The influence of availability, affect and empirical evidence on individual differences in children's understanding of pretence

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Abstract

This research focused on the issue of children's understanding of the pretend-reality distinction. In particular, it investigated several features of the availability hypothesis (Harris, Brown, Marriott, Whittall & Harmer, 1991; Johnson & Harris, 1994) and the pretence continuation account (Golomb & Galasso, 1995) which have been previously offered as competing explanations for children's behaviours during pretence. Specifically, the experiments reported here explored the role of differing forms of affect in both of these accounts and assessed the constraining influence of empirical evidence of reality on the effects of increased cognitive availability. To this end, a series of seven related experiments were conducted in which four to seven year old children (N = 591) were asked to pretend about the contents of empty boxes. The children's behaviours on a series of box selection tasks were then observed under conditions of differing affect and varying levels of empirical evidence (experiments 1 to 5). The children's spontaneous behaviours were also video recorded (experiments 6 and 7). Taken together, the results suggest that there are interactions between individual differences, age, affect and levels of empirical evidence which predict children's propensity towards making pretend-reality confusions. In relation to previous explanations of children's behaviour, the pretence continuation account (Golomb & Galasso, 1995) is unable to explain the complexity of the current findings and the results are instead more consistent with an account involving individual differences such as that proposed by Johnson and Harris (1994). However, there are two crucial contributions which the experiments reported here can make to these explanations. First, there are developmental changes which take place between four and seven years of age in relation to pretend-reality understanding and these changes interact with the individual differences identified by Johnson and Harris (1994). Second, the present data provide evidence of the central role played by affect in children's pretence. Overall, this thesis offers an account of children's understanding of the distinction between pretence and reality which incorporates both developmental and individual differences.
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Chapter 1: Introduction

Overview

The overall aim of the present chapter is to provide an account of the background to the research reported here. The chapter begins with a brief introduction to the nature of pretence and the developmental changes it undergoes in the period between its onset at twelve months of age and its decline some four or five years later. The discussion will then focus on two areas of debate within the literature relating to children's pretence. First, the issue of whether children understand pretence as a representational or behavioural activity will be discussed. Second, the extent to which children understand and maintain a distinction between pretence and reality will be considered. This latter discussion will highlight a paradox. Whilst children as young as three years old show clear evidence of understanding the basic distinction between pretence and reality, children of nine years old have been shown to believe in the magical causation of impossible outcomes and children as old as seven years have been found to experience confusion between what is real and what they have merely imagined. This paradox, and the various explanations that have been offered in an attempt to account for it, formed the focus of the current research. This chapter will show that the paradox cannot be simply attributed to methodological factors such as the types of dependent measures used in various studies or the types of entity that children have pretended about. Instead, psychological explanations for pretend-reality confusions must be considered. The discussion of these explanations will then lead to a statement of the aims of the present research - to develop a cohesive model to explain why some children, in some situations, become confused about the distinction between pretence and reality.

Definitions of pretence

Pretence is a form of play more readily identified and defined than other forms of play activity because it has several distinctive characteristics (Fein, 1981). The first of these characteristics is that the pretender cognitively constructs a reality that is somehow different, or thought by the pretender to be somehow different, from the true situation (Austin, 1970; Bateson, 1972; Bretherton, 1989; Bretherton & Beeghly, 1989; Lillard, 1993a, 1994; Piaget, 1951). In this sense, pretence can be considered a non-literal
Developmental trends in children's pretence

Age-related changes in children's pretence have been very well documented, for example, by Piaget (1951). The following section provides a broad overview of the typical findings obtained in the numerous studies conducted since which have considered such changes in children's pretence.

