keyboard and places her hand on one side.
Rachel

"No you don't know what buttons to press. I'll teach you when I'm finished."

Rachel does not look at Katie and continues typing. Katie looks turns and looks around the classroom.

Context: Clay table; Shona 59 months, Amber 63 months

Both girls have been creating individual projects at the clay table. They are sitting opposite each other.

Shona

"There we go on the snail. Did you...are you sure snails lay eggs?"

Amber looks at Shona's clay snail.

Amber

"No they have slugs."

Context: Shop area; Chris 62 months, Shelley 57 months

Chris approaches Shelley, the shopkeeper, holding a tie.

Chris

"I think I'll buy this today. How much is the tie?"

Chris holds out a handful of pretend money.

Shelley

"OK. Which colour?"

Chris points to one of the coloured coins in his hand.

Context: Puzzle corner; Ruth 60 months, Anne 57 months

Ruth hands Anne the puzzle she has finished. It is a Humpty Dumpty wooden puzzle in a frame.

Anne

"Yeah but we know where these little gumboots go now."

Anne takes the boot pieces out of the puzzle.

Context: Hospital corner; Karen 53 months, Tim 54 months, Keith 44 months

Karen is a nurse, Tim a doctor and Keith a patient. Karen is attending to Keith who is pretending to be asleep in the bed.

Karen

"Tim did you know nurses take care of babies?"

Karen does not look at Tim.

Tim

"Yes."

Keith

"Tim what happened to your apron."

Tim's apron has a rip in it. He looks at the rip then at Karen.

Tim

"I don't know."

Context: Clay table; Amber 63 months, Shona 59 months

Both girls are working on their own constructions. Amber looks behind her and sees the teacher cleaning a table. They make eye contact and Amber points at her construction.

Amber

"Look, I'm making a bird's nest with eggs."

Teacher

"Great. Have you made a bird?"

Amber

"Next."

Amber continues to work on her bird's nest.

Shona

"Do I know how to make a bird's nest?"

Shona is looking at Amber who looks up and nods her head.

Context: Outdoor climbing equipment; Samuel 55 months

Samuel is pretending to be a shopkeeper. A number of children have come up to him and pretended to buy food.

Samuel

"Would you like something at the shop?"
"Not now."
Samuel looks at the researcher and then in the direction she is looking.

"How do you know all these children's names? I think Sarah (teacher) told you."

"Do you."

"Yeah. I think."
Samuel smiles at the researcher.

In each of the examples above the word "know" appears as a reference to mental states, with the words "think" and "thought" appearing in fewer of the examples. The terms "think" and "know" have been identified as the first terms children use which make a reference to belief states (Bartsch & Wellman, 1995). Perner (1991) suggests the word "know" is used in three different ways by children. Firstly, they use it to associate knowledge with success, such as knowing how to complete a task. Hans demonstrates this type of usage in the extract from his interaction above. Secondly, children associate knowing with truth. Thus, children use the term when what they know corresponds with reality, as Karen illustrates when talking about the role of nurses. Finally, they use the term know when relaying their experiences. The final excerpt involving Samuel and the researcher is an example of this type of usage.

Children also used mental state terms in the context of forgetting thoughts or trying to remember. The terms children selected made direct reference to mental states, and indicated an understanding of the dynamic nature of thoughts. Children referred to how thoughts escaped them or tried to prompt thoughts in another, as illustrated in the following.

Context: Home corner; Shaun 47 months, Keith 44 months
Keith stands up and pretends to fly around the table as Batman. He has a shirt over his back for a cape. Shaun watches.

"You forgot Catwoman."
Keith  "No we only need Batman."

Context: Home corner; Shaun 47 months, Keith 44 months
Keith stands up and begins to walk out of the home corner.
Shaun  "You forgot the baby."
Keith looks at Shaun.
Keith  "Where is it?"
Shaun  "It’s up over there."
Shaun points to behind the cupboard.

Context: Craft area; Shona 59 months
Shona has been making wrapping paper. She finishes and shows the assistant.
Shona  "There. All finished. Mrs White look at that."
Shona points to the paper lying on the floor in front of her.
Assistant  "Wow. Shona would you like to put a few on the end?"
Mrs White is referring to the white area at the bottom of the paper.
Shona  "Oh I forgot about that."
Shona puts some paint on her brush and paints on the bottom of the paper.

Context: Puzzle corner; Ruth 60 months, Anne 57 months
Anne and Ruth are doing a puzzle together. Ruth holds a piece up for Anne to see.
Ruth  "Where’s that one?"
Anne looks at the puzzle piece Ruth is holding in her hand.
Anne  "I don’t... I forgot, I can’t remember."
They both giggle and Ruth points to a place in the puzzle. Anne places the piece in this position.

Context: Puzzle corner; Ruth 60 months, Anne 57 months
Ruth wants to do a three dimensional shape puzzle while Anne wants to do a different puzzle. Anne puts her puzzle back on the shelf and they start working on Ruth’s choice.
Anne  "Remember these."
Anne holds up another puzzle for Ruth to see. Ruth nods her head.

The final set of mental terms illustrates children talking about the nature of thoughts. In the excerpts presented below, children use mental terms which describe different types of mental states such as being clever, stressed and tricking.

Context: Block corner; Hans 52 months, Samuel 55 months
Both boys are building with wooden blocks. They have been working on individual projects but have begun to work together on

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one building. Hans looks at Samuel who is placing some blocks on the construction.

**Hans**
"We're working men."
Hans lifts more blocks off the shelf. Samuel smiles.

**Samuel**
"Don't worry we'll get it done before night time."
Samuel joins Hans at the shelf and helps him lift blocks.

**Context:** Puzzle corner; Charles 59 months, Gemma 56 months
Charles and Gemma are completing a puzzle together. They nearly have it finished.

**Charles**
"This one is easy peasy."
Gemma looks at Charles but he does not look up from the puzzle.

**Gemma**
"Japanesey!"
Both children giggle.

**Charles**
"Take that one out. Out you stupid piece. I know how to do this but I don't want to. Jodie (teacher) said I was clever at these."
Charles tries a number of different positions for the puzzle piece while Gemma watches.

**Context:** Building with clever sticks; Helen 63 months, Charles 59 months, Gemma 56 months
Helen and Gemma are looking at Charles who is building with the clever sticks.

**Helen**
"What are you making?"
Charles does not look at Helen.

**Charles**
"A trampoline."

**Helen**
"A trampoline? A basket? A monkey bars?"

**Charles**
"Nope."

**Helen**
"OK."

**Gemma**
"Trampoline?"

**Charles**
"Nope."

**Helen**
"Make up your mind, what is it? A swimming pool?"
Christopher nods.

**Charles**
"And that's the diving board."

Each of the previous examples illustrated how children were able to refer to their thoughts. It could be suggested that children were aiming to share meaning in each of their interactions by using mental terms to express what was occurring within their minds. References to mental states enabled the children to add meaning to their verbal and non-verbal actions by making their thoughts explicit. By using these terms in a functional manner children evidenced an understanding of the distinction between mind and action.
In summary, children used language to make reference to mental states and emotions and to provide insights into their personal knowledge. Children also made adjustments in the language they used to accommodate differences in their audiences. Such actions indicate a consideration of differences in perspective, understanding and sentiment. Therefore, it appears children used language as a tool for demonstrating their understanding of the mind.

Sharing Humour

Most actions which aimed to create a positive feeling in another were grouped under the theme of positive perspective taking. However, children also engaged in positive actions, such as the sharing of jokes and irony, with the intent of creating a jovial state in another. Actions which illustrated these characteristics were collated under the theme of sharing humour. The distinction which was made between actions which demonstrated a sharing of humour or positive perspective taking was based on the intent children illustrated. When sharing humour, individuals need to explicitly demonstrate that their intention is to be humorous, or the action may be misinterpreted. This intention can be expressed through verbal or nonverbal actions (Degotardi & Cross, 1999). For example, facial cues such as smiling, changes in vocal intonation, or laughing can indicate that the interaction is intended to be humorous. Alternatively, children may verbally state their intention to be humorous (Sullivan, Winner & Hopfield, 1995). In the following examples children demonstrated their intention of sharing humour with peers.

Context: Craft corner; Shona 59 months, Amber 63 months, Ruth 60 months
The three girls are sitting in a circle working on their own projects.
Shona is applying glue to some paper.

Shona "Hey. Stop sticking onto my paper!"
Shona is talking about a piece of crepe paper which keeps sticking to the sheet of paper she is working on. The other girls laugh.

**Ruth**
"That's got to go there."
Ruth is talking to herself as she sticks coloured paper onto a large sheet of white paper.

**Shona**
"You're funny. You're funny."
Shona is talking to Ruth and smiling. Ruth smiles back.
"Scissors. scissors!"
Shona is looking on the floor for scissors.

**Amber**
"There...there."
Amber points to the scissors. They all laugh. Shona laughs very loudly and other children in the room look at her. Shona picks up a pair of scissors.

**Shona**
"There you are. Don't pinch my nose!"
Shona is talking to the scissors she holds in front of her nose. The other girls laugh.

**Context:** Craft corner; Amber 63 months, Shona 59 months, Ruth 60 months
Amber is trying to stick some paper together but it keeps moving apart. She talks to the other girls but does not look up. The girls have been telling stories and laughing.

**Amber**
"I have a joke. Just like my mummy's tooth. She was watching the toast to pop up and fiddling with her tooth and opps it went out!"
They all laugh. Shona laughs very loudly.

**Context:** Shop corner; Chris 62 months, Harry 59 months
Chris is wearing a tie as he walks over to Harry.

**Chris**
"Look at my tie."
Harry laughs when he looks at the tie. Chris smiles and also laughs.

**Harry**
"It looks funny."
Harry is still laughing.

**Chris**
"I know. I buyed it."
Both boys smile at each other.

**Context:** Craft corner; Amber 63 months, Gemma 56 months, Ruth 60 months
Gemma comes into the craft corner where Amber and Ruth are working.

**Amber**
"Hello Gemma. Got another pretty necklace on again. I made a jewellery box."
Amber holds up the box for the others to see. They all laugh at the jewellery box.

**Amber**
"Not funny! Zip! Zip!"
Amber pretends to be serious but is holding back laughter as she pretends to zip Gemma's and Ruth's mouths. They all laugh at this.
In each of these examples, children explicitly indicate that they intended to share humour most commonly by laughing or smiling. Rather than verbally indicating their intent, children assumed others would understand the intended meaning of their actions. Thus, these children attributed mental states to others, and demonstrated their understanding of the mind. In contrast to these interactions, the following examples illustrate children "playing" with language with the intent of being humorous.

**Context:** Craft corner; Amber 63 months, Shona 59 months
Shona starts to cut paper with scissors. She talks to the scissors.
**Shona**
"Put them back in you silly bunny, silly bunny, silly rabbit!"
Shona is trying not to laugh as she says this. She does not look up.
**Amber**
"Bunny stay in your cage!"
They both laugh. Shona laughs very loudly.

**Context:** Craft corner; Amber 63 months, Shona 59 months
Shona places a piece of paper on her construction item.
**Shona**
"There you are silly chicken."
Shona is talking to the craft item she is constructing.
**Amber**
"Silly chicken!"
Amber is giggling.
**Shona**
"Silly chicken!"
**Amber**
"Don't you know you're the silly chicken!"
Shona and Amber are both laughing.
**Shona**
"What do you call a chook which stands on its head?"
Shona is looking at each of the girls. Amber looks at Shona.
**Amber**
"A chook stand!"
Shona looks at Amber and holds her own stomach.
**Shona**
"No!"
They both giggle.

**Context:** Puzzle corner; Charles 59 months, Gemma 56 months, Ethan 59 months
Charles and Gemma are doing a puzzle together. Ethan is working behind them and keeps saying "easy peasy" when he finds the location of each piece. Charles looks at Ethan.
**Charles**
"Could you stop saying peasy peasy?"
Ethan starts to meow like a cat on Charles's shoulder.
**Gemma**
"Shut up. Shut up."
Gemma is giggling as she says this and then covers her mouth with her hand.
**Charles**
"Meow you stupid dinosaur!"
**Gemma**
"Dinosaur!"
They all laugh.
Context: Water tub; Charles 59 months, Gemma 56 months
Charles and Gemma have two pieces of clear tubing. They have put
water inside the tubes and are holding the ends together.

Charles
"I'm driving."
Charles moves the tubing like a car steering wheel. He makes car
sounds. Gemma copies him. Charles then holds both ends of the
tubing over his head so the water runs out over his hair.
"Who’s peeing on me!"
Gemma and Charles laugh.

Charles
"Yee ha! Water everywhere!"
Gemma copies Charles.

In these examples it appears that children were playing with the intended
meaning of words. Rather than using words in the conventional manner, these
children placed the words in unusual combinations to create humour. Based on the
positive reactions of all children in each example, it appears, despite this
unconventional usage, that meaning was shared amongst the participants.
Interactions such as these indicate a consideration of the mind, because any attempt
at sharing humour implies one believes another will also find the action amusing
(Dunn, 1991). These also report that children will share different types of humour
with different audiences (Dunn, 1988). For example, what a child will share with a
peer as humour will not necessarily be the same humour they share with an adult.
A similar consideration of audience has been observed for the style of language
used by children (Gelman & Shatz, 1978).

Overall, children in the current study illustrated an ability to share humour
with peers during their everyday interactions. They made their intent known
through non-verbal and verbal actions, ensuring that meaning was shared. Children
were able to monitor if meaning was shared by focusing on the reactions of others.
Reactions such as laughter, smiling and nodding would indicate that meaning had
been shared because these could be interpreted as external cues that participants
had experienced some humour in the exchange. To achieve these reactions in the
examples presented in this section children needed to consider the mental states of other participants. In this way, the sharing of humour can be considered a further example of children's developing understanding of the mind.

Distinguishing Appearance from Reality

The ability to simultaneously consider multiple interpretations of reality is an important marker in the development of an understanding of mind. Without this understanding of the distinction it is difficult to engage in actions such as in deception, positive perspective taking, pretense and humour. Much empirical evidence suggests that children have difficulty making distinctions between appearances and reality (e.g. Flavell et al., 1986, 1987). In addition, age and verbal ability have been identified as important variables in the understanding of the appearance reality distinction in the affective domain (Ladouceur, Reid & Bedard, 1998). Many children in the current study demonstrated an ability to distinguish appearance and reality in their everyday interactions with peers. The following excerpts illustrate such interactions.

Context: Clay table; Shona 59 months, Amber 63 months
Shona is rolling clay between her hands.
Shona "Guess what?"
Amber "Shona?"
Shona has cut a piece of clay with fishing line.
Shona "I did it. I cut it. I wonder how clay tastes."
Amber "Yuk. It's dirt."
Shona "No, it's clay."
Amber "No they make dirt to clay."
Shona looks at Amber.
Shona "That means...that means."
Amber "That means it's really dirt."

Context: Outside looking for moths; Kayla 60 months, Rachel 63 months
Both girls are looking on the ground for moths.
Kayla "Oh oh. If we find a real one how can we help it?"
Rachel has found a piece of rubbish and holds it up for Kayla to see.
Rachel  "It's not real, is it?"
Kayla looks and then they look back on the ground.
"There's no ... just rubbish. Let's tell Jarrod we found a real one."
Rachel takes a piece of rubbish in her hand and the girls run to a
group of boys intending to say the rubbish is a moth.

Context: Throwing a ball; Judd 60 months, Chris 62 months, Harry 59 months
Judd is standing near the classroom door, while Chris and Harry are
throwing a ball across the playground to each other.
Judd  "Lunch time!"
Judd is looking at a group of children who are running into the
bathroom to wash their hands. Chris and Harry look towards the
bathroom.

Chris  "They're just pretending it's lunchtime. Harry throw me the ball.
Oh, it hit the pole."
Harry and Chris continue to throw the ball and ignore Judd.

Context: Puzzle corner; Toby 53 months, James 60 months, Ruth 60 months
Toby and James come into the puzzle corner. Toby is pretending
to be a dog by barking and using his arms as legs. Ruth looks at
Toby.

Ruth  "That's not a dog or a sheep. That's a person."

Toby  "We're just pretending."

The previous examples illustrate children making a distinction between
appearance and reality during everyday interactions. These interactions are
characterised by the use of mental state terms such as think, mean, guess, real or
pretend. In particular, the use of contrastive utterances such as real and pretend
make an explicit differentiation between reality and appearance, thereby providing
an insight into children's understanding of the distinction between the mind and
external states. Shatz et al. (1983) suggest that contrastives, such as those
illustrated in the examples above, are some of the strongest references children
make to mental states. Many children made these distinctions during episodes of
pretend play as illustrated below.

Context: Hospital corner; Karen 53 months, Eliza 59 months, Keith 44 months
Karen places a doll on the end of the bed Keith is lying in. Karen is
pretending to be a nurse while Keith is a patient and Tim a doctor.

Karen  "Here's a baby. She's asleep. Tell me when she wakes up."
Keith looks at Karen.
"Tim....where's Tim?"
Keith walks out of the hospital corner to find Tim. He comes back but still looks around the classroom.
Eliza walks over to the table in the hospital corner.
"I'll play too. I'll play too."
Eliza is looking at Karen. Karen does not look at Eliza.
"Only if you'll be this baby's mother. I'm the nurse and I take care of them."
"It's just a game. Pretend you're visiting that sick mother over there. Pretend he's a girl."
Karen points to Keith who has climbed back in the bed.

Context: Hospital corner; Toby 53 months, Karen 53 months, Keith 44 months
Keith takes off his apron and gets onto the bed, covering himself with the sheet.
"Look at Keith. He's sick. We're just pretending. Just pretending doctors."
Toby laughs. Keith is lying on the bed and Karen is listening to his back with a stethoscope.
"He's sick all right. I think you need a needle."
Karen picks up a syringe from on top of the drawers next to the bed and pretends to give Keith the needle.

Context: Kitchen; Shelley 57 months, Chris 62 months
Chris and Shelley are sitting at the kitchen table. Shelley starts to place some plastic food on a plate.
"You better have some tea. You better have some tea. You better have some medicine after tea."
Chris is pretending to eat a piece of plastic pie.
"It's just water, the medicine."

It has been argued that children do not need an understanding of the mind to engage in pretense (Lillard, 1993; Perner et al., 1994). However, in each of the above examples children explicitly indicated that they had an understanding of the distinction between internal and external states. As in the earlier examples, children use contrastives to demonstrate their understanding. The exception is the interaction between Shelley and Chris, where Shelley states the reality of the item without using any mental state terms. This interaction is evidence that children do
not have to use mental state language to demonstrate their understanding of
appearance and reality.

A relationship is proposed between the development of an understanding of
mind and the engagement in pretense (Dunn, 1994; Leslie, 1987, 1988; Taylor et
al., 1993). Children appear to distinguish pretense from reality before they
distinguish appearance from reality (Flavell et al., 1995). Moreover, those children
who engage in role enactment during pretense are most competent judges of other
individuals' mental states (Dunn, 1994). Children who have imaginary companions
are more likely to engage in fantasy play (Taylor et al., 1993), and children who are
more interested in participating in fantasy play appear to develop an understanding
of the mind earlier than children who do not engage in such play (Taylor &
Carlson, 1997). Hence, pretense appears to be an important variable in the
development of a theory of mind.

Important to any distinction between appearance and reality is the ability to
share meaning. If children make such distinctions but are unable to express them
in a manner which is understood by others, then the distinction is meaningless. By
using contrastives children are able to explicitly share their meaning with others. It
has been suggested that the appearance reality distinction is fundamental to
pretense and may be a context which facilitates the use of mental state language
(Hughes & Dunn, 1997). However, the use of such language was not always
adopted by children during episodes of pretense. During some interactions
children did not state the appearance reality distinction, but managed to maintain a
continuity between their actions, indicating they were sharing similar meanings and
distinctions. The following excerpt of pretense involving Samuel and Hans was
part of an episode which lasted for over one hour. While neither boy explicitly

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states any pretense definitions for the objects they are engaged with, each appears to share an understanding of the intentions and goals of others’ actions.

Context: Block mat: Samuel 55 months, Hans 52 months, Joel 55 months
Hans and Samuel have been building with blocks in a number of different areas on the block mat.

Hans
"Come on Samuel."
Hans suggests Samuel goes back to were they were building initially.

Samuel
"Yeah coming."
Both make piles of blocks and push them with a long block to where they were building.
"Someone is trapped in the rubble let’s get them out. Someone is trapped in the rubble let’s get them out."
Samuel starts to pull blocks away from the pile.

Hans
"No we’re working men."
Samuel continues to pull blocks away from the pile.

Samuel
"They’re trapped."
Hans watches and then also starts to pull blocks away.

Hans
"Hey someone’s in trouble."
Hans turns to Joel.
"Help."
Hans then turns back to the pile of blocks

Samuel
"We got to get them out."
Joel helps Hans and Samuel push blocks away from a pile they created earlier under the dollhouse.

Hans
"I’ve got to put this here."
Hans puts a doll under the pile of blocks. Samuel also puts a doll under the blocks.
"Help! They’re trapped in the rubble."
All the boys pull blocks off the pile looking for the dolls.

Samuel
"They’re there."
Samuel grabs at a doll.

Hans
"Where are they?"
Samuel pulls out a doll from under the blocks.

Samuel
"We got him! We got him!"
Samuel throws his hands in the air and smiles. Hans smiles back.

Joel
"Help! Help!"
Joel finds the doll under the blocks and starts kissing it.

Hans
"Now save the boy. Save the boy."
The three boys look through the pile of blocks.

Samuel
"Yeah. The boy."
Samuel holds up the doll for the others to see.

Hans
"It’s hard work."
Hans sighs.

Samuel
"We got him."
Samuel pulls out another doll from under the blocks.
Hans  "No we need to build this. Now we got to get him."
Starts to use a long flat block to prop up the pile of blocks.
Samuel  "Get him out of here. Get him out of here."
Samuel looks through the blocks again.
Hans  "We caught them. We caught them. Nobodies not trapped."
All three grab the dolls and push them together making squealing
and kissing sounds. They pretend to make the dolls laugh and hug
each other like a celebration.
Samuel  "Look! Got to get them out."
Samuel points to the pile of blocks again and starts digging with his
hands in the pile.
Joel walks off but Samuel and Hans do not notice. They continue to
look through the pile of blocks.
"They're down there got to get them out."
Samuel points at the centre of the pile of blocks.
Hans  "No let's make a pool."

This episode of play occurred a week after a well publicised local disaster.
As the result of a landslide, a number of ski lodges were demolished, killing a
number of people and trapping others. The actions of Joel, Samuel and Hans
closely reflect the actual rescue effort which was presented through all facets of the
media. The use of words such as trapped and rubble were common in the media
reports and are evident in the interaction between the boys.

During this episode of play both boys appeared to negotiate the meaning of
the interaction as they proceed. Even with the addition of Joel, the boys were still
able to construct meaning, with a consensus that the blocks represented rubble, and
that the dolls would be happy when rescued. Rather than using contrastives, the
boys were able to communicate the meaning of their actions nonverbally. An
interaction such as this requires individuals to attend to the intentions and goals of
their play partners (Dunn, 1991). However, these children not only had to attend to
the mental states of their partner, but also to demonstrate that they understood their
partners' intentions and goals, maintaining continuity. Therefore, not only did
these children evidence an understanding of the distinction between appearance
and reality, but also they illustrated a consideration of the impact this distinction would have on the mental states of others.

The distinction between appearance and reality reported here is consistent with empirical research which indicates similar understandings when children are provided with a context which is familiar (Krause & Saarnio, 1993; Wellman & Estes, 1986). When children interact in contexts which are emotionally significant for them, they retain control over the meaning which is generated (Dunn, 1991). As a consequence, children are able to negotiate meanings verbally and nonverbally, to ensure all peers share understanding.

However, on occasion in the current study meaning was not shared, and understandings needed to be redefined by participants. In the following three examples, children needed to define explicitly what the intended role or item was during the interaction.

Context: Shop corner; Shelley 57 months, Helen 63 months
Shelley is sitting behind a cash register at a table. Helen approaches her.
Shelley  "Would you like to buy a flower?"
Shelley points to some pencils which have a piece of round paper taped to one end.
Helen  "No they're lollipops."
Shelley  "No I said they are flowers. Would you like to buy a flower for your mum?"
Helen shakes her head.
Shelley  "No I want some eggs."
Shelley leans over to the shelf and takes an egg carton. She passes it to Shelley.
Helen  "OK. If you don't want the eggs just bring them back and give me the money OK."

Context: Home corner; Hailey 47 months, Narelle 47 months
Narelle is sitting on the bed. Hailey moves closer to her.
Hailey  "Are you sick? Yeah and I'm the doctor and you're sick."
Narelle backs away from Hailey.
Narelle  "No I'm not."
Narelle climbs out of the bed.
Hailey  "No just pretend. She's sick and I'm the doctor. I'm the doctor. Do you want to be the baby?"
Narelle returns to the bed.

Context: Home corner; Shaun 47 months, Keith 44 months
Keith has a shirt over his shoulders like a cape.
Keith  "This is Batman. This is Batman."
Keith waves the shirt. He walks to the cassette player.
"Would you like to listen to the music?"
Shaun ignores him and picks Keith’s doll off the bed. Keith smacks the doll and places it on the floor. He then sits on the bed.
"He not very nice."
Keith is talking about the doll. He puts the shirt over the doll’s face.
"Hey. Hey."
Shaun uncovers the doll’s face. He moves the blanket closer and lays the doll on it. Shaun covers the doll with the blanket. Keith picks up the doll from the floor and throws it at the doll Shaun is covering. Shaun pushes this doll away and finishes wrapping his doll.

The interactions above do not necessarily indicate that children did not understand the distinction between appearance and reality, but rather, that children did not explicitly present their definition of the difference in the given context. Whilst acknowledging they were in a pretend play context, in order to share meaning, the children being questioned needed to disclose more of their intentions and goals for the action. Initially there was a misunderstanding where the children were not always certain about their roles in the interaction, such as Narelle not wanting to stay in the bed. However, once the children explicitly presented their intentions and definitions for the given context they were able to reach consensus.

To sum, children were observed: using mental state language which made a contrast between external and internal perspectives; distinguishing roles for pretend play contexts; and clarifying definitions to ensure meaning was shared when an appearance was not consistent with reality. This evidence indicates that these
children can distinguish appearance from reality during their everyday interactions. This is fundamental for their developing theory of mind.

Mediating Action

From a sociocultural perspective, action is viewed as an internal and an external process, whereby the psychological processes motivating overt action are viewed together (Wertsch et al., 1995). Therefore, it is important to perceive action as being shaped by mediation, with any analysis of this process focusing not only on the use of skills and understandings, but also on the potential of these to impact on action. The title for the theme, mediating action, arises from the sociocultural literature, and aims to reflect the mentalistic and physical nature of action. Three distinctive behavioural characteristics were collated under the theme of mediating action. Firstly, activities which were controlled by one child, or which illustrated a group of children controlling others, were grouped as directing. Secondly, actions which illustrated collaboration and sharing were collated under the broader title of co-construction. Finally, actions where one child was guiding another were classified as modeling.

As children gain more experiences in the social world, they develop an understanding of how responsibilities and justifications can be used to manipulate others and satisfy their own needs (Dunn, 1991). Indeed, evidence indicates that they apply this knowledge in different ways, depending on their audience (Dunn, 1988). One situation which can evoke the need to clarify responsibilities and seek justifications is the context of dispute. While few children in this study directed others during everyday interactions, when conflict arose, they were more inclined to try and control others, as illustrated below:
Context: Shop corner; Eden 57 months, Shelley 57 months
Shelley is sitting behind the cash register. Eden comes over.

Eden
"I want to be shopkeeper."

Eden glared at Shelley.

Shelley
"No I am the shopkeeper."
Shelley stands up and looks in the cupboard behind her. There are a number of dresses hanging in the cupboard.

Eden
"I want the black dress."

Eden takes the black dress from the cupboard.

Shelley
"I want it."
Shelley takes the black dress from Eden’s hands.

Eden
"I'll have the red dress."

Context: Home corner; Lane 58 months, Shelley 57 months, Sarah 59 months, Katie 56 months
The three girls are working around a table, making food with playdough.

Lane
"I need some more playdough."
Lane takes some playdough Katie has in a pan. Shelley watches.

Shelley
"That was for Katie. That was for Katie."
Shelley takes the playdough from Lane and gives it back to Katie.
"There you go Katie."
Katie looks at Shelley.

Lane
"I've already got a big bit."
Shelley glares at Lane.

Shelley
"You've got to share."

Sarah
"You've got to share don't you?"

Shelley
"Yeah."

Context: Playdough table; Keith 44 months, Tim 54 months
Keith tries to take some of the playdough Tim has in front of him.
Tim grabs at the piece to stop Keith.

Keith
"Ahhh."
They tug over the piece. Keith stares at Tim and Tim lets go.

Context: Shop corner; Chris 62 months, Eden 57 months
Eden is behind the cash register. Chris comes into the shop.

Chris
"Eden is running the shop and she's not suppose to."
Chris is holding two boxes.

Eden
"Two dollars."
Eden puts out her hand to Chris to suggest he should give her two dollars.

Chris
"You shouldn't be running the shop."

"Yes I can."
Eden stands up and stares at Chris before walking out of the shop corner.

Context: Outdoor craft table; Jasmine 50 months, Narelle 47 months
Jasmine has a toy in her hand.

Jasmine
"No that's mine. No one is allow to have this. It's mine."
Jasmine is talking about the toy.
"You don’t know where this goes. Don’t."
Jasmine’s paper blows away and Narelle tries to catch it by standing on it. Jasmine glares at Narelle and snatches the paper.

Context: Outdoor equipment; Taylor 57 months (female), Katie 56 months
A small group of girls are whispering and looking at Taylor.
Taylor
"I heard that."
Taylor looks upset as she stares at the group of girls.
Katie
"Well she laughed. I was only laughing to find a moth.
Taylor
"I heard it."
Taylor walks away from Katie as she begins to talk.
Katie
"No that’s not really true. We were looking for a moth."

Context: Hospital corner; Keith 44 months, Karen 53 months
Keith is climbing out of the bed in the hospital corner. Karen sees Keith.
Karen
"Get back to bed."
Karen opens the top drawer next to the bed. There are two stethoscopes in the drawer.
Keith
"I’ll have one of those."
Keith climbs out of the bed and takes a stethoscope.
Karen
"No I’ll have it."
Karen grabs the stethoscope from Keith’s hands.

Context: Outdoor sandpit; Rachel 63 months, Katie 56 months
Rachel and Katie are in the sandpit engaged in parallel play.
Rachel
"Katie can you get me a tissue?"
Katie stands up and starts to walk away from Rachel.
"On your way can you get me a tissue?"
Katie walks to the table and gets a tissue. She returns to the sandpit and sits on a tyre near Rachel.
"Here."
Rachel holds out her hand indicating she wants the tissue.
Katie
"No I want it."
Katie holds onto the tissue and looks at Rachel.
Rachel
"Well if you don’t give it to me you can’t play and I’ve never played this with anyone."
Both girls stand up and Katie shakes her head. They walk off towards the classroom, Rachel appearing to follow Katie.
"You can’t play if you don’t give it to me."
Katie walks away.

Conflict situations are often highly emotive interactions where children are attempting to exert their point of view. It has been suggested that children are more competent demonstrating their understanding of the mind in such situations.
because of this emotional and personal nature (Dunn, 1988). Indeed, the usage of mental state terms during disputes at 33 months of age has been identified as a reliable predictor of performance on false belief tasks at 40 months (Dunn & Brown, 1994). It is possible that conflict situations provide incentives for children to explore the perspectives of others, and opportunities to think about other individuals’ thoughts in order to influence their mental states. This situation is particularly evident in the final example involving Rachel and Katie. Rachel tries to manipulate Katie by indicating that she has never played the game with anyone else, and if Katie does not give her the tissue, she cannot play. Hence, Rachel is making a judgement about the value Katie places on being able to play with her.

Children who frequently engage in pretend play are more inclined to attend to their peers’ mental states and are more likely to direct action by using references to mental states (Hughes & Dunn, 1997). The following excerpts illustrate how children can use such references to direct others.

Context: Puzzle corner; Anne 57 months, Ruth 60 months
Ruth is talking to the piece of puzzle in her hand, then passes it to Anne. They are completing a puzzle which pictures a family.
Anne "I know, you can do the mum and I'll do the kids."
Ruth "No you've done the kids. I'm the sister. I'm not going to be the brother. No, which should we do next? You choose."
Anne "We won't do the boy. You don't like boys."
Ruth "No we could do it together."
Anne "No I've got a good idea. Don't put them in the puzzle. Now where's the brother?"
Both girls look for the brother piece of the puzzle.

Context: Home corner; Narelle 47 months, Hailey 47 months
Narelle and Hailey are standing next to the bed.
Narelle "I'm the parent, remember."
Hailey "Yeah. You're the mum. Hello mummy."
Narelle goes to the table and picks up a doll. She begins to undress the doll. Hailey begins to walk out of the home corner.
Narelle "Bye bye."
Context: Block mat; Hans 52 months, Samuel 52 months
   Both boys are building together with blocks.

Hans    "We're building a pool."

Samuel  "You know what we could do...make a road. I'll show you."
   Samuel shows Hans what he is talking about by putting a flat block
   up on a nearby seat.
   "See. Wait a minute. Wait one..two..three. Ready set go!"
   Samuel places the flat block on angle and slides a smaller block
down it.

In each of the previous excerpts, children were interacting with peers they
chose, and using mental state terms to direct action, with most of the examples
occurring within the context of pretend play. Whilst the children in each example
are directing their peers, they are using mental state terms to create a sense of
collaboration. For example, in the interaction between Hailey and Narelle, Narelle
reminds Hailey of the roles they have designated in their play by referring directly
to her memory through the word remember.

In contrast to the directing of peers by using mental state terms are
examples of children directing others by making references to their own thoughts,
feelings, or characteristics.

Context: Throwing a ball; Harry 59 months, Chris 62 months
   Both boys are throwing a ball across the playground.

Harry    "I'm throwing it. I'm throwing."
            Harry has thrown the ball over arm and Chris is trying to throw it
            underarm.

Chris     "I said I didn't want you to throw it that way."

Context: Hospital corner; Karen 53 months, Keith 44 months, Tim 54 months
   Keith is lying in bed. Karen covers him with a sheet. Tim touches
   Keith's forehead with a stethoscope.

Karen    "I'm the nurse. I have to be a nurse because I'm a girl. Nurses take
care of babies."

In each of these examples, the children directing the action are drawing
attention away from their peer. For example, rather than telling Harry he did not
throw the ball correctly, Chris tells Harry he did not want the ball thrown in a particular manner. Hence, Chris draws the attention to his mental state rather than to Harry's ability. Similarly, Karen justifies her role allocation by referring to her gender rather than her or Keith's abilities. Therefore, akin to the actions illustrated as positive perspective taking, it is possible these children were considering the consequences of their responses, and did not want to leave their play partner feeling inadequate or not valued. Indeed, by reflecting on their own attributes, or attributes which cannot be controlled, children are reducing the force of their directing speech act, and perpetuating a positive attitude (Astington, 1994).

Another important characteristic identified under the theme of mediating action is collaboration. To enable children to participate in a collaborative manner, a degree of shared understanding needs to be established, where children "convey meaning through a system of shared concepts" (Farver, 1992, pp. 501). This can be achieved by considering the mental states of others through the negotiation of action and sharing of responsibility for choices, as evidenced in the following interactions.

**Context:** Home corner; Shelley 57 months, Laylor 52 months

Laylor is sitting at the kitchen table while Shelley stands nearby.

**Shelley**

"Would you like to be our little kid? Linda is our little kid but you can be our little kid and be sick forever."

Laylor nods her head and Shelley goes to the kitchen to get a small cup. Laylor sits at the table and Shelley returns with the cup.

"Here's your medicine."

Laylor takes the small cup and pretends to drink from it.

**Context:** Block mat; Samuel 55 months, Hans 52 months

Samuel and Hans are building houses with blocks. Each is working on their own house which join together to form one large building.

**Samuel**

"We could have the enormous house in the world. The enormous house. The big house."

Hans looks at the structure Samuel has built.

**Hans**

"Samuel. Wow it's big."

**Samuel**

"It's an enormous house."
Samuel walks around Hans to get some more blocks from the nearby shelf.

Hans
"Come on Samuel."

Samuel
"Just getting some more blocks. Just need something more."

Hans
"Samuel is that a big room?"
Hans points to structure Samuel has made.

Samuel
"Yeah."
Samuel walks back to his original position with an armful of blocks.

Hans
"We're the workers."

Samuel
"Yeah workers."

Context: Block mat; Samuel 55 months, Hans 52 months

Hans
"Look at this."
Hans has picked up a long flat block.
Samuel leans forward to see and bumps his structure. It topples down.

Samuel
"Oh!"

Hans
"Oh."

Samuel
"We'll have to start again. I'll get the timber."

Hans
"I'll put a big one."

Samuel
"I'll just get this one."
Samuel picks up a long block and places it on the pile.
Both look at each other as they make noises like "oh" and "ah" to suggest they are working really hard. They smile at each other.

"We nearly got it."

Hans
"I got mine."
Hans has moved his blocks into a larger pile.

Samuel
"I'll get these two over here. Now I'll get the timber over here. We can't get our house we got to get the timber."

Hans
"I nearly got it." (A large block).

Samuel
"I'll get it."

Hans
"Got it."

Samuel
"Got it. We have to move it up again. We're working."

Hans
"We have to put this in here. We needs some more blocks."

Samuel
"I'm trying to get this out."
Samuel tries to move a block from under the pile.
Hans gets some more blocks from of the shelf.

Hans
"Come on we're going to move all the timber in there."
Hans is referring to under the dollhouse.

Samuel
"Oh."

Context: Home corner; Shelley 57 months, Chris 62 months, Lane 58 months

Shelley
"What would you like?"

Chris
"No. I'm the dad."

Shelley
"OK and I'm the mum and you're the baby."
Shelley is pointing to Lane as the baby.

Context: Writing on the computer; Rachel 63 months, Katie 56 months

Rachel
"Once upon a time there was a little girl who lived in a house. Her name was Rachel."
Katie  "Why didn't you write Matthew my brother?"
Rachel "Cause I didn't think to. Now what should I write?"

Context: Home corner; James 60 months, Lane 58 months
James  "You can be the baby."
Lane  "No I'm the mum."
James  "Oh. Who's going to be the baby?"
Lane  "We don't have one."

The collaborative nature of the previous interactions illustrates how children are able to negotiate meaning by considering the thoughts and feelings of their social partners. Rather than directing their peers, these children assisted each other through a process of guided participation (Rogoff, 1995). As a consequence, the action and materials needed for such were "managed collaboratively by individuals and their social partners" (p. 146). The purpose in such interactions was shared by participants through explicit communication and routine. For example, in the interaction between James and Lane, roles were negotiated jointly through verbal statements. Conversely, in the excerpts involving Samuel and Hans, meaning was communicated through the familiarity provided by the routine of block building.

Further evidence of children sharing the purpose of their interaction was provided by a participant who was often observed directing other children. In previous examples, Karen was identified directing other children and trying to control the direction of interactions. However, in the following two excerpts she illustrated her ability to negotiate and work with her peers.

Context: Hospital corner; Keith 44 months, Karen 53 months
Keith  "I'll be the dad."
Karen  "OK. I'll wash this things up."
Keith  "OK. I'll wash these.
Karen moves to wash a pile of plates on the sink.
Karen: "No that’s clean. No that’s clean."
Keith: "No I’ll do everything. No I’ll do everything."
Karen: "No. I’ll do it. You pretend you’re the patient in hospital."
Keith: "How about I be the doctor?"
Karen does not respond to Keith. Keith walks to the drawer and gets a stethoscope. Karen sees Keith with the stethoscope.
Karen: "Hey you’re the patient. You’re the patient."
Keith: "No I’m not the patient."
Karen: "Keith, Keith, Keith you’re the patient. Keith, can you be the baby in the game?"
Keith: "OK."

Context: Hospital corner; Keith 44 months, Karen 53 months
Keith: "Can I be the doctor now?"
Karen: "No, be the patient."
Keith: "It’s cleaned up now."
Keith is talking to the girls he sees at the sink.
Karen: "Now we can go. Oh, they’ve left."
Karen is referring to the girls who were playing in the kitchen area.
"How about just we play?"
Keith: "Yeah."
They both walk into the kitchen area. Karen stands at the sink and tries to match the numbered plastic eggs. Keith is sitting at the table, pretending to eat.

Whilst many examples of collaboration were identified in the data, a number of participants effectively moved their peers into the zone of proximal development by modeling and scaffolding their actions as illustrated below.

Context: Puzzle area; Alex 46 months, Gail 46 months
Both girls are looking through a pile of cards used for a memory game.
Alex: "Just leave them."
Gail: "I know."
Gail starts to place cards on the memory board.
Alex: "I see how. Oh."
Alex copies what Gail is doing.

Context: Outside play; Katie 56 months, Rachel 63 months
Both girls are standing on the veranda looking at the other children playing.
Katie: "Where can we go?"
Rachel: "I know where."
Rachel walks towards a log and Katie follows. Rachel sits on a tyre then stands up and looks inside the log. Rachel points to the other end of the log and Katie goes there and looks inside.

Context: Block mat: Hans 52 months, Samuel 52 months

Hans

"We're building a pool."

"You know what we could do. Make a road. I'll show you."

Samuel shows Hans what he is talking about by putting a flat block up on a nearby seat.

"See. Wait a minute. Wait one...two...three. Ready. Set go!"

Samuel places the flat block on an angle and slides a smaller block down it.

By modelling actions for peers, children were helping others to move beyond their current understandings in a supportive and interactive manner. For example, Samuel explicitly states he will demonstrate the desired action for Hans. He then draws Hans’ attention to specific aspects of the construction through the use of verbal comments and by gesturing. In each of the examples above children select language and actions which will extend their partner, then provide opportunities for the peer to explore the new understanding without support. Indeed, the interactions are evidence of children establishing challenges for their partners, which they lead the partner through to facilitate success. These examples suggest children are considering the current and potential mental states of their peers, and adapting their actions to account for these differences. Without an understanding of a partner’s mental states, a child is unable to establish a baseline from which to extend the partner.

In summary, children were able to engage in actions which supported and subtly extended their peers. These children were able to participate in interactions involving collaboration, modelling and directing. They shared meaning by considering the mental states of their play partners. This in turn may have helped further understandings about the mind to develop.
Summary

In the previous section, results from the grounded theory analysis were presented. This analysis identified children demonstrating an understanding of the mind during their everyday interactions. A summary of each theme is presented in Table 5.2.

Table 5.2

<table>
<thead>
<tr>
<th>Theme</th>
<th>Definition of theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive perspective taking</td>
<td>Children generated positive outcomes for others while considering differences in perspectives.</td>
</tr>
<tr>
<td>Acts of deception</td>
<td>Children manipulated the mental states of others through actions and language with intent to deceive.</td>
</tr>
<tr>
<td>Talk about self, other and mind</td>
<td>Children made verbal references to mental states or discussed characteristics about themselves or others.</td>
</tr>
<tr>
<td>Sharing Humour</td>
<td>Children aimed to create a jovial state in another through actions such as sharing jokes or irony.</td>
</tr>
<tr>
<td>Distinguishing appearance from reality</td>
<td>Children made a distinction between what something appeared to be and what it really was.</td>
</tr>
<tr>
<td>Mediating action</td>
<td>Children either: directed others, engaged in collaborative tasks or modelled actions for others.</td>
</tr>
</tbody>
</table>

It could be suggested that some of the examples presented in this section do not explicitly evidence children using mental states. For example, expressions such as "Help me boy", "Make up your mind" and "You know what we could do" could be uttered without references to mentality by children imitating phrases they have heard other individuals use. This is possible for phrases which are used regularly
including calls for help, expressing manners such as "thank you" and pause fillers such as "you know". However, for other phrases this explanation is not justified. The statement "Meow, you stupid dinosaur" is one such example. The child this statement was directed at was pretending to be a cat but was referred to as a dinosaur by another child. Because dinosaurs are generally thought of as roaring and growling the children found humour in the idea of a dinosaur meowing. To share this humour the children in this interaction needed to understand that this statement was incorrect. Similarly, the statement "I forgot, I can't remember" combines two terms about memory. While both terms are used in everyday speech, it is rare for each to be used in the same sentence. When this usage is considered with the actions of the child, it is evident that she is making a reference to mentality. Therefore, for all of the interactions presented in this section it is necessary to consider each reference to the mind as one fragment of a larger interaction which reflects the sociocultural contexts of the participants.

In the following section the results from the grounded theory analysis are explored further. The interactions associated with each theme are analysed using the Continuum of Teaching Behaviours (Bredekamp & Rosegrant, 1995) and the results discussed in relation to related literature and the other analyses used in the case study phase.

THE NATURE OF INTERACTIONS ASSOCIATED WITH THE IDENTIFIED CHARACTERISTICS OF AN UNDERSTANDING OF MIND

Identifying Interactions in the Case Study Data

A criticism of much theory of mind research has been its focus on individual children rather than on children in their sociocultural context (Degotardi
& Cross, 1999; Raver & Leadbeater, 1993). While it appears necessary for children to interact with others when constructing knowledge (Nelson, 1996; Rogoff, 1990), there have been few theory of mind investigations involving children during their everyday interactions. Those investigations which have focused on children during everyday interactions have most often looked at the type of language children use, rather than at how it is used (e.g., Shatz et al., 1983). Thus, the emphasis is generally on language as an indicator rather than facilitator of development (Nelson, 1996). Most studies which have investigated language as a tool for development have been conducted with children under three years of age (e.g., Bretherton & Beeghly, 1982). The current study aimed to provide evidence of how older children use their understanding of the mind during their everyday interactions. The following section focuses on the types of interactions children engage in when demonstrating their theory of mind.

The Continuum of Teaching Behaviours (Bredekamp & Rosegrant, 1995) (see Table 3.14) was used to identify the type of interactions gathered under the themes which were identified through principles of grounded theory and presented in the first section of this chapter. As discussed in Chapter 3, this continuum was originally used to describe the interaction styles of teachers. In the current study it is used to describe the interactions of children. The rationale for such usage is based on the sociocultural framework of this study. If knowledge is socially constructed (Nelson, 1996), then it is proposed that all individuals can be "teachers" when needed. There are times when every individual is required to impart knowledge or to access it. There are even times when individuals can be learners and teachers in the same interaction. For example, if two children were sharing a book and one was reading and expanding on the text while the other was
highlighting important features of the illustrations both children would be learning and teaching.