The clearest developmental trend in children's pretence relates to changes in its prevalence. Children of younger than twelve months old are thought not to engage in pretence (Fein, 1981; Piaget, 1951). However, Belsky and Most (1981) argue that 'enactive naming', whereby the child's behaviour might be symbolic but lacks clear pretence signals, was evident in infants of only nine to ten and a half months old. For
example, an infant might raise an empty cup to their mouth but not then make pretend drinking sounds. Belsky and Most went on to argue that enactive naming is a precursor to the true pretence which did indeed emerge in their sample at around twelve months of age. Similarly, Reddy (1991) considers teasing to be an early indication of pretence. For example, an infant may offer a parent an object but refuse to let go at the last moment. This teasing emerges at around eight months and shares with pretence a non-literal quality and thus like enactive naming, may be a precursor to, or an early form of pretending.

Piaget (1951) argued that in the three to four years following its onset, pretence increases in prevalence until the age of six to seven years when it becomes less frequent and is replaced by realistic and rule based play activities. Evidence obtained by Wall, Pickert and Gibson (1989) supports this view, demonstrating an increase in the prevalence of pretence between the ages of five and six years. Moreover, in her review of the evidence, Fein (1981) concluded that on balance, the findings do support the inverted-U shaped developmental trend predicted by Piaget’s work. However, it is not simply the case that the prevalence of pretence is subject to age related changes, the nature of children’s pretend play activities also changes very dramatically during the pre-school and early school years.

It has been argued that the developmental changes in the nature of children’s pretence proceed through a series of sequentially ordered stages. Figure 1.1 (see page 5) is a modified version of Nicolich’s (1977) comparison of her own proposed sequence of levels of pretence with the stage based scheme proposed by Piaget (1951) - for further comparison, the sequence supported by research conducted by Belsky and Most (1981) has been added. The overall trend that is apparent from Figure 1.1 is one of increasingly complex and increasingly symbolic activity.

The onset of pretence at twelve months of age is marked by simple pretend gestures which the child directs towards themselves. These autosymbolic schemes (Nicolich, 1977 - level 2) or ‘pretend self’ (Belsky & Most, 1981 - level 7) activities tend to include behaviours which the child usually carries out, but in pretence these are carried out playfully, outside of their usual contexts. For example, a child at this stage might ‘drink’ from an empty cup. Subsequently, children begin to direct their pretend activities towards other people who at first tend to be passive recipients of the child’s activities. During this period of development the child might, for example, ‘feed’ a doll from an empty spoon. In the developmental sequences offered by Piaget (1951)
and Nicolich, a separate activity that also emerges at this stage is the pretend imitation of other people's activities. For example, children might sit and 'read' a newspaper as their parents do. The child's increasingly sophisticated attempts at combining these pretence schemes by carrying out the same pretend action on several recipients and then by carrying out ordered sequences of actions are discussed by Nicolich and by Belsky and Most. In both of these developmental schemes, the child is considered likely to, for example, make a teddy, a doll and then a parent 'drink' from an empty cup, before they are likely to 'feed' a doll and then put it to bed. Both of these forms of combinations of pretend schemes are thought to emerge prior to object substitution pretence. Object substitution pretence itself is said to develop such that the use of one object to symbolise another, is thought to emerge before the child uses their own body to represent some other person or object (Nicolich - levels 5.1 A and B; Piaget - types IIA and IIB).

In all three accounts of the developmental sequence in children's pretence summarised in Figure 1.1, the most complex or sophisticated forms of pretence are said to be those in which several pretend schemes are combined into a single, complex planned sequence. These combinations of pretend activities tend to be quite realistic in nature, in that they are based upon the enactment of real events. However, Piaget (1951), unlike Nicolich (1977) and Belsky and Most (1981), differentiates three forms of pretence at this stage. First, simple combinations in which the child enacts familiar events. Second, compensatory combinations in which the child effectively corrects reality, for example, by carrying out in pretence activities which would in reality be forbidden. Third, liquidating combinations in which the child re-enacts a difficult or frightening situation ensuring they emerge as competent or as having mastered the situation.