The frequencies of interactions in each theme are presented in Table 5.3. Using the continuum, no examples of support interactions were identified. Because of this support was not included on any of the tables reporting the results. When observing the frequencies presented in Table 5.3, it was evident that different types of interactions were more common in some themes than others. For example, acknowledging interactions were more common in the themes of positive perspective taking and sharing humour then in the themes of distinguishing an appearance from reality and acts of deception. Likewise, co-constructive interactions were more frequently identified under the themes of mediating action, distinguishing an appearance from reality and talk about self, other and mind. Furthermore, no demonstrative or directive interactions were reported for the themes of positive perspective taking or sharing humour. Similarly, no acknowledging or modelling interactions were reported for the themes of talk about self, other and mind or acts of deception. While most themes included a range of types of interactions, there did appear to be different types of interaction dominating different themes.

The frequencies presented in Table 5.3 were investigated further using the nonparametric Kruskal-Wallis Test. This test is a simple form of a one-way ANOVA for ranks (Wilkinson, Hill & Vang, 1992). After ranking the interactions from one to seven (acknowledge = 1, scaffold = 4, direct = 7), average weighted frequencies were produced for the interactions under each theme. For example, the frequencies for each interaction under the theme positive perspective taking were multiplied by one. Similarly the frequencies for each interaction under the theme
acts of deception were multiplied by six. The frequencies for each stage in this process are reported in Table 5.4.

Table 5.3

Frequencies of interaction types according to themes

<table>
<thead>
<tr>
<th></th>
<th>Positive perspective taking</th>
<th>Sharing humour</th>
<th>Mediating action</th>
<th>Distinguishing appearance and reality</th>
<th>Talk about self, other and mind</th>
<th>Acts of deception</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledge</td>
<td>14</td>
<td>6</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>8</td>
<td></td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facilitate</td>
<td>5</td>
<td></td>
<td>5</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Scaffold</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-construct</td>
<td>1</td>
<td>2</td>
<td>12</td>
<td>18</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Demonstrate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Direct</td>
<td></td>
<td>5</td>
<td>2</td>
<td>6</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

The resulting average weighted frequencies were not identical for each theme. Positive perspective taking had the lowest average weighted frequency, sharing humour had second lowest and mediating action the third lowest. Distinguishing appearance from reality had the third highest average weighted frequency, talk about self, other and mind the second highest, and acts of deception the highest. The difference between the average weighted frequencies is illustrated graphically in Table 5.4. Each asterisk represents the mean of the weighted frequencies. The sequence of these frequencies was significant (see Table 5.5).
Table 5.4

Average Weighted Frequencies for Interactions by Theme

<table>
<thead>
<tr>
<th></th>
<th>Positive perspective taking</th>
<th>Sharing humour</th>
<th>Mediating action</th>
<th>Distinguishing appearance and reality</th>
<th>Talk about self, other and mind</th>
<th>Acts of deception</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Acknowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Model</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Facilitate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Scaffold</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Co-construct</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Demonstrate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Direct</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Sum of frequencies           | 29                          | 8              | 31               | 22                                   | 27                              | 12                |
| Sum of weighted frequencies  | 54                          | 16             | 130              | 109                                  | 155                             | 82                |
| Average weighted frequencies | 1.86                        | 2              | 4.19             | 4.95                                 | 5.74                            | 6.83              |

Note: * represents the mean of weighted frequencies

The pattern observed in the average weighted frequencies indicated that the themes moved from less directive interactions to more directive interactions. For example, positive perspective taking and sharing humour were characterised mostly by the interaction types of acknowledging and modeling. Both of these interaction types were identified by Bredekamp and Rosegrant (1995) as guiding actions. The average weighted frequencies for the themes mediating action and distinguishing an appearance from reality fell between the interaction types scaffolding and co-constructing. Bredekamp and Rosegrant indicate that these
interactions are more directive than acknowledging and modeling actions. These
types of interactions tend to be in the middle of the Continuum of Teaching
Behaviours. The continuum indicates that scaffolding and modeling interactions
are less directive than demonstrating and directing. The average weighted
frequencies for the themes talk about self, other and mind, and acts of deception
tended to fall near these more directive interactions. Hence, some themes appeared
to be characterised by more guiding actions while others were characterised by
more directive actions.

Table 5.5
Results for Kruskal-Wallis Test for each Theme

<table>
<thead>
<tr>
<th>Theme</th>
<th>Frequency</th>
<th>Rank Sum</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive perspective taking</td>
<td>29</td>
<td>737</td>
<td>25.40</td>
</tr>
<tr>
<td>Sharing humour</td>
<td>8</td>
<td>216</td>
<td>27.00</td>
</tr>
<tr>
<td>Mediating action</td>
<td>31</td>
<td>1998</td>
<td>64.45</td>
</tr>
<tr>
<td>Distinguishing an appearance from reality</td>
<td>22</td>
<td>1649</td>
<td>74.95</td>
</tr>
<tr>
<td>Talk about self, other and mind</td>
<td>27</td>
<td>2402</td>
<td>88.96</td>
</tr>
<tr>
<td>Acts of deception</td>
<td>12</td>
<td>1383</td>
<td>115.25</td>
</tr>
</tbody>
</table>

Kruskal-Wallis Test Statistic = 79.113
\( p < .001 \) assuming chi-square distribution with 5 df

To further strengthen the claim that a sequence existed in the themes as
illustrated in Table 5.4 a set of contracts were completed producing Mann-Whitney
U Test Statistics (see Appendix J). While these were completed as post tests, they were planned in advance. Setting a conservative probability level to account for the multiple tests, two significant results were reported. Firstly, between the themes of sharing humour and mediating action and secondly, between talk about self, other and mind and acts of deception. While a significant result was not reported between the other themes, the differences supported the direction indicated in Table 5.4. For example, distinguishing appearance from reality then talk about self, other and mind. Also mediating action followed by distinguishing appearance from reality. The results for both these contracts were approaching significance. The only contract result which does not support this sequence is between the themes positive perspective taking and sharing humour. While the average weighted frequencies for these themes supported the sequence presented in Table 5.4, the ranks from the contracts were in the opposite direction. It is probable that this result was an artefact of the loss of variance through ranking, and the large sample size for positive perspective taking.

In the following paragraphs examples of interactions identified under each theme are presented.

Positive Perspective Taking and Sharing Humour

Both the themes of positive perspective taking and sharing humour were characterised by nondirective behaviours, with acknowledging actions being overwhelmingly the most common type of interaction demonstrated by children during activities gathered under each of these themes. However, other less frequently identified actions within these themes also indicated nondirective interactions such as modeling and co-constructing. According to Bredekamp and
Rosegrant (1995), acknowledging actions involves the giving of attention and positive encouragement to others so that they maintain engagement with the activity. For example, in the following interaction, which was categorised under the theme of sharing humour, the girls give attention to each other and positive encouragement through the repetition of rhyming words and comments such as "You're funny". The girls also maintain attention by making eye contact with each other.

Context: Craft corner; Amber 63 months, Shona 59 months, Ruth 60 months

Amber holds the scissors near her nose and looks at them.

Amber holds the scissors near her nose and looks at them.

"You don't pinch my nose."
Amber is talking to a pair of scissors. Shona and Amber look at each other and giggle. Ruth also looks at both girls but they do not look at her.

Shona

"You're funny."

Amber

(In a high pitched voice) "Hello possum."
They all look at each other and giggle.

Shona

"Hello possum blossom!"
They are all still looking and each other giggle again.

Amber

"You can play over here. If you don't play with us you have to stay with us."

Amber is looking at Ruth who is giggling. They all laugh.

Similarly, in the following interaction between Shona and Amber, which was categorised as being an example of positive perspective taking, Amber models the skill of cutting clay for Shona. According to the definitions provided for the continuum, modelling actions involves individuals displaying a skill or behaviour for another, using verbal and/or non-verbal behaviours (Bredekamp & Rosegrant, 1995). Amber uses language in association with the physical modelling when displaying her method for cutting clay. Amber also watches Shona as she cuts the clay, possibly monitoring Shona's attempt before offering encouragement through a smile.
Context: Modelling items with clay—Shona 59 months, Amber 63 months
Both girls are sitting opposite each other and working on their own projects. Occasionally they look up at each other.

Shona
"Could you make me a slime like that?"
Shona points to the clay Amber is using.

Amber
"Yes. All you need to do is this. Cut it...cut it."
Amber takes some fishing line and cuts the clay into three pieces.

Shona
"I'll try this."
Shona takes another piece of fishing line and also cuts the clay.
Amber looks at Shona as she cuts the clay then continues to cut her own piece. Both girls look at each other and smile.

Amber
"See I cut it."
Shona looks at Amber's clay then continues to cut her own.

Shona
"Cut. Cutter."
Shona is talking as she cuts the clay. Both girls stop cutting and start modelling their clay.

Mediating Action and Distinguishing Appearance from Reality

The two themes presented in the centre of Table 5.3 and Table 5.4—mediating action and distinguishing appearance from reality—illustrate mediating behaviours. Interactions grouped under these themes consisted of many examples of co-construction which involved individuals working on a task or learning collaboratively (Bredekamp & Rosegrant, 1995). However, these themes also contained a range of non-directive behaviours such as modelling, facilitating and scaffolding. Overall, the interactions gathered within these two themes required children to engage in collaborative actions where children took turns to guide others in explicit and subtle ways. In the following interaction, which was grouped under the theme of distinguishing appearance from reality, the girls are co-constructing but also demonstrate acknowledging behaviours by offering encouragement to each other through statements such as “That's the best she could do”.

Context: Craft corner; Shona 59 months, Amber 63 months, Ruth 60 months
The three girls are working on separate craft items but sitting in a circle in the craft area.

Shona
"There we go a little rubbish bin."
Shona holds up her creation. Nobody looks at Shona's creation. Amber is trying to wrap paper around one of her fingers.

Amber  "I don't think I can make a ring."

Nobody looks at Amber.

Shona  "It's not a real rubbish bin."

Amber looks at Ruth.

Amber  "She's pretending. That's the best she could do."

Shona  "That's the best I could do."

Amber looks at Shona.

Amber  "That's how rubbish bins are."

Shona moves closer to Amber and looks at Amber's fingers.

Shona  "Now what would you like me to do for the ring?"

Amber  "I'm right."

In interactions grouped under the themes of mediating action and distinguishing appearance from reality children appeared to take control of the action occasionally, but more often shared responsibility for the action. For instance, in the following interaction between Shelley and Lane both girls acknowledge each other through eye contact and smiles while playing together, but are also focused on their own tasks of putting on the ties.

Context: Home corner; Shelley 57 months, Lane 58 months

Shelley  "A red tie."

Shelley holds a red tie up for Lane to see. Lane looks at the tie.

Lane  "A brown tie."

Lane is holding a brown tie and holds it out towards Shelley for her to see. They look at each other.

Shelley  "I might wear this."

Shelley tries to put the tie on.

Lane  "I'm wearing this."

Lane tries to put her tie on. Both girls have their ties on and look at each other and smile.

Talk about Self, Other and Mind and Acts of Deception

While the theme of talk about self, other and mind also involved co-constructive actions, it was characterised by more demonstrative behaviours then the previously discussed themes. According to Bredekamp and Rosegrant (1995), demonstrative actions are more directive and refer to individuals who "actively
display a behaviour or engage in an activity while children observe the outcome" (p. 21). Another directive behaviour outlined on the Continuum of Teaching Behaviours was direction which was defined as providing specific directions with minimal room for error. Directive behaviour was demonstrated by Hans in the following interaction, which was grouped in the theme of talk about self, other and mind. Hans gives specific directions to Anthony and then provides a rationale for this decision to Samuel. There can be no misinterpretation of what Hans wants Anthony to do.

Context: Block corner; Hans 52 months, Samuel 55 months, Anthony 55 months
Hans and Samuel have been building for over half an hour in the block corner. Anthony, a child with special needs, comes into the corner and looks at the block construction.

Hans
(To Anthony) "Out out!"
Hans waves his arms at Anthony. Anthony steps back from Hans.
(To Samuel) "He can't come near our house. He doesn't know how to build it."
Hans glares at Anthony until Anthony walks away. Samuel looks at Anthony then at Hans. Samuel then continues to build.

Similar directive actions were identified in interactions grouped under the acts of deception theme. In the example below, Shelley is trying to conceal the location of the playdough so Lisa cannot use it. Shelley uses language which is very specific and ensures that Lisa knows Shelley does not want her to have the playdough. However, the language is also used to create the deception, with Shelley's verbal actions contradicting her physical action when she places the playdough under the sink after saying she will put it in the fridge.

Context: Kitchen corner-Sally 56 months, Shelley 57 months, Lisa 59 months
A group of girls are pretending to cook at the table in the kitchen. They have pots, plates, utensils and playdough. Lisa grabs a handful of playdough from Kiera. Kiera looks at her but does not say anything. Sally and Shelley have seen Lisa take the playdough.
Sally (To Lisa) "You've got to share don't you?"
Shelley nods and looks at Lisa.

Shelley "Yeah. I'm going to put these in the fridge."
Shelley takes some of Lisa's playdough and gives it to Kiera. Kiera does not say anything but begins to work with the extra playdough. Shelley picks up a tray filled with playdough. Lisa watches her.

Lisa "Where's the fridge?"
Shelley glares at Lisa.

Shelley "You can't know or you'll get more."
Shelley walks to the sink and looks at Lisa. When Lisa is not looking Shelley places the tray of playdough under the sink. Shelley glares at Lisa when she comes back to the table. Lisa looks at Shelley then back at her work.

Summary

To summarise, Table 5.2 and Table 5.3 present the frequency with which the different types of interactions were identified for each theme. There appeared to be a pattern of interactions common in the different themes. Non-directive actions were most common for the themes of positive perspective taking and sharing humour, mediating actions were the most frequent actions for the themes of mediating action and distinguishing appearance from reality, while directive actions were mostly identified within the themes of talk about self, other and mind, and acts of deception. However, while the previously discussed actions were the most common in the given themes, there were interactions which did not fit with the sequence identified in each theme. For example, there were five directive actions identified in examples from the theme of mediating action when the most common action in this theme was co-construction, a mediating behaviour. Thus, the data did not fit into a neat pattern, but rather, presented an overview of the relationship between the interactions and themes.
Developing a Model for Theory of Mind Interactions from the Data

Using the data presented in Table 5.2, a model was created to illustrate visually the relationship between the theory of mind themes and the identified types of interactions. This model, Theory of Mind Interactions Model, is presented in Figure 5.1. The Theory of Mind Interactions Model differs from the *Continuum of Teaching Behaviours* in a number of ways. Firstly, Bredekamp and Rosegrant (1995) indicate that their continuum moves between nondirective, mediating and directive actions. While the Theory of Mind Interactions Model also moves between such behaviours, these terms have been replaced by phrases which reflect terminology used in the theory of mind domain. These changes were made to emphasise the different purposes of each continuum. Secondly, Bredekamp and Rosegrant's continuum was intended for use with educators as a tool for identifying general teaching actions, while the Theory of Mind Interactions Model has been developed as a framework for focusing on actions related to an understanding of mind in children. Thirdly, the Theory of Mind Interactions Model has been developed based on evidence gathered from one sample. Further investigation is needed for the model to have external validity.

Figure 5.1

Theory of Mind Interactions Model

<table>
<thead>
<tr>
<th>Subtle theory of mind</th>
<th>Shared theory of mind</th>
<th>Overt theory of mind</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive perspective taking</td>
<td>Sharing humour</td>
<td>Mediating action</td>
</tr>
</tbody>
</table>

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On the Theory of Mind Interactions Model, nondirective actions are referred to as a subtle theory of mind (left of the model), mediating actions as a shared theory of mind (centre of the model), and directive actions as an overt theory of mind (right of the model). The use of theory of mind in this context aims to emphasise the mentalistic nature of the actions presented in the model and does not suggest any specific theoretical stance. The replacement of "nondirective" with "subtle theory of mind" emphasises the sociocultural perspective adopted in this study. In social and cultural contexts, children's understanding of mind is guided by more experienced individuals who aim to represent the world in a manner which facilitates action, rather than explains it (Nelson, 1996). This understanding does not have to be made explicit. Individuals can demonstrate their understandings about the mind through everyday actions and language in unconscious ways which recipients are often unaware of. For example, individuals who have been deceived by others are generally aware of the deception, making comments such as "I was tricked". However, during subtle theory of mind interactions recipients are generally not aware that their mentality has been considered because these interactions aim to create positive feelings in all participants. These positive feelings share the focus of the interaction between all of the participants rather than focusing only on the recipient.

Similar sociocultural notions to those used for a subtle theory of mind influenced the replacement of "mediating" with "shared theory of mind". While the term mediating is often used in the sociocultural literature (e.g. Nelson, 1996; Wertsch, 1993), using only this term can lead to an overlooking of the mentalistic nature of this action. By adopting the term "shared theory of mind" on the new model, the mentalistic collaborative nature of interactions is emphasised. Actions
collated in this area of the model most often illustrated shared activity such as co-construction where a degree of shared meaning has to be achieved for the activity to proceed. For meaning to be shared during collaborative interactions children need to share knowledge about action and mentality in a manner which is understood by all. Shared theory of mind interactions are more subtle than those identified as directing because they involve a reciprocal relationship between participants. Shared theory of mind interactions are different to subtle and overt theory of mind interactions. Overt interactions involve individuals controlling others while shared actions illustrate individuals working together and considering the mind of each participant to ensure meaning is maintained. While shared interactions can be guiding in nature, as described for subtle theory of mind interactions, shared interactions involve shared mentality between more than one individual.

As in the *Continuum of Teaching Behaviours*, the Theory of Mind Interactions Model uses the term “directing” to refer to overt understandings of mind. Interactions gathered in this area of the model generally involved one child using verbal and non-verbal means to direct another. The understandings demonstrated at this end of the model are more overt than those to the left of the model. This does not suggest that the understanding children have at this end of the model is more explicit than that to the left. Rather, it indicates that children do not use the same subtle means to demonstrate their understanding when acting at this end of the model as when acting at the opposite end. Often recipients of overt theory of mind activity are aware their mentality has been considered and will react in ways which acknowledge this awareness. For example, an individual may say
"You tricker!" or "I forgot." Each of the key terms presented in the model is summarised in Table 5.6.

Table 5.6

**Key Terms used in the Theory of Mind Interactions Model**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subtle theory of mind</td>
<td>Children demonstrate understandings of mind which are nondirective and subtle. Generally includes interactions of an acknowledging nature.</td>
</tr>
<tr>
<td>Shared theory of mind by</td>
<td>Children demonstrate their understanding of mind engaging in share meaning. Interactions are most often of a co-constructive nature.</td>
</tr>
<tr>
<td>Overt theory of mind</td>
<td>Children demonstrate understandings of mind which are directive. Demonstration and direction are the most frequently used interactions.</td>
</tr>
</tbody>
</table>

The data presented in this section suggests that there are specific types of interactions which characterise different aspects of an understanding of mind. Children appear to be using specific types of behaviour which differ according to the nature of the interaction. For example, more subtle forms of understanding require less directive actions than overt understandings. Rather than just identifying specific behaviours through the principles of grounded theory, the current study has also attempted to identify the nature of interactions characterising each theme. The Theory of Mind Interactions Model provides a graphic presentation of the diverse ways children can use their understandings of mind.
The model does not indicate that children's understanding of mind is linear in nature. Rather, the linear nature of the model indicates that an understanding of mind can range from being subtle to overt, and different understandings tend to be characterised by specific types of interaction. For example, positive perspective taking is characterised by more subtle interactions. Children can use any of these understandings of mind in any combination. For instance, a child could demonstrate an overt and subtle understanding of mind by firstly deceiving a peer then sharing humour about the consequences of the deception.

The Theory of Mind Interactions Model is not intended to indicate a developmental progression. Rather it is a model for identifying the relationship between types of interactions and understandings of mind. The model is a useful tool for observing, analysing and evaluating children's understandings of mind in everyday contexts. For example, if a child is not engaging in positive perspective taking, the child could be encouraged to use acknowledging interactions because these are more likely to be associated with acts of positive perspective taking. Similarly, if a child is reluctant to talk about the mind, more overt interactions may facilitate such talk. The model can also be used to create situations which may encourage specific social skills. For example, if a child is reluctant to talk and use directive actions, a situation could be create where the child is encouraged to demonstrate actions for others given demonstrative interactions were more common with overt understandings of the mind. In the converse situation, children who use their understandings overtly and have difficulty being subtle could be encouraged to engage in acknowledging and modeling. While this model does need to be interpreted with caution because it is based on data from a single sample, it does provide a structure for interpreting understandings of mind in
relation to specific types of interactions. Moreover, it takes account of a child’s role in demonstrating an understanding because it has been developed based on children’s everyday interactions.

Relating the Theory of Mind Interactions Model to the Interview Phase

Many of the actions identified on the Theory of Mind Interactions Model are similar to those presented in the narrative based tasks for the interview phase of this study. For example, in the story *Magic Carpet*, the Bananas in Pyjamas aimed to trick Morgan by making him believe he is really flying. While this was an act of deception, which according to the continuum is a directive action, the Bananas clearly stated that they felt sorry for Morgan and wanted to make him feel better, an action which could be considered as positive perspective taking. A range of other actions such as those identified under the headings of sharing humour, and talk about self, other and mind, are also evident in the same story. Similar relationships can also be identified in the stories used for the other narrative based tasks. Thus, it could be suggested that the actions presented in the narrative based tasks have a resemblance to those in which children engaged in spontaneously. This similarity presented children with identifiable actions and procedures they understood. Therefore, the Theory of Mind Interactions Model adds support for the inclusion of narrative based tasks in the current study by illustrating behaviours which were evident in these tasks.

A number of similarities can be identified between the Narrative and Sociocultural Contexts Interaction Model presented in Chapter 2 and the Theory of Mind Interactions Model presented in this chapter. Firstly, both models highlight the importance of sociocultural contexts in investigations of narrative. In the
Narrative and Sociocultural Contexts Interaction Model the sociocultural context is represented by the y axis. The upper end of this axis represents the child participating in an investigative task, while the lower end represents the researcher. To share meaning during an investigative task events need to refer to the child's and the researcher's sociocultural experiences. By not making these references there is no acknowledgment that understandings about the physical world are embedded in understandings about the sociocultural world, and that each of these understandings guides the other (Nelson, 1996). The Theory of Mind Interactions Model has also developed from this belief that sociocultural contexts are important. The model evolved from everyday interactions which were selected and controlled by the participants. This control enabled children to refer to both their physical and mental worlds as needed. It is suggested that the interactions and sociocultural contexts identified in Theory of Mind Interactions Model are those which were important to the participants because they were selected them. This control over the interactions enabled participants to refer to mentality and action in amounts which were needed by them to share meaning.

Another similarity between the Narrative and Sociocultural Contexts Interaction Model and the Theory of Mind Interactions Model is the focus on explicit and implicit understandings. The Narrative and Sociocultural Contexts Interaction Model presents both landscapes of narrative on the x axis. These landscapes move from explicit action on the right of the axis to implicit consciousness on the left. On the Theory of Mind Interactions Model implicit understandings are presented to the left of the model and explicit understandings to the right. For example, more subtle uses of mentality are evident in the interactions.
to the left of the model, while more explicit and directive interactions are illustrated in the evidence presented to the right of the model.

It is suggested that many traditional false belief tasks have focused more on the explicit understandings illustrated to the right of the Theory of Mind Interactions Model than on the subtle usage presented to the left. For example, in the Maxi task used by Wimmer and Perner (1983) children were required to focus on the thoughts of the character Maxi. The events which influenced these thoughts were presented explicitly for children and involved directive actions. On the Theory of Mind Interactions Model such interactions would also be presented to the right. Hence, the Maxi task is presented to the right of the Narrative and Sociocultural Contexts Interaction Model. This position reflects the stronger emphasis on the landscape of action rather than consciousness. In contrast, the observational based study of Shatz et al. (1983) focused on children participating in everyday interactions which they selected and controlled. The control children had in this investigation provided opportunities for a range of understandings of mind to be identified as presented on the Theory of Mind Interactions Model. To make meaning during these interactions children needed to use both landscapes of narrative and consequently, the Shatz et al. study was placed centrally on the Narrative and Sociocultural Contexts Interaction Model.

Summary

In summary, the themes which resulted from using principles of grounded theory were characterised by a range of different interactions. However, specific types of interactions were more characteristic of some themes than others. The themes were sequenced on a model which ranged from non-directive to directive
actions, indicating the most common type of interaction in each theme. Because the actions identified in the themes had similarities to the actions presented in the stories used during the interview phase, it is suggested that these stories presented actions in which children also engaged.

The previous two sections have focused primarily on the children’s actions. The final section of this chapter focuses on the mental state language children used in everyday interactions.

FUNCTIONAL MEANING IN CONVERSATION SCALE

The Functional Meaning in Conversation Scale (Shatz et al., 1983) (see Appendix F) has been used or modified in numerous studies to identify functional mental term usage (e.g. Dockett, 1994; Furrow et al., 1992; Szarkowicz, 1995). In the current study it was used to investigate children’s use of mental state language during everyday interactions as part of a triangulated approach to data collection and analysis. The results from this analysis are not intended to be interpreted in isolation from the other phases of the current research. Rather, it is intended that all the results be interpreted together to provide a comprehensive picture of children’s understanding of mind. While the interview phase of this study involved empirical contexts for investigation, the case study phase has involved data being gathered during everyday interactions. While the data analysed using principles of grounded theory and the Continuum of Teaching Behaviours focused on both children’s actions and language, the results from the Shatz et al. scale focused only on language. This focus was adopted because the results were intended to heighten the external validity of the interview phase. Because mental state terms were presented in the questions at each interview it was necessary to identify whether or
not children used such terms in their everyday interactions. If children naturally used mental state terms in a functional manner, it could be argued that they understood the meaning of these terms, and would, therefore, understand such references to mentality during the interview phases of this study.

Using the *Functional Meaning in Conversation Scale* (Shatz et al., 1983) a total of 1946 utterances were identified in the case study data. These utterances were gathered from the 24 participants generally over two or three days for each participant. A minimum of 30 minutes of observations was gathered for each participant. Shatz et al. outline seven categories for coding utterances using their scale and three forms of additional coding-initiation, form coding and contrastives. In the current study, the seven categories and one additional form of coding were used. This additional coding was the use of contrastives. The decision to use only these categories was based on the type of analysis which was required. Because the results from this analysis were used to support the use of mental state terms in the interview phase, only categories which referred to mental terms were utilised. The categories of initiation and form coding did not focus directly on mental state terms and for this reason were not used. Of the 1946 utterances identified in the data, 86 (4.4%) mental state terms were coded. The distribution and frequency of these terms are presented in Table 5.7.

Particular attention needs to be made of the categories "mental state terms" and "contrastives" because the utterances collated under these titles make direct references to mentality. Evidence gathered under the category of *mental state terms* illustrates children using terms which, with consideration of context, "refer to the thoughts, memories or knowledge of the speaker, listener, or a third person" (Shatz et al., 1983, p. 307). Because mental states are not directly observable,
language which refers to mentality can assist in interpreting understandings of the mind. Evidence gathered for this category is very similar to that collated under the theme of talk about self, other and mind. If the same examples were gathered under the mental states category and the theme talk about self, other and mind, it could be suggested that validity of each was heightened.

Table 5.7

Type and frequency of mental state terms

<table>
<thead>
<tr>
<th>Coded term</th>
<th>Frequency</th>
<th>Number of children using word</th>
</tr>
</thead>
<tbody>
<tr>
<td>know</td>
<td>32</td>
<td>17</td>
</tr>
<tr>
<td>think</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>pretend/pretending</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>forgot/forget</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>tricky</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>remember</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>really</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>might</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>real</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>guess</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>mean</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>wonder</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>sure</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>worry</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>surprise</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>actually</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>mind</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>lucky</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>clever</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>idea</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>86</td>
<td></td>
</tr>
</tbody>
</table>

Utterances coded as contrastives also provided evidence of an understanding of mind by referring to an inconsistency between a mental state and
reality. These contrastives are like distinctions between appearance and reality which characterised the theme distinguish an appearance from a reality. Hence, the data gathered under this contrastives category is the verbal evidence of children distinguishing appearance from reality. As was the case for the theme of talk about self, other and mind with the category of mental state terms, similarities between the theme distinguishing appearance from reality and the category contrastives may also increase validity of both the theme and language data. Evidence for each category is presented in the next section.

Mental State Terms

Of the 86 utterances coded as mental state terms according to the categories outlined by Shatz et al. (1983), 51 made a direct reference to mental states. 35 included a mental state term but did not make a direct reference to mental states. When coding utterances according to this category it was necessary to consider the context in which the terms were used. For a term to be coded as a reference to mental states, it needed to make a direct reference to mentality rather than using a term without a reference to mind. For example, "you know" is often used colloquially to indicate the end of a turn or initiate an interaction. Similarly, "I don't know" can be used without making references to mental states. Uses of "I don't know" which did not refer to mental states were coded under a category which was specifically for references of this nature. When "I don't know" was used to refer to the state of not having the appropriate knowledge it was coded as a reference to a mental state. When it was not used in this manner it was not coded as a reference to mentality.
In the current study, *know* was the most frequently used mental state term (32 utterances). The next most frequently used mental state terms were *think* and *pretend/pretending* with ten references each. The identification of these terms as the most frequently used is consistent with other studies (Shatz et al., 1983; Szarkowicz, 1995). Each of the following examples illustrates children using the term *know* as a reference to a knowledge state. A number of these examples also include the terms *think* or *thought*. Evidence of children using these terms was also reported for the theme talk about self, other and mind in section one of this chapter.

The 32 uses of *know* were made by 17 different children. Thus, over two thirds of children observed for the case study phase used the word *know* as a reference to a mental state. Often the same children used *know* more than once in different interactions. Both the terms *know* and *think* were presented to children during questioning in the interview phase of this study. Based on the evidence in this chapter it could be assumed that many children did understand these terms and were not confused by their meaning during the interviews. In the following excerpts, terms which make a direct reference to mental states are presented in bold italics.

**Context:** Playdough table; Shaun 47 months, Keith 44 months

Both boys are sitting next to each other at a table, constructing with dough. Shaun is cutting dough with a star shaped cutter.

*Shaun*

"Look at the space ship I made."

Shaun holds up a star shaped piece of playdough. Keith looks at it then looks back at his work. Shaun looks on the table and runs his hand over the cutting shapes which are lying on the table. He points to the star shape cutter.

"Do you know if there's another one? I thought there was one."

Keith shakes his head.

**Context:** Hospital corner; Karen 53 months, Tim 54 months, Keith 44 months

Karen is a nurse, Tim a doctor and Keith a patient. Karen is attending to Keith who is pretending to be asleep in the bed.
Karen  "Tim did you know nurses take care of babies?"
Karen does not look at Tim.
Tim  "Yes."

Context: Clay table; Amber 63 months, Shona 59 months
Both girls are working on their own constructions. Amber looks behind her and sees the teacher cleaning a table. They make eye contact and Amber points at her construction.
Amber  "Look, I'm making a bird's nest with eggs."
Teacher  "Great. Have you made a bird?"
Amber  "Next."
Amber continues to work on her bird's nest.
Shona  "Do I know how to make a bird's nest?"
Shona is looking at Amber who looks up and nods her head.

Context: Outdoor climbing equipment; Samuel 55 months
Samuel is pretending to be a shopkeeper. A number of children have come up to him and pretended to buy food.
Samuel  "Would you like something at the shop?"
Researcher  "Not now."
Samuel looks at the researcher and then in the direction she is looking.
Samuel  "How do you know all these children's names? I think Sarah (teacher) told you."
Researcher  "Do you."
Samuel  "Yeah. I think."
Samuel smiles at the researcher.

Context: Block corner; Hans 52 months, Samuel 55 months, Anthony 55 months
Hans and Samuel have been co-constructing with blocks. Anthony enters the block area and stands nearby watching Hans and Samuel.
Hans  (To Anthony) "Out out!"
(To Samuel) "He can't come near our house. He doesn't know how to build it."
Hans glares at Anthony until Anthony walks away. Samuel looks at Anthony then at Hans. Samuel then continues to build.

While not all children used mental state terms during their interactions, this absence cannot be interpreted as a lack of understanding. In examples presented in this section and under the theme of talk about self, other and mind there is evidence that other children surrounding the child who used mental state terms understood what the term meant. For instance, in the interaction between Tim and Karen, Tim
responded appropriately to Karen’s question about his knowledge. Similar reactions can be identified in the examples of mental state term usage presented under the talk about self, other and mind theme. If the term had not been understood it would be expected that children would act inappropriately and possibly draw comment from the child who used the mental state term.

Modulation of Assertion

The second category used for coding utterances related to the nature of assertions. Utterances coded under this category illustrate “the degree of certainty with which a speaker makes an assertion” (Shatz et al., 1983, p. 308). For example, statements could be strengthened by the use of the word know or weakened by the word might as in the following extract, when Helen expresses a degree of uncertainty by using the words think and might.

Context: Building with clever sticks; Helen 63 months, Charles 59 months
Charles is trying to stick two pieces together but appears to be finding it difficult as the pieces keep slipping apart. Helen is watching him.
Helen "I think you might be having a bit of trouble."

A total of eight utterances were coded under this category and included words such as might, guess and actually. The use of such terms was common in statements and questions as in the following examples.

Context: Playing with clay; Shona 59 months, Amber 63 months
Both girls are constructing at the table, working on separate tasks. Shona holds some small balls of clay in the palm of her hand for Amber to see.
Shona "Are you sure snails lay eggs?"
Context: Painting; Helen 63 months, Frances 53 months
Frances has walked over to the painting area and asked if any children need help. Helen has accepted Frances’ offer of help but then appears to change her decision. Helen looks at Frances.

Helen
"I actually don't need any help."

Context: Home corner; Shelley 57 months
Shelley is looking in the cupboard at dresses. She lifts two out of the cupboard and looks at each. She places one back in the cupboard but still holds one dress.

Shelley
"I might wear this."

Context: Shop area; Chris 62 months
Chris is in the shop area and is looking over some of the items for sale. He picks up a tie and takes it the shopkeeper.

Chris
"I think I'll buy this today. How much is the tie?"

A number of the terms children used to modulate their statements were included in the stories for the interview phase of this study. For example, in the book version of King Rat the Rat used might in the following statement:
"...someone might think I was King Rat" (Hopkinson, 1995, p. 3). The inclusion of such terms in children's everyday interactions and the narrative based tasks reduced the chance that children would encounter unfamiliar language during the interviews which could confound their attempts at demonstrating understanding.

Directing the Interaction

Within the data used to create the Theory of Mind Interactions Model, numerous directing actions were observed when children were demonstrating their understanding of mind. However, only two utterances were identified which used mental terms to "focus the conversation" or assist the interaction (Shatz et al., 1983, pp. 308). Shatz et al. suggest there are three different ways mental state terms can be used to direct an interaction. Firstly, terms can be used to gain attention such as in the first example where Shona attempts to gain Amber's attention with the
question "Guess what?". Secondly, such terms can be used to access information such as guess in the second example. Finally, Shatz et al. suggest that mental terms can be used to direct interactions by introducing an activity such as "I think I'll play with the clay now." No examples of this third nature were identified in the data. The two examples of children directing the interaction are presented below.

Context: Playing with clay; Amber 63 months, Shona 59 months
Shona is rolling the clay between her hands. She looks towards Amber who is looking at her clay.

Shona "Guess what?"
Amber "Shona..."

Context: Puzzle corner; Charles 59 months, Max 57 months
Both boys are sharing the same puzzle. Charles has been assisting Max by pointing to the locations for each piece.

Max "Where's it go?"
Max is holding a puzzle piece so Charles can see it.

Charles "Yep there. Take that out or otherwise...nah it doesn't go there. Oh no. Oh no. Oh no guess what goes there?"
Charles takes a piece off the puzzle and places it in a different position.

Clarification
Utterances collected under the category of clarification illustrated attempts to clarify statements made by self or others. Shatz et al. (1983) also group repairs in this category. For example, "This is a red, I mean pink car." No repairs were identified in the data but a total of five clarifications were grouped in this category. Examples of such utterances follow.

Context: Clay table; Amber 63 months, Shona 59 months
Both girls are talking about how clay is made.

Amber "No they make dirt to clay."
Shona "That means...that means..."
Amber "That means it's really dirt."

Context: Water tub; Charles 59 months, Gemma 56 months
Both children have plastic tubing which they are filling with water and then pouring the water into the tub. Charles looks at Gemma and says, "You're not really marrying me are you?"

In both these examples the children used mental state terms to clarify their thoughts about a situation. In the first instance, Shona clarified her thoughts about what clay was made from, while Charles tried to determine if Gemma wanted to marry him or not. Through the use of *really* Charles also made a distinction between the belief that they were getting married and the reality that they were not.

**Expression of Desire**

The mental terms *hope* and *wish* can often be references to desires rather than belief states, and thus, were coded under a separate category. In the current study no references included the terms *hope* or *wish*.

**Action-Memory**

References to memory or knowledge about the presence or absence of an object were coded under the category of action-memory. Shatz et al. (1983) suggest such uses are not references to mental states or examples of directing the interaction. More commonly, utterances of this nature are used as prompts for the listener. Previously utterances under this category and that of expression of desire were coded as references to mental states (Gelman & Shatz, 1977). However, the Shatz et al. scale is a more conservative measure of mental state references and is very specific about what is considered a reference to mentality. Only the following two utterances were coded as examples of action-memory in the current study.
Context: Painting; Shona 59 months
Shona is sitting on the floor and painting by herself. The teacher comes over to her and looks at her painting.

Teacher
"Wow Shona would you like to put a few on the end?"
The teacher points to the base of the paper which has not been painted.

Shona
"Oh I forgot about that."
Shona hits her forehead and starts to paint on the base of the paper.

Context: Completing a puzzle; Anne 57 months, Ruth 60 months
Anne selects a puzzle and shows it to Ruth.

Anne
"Remember these."
Ruth nods and Anne then turns the puzzle over so the pieces fall out.

I Don’t Know

Shatz et al. (1983) regard the use of I don’t know as conversational rather than functional. In the current study three uses of this phrase were identified. None of these were coded as references to mental states. All other uses of the term know were coded as functional.

Contrastives

When children use a contrastive they make an explicit distinction between what an item may appear to be and what the reality is, demonstrating their understanding of the distinction between an appearance and a reality. Many of the examples coded in this category were also identified under the theme of distinguishing an appearance from reality. In the current analysis a total of seven utterances were identified as contrastives. These included:

Context: Puzzle corner; Toby 53 months, James 60 months, Ruth 60 months
Toby and James come into the puzzle corner and Toby is pretending to be a dog by barking and using his arms as legs.

Ruth
"That’s not a dog or a sheep. That’s a person."

Toby
"We’re just pretending."
Context: Craft corner; Shona 59 months, Amber 63 months, Ruth 60 months
All the girls are working on separate projects but are talking to each other and sitting in a circle.

Shona  "There we go a little rubbish bin."
Shona holds up her creation for the others to see.

Amber  "I don’t think I can make a ring."
Shona does not look at Amber.

Shona  "It’s not a real rubbish bin."
Amber looks at Shona’s creation.

Amber  "She’s pretending. That’s the best she could do."

Several utterances in the following example (from the theme of distinguishing an appearance from reality) were coded. Firstly, the use of mean enabled it to be coded as clarification. Secondly, the term guess was used to gain attention and was coded as directing the interaction. Finally, really was coded as a mental state term because Shona used it to emphasise the distinction between what she believed about clay and clay really was.

Context: Clay table; Shona 59 months, Amber 63 months
Shona is rolling clay between her hands.

Shona  "Guess what?"
Amber  "Shona?"

Shona has cut a piece of clay with fishing line.

Shona  "I did it. I cut it. I wonder how clay tastes."
Amber  "Yuk. It’s dirt."
Shona  "No, it’s clay."
Amber  "No they make dirt to clay."
Shona looks at Amber.

Shona  "That means...that means."
Amber  "That means it’s really dirt."

The identification of contrastives in the data can increase the validity of the evidence gathered under the theme of distinguishing an appearance from reality.

The Functional Meaning in Conversation Scale (Shatz et al., 1983) is an established measure in theory of mind research and presents investigators with concise directions for use. There is less opportunity for subjectivity to confound results. However, when using the principles of grounded theory to generate themes
from the data, the researcher was required to engage in many subjective decisions. While these decisions were directed by the literature and confirmed by a second rater, there were still concerns about the subjective nature of decisions. By identifying similar data in the mental state terms and contrastive categories through the themes of talk about self, other and mind, and distinguishing an appearance from reality, internal validity was heightened. While this process does not eliminate the subjectivity involved in the grounded theory analysis, it does provide standardised results for comparison.

Summary of Results from the Functional Meaning in Conversation Scale

Through the use of the Functional Meaning in Conversation Scale (Shatz et al., 1983) the case study children were reported using a variety of mental state terms in their everyday interactions. Of the terms identified in the data, know and think were the most frequently used references to mental states, with the term know being used by over two thirds of children in the sample. The terms know and think were also the most frequently presented mental state terms in the interview phase of the current study. On the basis that many children used these terms during their everyday interactions, it could be assumed that most children understood these as references to mental states during the interviews. Hence, these terms were not unfamiliar to children and are unlikely to have confounded their performance during the interview tasks.

CONCLUSION

The primary aim of the case study phase was to investigate aspects of an understanding of mind within naturalistic contexts. The results from this phase
were intended to complement those gathered during the interview phase, rather than to be interpreted as an isolated study. Because the data presented in this chapter were gathered during children's everyday interactions, it provided evidence complementary to the interview data by addressing three objectives. Firstly, using principles of grounded theory, characteristics of an understanding of mind within naturalistic contexts were identified. Six themes evidencing understandings of the mind were identified in this stage of the analysis. Secondly, the types of interactions children engaged in when demonstrating their understanding of mind were investigated. Specific actions were identified in some themes more than others and the relationship between these understandings and specific types of interactions were presented graphically through the Theory of Mind Interactions Model. The final analysis focused on the mental state language children used in their everyday interactions. Children used a variety of mental state terms during their everyday interactions, with some of these terms being the same as those used during the interview phase.

Relationships were identified between a number of the results. There were similarities between evidence gathered for some themes and mental state language, and between these and the mental state terms used in the interview phase. For example, the mental state term know was identified in the theme talk about self, other and mind, and was reported as the term children used most frequently to refer to mental states during naturalistic interactions. Think was also a frequently used mental state term during everyday interactions and the interview phase. Similarly, acts of deception which were evident in the Bananas in Pyjamas stories were also evident in these data, with numerous children trying to deceive others during their everyday interactions. Therefore, the understandings of mind which have been
reported in Chapters 4 and 5 do not appear to be an artefact of the adopted methodology, or isolated to only the interview or case study contexts. Rather, it can be argued that the behaviours identified in the case study phase are similar to those elicited in the interviews, and that the case study findings provide evidence to heighten the external validity of the interview phase.
CHAPTER 6
DISCUSSION

This chapter discusses results for the current study in light of related research. The limitations of this study and future directions are discussed.

SUMMARY OF FINDINGS

The current study used two different methods of data collection: Interview and case study. The interview phase aimed to identify some characteristics of narrative which could influence children's ability to demonstrate an understanding of false belief. A series of models were built with logistic regression analyses using data from the interviews. The case study phase of this study aimed to identify characteristics of an understanding of mind during everyday interactions. These case study results were used to illustrate the validity of the behaviours identified in the interviews.

Interview Phase

A total of five interviews were completed in the current study. Four of these interviews were designed to answer specific research questions, while Interview 2 was used to gather data for use as a control of receptive verbal ability in the analyses. Data were analysed through correlation and logistic regression analyses. These analyses aimed to identify characteristics of the narrative used in non-traditional false belief tasks which influenced children's ability to demonstrate an understanding of mind. Age was not the most important variable studied in the interview phase. The focus in each interview task was the nature of contexts where children could demonstrate their understanding of false belief. The interview tasks
presented to children aimed to replicate situations where they would be required to use their understanding of mind in everyday contexts. Through this focus this thesis aimed to assist educators of preschool aged children by identifying ways children could be assisted to demonstrate an understanding of mind during narrative based activities.

Interview 1

Research question: Can children demonstrate an understanding of false belief when presented with non-traditional false belief tasks?

In Interview 1 children were either read the story or watched the video of *Magic Carpet*. Significantly more children demonstrated an understanding of mind in the context of the video than the book. This result was irrespective of age and controlling for verbal ability. When this result was compared with that from the traditional task, also completed during Interview 1, more children were able to demonstrate their understanding on the non-traditional task than the traditional task. Therefore, children could demonstrate their understanding of mind during the non-traditional false belief task, with more children able to do so in the context of the video than the book.

Interview 3

Research question: Can more children exhibit an understanding of false belief if they actively participate in the narrative of tasks?

Children either actively participated in the sharing of the book *Monster Bananas* or were read the story without participation. Active participation involved children using finger puppets and making vocalisations when prompted. Significantly more children demonstrated an understanding of false belief during the active participation treatment than in the control group. These results were
irrespective of age and controlling for verbal ability. Therefore, more children could exhibit an understanding of false belief when they actively participated in the narrative of the task.

Interview 4

Research question: Are more children able to demonstrate an understanding of false belief if they are presented with more detailed episodes of a false belief narrative?

Interview 4 aimed to identify whether or not more children could demonstrate their understanding of mind when presented with the detailed narrative of the video-in-book condition than when read the original story. Children were either read the original version of the book King Rat or a version where the oral text was placed with the verbal narrative from the video King Rat. The second version was referred to as the video-in-book. Significantly more children in the video-in-book group demonstrated an understanding of mind than in the original book group. This result was irrespective of age and controlling for verbal ability. Therefore, more children were able to demonstrate their understanding of false belief when presented with more detailed episodes of a false belief narrative.

Interview 5

Research question: Can children demonstrate an understanding of false belief in a literature based task with no trickery?

Children were read the book Harry the Dirty Dog in Interview 5. The results from this interview were compared with the traditional results collected during Interview 1 and Interview 2. More children demonstrated an understanding in a literature based task, where the false belief was not a consequence of trickery,
than on two traditional tasks. Verbal ability was a significant predictor of performance on the *Harry the Dirty Dog* task.