Taken together, the sequences or stages in the development of children's pretence offered by Piaget (1951), Nicolich (1977) and Belsky and Most (1981) differ in terms of some of the specific divisions of stages, or levels, that are made. However, all three models reflect very clearly the idea that children's pretence becomes increasingly sophisticated with age. The ways in which children's pretence becomes more sophisticated can be considered in terms of three key processes: decontextualization, decentration, and integration. In the sections which follow, these processes will be defined and evidence relating to each will be discussed.
Figure 1.1: A comparison of the sequences of developmental changes in the nature of children’s pretence proposed by Piaget (1951), Nicolich (1977) and Belsky and Most (1981)

<table>
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<tr>
<td>Type IIB: Identification of child's body with that of other people or with things</td>
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Decontextualization

The decontextualization of pretence can be described as the process by which behaviours and objects used in pretence become increasingly detached from their real-life contexts and uses (Flavell, 1985). Although it is evident in other types of pretence, this process is best illustrated by the developmental changes apparent in children’s object substitution pretence. Broadly speaking, with increasing age children use progressively less and less realistic objects to symbolise other objects until ultimately such props are not required and children behave towards imaginary objects during their pretend play (Bretherton & Beeghly, 1989; Fein, 1981; Flavell, 1985). In fact, about a third of three to five year old children go on to construct imaginary friends (Manosevitz, Prentice & Wilson, 1973; Taylor & Carlson, 1997) - a very specific form of imaginary object pretence.

In their investigation of object substitution pretence, Elder and Pederson (1978) asked children to pretend using substitute objects that were physically similar to the real object that would be used in that activity (for example, to comb their hair using a rectangular, flat piece of wood), or using dissimilar substitute objects which had their own, alternative function (for example, to make a telephone call using a saucepan) or with no object present. The results gave clear evidence of decontextualization - two and a half year old children were only able to use similar objects in their substitutions whereas three year old children could successfully use similar and dissimilar substitute objects. Similar findings have been obtained by researchers such as Corrigan (1987) and Fein (1975). A recent study has also shown that children’s comprehension of pretend actions carried out by other people also undergoes a process of decontextualization - by two years of age children understand the use of substitute objects by other pretenders (Harris & Kavanaugh, 1993a).

By the age of three and a half years, the children in Elder and Pederson’s (1978) study began to successfully produce appropriate pretend actions in the absence of any substitute objects. In other words, these children had begun to produce imaginary object pretence. Overton and Jackson (1973) and later, Boyatzis and Watson (1993) have investigated the nature of children’s actions when they are asked to pretend to do something and there are no substitute objects available to them. The results obtained suggest a developmental process of decontextualization within children’s responses. Both studies found that children of under three years old failed to produce any form of imaginary object pretence and that children aged three to four years responded by inserting a body part as a substitute object. So for example, when asked to pretend to
brush their teeth, three to four year old children used a finger to represent a toothbrush. By the age of five years, the children in the Boyatzis and Watson study were able to use imaginary objects in the pretence, demonstrating that their pretence was independent of the features of the immediate context. A slightly different pattern of results was observed by Overton and Jackson who found that between the ages of four and six years children became increasingly able to use imaginary objects in self-direct pretend actions, but only between the ages of six and eight years could they use imaginary objects in pretend actions directed towards others. Recently, O’Reilly (1995) has investigated children’s understanding of imaginary object pretence carried out by another person. She found that children of three years old were able to understand pretend actions in which a body part was used as a substitute object but that only children over five years of age could successfully comprehend imaginary object pretence.

Taken together, the findings from investigations of children’s object substitution pretence clearly reflect a process of decontextualization - initially children are dependent on the use of realistic props in their pretence, these become less and less realistic until a point at which children can pretend without substitute objects of any form.

**Decentration**

Through the process of decentration, with age, pretence becomes less exclusively self-directed and focused on the child’s own everyday activities, and increasingly directed towards other people and the enactment of activities that the child would not normally carry out. In other words, pretence becomes an increasingly social activity. Evidence of this process can be obtained from at least three aspects of children’s pretend play. First, the use of the self and other people as referents in pretence. Second, the enactment of social roles. Third, sociodramatic and social pretend play.