**Interpreting the Results from the Interview Phase**

It is acknowledged that the traditional false belief tasks used in this study were not those most often cited in discussions about a representational understanding of mind. For example, the work of Flavell et al., (1987) influenced the design of the traditional tasks rather than the work of Wimmer and Perner (1983) or Gopnik and Astington (1988). This choice was made because the current study aimed to provide children with traditional tasks which explored similar understandings to those presented in the narrative based tasks. Furthermore, the current study did not investigate whether or not children were demonstrating a representational understanding of mind. Rather, it explored how children demonstrated a theory of mind in a variety of contexts not traditionally used in studies of false belief. More children were able to demonstrate their understanding of false belief in each of the experimental conditions tested during the interview phase. These findings were irrespective of age and controlling for verbal ability. The evidence reported for the interview phase suggests that even some 5-year-olds can respond incorrectly on a false belief task. While it is believed that children of this age have a representational theory of mind and that younger children do not have such an understanding (e.g., Perner, 1991), the current study indicates that most children between three and five years of age can demonstrate their theory of mind in some contexts but not others. Some 5-year-olds were able to demonstrate their understanding during some of the literature based tasks, but not all children were able to do so in every context. Similarly, some 3-year-olds were able to
demonstrate their understanding during some of the literature based tasks, but not all.

An important characteristic of the interview phase was that the materials used were commercially available and the characters presented were known to all the participants. While these materials were adapted for the treatment conditions, the non-treatment groups experienced the materials in their commercially available form. Hence, it could be suggested that these tasks investigated children's understanding of mind within their sociocultural context by using materials children naturally engaged.

Case Study Phase

Research question: What characteristics of an understanding of mind do children demonstrate during their everyday interactions?

Observation was the primary method for data collection in the case study phase. Twenty four children were observed, and this data was used to form individual case studies. The aim of the case study phase was to identify characteristics of an understanding of mind within naturalistic contexts. The data gathered were analysed in three different ways. Initially the data was analysed using principles of grounded theory. Using this analysis, six themes were identified in the data: Positive perspective taking; sharing humour; mediating action; distinguishing appearance from reality; talk about self, other and mind; acts of deception. Each theme contained evidence of children demonstrating different behaviours related to an understanding of mind during their everyday interactions.
In the second analysis the *Continuum of Teaching Behaviours* (Bredekamp & Rosegrant, 1995) was used to identify the types of interactions which were common in each theme. A relationship was identified between some behaviours and themes. This relationship was presented diagrammatically through the Theory of Mind Interactions Model. Evidence indicated that non-directive behaviours were most commonly demonstrated in the themes of positive perspective taking and sharing humour. Guiding actions were identified most in the themes of mediating action and distinguishing appearance from reality, while directing actions were most common in the themes: Talk about self, other and mind, and acts of deception.

The case study data were also analysed to identify the type and frequency of mental state terms used by children during their everyday interactions. Evidence indicated that children used *know* and *think* most often.

Interpreting the Results from both Phases

Rather than focusing on the age at which children could demonstrate their understanding, the current study was more concerned with identifying some contexts where children could evidence their understanding. The results from the interview phase indicated that, irrespective of age, children could demonstrate an understanding of mind in some contexts but not others. Many children did fail one or more of the interview tasks. However, this did not indicate that children lacked an understanding of mind. A theory of mind is characterised by numerous behaviours and not all of these could be addressed in the interview phase of the current study. Many of these behaviours could only be explored within the social
contexts children encountered everyday. It is argued that some traditional paradigms have underestimated children's understanding of mind by ignoring the social contexts of children. Because of this, and in keeping with sociocultural philosophy, a case study phase was included in the current research. The evidence from the case study phase indicates that an understanding of mind is characterised by a number of behaviours which are not often addressed in the traditional false belief paradigm.

Similar understandings of mind were demonstrated by children during their everyday interactions as were presented in the non-traditional false belief tasks. For example, numerous children engaged in deceptive behaviours, shared humour and extended positive sentiments to others. In the Bananas in Pyjamas stories the main characters also engaged in these behaviours. Given that children were able to engage in these actions without prompting, it is proposed that children did understand the mentality involved in such behaviour, and that their ability to demonstrate an understanding of mind was not an artifact of the experimental context. Moreover, children were identified during their naturalistic activities using many of the mental state terms presented during the interview phase. In particular, the terms know and think were the most frequently used terms during children's everyday interactions and the interview phase. More than half of the participants used know as a mental state reference during their everyday interactions. Based on the meaning which was shared between participants through this usage it can be assumed these children understood the meaning of this term. For example, no children questioned the usage of mental state terms or misinterpreted the terms.
The tasks presented during the interview phase of this study were presented on the Narrative and Sociocultural Contexts Interaction Model. This model illustrated the interaction between the landscapes of narrative and the sociocultural contexts of participants during a task. The types of theory of mind understandings children demonstrated during their everyday interactions were illustrated through the Theory of Mind Interactions Model presented in Chapter 5. Both of these models have similarities. Each model illustrates the importance of the sociocultural context in situations where children are attempting to use their understandings of mind. More importantly, these models illustrate that these understandings can be implicit or explicit in nature. The Narrative and Sociocultural Contexts Interaction Model depicts the landscapes of narrative moving from being explicit action based on the right hand side to implicitly conscious based on the left hand side. Based on the results from the Theory of Mind Interactions Model it appears that many children are able to engage in the full range of understandings about the mind. That is, these children are able to use explicit and implicit understandings during their everyday interactions. However, when many interview based false belief tasks are placed on the Narrative and Sociocultural Contexts Interaction Model they tend to be positioned on the right hand side. This positioning reflects their tendency to focus more on the explicit action based understandings rather than the implicit unconscious understandings about the mind. This difference suggests that there are understandings about the mind which children are able to engage in during their everyday interactions but which are not being explored in interview based investigations. This proposal and how it relates to the tasks present in the current study is discussed further in the
section Narrative and the Current Research Contexts. In the following section the results from both phases are discussed with related research.

GENERAL DISCUSSION

Theoretical Perspectives

Theory Theory

The results from this study are not consistent with evidence presented from a theory theory perspective (e.g., Gopnik & Meltzoff, 1997; Wellman, 1990) which suggests that a theory of mind develops through a process of theory construction and modification (e.g., Gopnik & Wellman, 1992). Rather than children demonstrating an "all-or-nothing" understanding, most children in the current study were able to demonstrate an understanding of false belief in some contexts but not others. Many children who were unable to successfully complete the traditional false belief tasks were able to evidence an understanding of false belief during one or more of the literature based tasks. If children were to evidence a theory theory form of development it would be expected that they would get all false belief tasks correct or all incorrect. Hence, the theory they held about the mind would be applicable in all situations irrespective of the contexts in which it was presented. The only situation where children would be not be expected to answer all questions correctly or incorrectly is when they were changing their theory. During theory change a child may get one task correct and a different task incorrect, evidencing an "all-or-nothing" understanding within tasks rather than between tasks. Most children in the current study were able to evidence their understanding under specific conditions and in particular contexts. Because many children in the sample were over four years of age, based on the previous research (e.g., Wellman, 1990;
Wimmer & Perner, 1983), it would be expected that they had already developed a theory about the mind. This theory should have enabled them to respond in the same manner to similar tasks. For example, underlying the Bananas in Pyjamas tasks was deception. It would be expected that children could use the same theory about deception for each of these tasks. Despite this, some children were correct on some of Bananas in Pyjamas tasks and incorrect on others. Thereby, they did not evidence their understanding across similar tasks.

It could be argued that the difference in results between the traditional and literature based tasks indicates that the tests were investigating different understandings. Indeed, the traditional tasks did focus on an understanding of mind in self while the literature based tasks focused on an understanding in others. However, evidence indicates that an understanding in self and other develops at the same time (Gopnik & Astington. 1988; Szarkowicz 1999; Wimmer & Hartl, 1991). Theory theorists suggest children "who are in the grip of a theory might ignore even very strong counterevidence to that theory (Astington & Gopnik, 1991, p. 18). Therefore, when confronted with the candle which looked like a cake, children may have found it hard to accept reality when they initially believed the candle was a cake. However, if their thinking was theory-like then these children could engage in a slow theory change if presented with evidence which was contrary to their current theory. Children did not appear to be changing their answers during the tasks, or even over the interview period, despite counter evidence being presented to them. For example, in the story Magic Carpet the character Morgan says he is flying but the narrator and Bananas in Pyjamas reinforce the reality that he is being tricked. Even with explicit evidence such as this, children who believed Morgan was flying continued to respond in a manner which suggested they believed he was
really flying. Therefore, the counter evidence did not appear to assist them in developing a new theory.

**Modularity**

While not testing modularity theory in the current study, these results are not consistent with many of the beliefs associated with the modularity perspective of development. The modularity perspective assumes that children develop a theory-like understanding about the mind, but that this understanding is innate rather than a result of experience (e.g., Leslie, 1994). It is assumed that children have a basic understanding of the mind which is not influenced by different experiences or culture (e.g., Fodor, 1992; Leslie, 1994). Leslie suggests that children develop a basic domain-specific theory of mind at around two years of age. In the current study, children were able to evidence their understanding in some contexts but not others. If children did have a basic understanding of mind it would be expected that age would be an important predictor of performance for all tasks because older children would have developed a more comprehensive understanding than younger children. This was not the case. Both younger and older children were correct and incorrect on different interview tasks.

**Simulation**

The results from this study are not provide support for the simulation perspective of development which suggests that children use their own experiences of mental states as a basis for imagining how they would feel in the position of another (Harris, 1991). In the current study, children were required to consider the mental states of others in each of the literature based tasks, and to reflect on their
own mental states in the traditional tasks. If children were to simulate their understanding of mind and apply this to others, it would be expected that they could demonstrate the same understanding in themselves. However, this was not the case. Significantly more children were able to demonstrate their understanding of others' mental states during the literature based tasks than their own on the traditional tasks. Moreover, the literature based tasks required children to simulate mental states in a variety of characters ranging from bears, to the Bananas in Pyjamas, to children. This diversity in characters does not appear to have limited children's attempts at attributing mental states to others. Nevertheless, it could be argued that the inclusion of a traditional task which required children to attribute mental states to others, such as the Maxi task (Wimmer & Perner, 1983), would have strengthened this study by offering a comparison between a traditional and non-traditional task requiring the attribution of mental states to others.

**Enculturation**

Nelson (1996) argues that children's understanding of mind is innate until approximately two years of age, and that after this, development is enculturated and becomes more explicit. Furthermore, Nelson links the proposed development of representational understanding at four years of age with linguistic competence. Therefore, the quality and quantity of children's social interactions, in which language is a key tool for sharing meaning, appears to be critical for the development of a theory of mind. The early experiences children gain with language as a tool for sharing understanding and for constructing meaning occur in social contexts. These experiences require children to consider the mental states of others if they are to generate meaning. It is this constant need to express and
extract meaning in social constructs which facilitates an understanding of mind. Given that evidence from both the current and previous studies (e.g., Jenkins & Astington, 1996) indicates that language is an important variable for understandings of the mind, elements of Nelson's (1996) proposal have merit. In particular, Nelson suggests that representational understanding develops in collaboration with others within social contexts. Hence, development occurs both individually within children, and socially between children and other community members. This thesis argues that an important medium for transmitting understandings individually and socially is narrative. It is proposed that narrative is used to tie history with current experiences, and is only given meaning when it is shared in the wider community (Bruner, 1990; Nelson, 1996). Individuals can use narrative to entwine their previous experiences involving an understanding of mind with their current experiences. In the current study it is proposed that the literature based tasks enabled narrative to serve this function. These tasks not only required children to reflect on their current experiences, but also demanded them to use their previous knowledge when constructing meaning. Therefore, it is argued that the results from the interview phase support an enculturation perspective of development (Astington, 1996). Development is viewed as being embedded in the sociocultural context where social interactions, through necessity, facilitate an understanding of mind.

The current results do not suggest that children developed a theoretical understanding of the mind which could be generalised to every situation they encountered. Rather, it seems children were able to evidence their understanding in some situations and not others. Similar results were reported by Clancy et al. (1998). The critical characteristic in these conditions and contexts appears to be
the nature and structure of the narrative. For example, more children were able to
demonstrate their understanding when they actively participated in the narrative
and when presented with a more detailed verbal narrative. Furthermore, in every
interview, more children were able to demonstrate their understanding during
stories which were not contrived for the purpose of investigation, rather than on
tasks specifically created for purpose of research. In support of Hala (1999),
narratives appeared to require more than a focus on false belief action for children
to demonstrate their understanding of mind. Removing the detail in a narrative to
focus only on the understanding for investigation does not acknowledge the
facilitative role of language in development, and does not reflect the experiences
which children encounter everyday which require a theory of mind. The ability for
children to demonstrate an understanding appears to require the consideration of
two factors: What experiences children bring to a research context; and how in
designing a context, these experiences are considered.

It is possible that the different results for different contexts are evidence of
children moving in and out of their zones of proximal development. The zone of
proximal development is the area of understanding that children can achieve with
support from materials or more knowledgeable individuals (Astington, 1996). It is
proposed that all learning occurs within this zone (Rogoff, 1990). Some children
may have been in this zone when they were attempting the false belief tasks used in
the current study and needed scaffolding to pass. When children were in the
experimental conditions they were scaffolded by the treatments. However, when
children were in the non-treatments or completing the traditional tasks they did not
receive scaffolding from the tasks and consequently, were not able to demonstrate
their understanding. Astington (1996) suggests that changes in understanding
cannot occur without scaffolding. Given this, the treatments which did scaffold children may have also facilitated further understandings of the mind for the participants.

It has been suggested that culture and cognition create each other within social interactions (Cole, 1985). While children in the current study were able to demonstrate their understanding during literature based tasks, children from non-literate communities may experience great difficulties with these tasks. A growing number of cross-cultural studies are indicating that there are universal aspects of an understanding of mind (Lee, Olson & Torrance, 1999; Vinden, 1999). However, it has been suggested that the language a community uses to talk about the mind may influence the nature of this understanding (Lee et al, 1999). Given this, the Bananas in Pyjamas materials may be specific to the Western community in which they were developed. Further investigations using these materials in different cultures would provide valuable insights into what characterises an understanding of mind and how it develops.

The Nature of Narrative in False Belief Tasks

In the current study the following characteristics of narrative were identified as being important for children during false belief tasks: Narrative style, active participation and narrative detail. The results from Interview 1 revealed that children could demonstrate an understanding of false belief during non-traditional tasks. An important characteristic of the materials used during Interview 1 was that they were presented in their original form. Both the book and video were commercially available, reflecting how an understanding of mind can be used in everyday situations, thereby contextualising the study. The results indicate that the
characteristics of the task were stronger predictors of performance than the personal characteristics which children brought to the research context. Rather than indicating that children either have an understanding of mind or do not have such an understanding, the evidence from Interview 1 suggests children may be able to demonstrate this understanding in some contexts but not others.

It has been reported that the structural properties which influence memory during the sharing of a book are the same as those for video (van den Broek, Lorch & Thurlow, 1996). Thus, the significant difference in how many children demonstrated their understanding during the book or video cannot be attributed to differences in the memory demands of each task. There appeared to be characteristics of the video which enabled more children to demonstrate their understanding in the video context than the book. It is argued that one of these characteristics is the nature of video presentations. Moses (1993) suggests that video is more "visually engaging" for children (p. 19), with the action in videos being complete and explicit (Mayes et al., 1994). There are also often cues in a video presentation such as music, vocal intonation and body language (Mayes et al., 1994; Szarkowicz, 1998) which may position the landscape of consciousness into a context where it becomes meaningful. For example, the Bananas in Pyjamas move away from Morgan when he tells them his carpet won't fly. The Bananas whisper to each other, each raises one hand to beside his head, points an index finger to gesture he has an idea and nods his head. In the book the first illustration for this episode shows the Bananas standing next to Morgan. The second illustration depicts the Bananas by themselves, each with a hand beside their heads, pointing an index finger. The notion that the Bananas had an idea is not as explicit in the book as the video because readers cannot see the movement which makes
meaning of the body language. It is argued that in this example from the book that the landscape of action remained disconnected from the landscape of consciousness. When these landscapes were disconnected, children found it difficult to make meaning and inferences about the characters’ minds.

Children may also have found it difficult to connect the landscapes of action and consciousness in the book of *Magic Carpet* because they were distracted by the illustrations (Zazanis, 1991). When Zazanis asked 3-year-olds to retell a verbal narrative, few had difficulty. But, when the narrative included illustrations, many of the same children were unable to retell. The illustrations in the book version of *Magic Carpet* were still photography from the video version. However, on their own, these illustrations did not provide any meaning about the landscape of consciousness. Children needed to listen to the verbal narrative for information about the landscape of consciousness. It is argued that children in the book group may have divided their attention between the illustrations and verbal narrative, thereby missing some information presented in the verbal narrative. In contrast, many cues about the landscape of consciousness were presented through the visual component of the video, such as body language, possibly enabling more children to connect the landscapes of narrative.

It is proposed that the video context presented children with more opportunities to entwine the landscape of action with the landscape of consciousness. One way to achieve this was to present information about characters’ mentality through the visuals of the video. Another possible way was to present more detail in the verbal narrative. This proposal was explored in Interview 4 which presented children with a more detailed narrative (the verbal narrative from the video referred to as the video-in-book). The video-in-book
narrative was characterised by a narrator who summarised the action and mentality at the end of each episode, thereby, entwining each of the landscapes of narrative in a cohesive manner. This approach contrasts that adopted in many traditional tasks where the language has been stripped to focus only on the false belief action. Because the design of traditional tasks often results in the removal of vital cues, children may find it difficult to identify these situations as false beliefs (Hala, 1999). It is argued that the video-in-book narrative presented the landscapes of narrative in a balanced manner because the initial aim of the narrative was to tell a story and entertain, rather than to focus only on false belief. Therefore, the results for Interview 4 further validate the theoretical framework of this study, namely an enculturation perspective which, through its recognition of sociocultural influences, argues for the presentation of a more contextualised research paradigm.

Unlike many investigations of mind where language has been used as an indicator of understanding (e.g., Bretherton & Beeghly, 1982; Shatz et al, 1983), in the current study language was viewed as a facilitator of development, mediating action within a social context (Nelson, 1995; Wertsch, 1985). It is argued that a knowledge of the mind comes from using language and that meaning is only developed when children use language during their every day interactions (Wittgenstein, 1967). Given language is perceived as a tool for developing understanding, then it is possible that the verbal narratives of the videos in Interview 1 and 4 acted as catalysts for children, mediating their understanding.

Lewis (1994) suggests that mentality in stories is often understated and not fully appreciated by children. Indeed, even 4-year-olds have emphasised more action than consciousness when retelling events from book and video contexts (van den Broek et al., 1996). If children do not receive sufficient information from the
landscape of consciousness they may have imputed their own knowledge to characters (Feldman et al., 1990). When most of the information presented to children has focused on the action in a story, children will base their interpretations of mentality on the action. The result is that children impute their own mental states to others based on the action they have observed. It is possible that the book narrative in Interview 1 and 4 did not present children with sufficient information, or opportunities to access the information, about the mentality of the situation. When the narratives for book and video versions were compared there was not a large difference in the amount of mental state language used in each version (see Table 3. 5). However, both video versions did present children with more words than their book counterparts. These extra words may have reinforced the central issues in each story. Evidence indicates that children need to have the central issues of a narrative highlighted so that irrelevant information does not confound their attempts to gain meaning (Clancy et al., 1998). The additional detail in the video versions presented in Interview 1 and 4 may have assisted children in focusing on the central concerns the narratives.

Interviews 1 and 4 focused on the verbal narratives and materials used in non-traditional false belief tasks. On the basis that children are more motivated to respond when actively participating in a false belief task (Sullivan & Winner, 1993), Interview 3 investigated the role of active participation in a non-traditional literature based task. The results indicated that active participation was an important predictor of performance. Like the results for the Bananas in Pyjamas tasks in Interview 1 and 4, age was not a significant variable in Interview 3. Even after controlling for verbal ability, active participation was the most important predictor of performance on the false belief questioning. Consistent with the
results from Interview 1 and 4, the results from Interview 3 were not consistent
with much of the theory of mind research which indicates that age is an important
predictor of performance (e.g., Wellman, 1990; Wimmer & Perner, 1983). It could
be suggested that children evidenced a behavioural rather than mentalistic
understanding of mind in the participation treatment. In Chandler et al. (1989) 3-
year-olds demonstrated an understanding of mind when they participated in the
deceptive action of the task. It was suggested that this understanding was
behavioural and not mentalistic (Sodian et al., 1991). However, when specific
controls were included in this task the original results were replicated, suggesting
children had evidenced more than a behavioural understanding of mind. In the
current study, more children were able to demonstrate their understanding of false
belief when they participated in the task for Interview 3. It is proposed that this
understanding was more than a behavioural example of a theory of mind because
children needed to consider the mental states of five characters in the story while
only having puppets for two characters. For the majority of the characters children
had to rely only on the story when making inferences.

In Interview 3 it is possible that the process of active participation
reinforced the deceptive behaviour involved in the story Monster Bananas. By
participating in the task children may have been able to physically experience the
mentality involved in the false belief behaviour. For example, an important action
for children in the participation group was the placing of pretend seaweed on the
Bananas in Pyjamas' puppets. This process enabled children to see the puppets
were always the Bananas in Pyjamas even when they wore their seaweed disguises.
It is argued that this process enabled children to physically reinforce the connection
between the landscapes of action and consciousness.
When considering the everyday activities of children, the act of dressing-up is significant both as a practical experience and as a play activity. All children in this study had engaged in some form of dressing-up because it was incorporated into the preschool program. Thus, one can assume they were familiar with the appearance and reality distinction that is associated with such an activity. This distinction could also be applied to the procedure of dressing-up the Bananas in Pyjamas in pretend seaweed during Interview 3. Children in the participation group were able to transform the Bananas into monsters at the beginning of the task and return them back to Bananas in Pyjamas at the end. Hence, these children were able to apply their knowledge from the dress-up activity to the Bananas in Pyjamas task making it a more meaningful and practical experience.

Given the relationship between pretense and dressing-up, it could be argued that children in Interview 3 responded to the three questions on the basis of pretense rather than false belief. It has been reported that children understanding pretense earlier than false belief, especially when the pretense is supported by action (Lillard & Flavell, 1992). However, it has also been suggested that children cannot understand pretense without understanding the associated false belief (Fodor, 1992) and that children need knowledge and intent to engage in pretense (Lillard, 1993). There is no clue in the story that the characters are only acting-as-if. In Monster Bananas the teddy bears appearance and language indicates that they were genuinely frightened by what they believed was on the beach. They do not appear to be merely acting-as-if there are monsters on the beach. Given evidence which indicates that even 3-year-olds understand that actions are intentional if they match individuals’ statements (Astington, 1991), all children in the sample should have understood the intent behind the actions of the characters.
Moreover, while children may have been able to answer the first false belief question on the basis of pretense, they could not use the same basis for the second and third questions. Because children were only coded as being correct if they responded correctly to both parts of the three false belief questions, those children who responded on the basis of pretense would not have been correct on the three questions, and consequently their responses would have been coded as incorrect. Taken together, the conservative coding of responses and the explicit presentation of each character's intent minimised the potential for children to respond on the basis of pretense.

In the current research, receptive verbal ability was identified as a significant variable in all interview tasks. While each of the narrative conditions were more important after controlling for verbal ability, differences in receptive language were still influential predictors. Given this, and results which indicate that a range of understandings related to the mind develop simultaneously (e.g., Clancy et al., 1998; Jenkins & Astington, 1996), it is proposed that a theory of mind is part of a more domain general development with numerous cognitive understandings occurring simultaneously rather than in isolation. This proposal supports the executive functioning account of development which suggests that children's difficulty with traditional false belief tasks is due to characteristics of the task rather than a conceptual deficit. For example, characteristics such as working memory (Keenan, 1999) and inhibitory control (Hughes, 1998) have been identified as significant predictors of performance on false belief tasks. It appears that the way a task is presented is more important than the personal characteristics a child brings to the experimental context.
While executive functioning provides one possible explanation for the results in this study, it was not the theory tested. Data concerning key executive variables were not collected in this study and assumptions about this theory cannot be made without such evidence. Rather than focusing on the cognitive demands of tasks, the current study investigated sociocultural influences. Hence, development was perceived as occurring in a child's social and cultural context. An important variable for an enculturation perspective is language. Language is the "medium through which the mind becomes culturally mediated" (Nelson, 1996, p. 119). It is the tool for conveying knowledge about the world. The significance of verbal ability in the current study is explained as an example of language being a tool for generating meaning, which children used to gain meaning in the interview tasks and to express meaning in the case study phase. Those children who did not understand the language used in the interview tasks would have been unable to make meaning and consequently, unable to demonstrate their understanding. The results from Interview 4 reinforce the notion that language is an important variable in any investigation of an understanding of mind. During Interview 4 more children were able to demonstrate their understanding when presented with the detailed verbal narrative than the original book narrative. It has been proposed that this detailed narrative enabled children to entwine the landscapes of narrative, thereby enabling meaning to be made based on the action and mentality. It is not denied that children's performance may have been influenced by executive demands in this study. However, with only data for receptive language no assumptions can be made about any executive influences other than verbal ability.

Astington (1996) has suggested that children often learn the procedures for contexts they regularly experience and can engage in such without having a explicit
understanding of related concepts. Trickery is one such context. Because all of the Bananas in Pyjamas materials presented the false belief actions in the context of trickery. Interview 5 aimed to investigate if children were able to demonstrate a theory of mind during a non-traditional literature based task without trickery. The results from Interview 5 indicated that children were able to demonstrate their understanding of false belief during the literature based task without trickery. While fewer children were able to demonstrate their understanding during the Harry the Dirty Dog task than the Bananas in Pyjamas tasks, more children answered the questions correctly during Interview 5 than on each of the traditional tasks.

Further evidence against children using procedural knowledge is provided by the large number of children who were able to evidence an understanding of mind during their everyday interactions in the case study phase. These children demonstrated their theories of mind in a range of contexts which were not always familiar.

An alternative proposition to the procedural knowledge argument presented by Astington (1996) could be that children found it easier to demonstrate their understanding of mind when presented with contexts which reflected aspects of their everyday experiences. For example, children regularly shared literature at preschool and watched television at home to varying degrees. These experiences were meaningful for children because they were valued by their cultural group. The inclusion of such experiences may have enabled children to create a "shared context" with the researcher (Sperber & Wilson, 1986). In a shared context, the researcher and participant would have been accessing similar cognitive structures.

In the current study the researcher addressed the need for a shared context by
presenting children with contextualised materials, using language which was at the children's linguistic level, and providing more than one context for children to demonstrate their understanding. This final consideration is particularly important because children often become disengaged in a context where meaning is not shared. By providing children with a variety of interview tasks, the chance of achieving a shared context was increased.

It has been suggested that an understanding of mind may not develop the same way in all cultures (Vinden, 1999). For example, when a group of Western children living in Papua New Guinea were tested with traditional false belief tasks they were found to develop a representational understanding approximately one year later than children living in Western societies. In the same study, Mofu children of Papua New Guinea, who did not attend school, were reported first evidencing an understanding of mind between seven and ten years of age. In the current study many children were not able to demonstrate their understanding during the traditional tasks. Despite most participants being over four years of age, the time when a representational understanding of mind has been evidenced in Western samples (e.g., Perner, 1991), both younger and older children were unable to answer the false belief questions correctly.

It is possible that the materials used in the traditional tasks confounded children's performance. Many children in the study had no experience with candles apart from seeing small candles on a birthday cake. In the country of this study candles were not generally used in everyday contexts and may not have been familiar to many children. The use of pretend ice cubes during the second traditional task may have also created some difficulties for children. This task was completed in winter when it was not customary to place ice cubes in a drink. If a
behaviour was being demonstrated by the researcher which was not consistent with what participants knew about the culture, a shared context as defined by Sperber and Wilson (1986), would have been difficult to achieve. It is also possible that the traditional tasks used in this study did not reflect the theory of mind that participants used during their everyday interactions. These children may have been able to identify situations which required an understanding of mind during their everyday interactions but not recognise the need for such understanding in contexts which were not meaningful. The sociocultural account of development indicates that understandings are gained by participating with other individuals in the social and cultural activities which are appreciated by the given culture (Bruner, 1990; Feldman, 1992). If the behaviours presented in the traditional tasks were not those appreciated by the culture children may not have had the necessary understandings to respond correctly.

The number of children who demonstrated understanding after experiencing each of the conditions (video, active participation and video-in-book narrative) was much higher than the numbers reported in many studies of false belief. For example, the success rates of 3- to 4-year-olds on false belief tasks have been reported as ranging from 0% to 45% when traditional tasks have been used (e.g., Mayes et al., 1994; Wimmer & Perner, 1983). Results have also remained relatively low when traditional tasks have been merely modified (e.g., Glenn et al., 1993; Astington & Gopnik, 1988). Even in the current study only 30% of children aged from three to five years of age were able to demonstrate their understanding of false belief on either of the traditional tasks. However, despite difficulties with the traditional tasks, many children in the current study were able to demonstrate their understanding in one or more of the literature based false belief tasks. This
ability to demonstrate understanding was irrespective of age. Both younger and older children appear to have demonstrated their understanding of mind on some tasks but not all. Given this, it appears that children do have an understanding of mind but that this understanding may be limited to specific contexts. The traditional paradigm may not be the context in which most children are able to demonstrate their understanding (Miller et al., 1997). It is argued that this is because an understanding of mind is characterised by many different understandings and that the traditional paradigm does not enable children to identify which understanding is required. When children are presented with contexts which clearly identify themselves as requiring an understanding of mind, children appear to have fewer difficulties. In the current study, contexts which considered the narrative style, active participation of children and narrative detail were found to be more conducive to children demonstrating their understanding of mind than traditional contexts.

Children’s Understanding of Mind during Everyday Interactions

The evidence presented in the case study phase suggests that many children between three and five years of age demonstrated an understanding of mind during their everyday interactions. This understanding appears to be characterised by different behaviours and facilitated by different types of interactions. In particular, children: Used six different types of understanding related to the mind, engaged in interactions which ranged from being overt to subtle when demonstrating their understanding of mind, and used a range of mental state terms during their everyday interactions. The results gathered in the case study phase add evidence to
theory of mind research regarding how and when children use their understanding of mind by refining the criteria which can be used to identify theory of mind understandings.

The understandings of mind which children demonstrated during their everyday interactions did not always indicate a representational understanding as tested on false belief tasks. Rather the evidence indicated that children did understand the subjective nature of the mind and how it could be manipulated by actions. It is possible that many of the children in the study would not have been able to explain what the role of the mind. However, being unable to explain an understanding in one context does not mean the understanding has not been accomplished or cannot be explained in a different situation. The theory of mind evidenced by children in the current study was an everyday understanding. However, this everyday understanding was explored within social contexts where it was necessary for children to make meaning. If the intent of actions related to an understanding of mind were not understood by children it is unlikely these children would have been able to make meaning in a social context. In the examples presented in the case study phase, participants made meaning and shared this with their peers. If meaning had not been achieved, other children would have questioned the behaviour.

It could be suggested that children in the case study phase were able to demonstrate their understanding of mind through their narrative voice. Olson (1990) suggests that narrators' voices are characterised by the use of mental state terms and discussion about their consciousness. In the current study, many children did talk about the mind and used mental state terms during their everyday interactions. This was demonstrated through the theory of mind themes and
findings from the *Functional Meaning in Conversation Scale* (Shatz et al., 1983). It is possible that the use of a narrator's voice was facilitated by the context in which it was explored. Children demonstrate their theory of mind in familiar contexts before they do so in unfamiliar situations, such as many interview settings (Dunn, 1991). The everyday contexts used to gather data in this study may have been more spontaneous settings for children to evidence their an understandings about the mind than many settings used for traditional tasks.

The experiences children encounter during their everyday experiences in a preschool setting are very different to those that confront them in an experimental context. In the preschool setting children are familiar with the procedures that occur throughout their day and are aware of the expectations associated with these. In an experimental context children are often not aware of how they are expected to react to the researcher and the tasks that are presented. Without any knowledge of what is expected children may attempt to guess what a researcher expects from them. However, when children are guessing they may not be demonstrating the knowledge they have. In the familiar setting of their preschool centre children in the current study were not presented with a situation requiring them to make assumptions about what a researcher was expecting from them. It could be suggested that children were able to act in a natural way in such a setting and focus on mindreading their peers rather than attempting to mindread the researcher. It is probable that the mindreading of peers illustrated in the case study phase of this thesis required children to use many different understandings about the mind and that many of these understandings were different to those elicited in interview settings.
Indeed, the evidence presented in the Theory of Mind Interactions Model indicates that an understanding of mind is characterised by a range of different behaviours. It is proposed that many of the behaviours investigated using traditional false belief tasks have been overt understandings. These understandings are those on right hand side of the model. For example, traditional tasks have most often focused on children demonstrating understandings which involve deception or an understanding of mental terms (e.g., Sodian et al., 1991; Wimmer & Perner, 1983). Less attention has been made of the subtle ways children demonstrate their understanding of mind. For example, when a child conveys sympathy to another child, models actions for others or shares humour. While these understandings are often more subtle in nature, they do require children to demonstrate their theory of mind by considering a different perspective, considering the experiences of another and adapting actions to account for differences in knowledge. Indeed, in social contexts it is these subtle forms of understanding which are perceived as more important, given that the intent is to generate a positive interaction. The Theory of Mind Interactions Model draws attention to these behaviours which can often be overlooked as evidence for an understanding of mind because they have not been frequently reported in the literature.

The Theory of Mind Interactions Model can also provide insights into the types of interactions which may facilitate particular understandings of the mind. It is possible that the relationships between interactions and specific understandings of mind can be used to inform the design of future investigations. The model illustrates the type of consideration children made about the mental states of others in order to achieve the desired action in another. For example, if children wanted to take the perspective of others they would use guiding, rather than directive,
actions. In deceiving others they used directive rather than guiding interactions. If children rely on only one behaviour or a small number of the interactions outlined on the model it is likely that they will be ineffective in most social contexts. Children need to engage in the full range of understandings and actions presented on the model if they are to become competent in social interactions. Without this full range of understandings children may find it difficult to share meaning with others. Given this, the Theory of Mind Interactions Model has the potential to be used as a tool for assessment in educational settings and as scale for analysis of data. While the results are based on a small sample and cannot be extrapolated to other populations, they do have the potential to stimulate debate on what constitutes an understanding of mind and the best ways to investigate such an understanding.

Few theory of mind studies undertaken during everyday activities have focused on preschool aged children. Studies of this nature have generally been undertaken with younger samples in their home settings (e.g., Bretherton & Beeghly, 1982). Those studies which have focused on preschool aged children have also identified similar ways to those present in this thesis about how preschool aged children can use their understandings about the mind during their everyday interactions (e.g., Degotardi & Cross, 1999). Evidence indicates that children use their theory of mind through actions and language. However, many interview based investigations about the mind have relied on language as the medium for expressing understanding (e.g., Wimmer & Perner, 1983). By relying only on language researchers reduce the ways in which children can demonstrate their understandings about the mind. In such a situation children may be identified as not having a theory of mind because they are unable to express their understanding
through language. However, the same children may be able to express their understandings if provided with opportunities to use actions with language. The everyday interactions used in the current study enabled children to use actions with language in contexts they were familiar with. This usage was not elicited by a researcher in an experimental context. Rather, the understandings illustrated in the case studies reflect spontaneous behaviours to everyday occurrences. Therefore, the understandings of mind presented are those which are important for the participants not researcher.

The evidence presented in the case study phase illustrates how important a theory of mind is for preschool aged children during their everyday interactions. The consequences of not having such an understanding are that children find it difficult to participate in social interactions which require them to consider the mentality of others. Without this understanding children can find it difficult to enter an interaction with others and maintain meaning during any interaction. This point is reinforced by research which has reported correlations between a theory of mind and social variables such as peer popularity (Dockett et al., 1999). The evidence presented in this study from everyday interactions provides examples of contexts which can be used to facilitate an understanding of mind in preschool aged children. For example, a children might be encouraged to use more acknowledging interactions when engaged in positive perspective taking. The specific nature of understandings identified in this study provides examples of behaviours educators can facilitate in children to help them become more competent in their social interactions. This competence will increase the opportunities children have to share meaning.

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The everyday interactions observed in this study indicate that a theory of mind can be used to achieve positive outcomes for others such as sharing humour and praise, but can also be used in negative ways such as to deceive. These different types of understandings have consequences for the user and recipient. For example, Child A may try to share humour with Child B. If Child B understands the humour she will probably laugh making Child A feel good because this is the reaction he expected. However, if Child B does not understand the humour she will probably not act jovially and Child A may feel he did not read the mind of Child B appropriately. Consequently both children may exit the interaction feeling confused because meaning was not shared. While many studies about the mind have looked at when children develop their understanding of mind, the ways children can use their theory of mind everyday have not been extensively explored. Without evidence about how children use their understandings during everyday interactions educators cannot develop strategies for facilitating a theory of mind and minimising the negative impacts of interactions such as those between Child A and Child B. Therefore, educators can use the evidence presented in this study to facilitate children’s understandings about the processes and products of a theory of mind.

Narrative and the Current Research Contexts

The experiences children bring to a research context are important and need to be considered when developing contextualised methodology for investigating an understanding of mind. Children’s experiences are acknowledged by considering the narrative and sociocultural contexts of a task. Narrative serves as the structure through which understandings are investigated by a researcher and expressed by
children. In the current study, narrative has been used as the structure for investigating and demonstrating an understanding of mind. By manipulating parts of the narrative the characteristics of active participation, detail in the narrative landscape, and material used in the presentation were identified as being important.

The Narrative and Sociocultural Contexts Interaction Model

It is argued in this thesis that the sociocultural contexts and narratives adopted during everyday interactions and interviews are important when children are attempting to share meaning. It is proposed that meaning cannot be shared if both of these variables are not considered in an interaction. For example, most children will interact differently in interview contexts because in these the interviewer generally controls the narrative and selects the sociocultural context. In such a situation children do not participate using narratives and sociocultural contexts which are important to them. However, during everyday interactions children can determine the sociocultural context and control the narrative. This enables children to vary the narrative and sociocultural context in a manner which allows them to share meaning.

The Narrative and Sociocultural Contexts Interaction Model is presented in Figure 6.1. This model illustrates the interaction between the narrative landscape and sociocultural context for each task in the current study. The characteristics of each quarter were presented in Table 2.1 in Chapter 2. On this graphic, the sociocultural context in a research setting is represented by the child and the researcher. Tasks which are positioned above the x axis are controlled more by the child than the researcher. For example, observational investigations which occur in contexts selected by children allow children to determine what and how
understanding is demonstrated. Tasks which use materials from children’s everyday experiences give control to children by contextualising the task. For example, the participation condition in Interview 3 is positioned above the x axis because it gave children control during the task through opportunities for active participation, and because it used materials, such as the puppets and Bananas in Pyjamas book, which were part of children’s everyday experiences. Tasks positioned below the x axis gave more control to the researcher than children. These tasks did not allow children to determine what or when understandings would be demonstrated. Included here were tasks which did not enable children to actively participate and presented children with materials they would not encounter outside of a research situation. The traditional tasks from the current study are positioned in this area because neither used materials children encountered during their everyday interactions. All aspects of these tasks were controlled by the researcher with the role of children being to respond to the researcher’s questions.

The x axis on the Narrative and Sociocultural Contexts Interaction Model represents the landscapes of narrative. The landscape of consciousness is presented to the left of the y axis while the landscape of action is presented to the right of the y axis. A task to the left of the y axis would present children with more detail about the mentality than the action of a situation. None of the tasks in the current study were of this nature. Tasks located to the right of the y axis presented children with more detail from the landscape of action than consciousness. Both the traditional tasks used in this research are located in this half of the model. The traditional tasks did not present children with a balance of information from the landscapes of narrative presenting more action than mentality.
Figure 6.1

Interview Tasks from the Current Study on the Narrative and Sociocultural

Contexts Interaction Model

\[ y = \text{narrative landscapes} \]
\[ x = \text{sociocultural context} \]

\[ y \uparrow \text{Child} \]
\[ \downarrow \text{Researcher} \]

* Participation - Monster Bananas
* Video - Magic Carpet

\[ x \]

\[ \leftarrow \text{Consciousness} \]

Video-in-book
King Rat*

Books - Magic Carpet,
* King Rat & Monster
Bananas
* Harry

\[ \Rightarrow \text{Action} \]

* Traditional

By considering the x and y axes together, the interaction between the landscapes of narrative and sociocultural contexts can be presented graphically on the model. For example, the traditional tasks are located in the lower right quarter because they were controlled by the researcher more than the children, and presented more detail about the action than the mentality of the situation. It is argued that it is this imbalance between the landscapes of narrative and sociocultural context which prevents many children from demonstrating their understanding during traditional tasks. If the traditional tasks were adapted to consider the characteristics of narrative identified as significant predictors in the
current study (active participation, narrative detail and narrative style) these traditional tasks would be positioned closer to the intersection of the x and y axis because it is at this intersection that a shared context between the researcher and child occurs.

Each of the non-treatment books and *Harry the Dirty Dog* are positioned in the lower right hand quarter of the model. These three books gave the researcher control over the materials and information which was presented. For example, the children in the control condition for *Monster Bananas* were read the book by the researcher with minimal verbal interaction and no control over the task materials. In contrast, children in the active participation treatment had a degree of control during the task through the puppets and their vocalisations. Each of these books also presented children with more detail from the landscape of action than consciousness. For example, in Interview 3 many children who did not actively participate in the task thought there were really monsters on the beach despite aspects of the narrative indicating that the monsters were really the Bananas. Fewer children demonstrated the same interpretation during the participation condition. Research indicates that when children do not receive sufficient information about the mentality of a situation they will base their inferences on action (Feldman et al., 1990). It is possible that some children in the non-treatment tasks used this as a basis for responding to the questioning.

The *King Rat* video-in-book is positioned in the lower right hand quarter of the model. This positioning is very close to the y axis because the detailed narrative of the task appears to have enabled many children to entwine the landscape of action with the landscape of consciousness. However, the task was controlled by the researcher with children having limited opportunities to participate beyond...
responding to the questions. The video-in-book task is positioned higher on the y axis than the traditional tasks because, unlike the traditional tasks, it presented children with contextualised materials. Similar characteristics are represented by the positioning of the non-treatment books and *Harry the Dirty Dog*. Unlike the unfamiliar materials used in the traditional tasks, these books were commercially available and part of children's day-to-day experiences.

The video condition for *Magic Carpet* was positioned in the upper right hand quarter of the model. The task is located close to the y axis to reflect the balanced detail presented from the landscapes of narrative. When compared with the book version of *Magic Carpet*, children in the video group were presented with verbal and physical information about the mentality of the characters. This physical information was presented in an animated manner with many cues to reinforce the central issues. The video version is positioned above the x axis because it gave children a degree of control over the task. The video was external to both the child and researcher, and was a presentation medium from children's everyday experiences. The video version is positioned below the participation condition from Interview 3 because it appears to have achieved a greater shared context than the participation task. While the participation condition did provide children with an opportunity to share in the presentation of information, how and when the information was presented was controlled by the researcher. In contrast, the video was a set presentation which was external to both the child and researcher. The researcher did control when questions were asked but did not control the way the information was presented due to the fixed format of the video. For example, there may have been slight differences in the way a story was read to
children because the researcher may have, be it aware, used slightly different vocal
tones during readings. Such a situation was avoided with the video presentation.

While developed from different phases of this research the Narrative and
Sociocultural Contexts Interaction Model and Theory of Mind Interactions Model
presented in Chapter 5 do have similarities. Both models focus on the action and
language used to share meaning in sociocultural contexts. Individuals appear to be
able to use this action and language in explicit and implicit ways. On the Narrative
and Sociocultural Contexts Interaction Model these explicit and implicit
approaches are represented by the x axis which focuses on narrative. Explicit
understandings are presented to the right of the axis while implicit understandings
are presented to the left. On the Theory of Mind Interactions Model explicit,
directive understandings are presented to the right of the model while implicit,
subtle understandings are presented to the left. The understandings explored in the
interview phase of this study focused more on explicit, directive understandings
than implicit, subtle understandings. However, the evidence from the case study
phase indicates that many children were able to use implicit, subtle understandings
during their everyday interactions. If this investigation had only used interviews as
a method of data collection more subtle understandings of mind would not have
been identified. Yet it is these more subtle understandings which individuals try to
facilitate in children because they are most often associated with positive social
interactions such as praise and humour.

Given the traditional false belief and narrative based tasks used in this study
focused primarily on explicit understandings, it is possible that many other similar
interview based studies may have also only focused on an explicit theory of mind.
However, there are methods for designed investigations of more subtle
understandings. The Theory of Mind Interactions Model provides researchers with evidence of the types of interactions associated with more implicit understandings. By considering these understandings in the context of the Narrative and Sociocultural Contexts Interaction Model the narrative and contextual needs of children can be addressed. For example, a study which focused on an implicit understanding such as positive perspective taking would be placed to the left of the y axis. If children were able to completely control the sociocultural context, such as during everyday interactions, the task would be placed above the x axis, in the upper left hand quarter of the model. If the sociocultural context was controlled by the researcher, such as in an interview where a child was not an active participant, the task would be positioned below the x axis in the lower left hand quarter of the model. By using the Narrative and Sociocultural Contexts Interaction Model tasks can be designed to investigate different understandings of mind in ways which consider the needs of all participants. Therefore, both the Narrative and Sociocultural Contexts Interaction Model and the Theory of Mind Interactions Model can be used to inform the design for future theory of mind studies.

Summary

In summary, the Narrative and Sociocultural Contexts Interaction Model is a graphic representation of the interaction between the landscapes of narrative and the sociocultural context during investigations of an understanding of mind. The model enables tasks to be positioned in any of the four quarters according to the degree of detail presented from each landscape of narrative and the degree of control participants and researchers have. The aim in any investigation is to create a shared context between the researcher and participant so meaning can be made and shared. By adjusting the amount of control researchers and children have, and
the detail presented from the landscapes of action and consciousness, children can be given an increased or decreased chance of sharing meaning. In the current study it is proposed that the video context of Magic Carpet was the task closest to achieving a shared context, and that the traditional tasks were the furthest from this.

LIMITATIONS OF THE CURRENT STUDY

In the current study, two different methodologies were adopted to collecting data, namely interview and quantitative analysis, and observation using qualitative analysis. This approach was taken so a number of different contexts could be investigated in an attempt to heighten validity and identify different understandings in different contexts. The evidence of similar understandings in the case study data as identified during the interviews, to support the sociocultural framework of this study, suggests that these understandings reflect children's ability rather than merely being artifacts from the interview contexts. Furthermore, the presence of numerous references to mental states in the case study data demonstrates that children did understand these terms, and that their performance was not confounded by the presence of these during the interviews.