In terms of self and other referencing in children’s pretence, the process of decentration is reflected in the gradual shift from all pretend actions being self-directed, to being directed towards (passive) others, until finally others are treated as independent agents who carry out activities of their own volition (Bretherton & Beeghly, 1989; Fein, 1981; Flavell, 1985). The basic finding that self-directed pretence emerges in children’s behaviour prior to other-directed behaviour has been obtained in numerous studies (for example, Belsky & Most, 1981; Corrigan, 1987; Nicolich, 1977; Piaget, 1951; Watson & Fischer, 1980). Once other-directed pretence
emerges it undergoes further developmental changes which can also be interpreted as reflecting the process of decentration. The development of children’s use of other agents in their pretence was investigated in a study by Watson and Fischer (1980) who observed a gradual process of decentration whereby initially the child could only act with themselves as pretend agents (at twelve months). By the age of two years, children were able to imitate and to spontaneously produce acts in which some other is an active agent (for example, that a doll is walking). Comparable findings were obtained in a recent study by Kavanaugh, Eizenman and Harris (1997) in which children’s comprehension of other people’s pretence when they treat other objects as having independent agency was assessed. The two year old children in this study understood the experimenter’s actions when, for example, a mother doll was made to feed a baby doll. By two and a half years of age, children were found to be highly competent in this domain, no longer making errors when asked to complete a pretence act which involved an independent agent and which had been started by the experimenter.

The findings relating to children’s enactment of social roles during pretence provide further evidence of decentration. Initially, children simply pretend to do what are effectively their own everyday activities. The child then begins to imitate the activities of other people during their pretence (Bretherton & Beeghly, 1989; Piaget, 1951) and this is followed by the onset of social pretend play at the age of two to two and a half years. Initially, social pretence is simple and most frequently involves the child’s mother as the play partner. However, by the age of three years, children are more likely to pretend with other children, particularly an elder sibling (Haight & Miller, 1992; Howes, 1985; Youngblade & Dunn, 1995). By the age of three to four years, children begin to engage in sociodramatic play (Fein, 1981; Flavell, 1985; Watson & Fischer, 1980) whereby they play together co-operatively by enacting the social roles involved in a specific theme (Fein, 1981). The process of decentration in children’s sociodramatic play was very clearly shown in a study by Garvey and Berndt (1977). These researchers observed that three year old children tended to enact family based roles and importantly, these tended to be self-referenced. For example, the children enacted parent-child relationships. In contrast, although family relationships were still a popular theme, the five year old children in the study tended to enact more diverse roles, including those which they could not have experienced directly themselves (for example, husband-wife relationships).
Integration

The integration of pretence can be described as the process through which increasingly long and complex sequences of pretend actions are produced (Bretherton & Beeghly, 1989). The developmental trend apparent from the research literature is that children initially produce brief single pretend gestures, gradually combining these into ordered sequences of actions of longer duration (Belsky & Most, 1981; Corrigan, 1987; Nicolich, 1977; Slade, 1987) until ultimately, complex sequences of pretend actions following plots emerge, often in the form of sociodramatic play (Bretherton & Beeghly, 1989). In terms of children's comprehension of other people's pretend activities, Harris, Kavanaugh and Meredith (1994) offer evidence that two year old children understand that the pretend actions carried out by other people can be integrated into a coherent and causally connected episode. For example, the children predicted that when a duck was made to 'pour' pretend milk into a matchbox and then to 'pour' this over a horse, this made the horse 'milky'. The younger two year old children involved in the study were less systematic in their responses than the older two year old children. Nevertheless, the study provides a clear indication that integrated pretend episodes are understood, as well as produced, early in the development of pretence.