Despite these strengths, there are a number of limitations in the current study. Firstly there was a large difference in the mean age and verbal ability between the video-in-book group and book groups in Interview 4. It is possible that these group differences may have accounted for some of the differences in performance between the two groups on the given task. When using random assignment to groups the aims were to obtain a sample which was representative and which would therefore reduce bias.
A second limitation relates to the traditional tasks. Both traditional tasks required children to consider their own mental states while the literature based tasks demanded they focus on the mental states of others. While evidence indicates that an understanding of self and other develops simultaneously (Gopnik & Astington, 1988), it is possible that some of the differences between the traditional and literature based tasks could be attributed to this factor. The inclusion of a traditional task which required children to focus on the mental states of others would have strengthened this study. Furthermore, the timing of traditional tasks during the interview phase should have been considered more thoughtfully. Both traditional tasks were undertaken in the early stages of the interview process and no traditional data was available for comparison with later interviews. It is also possible that maturational effects may have influenced children's performance during Interview 5, but without a traditional task for comparison with earlier data, this cannot be ascertained.

A third limitation of the interview phase was the fixed order of the questions. This fixed style of presentation was adopted in the current study to ensure there was consistency between each of the narrative conditions and the traditional tasks. Fixed order questions were presented to each participant for the traditional tasks. The nature of these questions were based on previous studies which have used similar materials to those adopted for the traditional false belief tasks in this research (Gopnik & Astington, 1988; Miller et al., 1997). This fixed order presentation was also used for the narrative based false belief tasks to enable a comparison to be made between these and the traditional tasks.

Evidence indicates that children can be influenced in some situations by repeated questioning such as that adopted in this research (Siegal, 1991). This
evidence was considered in the current study and a number of actions were undertaken to minimise the impact question format presented in the interviews. Firstly, children were required to respond correctly to all questions on a given task to be coded as correct. Secondly, different children were allocated to different experimental conditions for each task. The results from each of these conditions could be compared to the results for the traditional tasks and found to fluctuate. Hence, overall children were not responding with the same answers to all tasks.

A further limitation of this study is the wide age range of participants. Children who ranged from 3- to 5-year-olds were included in this study to reflect the age composition of preschool classrooms in the country where this study was undertaken. Unfortunately at the time of this study there was only a small number children under three and a half years of age in the setting adopted for investigation. The size of this young 3-year-old sample does limit the conclusions which can be made about their performance. However, unlike many studies concerning theory of mind, in the current research 4- and 5-year-olds also had difficulties with some of the presented tasks. It is proposed that this difficulty was not due to age but was related to the nature of the tasks. Age was not considered the most important variable in this study. Rather, if the narrative of the task was not conducive to the sociocultural context of the preschool participants then the children would find the tasks difficult irrespective of their age. This proposal is consistent with the sociocultural theoretical stance of this study. This theoretical position is supported by the results from the older children in the sample. A particular inconsistency between this study and many others (e.g., Flavell, 1988) was that many 4- and 5-year-olds did have difficulties with the traditional tasks used for this investigation. This difficulty may have been related to the materials which were used. Many
children in the current study had not experienced candles and may have found it
difficult to think of a cake being a candle. For many children the candle was not an
item which referred to their sociocultural context. Indeed, these children were
confronted with conflicting information about an object they were not familiar
with; namely, the item appeared to be a cake but was really constructed of a
material they had not encountered previously. This unfamiliarity with candles may
have confounded the false belief children were intended to experience because they
did not understanding what the cake really was.

A further limitation has been identified in the case study collection
procedure. Rather than allowing the data collection to be directed by the evidence
which was gathered, as is most often the case in studies utilising principles of
grounded theory (Woods, 1986), time was used to constrain the collection
procedure. Generally, data collection occurs until a point of saturation is reached,
where no more data can be gathered to enhance the evidence. However, in the
current study, a minimum of 30 minutes of observations were gathered for each
participant. It is possible that a larger amount of pertinent data could have been
gathered, strengthening the themes if a saturation point rather than time limit was
used when collecting the data.

A further limitation of the current study relates to the questioning used in
the literature based interview tasks. The results indicate that most children either
got all the questions correct or all incorrect during each of the literature based
interviews. There were few children who got some questions correct and others
incorrect for each tasks. It is possible that this pattern of results was a consequence
of the questioning presented in each task. For each literature based interview the
wording and structure for questioning was the same. This approach was adopted to
maintain consistency between each interview. However, it is possible that some children may have had difficulties with the questioning, and even if having a theory of mind, were unable to demonstrate this because they did not understand the questions. Evidence indicates that the type of questioning used in tasks can confound children’s performance (Siegal, 1991). If this was the case these children would have been unable to demonstrate their understanding at each interview because all questions followed the same format. If a range of formats for questioning had been used, more children may have been able to demonstrate their understanding.

AREAS FOR FURTHER RESEARCH

In the interview phase of the current study three characteristics of narrative were investigated as possible predictor variables. Results indicated that the narrative style, active participation and detail of the narrative landscapes were significant predictors. However, the evidence suggests there were possibly other important variables worthy of investigation. For example, while the video verbal text was placed in the book for Interview 4, the book text was not investigated in the video presentation. Such a comparison may have provided insights into the way the narrative assisted or hindered children’s attempts at demonstrating understanding. Furthermore, it is possible that different characteristics of narrative may be important in different stories, and that those identified in the current study only relate to Bananas in Pyjamas stories. Similarly, the identified characteristics may only be applicable to children who are familiar with the Bananas in Pyjamas, and children who do not know these characters may require different characteristics of narrative when demonstrating understanding. Further research with different
samples and forms of literature appears necessary in the area of children’s understanding of mind. Additionally, research with different cultural groups to explore the possibility of innate understandings can only add to knowledge of theory of mind.

Children not only need appropriate cognitive understandings, but also need to be aware of how to make these understandings meaningful within a sociocultural context. Therefore, even when children pass traditional theory of mind tasks it cannot be assumed that they are able to apply their understanding in a range of sociocultural contexts. The current study has presented two different contexts—literature based interview and everyday interactions—where an understanding of mind was evidenced. While similar understandings of mind were identified in each context, it appears that the more subtle understandings of mind were only identified in the case study phase, adding support to the contextualised theoretical framework chosen for the current study. Given few studies have focused on these understandings (e.g., Degotardi & Cross, 1999; Dunn, 1988), further research concerning more subtle understandings of mind seems needed.

Receptive verbal ability was the only executive functioning variable collected in the current study. Numerous studies have indicated that executive demands may influence children’s performance on traditional false belief tasks (e.g., Hala, 1999). While this study did focus on the narrative and the sociocultural contexts of the selected false belief tasks, data for more executive functioning variables would have provided greater insights into children’s understandings. Future narrative based studies of false belief would be strengthened by the inclusion of more executive functioning data than receptive verbal ability alone.
In the current study only one form of traditional false belief task was presented to children. This task required children to reflect on their own mental states and not those of others. In contrast, the literature based tasks required that children think about the mental states of themselves and others. It would be beneficial for further comparisons between traditional and literature based tasks which used traditional tasks that required children to reflect on the mental states of others. Furthermore, it would be interesting to compare the results between literature based tasks like those used in the current study and a literature based traditional task such as that of Wellman and Bartsch (1988). Such a comparison could provide further insight into the role narrative plays in investigations of an understanding of mind.

SUMMARY

In summary, the current study indicates that many preschool aged children do have understandings about the mind. They understand that the mind is subjective and can be used to influence actions in self and other. This understanding is not necessarily representational and is not evidence that children will be correct on every false belief task they are tested on. Rather, it is argued that the understanding of mind presented in this study was characterised by a range of behaviours which are not always investigated in the traditional paradigm. Rather than focusing on the age when children demonstrate a theory of mind (e.g., Wimmer & Perner, 1983), the current study focused on how children used this understanding during their everyday interactions and on non-traditional literature based tasks. It is suggested that there may be many characteristics of an understanding of mind but that children may not be able to evidence this
understanding in all contexts. While many children may have difficulty correctly answering traditional false belief tasks, it does not appear appropriate to say these children do not have any understanding about false belief or, more generally, the mind.

In the following chapter educational implications and conclusions of this study are presented.
CHAPTER 7

CONCLUSIONS

In this final chapter the conclusions from the current study are presented. A discussion of the educational implications is also provided.

SUMMARY AND CONCLUSIONS

Summary of the Findings

Based on the results from the interview phase of this study, three characteristics of narrative-narrative style, active participation and detail of the narrative landscape-were identified as being important for children when demonstrating an understanding of false belief. More children were reported demonstrating an understanding of false belief during each of the treatment literature based false belief tasks than on the traditional tasks. These results were irrespective of age and controlling for verbal ability. The evidence suggests that three to five year old children do have an understanding of false belief which they are able to demonstrate in some contexts but not all. It appears that children have a better chance of demonstrating their understanding of mind when an interview context enables them to actively participate, and when the context provides sufficient detail from each of the landscapes of narrative.

The case study phase aimed to identify characteristics of an understanding of mind during children’s everyday interactions. The observational data were analysed in three different ways. Firstly, principles of grounded theory were used to identify characteristics of an understanding of mind within naturalistic contexts. Six main areas of understanding were identified in the case study data. These areas were referred to as themes and were titled: Positive perspective taking, sharing
humour, mediating action, distinguishing appearance from reality, talk about self other and mind, and acts of deception. Using the Continuum of Teaching Behaviours (Bredekamp & Rosegrant, 1995), the main types of interactions within each theme were identified. These interactions ranged from guiding actions to directive actions. Specific types of interaction were identified in some themes more frequently than others. This relationship was presented graphically on the Theory of Mind Interactions Model.

The final analysis focused on the mental state language children used during their everyday interactions. Evidence indicated that children used many of the same mental state references in their everyday interactions as were presented during the literature based tasks in the interview phase. Moreover, the use of these terms indicated that most children understood their meaning. Overall, the results from the case study phase indicated that most children were able to evidence an understanding of mind during their everyday interactions, and that this understanding was characterised by many different behaviours.

Conclusions from the Current Study

The evidence presented in this thesis suggests that children between three and five years of age do have an understanding of mind, but that they are not able to demonstrate this understanding in all contexts. In the current study children demonstrated an understanding during non-traditional false belief tasks and everyday interactions. It is argued that many studies have underestimated children’s understanding of mind because a theory of mind is characterised by many behaviours and not all of these are addressed in the traditional paradigm. Furthermore, some researchers may be dismissing evidence of an understanding of
mind because they have focused on a narrowly defined criteria of what constitutes an understanding.

In the current study it has been suggested that there are some characteristics of an interview context which can be adapted to assist children to demonstrate their understandings. Firstly, the narrative style presented to children is important. In this research more children were able to demonstrate their understanding in the context of a video than a book. Secondly, providing children with opportunities to actively participate in an interview was also identified as a significant predictor of performance. Finally, the detail of the narrative presented to children was also important. More children demonstrated an understanding when presented with a more detailed narrative. These results were all irrespective of age and controlling for verbal ability. Based on the results from the current study, it appears that 3- to 5-year-old children are able to demonstrate their understanding of mind in some contexts but not others. In the current study both younger and older children had difficulty demonstrating their understanding in selected contexts. Rather than focusing on the age at which children evidence their theory of mind, it may be more important to focus on the characteristics of the tasks used to investigate such, and the way children use this understanding everyday.

The results from this research make a significant contribution to the theory of mind literature. This study provides an insight into some of the literature based contexts in which children use their understanding of mind and how they use this understanding during their everyday interactions. Rather than reporting that age was a significant variable in these investigations of false belief, this research indicates that the context in which an understanding was elicited was the most important predictor of children’s performance. The findings suggest that even 5-
year-olds can experience difficulties demonstrating their understanding of mind in some contexts.

Furthermore, the evidence presented in this thesis suggests that an understanding of mind is characterised by a range of behaviours. Children appear to be able to use their understandings in subtle and overt ways to either guide or direct the action of others. It is possible that the traditional paradigm has not addressed many of the behaviours associated with an understanding of mind, and as a consequence, has lead to an underestimation of 3- to 5-year-olds understanding of mind.

In the following section the educational implications of these results are discussed.

EDUCATIONAL IMPLICATIONS

A number of implications for those working with preschool aged children result from this study. Firstly, the evidence from the interview phase has implications for the way literature is shared with children. The results for the four literature based false belief tasks indicate that children do not always understanding literature in the manner which is assumed by many adults. During each of these tasks a large number of children was unable to demonstrate an understanding of mind. The number of children who were able to understand the mentality in these stories was influenced by the way the stories were presented. By manipulating different characteristics of the narrative, children were given an increased or reduced opportunity of demonstrating their understanding of mind. For example, children's opportunity to demonstrate an understanding during *Monster Bananas* was increased when they could actively participate in the sharing.
Without an understanding of the mentality presented in the literature based tasks used in this study meaning was lost. Children needed to understand the mentality to enjoy the humour presented in each book. However, the evidence indicated that merely reading the story to children did not assist most to gain an understanding of the mentality. Educators need to adapt the narrative in one or more of the ways identified in the current study if more children are to understand the mentality. For example, while reading a story an educator may ask children to act out parts, enabling them to become involved in the sharing. An educator could also supplement presentations of literature with other forms of media. For instance, children could watch a story on video then have the book read to them.

Secondly, these results reinforce the need to accommodate the diverse needs of children when assessing their understandings. While children may not be able to demonstrate their abilities in one context, they may be successful in another. It cannot be assumed that children do not have an understanding, such as a theory of mind, based on a single finding. It is not always possible to address each behaviour associated with an understanding when only a limited range of contexts are tested. Consequently, it is possible that many behaviours associated with an understanding can be overlooked when investigated through a limited set of tasks. If children are unable to demonstrate their understanding in one context it cannot be assumed that the understanding has not developed yet. In the current study, most children were able to demonstrate their understanding in some contexts and not others. This is not evidence that these children are yet to develop some understanding of mind because they were unable to respond correctly in each context. Rather, it appears that some contexts are more suitable for children to demonstrate specific behaviours than others. For example, the traditional false
belief paradigm may not address the same theory of mind behaviours children encounter during their everyday interactions. By just focusing on the results from the traditional tasks it appeared most children did not have an understanding of mind. However, the difficulties children had on the traditional tasks did not indicate that they did not use an understanding of mind during their everyday interactions. The problems many children have demonstrating an understanding of mind appears to be specific to the context in which it is investigated.

While some children may not be able to demonstrate their understanding of mind during experimental contexts such as interviews, it is possible that they can do so during their naturalistic activities. In particular, many studies concerning children’s theories of mind have focused on directive behaviours such as deception (e.g., Chandler et al., 1989; Winner & Sullivan, 1993). but in the current study the results indicated that this was not the only way children could use their understanding of mind. Studies which have focused on children during their everyday interactions have also discovered a range of understandings related to the mind (Degotardi & Cross, 1999; Dunn, 1988). It is possible that many experimental investigations have overlooked the more subtle ways children can use a theory of mind. For example, it is possible that while children are not demonstrating overt understandings such as those involved in deceiving others, they could be engaging in more subtle actions which guide others. Moreover, in many social contexts it is these more subtle forms of understanding which are perceived as more important, given the intent is to generate a positive interaction. In contrast, it is often understandings which have been grouped at the directive end of the continuum which are characteristic of children who bully and coerce their peers (Dockett et al., 1999; Ladd, Price & Hart, 1988). These children may be able
to demonstrate their understanding in contexts which focus on directive actions, but have difficulties during more subtle interactions where they need to "read" the situation more closely. Indeed, this difficulty also appears to be characteristic of unpopular children, with research indicating that popular children are able to use their understanding of the mind to assess social situations more effectively than less popular children (Dockett et al., 1999).

Given the influence an understanding of mind has on social experiences such as bullying and peer popularity, the Theory of Mind Interactions Model has a number of implications for educators. Firstly, it provides educators with a framework for focusing on the types of understandings of mind children use during their everyday interactions. By focusing on these it can be determined whether or not children are relying on one or only a small range of interactions when using their understanding of mind. If children rely on only a small range of understandings, irrespective if the understandings are subtle or directive, their social interactions will be restricted. For example, if a child was only using directive interactions when trying to enter a co-constructive situation, she might be rejected by other children in the co-construction because she was being too overt in expressing her mind. The child might be more successful if she was encouraged to use more subtle behaviours such as offering advice or praise before entering the co-constructive situation. Similarly, if a child was only using subtle interactions which were preventing him from entering group play, he might need to learn strategies for speaking about his mind and being more directive. It is important for educators to facilitate both a subtle and overt understanding of the mind if children are to be successful in a variety of social contexts. By using the Theory of Mind
Interactions Model, educators may be better able to identify specific developmental "trouble spots" and provide more individualised support.

Educators have an important role in proving support for children when they are trying to demonstrate their understandings. Apart from exploring understandings in a number of contexts, educators need to adapt these contexts so they address the understandings being investigated. For example, children might find it easier to demonstrate their understanding during a video than a book. Educators also have a role in providing scaffolding for children. Astington (1996) suggests scaffolding can be presented in a variety of forms including active participation, using familiar materials or adapting the language so it is at children's linguistic level. When sharing literature, scaffolding could even be provided by asking children to retell the events at the end of each episode. Indeed, Lewis et al. (1994) found retelling helped children recall information during a false belief task. In addition to scaffolding children during their educational experiences, educators need to consider the experiences children bring with them to a context, and to design learning experiences in a manner which acknowledges these experiences.

An important characteristic in any research is cultural background. For some cultures it may not be appropriate to demonstrate the overt understandings of mind identified in the current study. Similarly, in most countries children would not know who the Bananas in Pyjamas were because they were indicatively Australian. Characteristics such as these would need to be considered when using the Theory of Mind Interactions Model and when encouraging different behaviours associated with an understanding of the mind.

In the current study the Continuum of Teaching Behaviours was used with children as the focus rather than adult educators (Bredekamp & Rosegrant, 1995).
interactions. This study has illustrated how the Continuum of Teaching Behaviours can be used with children. Moreover, it has also suggested ways the continuum can be used with the Theory of Mind Interaction Model to facilitate different types of interactions in children. In the following section of this chapter, the final conclusions for this thesis are presented.

CONCLUSION

In conclusion, the results from the current study indicate that 3- to 5-year-olds can demonstrate an understanding of the mind during non-traditional false belief tasks and everyday interactions. The results suggest that a theory of mind is characterised by a variety of behaviours which may not always be addressed in the traditional paradigm. Each of these understandings appears to be facilitated by specific types of contexts and characteristics of narrative. In an interview context, narrative style, active participation, and narrative detail were significant influences on children's performance. These results were irrespective of age and controlling for verbal ability. During everyday interactions, children displayed six different types of understanding of mind. These understandings were grouped under themes in the current study and were: Positive perspective taking, sharing humour, mediating action, distinguishing appearance from reality, talk about self other and mind, and acts of deception. Each of these themes was characterised by some types of interactions more than others. Generally subtle interactions characterised the themes of positive perspective taking and sharing humour. Sharing interactions were most common in the themes of mediating action and distinguishing appearance from reality. Directive interactions were generally in the themes of talk about self other and mind and acts of deception. The relationship between the
themes and types of interactions was presented graphically through the Theory of Mind Interactions Model.

A final finding of this study was that children used similar mental state terms during their everyday interactions as were used in the non-traditional false belief tasks. It is argued that many children did understand these terms when they encountered them in the interview phase and their responses were not an artefact of the experimental context.

Interpreting the results for both the interview and case studies phases 3-to 5-year-old children can demonstrate an understanding of mind in some contexts but not others. The results indicate that both younger and older children have difficulties with some false belief tasks, but not all. The current study indicated that narrative style, active participation and narrative detail were important characteristics of tasks which needed to be considered when investigating an understanding of mind in children. Based on the evidence, it is suggested that many traditional false belief tasks have underestimated the understanding of mind of preschool aged children by not addressing the diverse nature of a theory of mind.
REFERENCES


Pratt, C., & Bryant, P. (1990). Young children understand that looking leads to knowing (So long as they are looking into a single barrel). *Child Development, 61*, 973-982.


APPENDIXES
APPENDIX A

DISTRIBUTION OF PARTICIPANTS BY AGE

FIGURE A1

![Bar chart showing distribution of participants by age in months. The x-axis represents age in months, ranging from 31 to 61, and the y-axis represents the number of children, ranging from 0 to 5. The chart depicts the number of children in each age group, with some age groups having multiple bars indicating the number of participants in that age range.]
APPENDIX B

NARRATIVES FROM MAGIC CARPET

Narrative from the Book Magic Carpet (Tulloch, 1993)

Morgan had found a beautiful carpet in the Rat in the hat’s shop.

"That’s a very special carpet, Morgan," said the Rat in the hat. "It’s magic. You sit on it, say the magic words and off it flies, taking you anywhere you want to go."

Morgan bought the carpet straight away.

He couldn’t wait to see it fly. (Control question asked).

He tried some magic words, "Alakazam! Carpet-fly!"

But that Rat in the hat had tricked Morgan. The carpet wouldn’t fly. It wasn’t magic at all. Poor Morgan!

The Bananas in Pyjamas felt sorry for Morgan when he told them his magic carpet wouldn’t fly.

"Are you thinking what I’m thinking, B1?"

"I think I am, B2. It’s Trick Time!"

The bananas had a plan to make Morgan think the carpet was flying.

First they blindfolded Morgan so that he couldn’t see. The they said some magic words, "Alakazam, Alakazoom! Carpet fly, around the room!"

And they tipped the carpet from side to side to make Morgan feel as if he was flying. He had a really exciting ride! (First false belief question asked).

When the ride was over, Morgan went off to try out his magic carpet in the park. The bananas went too. They wanted to try out another trick.

"Whatever are you doing?" asked Amy.
"Shhh! It's just a trick. Don't tell Morgan," whispered the bananas.

The bananas pretended to give Morgan an exciting magic carpet ride in the park.

Amy brushed leaves past Morgan's face to make him think he was flying up through the trees. (Second false belief question asked)

Morgan took off the blindfold and saw that he wasn't really flying after all.

"You trickers!" giggled Morgan.

"We're sorry, Morgan," said the bananas. "We knew your carpet wasn't really magic. But we wanted you to have an exciting ride." And they all laughed.

Just then the Rat in the hat arrived.

The Rat was surprised to hear that the carpet really was magic.

He was very surprised when he felt himself flying.

He was very, very surprised when he felt himself flying through the trees.

And a bit frightened too! "Cheese and whiskers! How do I stop this thing! I want to get off!"

But once he got use to it, he had a very exciting magic carpet ride! (Third false belief question asked).

Extracted with permission from *Magic Carpet*, by Richard Tulloch, and published by ABC Books, Sydney, Australia.

**Narrative from the Video Magic Carpet** (Harris, 1994)

(Narrator) One day while Morgan was in the Rat in the hat's shop something special caught his eye.

(Morgan) "This is a beautiful carpet Rat. It would look great in my bedroom."

(Rat) "Oh that's a very special carpet Morgan."
(Morgan) "Special? What's special about it?"

(Rat) "Oh....um it's magic."

(Morgan) "Oh....magic....really?"

(Rat) "Oh yes. You sit on that carpet and say the magic words and off it goes flying around the room taking you anywhere you want to go."

(Morgan) "Are you sure?"

(Rat) "Oh oh oh Morgan trust me I'm a rat."

(Morgan) "Oh can I have a go then?"

(Rat) "Oh no. It's only magic when you own the carpet. You have to buy it first."

(Morgan) "Well if it really is magic...."

(Narrator) Morgan bought the carpet and took it home. He was so proud to have a magic carpet and he couldn't wait to see it fly. (Control question asked).

(Morgan) "Mmm....Abracadabra. Carpet fly. Oh dear I'm sure I could make it work if only I could find the right magic words. Alacazoom, carpet fly. Oh dear."

(Bananas in Pyjamas) "Hello Morgan."

(Morgan) "Hello Bananas."

(B2) "What's wrong Morgan?"

(Morgan) "Oh I've got this magic carpet but I can't make it fly."

(B2) "Are you thinking what I'm thinking B1?"

(B1) "I think I am B2."

(Bananas in Pyjamas) "It's trick time!"

(Narrator) The Bananas felt sorry for Morgan because they knew his magic carpet wouldn't fly so they thought up a plan to make him think it was flying.

(B1) "Oh Morgan to make a magic carpet fly first you have to put on a blindfold so that you can't see."
(Morgan) "A blindfold?"

(B2) "Yes. The magic doesn't work if you're peeking. And then you say the magic words. Abracadabra! Alacazoom! Carpet fly around the room!"

(Morgan) "Oh it's working! The carpet is magic. I'm flying! I'm flying!"

(Narrator) Morgan couldn't see that it was the Bananas who were making the carpet fly and he had a really exciting ride. (First false belief question asked).

(Morgan) "What happened?"

(B2) "You've landed again Morgan."

(Morgan) "Oh that was so exciting. Did you see me flying?"

(Bananas in Pyjamas) "Oh...Ah."

(Morgan) "I wonder if my magic carpet will work outside in the park?"

(Bananas in Pyjamas) "Oh."

(Morgan) "I'm not quite sure what the right words are for making magic carpets fly outside so I'll make some up."

(Amy) "Bananas whatever are you doing?"

(B2) "Shh. Quiet Amy. We're playing a trick on Morgan. Don't tell him."

(Amy) "Morgan. It's Amy. I've come to see you fly above the trees this time."

(Morgan) "Amy this magic carpet can take me flying anywhere. All I have to do is say the right words. Alacazaam. Alacazee. Carpet fly through the trees. Oh see amy. I'm up in the sky."

(Amy) "Morgan come back you're going too close to that tree."

(Morgan) "I'm flying through the trees." (Second false belief question asked).

(Narrator) The Bananas thought Amy's trick was so funny they started to laugh so much they nearly dropped the table.

(Morgan) "I saw that. You trickers. I really thought I was flying."
(B2) "We're sorry Morgan. We knew your carpet wasn't really magic."

(B1) "But we wanted you to have an exciting ride all the same."

(Rat) "Hello Bananas. Hello Teddies."

(Morgan) "Hello Rat. Would you like a ride on my magic carpet?"

(Rat) "Oh. It's not really magic....is it?"

(Bananas and Teddies) "Mmmhmm."

(Rat) "I won't fall off will I?"

(Morgan) "Believe me Rat, you'll love it. Alacazaam."

(Bananas in Pyjamas) "Alacazee."

(Bananas and Teddies) "Carpet fly overseas."

(Rat) "I'm flying. How do I stop this? Morgan I'm getting air sick. I want to get off." (Third false belief question asked).

Extracted with permission from *Bananas in Pyjamas. Monster Bananas*, by Helena Harris, and published by ABC Video, Sydney, Australia.
APPENDIX C

NARRATIVE FROM MONSTER BANANAS

Narrative from the Book Monster Bananas (Hopkinson, 1994)

One day the Bananas in Pyjamas found something washed up on the beach.

It looked like it could be...

...a sea monster!

"It's very still for a sea monster, B1."

"Perhaps it's asleep, B2."

So the Bananas decided to have a closer look. "This isn't a sea monster at all, B1. It's just a pile of seaweed!" (Control question asked).

"Now you look like a sea monster, B1!"

"Are you thinking what I'm thinking, B1?"

"I think I am, B2."

"It's Trick Time!"

The Bananas covered themselves in seaweed, lay down on the sand and waited...

It wasn't long before Morgan came down to the beach. "What's this?" said Morgan. "It looks as if it could almost be..."

"Rarrrgh!" roared the Bananas.

"...A sea monster!" cried Morgan. (First false belief question asked).

Morgan ran all the way back to the Teddies' house. "What's the matter?" asked Lulu.

"There's a sea monster on the beach!" said Morgan.

"A sea monster? There's no such thing! Said Lulu.

Lulu took Morgan back to the beach. "There's the monster," said Morgan.
"Rarrghh!" roared the Bananas.

"A sea monster! A sea monster!" cried Lulu and Morgan. **(Second false belief question asked).**

"It’s fun being a sea monster, B2."

"It’s lots and lots of fun, B1."

Lulu and Morgan ran home and told Amy about the sea monster on the beach.

Amy decided to take a photo of the sea monster. "Are you coming?"

"There’s the sea monster," whispered Lulu and Morgan.

"Rarrghh!" roared the Bananas. **(Third false belief question asked).** Flash went the camera.

"That’s not a sea monster," said Lulu.

"That’s the Bananas! said Morgan.

"You trickers!" laughed Amy.

"We were just pretending to be sea monsters," said B1.

"There’s plenty of seaweed...we can all be monsters!" said B2.

So the Bananas and Teddies had great fun playing sea monsters on the beach for the rest of the day.

Extracted with permission from *Monster Bananas*, by Simon Hopkinson, and published by ABC Books, Sydney, Australia.
APPENDIX D

FREQUENCY DISTRIBUTIONS OF PILOT STUDY DATA

Figure D1

Distribution of correct responses by task for Collection One

Figure D2

Distribution of correct responses by task for Collection Two
APPENDIX E

NARRATIVES FROM KING RAT

Narrative from the Book King Rat (Hopkinson, 1995)

One day Rat in a Hat was looking through his book, 'Great rats in History'.

Rat's favourite picture was the one of King Rat. "So dignified! So handsome! It would be such fun to be a King," Rat in a Hat said to himself.

"Come to think of it, I look a bit like King Rat. In fact, with a crown and a robe someone might think I was King Rat." (Control question asked).

A little later there was a knock on the Bananas' front door. "Who can that be, B1?" said B2.

The Bananas didn't recognise Rat in his disguise. "Who are you?" asked B1.

"For your information, you unfortunate fruits, I happened to be King Rat!" replied Rat in a Hat.

"I was hoping to make a surprise royal visit to my cousin Rat in a Hat, but he appears to be out," said Rat in a Hat.

"I didn't know Rat had a king for a cousin, B2," whispered B1. (First false belief question asked).

So the Bananas invited King Rat to pay them a royal visit. "Bring me food! Food fit for a king!" ordered Rat.

"Of course," said the Bananas and brought him all the food they could find.

"We're very lucky, B1."

"Very, very lucky, B2!"

"We've never had a king in the house before!"

"We should go and tell the Teddies!"
The Bananas ran to the Teddies’ house. "Oh, Lulu, you’ve got to come quickly!" said B1.

"You’ve got to come and meet the king!" said B2.

"A king! I’ve always dreamed of meeting a king!” said Lulu. (Second false belief question asked).

Back at the Bananas’ house, Rat in a Hat, full of food... had fallen fast asleep.

"In there Lulu," whispered B1.


"But that’s no king," said Lulu. "That’s Rat!"

Oh that Rat in a Hat! "Are you thinking what I’m thinking, B1?" said B2.

"I think I am, B2."

"It’s Tricking Time!"

So the tricky Bananas woke up the sleeping Rat.

"Your majesty must be very disappointed to have missed seeing your cousin Rat in a Hat," said B1.

"But at least we can show you his splendid shop," said B2.

"Lead on, my good Bananas," said King Rat.

When they arrived at Rat’s shop, the tricky Teddies were waiting. "Your Majesty, may I present our dear friend Princess Lulu!” said B1.

"Delighted!" said Rat.

"And may I present Prince Morgan!" said B2.

"Honoured!" said Rat. (Third false belief question asked).

"And this, of course, is our very own Queen Amy," said B1.

"Queen Amy!" Rat laughed. "Queen Amy indeed."
And for the rest of the day the Bananas, the Teddies and Rat in a Hat had lots of fun playing kings and queens.

Extracted with permission from *King Rat*, by Simon Hopkinson, and published by ABC Books, Sydney, Australia.

**Narrative from the Video *King Rat* (Burnstock, 1995)**

One day Rat in a Hat was looking through his favourite book, 'Great Rats of History'.

"Oh my hero King Rat. Oh so dignified! So handsome!"

"Oh, come to think of it, I look a bit like King Rat. In fact, with a crown and a robe someone might quite easily think I was a king. Oh, someone like the Bananas." *(Control question asked).*

The Bananas were in the middle of doing the housework when....

"Oh oh, who are you?" said the surprised Bananas.

"Oh my good man is this the house of the Bananas?" asked the Rat in a Hat.

"Yes it is; and we're the Bananas. Who are you?" asked B2.

"For your information, you unfortunate fruits, I happen to be King Rat."

The Bananas had no idea that the King was really Rat in a Hat in disguise.

"Bow B1, bow," said B2.

"Oh, I don't know how B1," answered B2.

"Oh just follow me! Ah, it's a great honour your Majesty," said B2.

"Indeed, indeed! I came to visit my dear cousin Rat in a Hat but he's out, alas."

"I didn't know Rat had a king for a cousin, B1."

"Neither did I, B2." *(First false belief question asked).*
"We're only distant cousins; ah, trust me I'm a rat! So bring me some food; food fit for a king!" said Rat in a Hat.

"Oh, food fit for a king B1," said B2.


So the Bananas brought King Rat all the food they could find.

"Oh we've never had a king in the house, B1," said B2.

"We should go and tell the Teddies, B2," said B1.

"At once, B1."

"Bow B2!"

"Bow B1!"

"Excuse us your Majesty," said the Bananas as they ran to tell the Teddies.

"Lulu Lulu Lulu Lulu! You've got to come quickly! We've got a visitor. A very, very, very, very special visitor!" said the Bananas.

"Oh Bananas, who?" asked Lulu.

"It's a king. King Rat!" said the Bananas in Pyjamas.

"Oh a king; a real king!" said Lulu.

"But off course! And he's sitting in our house eating our food right now," said the Bananas.

"Oh, but I've always dreamt of meeting a king," replied Lulu. "Just give me a few minutes Bananas while I change into my party clothes." (Second false belief question asked).

Meanwhile back at the Bananas house....

"In there Lulu," said B2.

"The King's in there," said B1.

"Oh the king's fallen fast asleep, B1."
"Fast asleep, B2."

"That's the king?" asked Lulu.

"Shh Lulu or you'll wake his Majesty," said the Bananas.

"But that's no king. That's Rat!" said Lulu.

"Oh dear! He's tricked us B1!"

"He certainly did B2; and he's eaten all our food!"

"Oh that Rat in a Hat!" said the Bananas.

"Are you thinking what I'm thinking, B1?" said B2.

"I think I am, B2."

"It's trick time!"

So the tricky Bananas woke up the sleeping Rat in a Hat.

"Your Majesty we know you must be very disappointed to have missed your cousin Rat in a Hat," said B2.

"But please allow us the pleasure of showing you around his splendid shop," said B1.

"Oh, if you insist," said Rat in a Hat.

And when they got to the Rat's shop the tricking Teddies were waiting.

"Your Majesty may we present our dear friends Princess Lulu..."

"...and Prince Morgan," said the Bananas.

"Your Majesty," said Lulu and Morgan.

"Delighted," replied Rat. (Third false belief question asked).

"And our very own Queen Amy," said the Bananas.

"King Rat," said Amy.

"Queen Amy," laughed Rat.
And the Bananas and Teddies had lots of fun playing kings and queens and eating all of the Rat's food.

Extracted with permission from *Bananas in Pyjamas. Surf's up*, by Tammy Burnstock, and published by ABC Video, Sydney, Australia.
APPENDIX F

OVERVIEW OF THE FUNCTIONAL MEANING IN CONVERSATION SCALE

Table F1

Overview of the Functional Meaning in Conversation Scale (Shatz et al., 1983)

<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental state reference</td>
<td>Using terms which make a reference to cognitive processes in self or others. Example: &quot;I forgot to bring my library book.&quot;</td>
</tr>
<tr>
<td>Modulation of assertion</td>
<td>Strengthening or weakening a statement through the use of mental state terms. Example: &quot;That might be my jumper.&quot;</td>
</tr>
<tr>
<td>Directing the interaction</td>
<td>Using mental state terms to gain attention, access information or to focus the conversation. Example: &quot;Guess what is special about today?&quot;</td>
</tr>
<tr>
<td>Clarification</td>
<td>Using mental state terms to clarify utterances made by self or others. Example: &quot;What do you mean?&quot;</td>
</tr>
<tr>
<td>Expressions of desires</td>
<td>Using a mental state term to express a desire. Example: &quot;I wish I could open my present.&quot;</td>
</tr>
<tr>
<td>Action-memory</td>
<td>Using mental state terms to prompt or remind or others about an action. Example: &quot;Remember to take off your shoes.&quot;</td>
</tr>
<tr>
<td>I don't know</td>
<td>When the statement &quot;I don't know&quot; is not used as a reference to a mental state.</td>
</tr>
<tr>
<td>Contrastives</td>
<td>Using mental state terms to contrast a mental state or aspect of reality. Example: &quot;He's not a real dog, he's just pretending.&quot;</td>
</tr>
</tbody>
</table>

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### APPENDIX G

**RESULTS FROM NON-TREATMENT GROUPS**

Table G1

**Results for Non-Treatment Groups in Interviews 1, 3 and 4, and all Children in Interview 5**

<table>
<thead>
<tr>
<th>Interview</th>
<th>Number of children correct</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview 1</td>
<td>18</td>
<td><em>Magic Carpet and Harry the Dirty Dog</em></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td><em>Magic Carpet only</em></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td><em>Harry the Dirty Dog only</em></td>
</tr>
<tr>
<td>Interview 3</td>
<td>24</td>
<td><em>Monster Bananas and Harry the Dirty Dog</em></td>
</tr>
<tr>
<td></td>
<td>11</td>
<td><em>Monster Bananas only</em></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td><em>Harry the Dirty Dog only</em></td>
</tr>
<tr>
<td>Interview 4</td>
<td>16</td>
<td><em>King Rat and Harry the Dirty Dog</em></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td><em>King Rat only</em></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td><em>Harry the Dirty Dog only</em></td>
</tr>
</tbody>
</table>

Table G2

**Results for Non-Treatment Groups in Interviews 1, 3 and 4, and Traditional Tasks**

<table>
<thead>
<tr>
<th>Interview</th>
<th>Number of children correct</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview 1</td>
<td>15</td>
<td><em>Magic Carpet and both traditional tasks</em></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td><em>Magic Carpet only</em></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td><em>Both traditional tasks only</em></td>
</tr>
<tr>
<td>Interview 3</td>
<td>12</td>
<td><em>Monster Bananas and both traditional tasks</em></td>
</tr>
<tr>
<td></td>
<td>20</td>
<td><em>Monster Bananas only</em></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td><em>Both traditional tasks only</em></td>
</tr>
<tr>
<td>Interview 4</td>
<td>6</td>
<td><em>King Rat and both traditional tasks</em></td>
</tr>
<tr>
<td></td>
<td>14</td>
<td><em>King Rat only</em></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td><em>Both traditional tasks only</em></td>
</tr>
</tbody>
</table>
APPENDIX H

BINOMIAL TEST RESULTS FOR INTERVIEW PHASE

Table H1

**Binomial test results for interview tasks**

<table>
<thead>
<tr>
<th></th>
<th>Incorrect</th>
<th>Correct</th>
<th>Test proportion .50</th>
<th>Observed proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional 1</td>
<td>71</td>
<td>34</td>
<td>.50</td>
<td>.68</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(p = .000)</td>
<td></td>
</tr>
<tr>
<td>Traditional 2</td>
<td>73</td>
<td>32</td>
<td>.50</td>
<td>.70</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(p = .000)</td>
<td></td>
</tr>
<tr>
<td>Magic Carpet</td>
<td>26</td>
<td>79</td>
<td>.50</td>
<td>.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(p = .000)</td>
<td></td>
</tr>
<tr>
<td>Monster Bananas</td>
<td>22</td>
<td>74</td>
<td>.50</td>
<td>.79</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(p = .000)</td>
<td></td>
</tr>
<tr>
<td>King Rat</td>
<td>31</td>
<td>74</td>
<td>.50</td>
<td>.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(p = .000)</td>
<td></td>
</tr>
<tr>
<td>Harry</td>
<td>40</td>
<td>65</td>
<td>.50</td>
<td>.68</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(p = .000)</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX I

DESCRIPTIVE DATA FOR CASE STUDY PARTICIPANTS

Table I1

Descriptive data and Interview 1 results for case study participants

<table>
<thead>
<tr>
<th>Pseudo</th>
<th>Gender</th>
<th>Age (months)</th>
<th>PPVT-R (raw)</th>
<th>Interviews*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Angela</td>
<td>female</td>
<td>44</td>
<td>43</td>
<td>video 0</td>
</tr>
<tr>
<td>Narelle</td>
<td>female</td>
<td>46</td>
<td>48</td>
<td>video 1</td>
</tr>
<tr>
<td>Shaun</td>
<td>male</td>
<td>47</td>
<td>50</td>
<td>book 0</td>
</tr>
<tr>
<td>James</td>
<td>male</td>
<td>60</td>
<td>50</td>
<td>video 1</td>
</tr>
<tr>
<td>Katie</td>
<td>female</td>
<td>56</td>
<td>65</td>
<td>video 1</td>
</tr>
<tr>
<td>Tim</td>
<td>male</td>
<td>54</td>
<td>66</td>
<td>book 1</td>
</tr>
<tr>
<td>Helen</td>
<td>female</td>
<td>60</td>
<td>86</td>
<td>video 1</td>
</tr>
<tr>
<td>Gemma</td>
<td>female</td>
<td>56</td>
<td>62</td>
<td>video 1</td>
</tr>
<tr>
<td>Shelley</td>
<td>female</td>
<td>57</td>
<td>56</td>
<td>video 1</td>
</tr>
<tr>
<td>Chris</td>
<td>male</td>
<td>62</td>
<td>69</td>
<td>video 1</td>
</tr>
<tr>
<td>Harry</td>
<td>male</td>
<td>62</td>
<td>69</td>
<td>video 1</td>
</tr>
<tr>
<td>Charles</td>
<td>male</td>
<td>59</td>
<td>42</td>
<td>video 1</td>
</tr>
<tr>
<td>Elisa</td>
<td>female</td>
<td>59</td>
<td>56</td>
<td>book 0</td>
</tr>
<tr>
<td>Toby</td>
<td>male</td>
<td>53</td>
<td>56</td>
<td>book 0</td>
</tr>
<tr>
<td>Amber</td>
<td>female</td>
<td>60</td>
<td>72</td>
<td>book 1</td>
</tr>
<tr>
<td>Anne</td>
<td>female</td>
<td>54</td>
<td>62</td>
<td>book 0</td>
</tr>
<tr>
<td>Ruth</td>
<td>female</td>
<td>60</td>
<td>56</td>
<td>video 1</td>
</tr>
<tr>
<td>Keith</td>
<td>male</td>
<td>44</td>
<td>30</td>
<td>video 0</td>
</tr>
<tr>
<td>Shona</td>
<td>female</td>
<td>56</td>
<td>73</td>
<td>book 1</td>
</tr>
<tr>
<td>Karen</td>
<td>female</td>
<td>53</td>
<td>63</td>
<td>book 1</td>
</tr>
<tr>
<td>Gail</td>
<td>female</td>
<td>46</td>
<td>48</td>
<td>video 1</td>
</tr>
<tr>
<td>Rachel</td>
<td>female</td>
<td>63</td>
<td>65</td>
<td>video 1</td>
</tr>
<tr>
<td>Samuel</td>
<td>male</td>
<td>55</td>
<td>83</td>
<td>video 1</td>
</tr>
<tr>
<td>Hans</td>
<td>male</td>
<td>52</td>
<td>63</td>
<td>book 0</td>
</tr>
</tbody>
</table>

Note: * Interviews coded as 0 = incorrect and 1 = correct. Interview 1 children either watch the video or book of Magic Carpet. In Interview 3 children either actively participated (pup) or did not participate (non) in the sharing of the book Monster Bananas. In Interview 4 children were read the book or video-in-book (video) version of the book King Rat. In Interview 5 children were read the story Harry the Dirty Dog.

** Represents the total for both traditional tasks. 0 = both tasks incorrect, 1 = both tasks correct.
APPENDIX J

MANN-WHITNEY U TEST RESULTS

Table J1

Results for Mann-Whitney U Test for Positive Perspective Taking and Sharing

<table>
<thead>
<tr>
<th>Theme</th>
<th>Results Count</th>
<th>Rank sum</th>
<th>Rank mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive perspective taking</td>
<td>29</td>
<td>569.00</td>
<td>19.58</td>
</tr>
<tr>
<td>Sharing humour</td>
<td>8</td>
<td>135.00</td>
<td>16.87</td>
</tr>
</tbody>
</table>

Mann-Whitney U Test Statistic = 133.00  \( p = .049 \)
Chi-square approximation = 0.47, df = 1

Table J2

Results for Mann-Whitney U Test for Sharing Humour and Mediating Action

<table>
<thead>
<tr>
<th>Theme</th>
<th>Results Count</th>
<th>Rank sum</th>
<th>Rank mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharing humour</td>
<td>8</td>
<td>76.00</td>
<td>9.50</td>
</tr>
<tr>
<td>Mediating action</td>
<td>31</td>
<td>704.00</td>
<td>22.70</td>
</tr>
</tbody>
</table>

Mann-Whitney U Test Statistic = 40.00  \( p = .00 \)
Chi-square approximation = 9.10, df = 1
Table J3

Results for Mann-Whitney U Test for Mediating Action and Distinguishing Appearance from Reality

<table>
<thead>
<tr>
<th>Theme</th>
<th>Results Count</th>
<th>Rank sum</th>
<th>Rank mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mediating action</td>
<td>31</td>
<td>747.50</td>
<td>24.09</td>
</tr>
<tr>
<td>Distinguishing appearance</td>
<td>22</td>
<td>683.50</td>
<td>31.11</td>
</tr>
<tr>
<td>from reality</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mann-Whitney U Test Statistic = 251.50  \( p = .07 \)
Chi-square approximation = 3.213, df = 1

Table J4

Results for Mann-Whitney U Test for Distinguishing Appearance from Reality and Talk about Self, Other and Mind

<table>
<thead>
<tr>
<th>Theme</th>
<th>Results Count</th>
<th>Rank sum</th>
<th>Rank mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distinguishing appearance</td>
<td>22</td>
<td>448.00</td>
<td>20.36</td>
</tr>
<tr>
<td>from reality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talk about self, other and mind</td>
<td>27</td>
<td>777.00</td>
<td>28.77</td>
</tr>
</tbody>
</table>

Mann-Whitney U Test Statistic = 195.00  \( p = .02 \)
Chi-square approximation = 5.22, df = 1
Table J5

Results for Mann-Whitney U Test for Talk about Self, Other and Mind, and Acts of Deception

<table>
<thead>
<tr>
<th>Theme</th>
<th>Results Count</th>
<th>Rank sum</th>
<th>Rank mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talk about self, other and mind</td>
<td>27</td>
<td>428.00</td>
<td>15.85</td>
</tr>
<tr>
<td>Acts of deception</td>
<td>12</td>
<td>352.00</td>
<td>29.33</td>
</tr>
</tbody>
</table>

Mann-Whitney U Test Statistic = 50.00  \( p = .00 \)
Chi-square approximation = 12.94, df = 1