The evidence reviewed in this section suggests that there is considerable agreement over the sorts of behaviours that are thought to characterise pretence and over the developmental progression that these behaviours follow. However, within the literature on children's pretence there remain two main areas of continued debate. First, whether children understand pretence as a cognitive, mentalistic activity, or merely as a form of behaviour. Second, the nature of children's understanding of the distinction or boundary between pretence and reality. This second issue forms the basis of the research to be reported here and will therefore be discussed in some depth. However, the discussion now turns to the debate about children's understanding of pretence as a mentalistic or behavioural activity.

Children's understanding of the nature of pretence

In recent years there has been a growing interest in children's understanding of their own and other people's minds - children's 'theory of mind' (for example, Astington, 1994; Astington, Harris & Olson, 1988; Lewis & Mitchell, 1994; Wellman, 1990; Whiten, 1991). One feature of this research has been a considerable interest in the
extent to which children understand pretence as a mental representational activity in which the pretender holds two conflicting mental representations of certain objects and situations - what has been pretended and what is really the case. It is very striking that children of under the age of four years fail on a variety of tasks that require them to hold two conflicting representations of the same situation, whilst the conceptually similar ability to pretend emerges at least two years earlier. Children of less than four years old typically fail tasks designed to assess their understanding of the ‘appearance-reality’ distinction in which it is necessary for the child to simultaneously mentally represent what an object really is and what it looks like. For example, young children seem unable to state that whilst an object might look like a rock, it is in fact a sponge (Flavell, 1986; Flavell, Flavell & Green, 1987; Flavell, Green & Flavell, 1990). Similarly, three year old children tend to fail false-belief tasks in which they must mentally represent their own (correct) beliefs about a situation and a protagonist’s (incorrect) beliefs about the same situation (for example, Baron-Cohen, Leslie & Frith, 1985; Wimmer & Perner, 1983) and tasks which require them to report their own previous beliefs (for example, Astington & Gopnik, 1988; Gopnik & Astington, 1988; Gopnik & Slaughter, 1991). These apparently paradoxical findings have lead to a lively debate about whether children’s pretence reflects a precocious understanding of mental representation or whether children of under four years old have a simpler, non-representational understanding of pretence.

The view that pretence can be considered a representational activity was originally associated with the work of Piaget (1951) who argued that the onset of pretence marked the emergence of the semiotic function. That is, pretence marks a qualitative change in the child’s thinking which means that rather than equating symbols with what they signify, the child appreciates that the signifier can be differentiated from what is signified. The child becomes able to use one object as a symbol for, or to represent, another, and hence the emergence of pretend play. More recently, the idea that pretence is understood by children as a representational activity has been developed by Leslie (1987, 1988, 1991, 1992, 1994; Leslie & Frith, 1990). Like Piaget, Leslie argues that during pretence children must hold a representation of the true situation and a representation of what is being pretended. However, Leslie goes further to make some very specific claims about the nature of these conflicting representations, the cognitive system required to generate and manage them, and the relationship between the child’s capacity for pretence and their theory of mind.
Leslie (1987, 1988) begins with the claim that humans have a basic capacity to form accurate, literal representations of the world - primary representations. However, in pretence the child forms two representations of the same situation such that they simultaneously represent reality and what has been pretended. Leslie argues that the representation of the pretence must somehow be differentiated or separated from the literal primary representation, otherwise the primary representational system would be severely compromised by the arbitrary changes in meaning that are made during pretence. In other words, a child who treated a pretend representation of a banana as a telephone, as a primary representation would soon be very confused about the properties and functions of these objects. Leslie argues that pretence therefore requires the generation of a copy of the primary representation which is ‘decoupled’ or ‘quarantined’ such that normal assumptions about reference, truth and existence do not apply. This secondary representation is termed by Leslie a ‘metarepresentation’ since rather than being a representation of the world, it is a representation of a (primary) representation. Overall, Leslie believes that pretence is a representational activity and is an early manifestation of the child’s ability to understand their own and other people’s mental states. According to Leslie’s model (1987, 1994; Leslie & Frith, 1990) the same cognitive system that is responsible for raising, manipulating and interpreting pretend metarepresentations is responsible for the child’s understanding of mental states such as belief, in which assumptions about reference, truth and existence also need to be suspended. Leslie subsequently terms this cognitive system the ‘theory of mind module’ (Leslie, 1991, 1992, 1994).

According to Leslie (1987, 1988, 1994), the delay between the onset of pretence and the ability to succeed on tasks in which the child is required to hold conflicting representations of the same situation cannot be a consequence of a lack of a cognitive system that can manage such representations. Leslie instead argues that this lag is a consequence of the relative complexity of false belief tasks relative to pretence. In pretence the alternative representation of the situation is simply stipulated or made up. In contrast, in the case of belief there is a correct alternative representation which must be inferred or calculated on the basis of the person’s experience of the situation. Furthermore, false belief tasks require the child to comprehend the causal relationship between beliefs and situations in the world.

Leslie’s (1987) view of the representational nature of pretence and the relationship between pretence and the child’s theory of mind has received considerable criticism. It is beyond the scope of this chapter to enter into a full discussion of the issues raised by
these critiques, for example, the claim that the theory is non-developmental (Bradley, 1993; Hobson, 1990) and that it a non-social account of children's understanding of other people (Hobson, 1990), and Leslie's response to some of these criticisms (Leslie & Frith, 1990; Leslie, 1994). However, one criticism of Leslie's theory which is particularly pertinent to the current debate was levelled by Perner (1991) who, in offering an alternative account of children's understanding of pretence, criticised Leslie's use of the term metarepresentation to describe the representations that are generated during pretence. Whilst Perner agrees that pretend representations emerge as copies of primary representations, he believes that rather than being representations of representations (metarepresentations) these are simply representations. To make his point clearer, Perner asks the question of what is obtained by making a copy of a picture. The answer for Perner is another picture, or in other words, another representation - it is not a representation of a representation, or a picture of a picture, it is simply another picture (a similar point is also made by Jarrold, Carruthers, Smith & Boucher, 1994). Perner argues that the same logic also applies to pretence and that Leslie had therefore been unjustified in attributing children with the capacity to understand metarepresentation. In his response to this criticism, Leslie (1994) denied that he had made any claim that children explicitly understand metarepresentation, instead arguing that children have a mentalistic understanding of pretence with an implicit understanding of the mind as representational.

Perner's (1991) criticism of Leslie's (1987) account of children's understanding of pretence emerges out of his conviction that children are not capable of fully understanding the mind as a representational entity until the age of four years. Below that age, children are said to operate as situation theorists (Perner, 1988, 1991; Perner & Astington, 1992). That is, in Perner's view pretence simply marks the child's emerging ability to construct mental models of hypothetical situations and to behave in terms of these situations, or to act as if these situations were true, by switching action control from their mental model of the real situation to their mental model of an alternative situation. Pretence simply reflects the child's ability to think about how the world is not, and to act as if the world were like that. Perner strongly denies that this requires any representational or symbolic activity - the child's understanding remains entirely at the level of behaviour in terms of differing situations. In terms of how they understand pretence in others, Perner sees children as able to conceive of other people as responding to actual and possible situations, however the child does not view the other person as metarepresenting those situations.
Recently, Perner (1995; Perner, Baker & Hutton, 1994) has discussed the young child's inability to distinguish pretence (knowingly acting in terms of an untrue situation) and belief (mistakenly behaving in terms of an untrue situation). Rather than conceiving of pretence and belief as separate mental states, the child is said to understand them in terms of an undifferentiated concept of 'prebelief' - they understand that they and other people might behave in terms of something that is untrue but do not differentiate whether or not it is known to be untrue. Consequently the child fails to differentiate between pretence and false beliefs. Overall, Perner's view is that young children have a very limited understanding of pretence that is restricted by their inability to conceive of the mind as representational before the age of four years.

Although they offer quite different explanations of the nature of children's understanding of pretence, other authors have likewise argued that young children have a non-representational understanding of pretence. Harris and Kavanaugh (1993a, 1993b) argue that children understand pretence as a special form of activity, or behaviour, that is directed at make-believe objects and situations. In doing this, children do not need to conceive of the underlying mental representations held by the pretender. Instead, children observe an action with a missing component, for example, nothing is 'poured' from an empty tea pot, and perceive this as a special or 'deviant' activity. The child then processes the action in a constructive fashion by imaginatively restoring the missing components, for example, by imagining that tea is being poured. In this case, the tea is 'flagged' as being make-believe tea (Harris, 1994a). According to this model, objects to be used as props in the pretence are flagged as such and whenever the props are acted upon the flags are read and edited as appropriate. This allows the child to keep track of sequences of events and pretend transformations, for example, by allowing them to infer, based on their real world knowledge, the consequences of spilling pretend tea. At the end of the pretend episode these flags are discounted and thus no representational abuse occurs (Harris & Kavanaugh, 1993a).

Harris and Kavanaugh (1993a) further develop this model of children's pretence in terms of an analogy between the comprehension of pretend episodes and story comprehension. In pretence, the child must keep track of the pretend identity of make-believe props (use of flagging) and similarly in text comprehension the reader must keep track of the identity of objects and situations that have been referred to. In both pretence and story comprehension, referents are temporarily focused on, causal inferences are required to integrate sequences of events and constructive processing is required to give an interconnected representation of the pretend episode or story.
In terms of the current discussion, the important point to be drawn from this, is that it proceeds without an understanding of the pretender's, or story writer's, representational state. In pretence, a situation and the objects therein are flagged as make-believe and the child simply behaves and interprets other people's behaviour in terms of their mental stance towards what is stipulated within that make-believe situation.

The child's ability to reason in terms of pretend stipulations and to imaginatively construct or simulate events and outcomes accordingly, relates to Harris' account of the child's ability to predict and explain other people's behaviour in terms of their mental states. In offering his 'simulation account' of the child's theory of mind, Harris (1989, 1991, 1992, 1993; see also Johnson, 1988) argues that to predict another person's behaviour in terms of their beliefs and desires requires that the child sets aside their own beliefs and desires (adjusts the default settings) and simulates, or imaginatively constructs, a representation of what they would do if they shared the other person's beliefs and desires. Similarly, in reasoning about pretend scenarios, the child sets aside what they know about current reality and imaginatively simulates events in terms of the pretend stipulations (Harris, 1994a). For Harris, therefore, neither pretence nor an understanding of other minds, requires the child to conceive of the mind as representational. The additional difficulty in understanding concepts such as false belief, is for Harris, related to the greater number of default settings that must be adjusted and the need for the child to appreciate the actor's understanding of the hypothetical situation as true or not. Thus for Harris, the delay between the onset of pretence and the child's success on theory of mind tasks such as the false belief task, does not reflect difficulty in understanding the mind as representational since this conceptualisation of the mind is not necessary in either case.

A further account which suggests that children understand pretence in terms of behaviour rather than mental representation is offered by Lillard (1993a, 1993b, 1994, 1996; Lillard & Flavell, 1992). Lillard's position on this matter is similar to that of Harris and Kavanaugh (1993a, 1993b) since she too argues that young children simply understand pretence as acting as-if something were the case. To clarify her argument, Lillard (1996) gives the example of how children understand what is happening when another person pretends to brush their teeth with a pencil. Lillard claims that children understand the person as engaging in toothbrush-like actions with the pencil - the child does not conceive of the pencil as being mentally represented as a toothbrush. Thus Lillard, like Harris and Kavanaugh, sees young children's understanding of pretence as
a behavioural one in which the child acts as-if. Indeed, Lillard goes even further to argue that young children do not conceive of the mind as necessary for pretence - instead, all that is needed is a body to carry out pretend actions (Lillard, 1996).

The preceding discussion has offered four accounts of the nature of young children's understanding of pretence. To recap, Leslie (1987, 1988, 1991, 1992, 1994; Leslie & Frith, 1990) argued that children understand pretence as a metarepresentational activity in which, for example, one object represents or symbolises another. In contrast, Perner (1988, 1991, 1995; Perner & Astington, 1992; Perner, Baker & Hutton, 1994), Harris and Kavanaugh (1993a, 1993b; Harris, 1994a) and Lillard (1993a, 1993b, 1994, 1996; Lillard & Flavell, 1992) conceptualise young children as understanding pretence in simpler, behavioural terms. However, there are also more subtle similarities and differences between each of these accounts - these will be briefly discussed before some of the research evidence relating to this issue is described.

Although they disagree on the nature of children's understanding of pretence, Leslie (1987, 1994) and Perner (1988, 1991; Perner & Astington, 1992) are in agreement that prior to the onset of pretence children are only able to represent the world in accurate and literal ways. Leslie refers to these as primary representations, whilst Perner discusses single updating mental models. These authors are also in agreement that pretence marks the child's emerging ability to generate secondary representations or further mental models, that originate as copies of the primary representations from which they must be separated if representational abuse is to be avoided (Leslie, 1994; Perner, 1991). However, it is at this point that the two accounts begin to diverge. For Leslie, these secondary representations are representations of primary representations (metarepresentations) whereas for Perner they are models of alternative, possibly hypothetical situations and as such have no metarepresentational content (Perner, 1991).

Harris and Kavanaugh (1993a) note that their account of children's understanding of pretence shares with that offered by Leslie (1987), a commitment to the idea that children can deploy their real world knowledge about causal events when comprehending pretend sequences, and an agreement that pretend representations must somehow be differentiated from representations of reality (this latter point is also made by Perner, 1991). It is at this point that the two accounts diverge. Harris and Kavanaugh argue that this differentiation is achieved through a process of flagging whereby the pretender starts with a pretend stipulation and locates an appropriate
prop, which is flagged as having make-believe content. These flags are read and edited in accordance with subsequent pretend transformations. In contrast, Leslie's decoupling model posits that a prop is obtained and the primary representation of it is copied into a decoupled secondary representation which is then edited as appropriate. A further difference between these accounts is that whilst Leslie suggests that pretence reflects a new logical capacity (to metarepresent) on the part of the child, by drawing an analogy between pretence comprehension and story comprehension, Harris and Kavanaugh note that pretence is simply another aspect of the child's developing capacity for involvement in fictional worlds.

There are two very noticeable similarities between the Harris and Kavanaugh (1993a, 1993b) account of children's pretence and that offered by Perner (1988, 1991; Perner & Astington, 1992). First, both accounts see children's understanding of pretence as behavioural, that is, in terms of people acting as-if something untrue were true. Second, that understanding of pretence does not require any metarepresentational capability. The differences between these two accounts are actually quite subtle. Whilst Perner argues that pretend actions are understood as being directed at hypothetical situations, Harris and Kavanaugh (1993a) argue that pretence is understood as actions directed at make-believe stipulations and objects. The Lillard (1993a, 1993b, 1994, 1996; Lillard & Flavell, 1992) account is probably best treated as most similar to that offered by Harris and Kavanaugh - that pretence is understood in terms of acting as-if, and not as a mental representational activity. However, the Lillard account is the more extreme of the two since she would argue that children have absolutely no insight into the mentalistic nature of pretence.

As can be seen from this discussion, broadly speaking these four accounts are divisible in terms of the level of psychological insight into pretence that is attributed to the young child and in terms of what the child's as-if behaviour is directed towards (hypothetical situations or make-believe objects). The research evidence pertaining to these accounts will now be summarised.

There have been a number of studies investigating children's ability to comprehend pretend stipulations and complex causal sequences of pretend transformations (Harris & Kavanaugh, 1993a; Harris, Kavanaugh & Meredith, 1994; Leslie, 1994; Walker-Andrews & Harris, 1993). The results from these studies provide convincing evidence that children as young as two to three years of age can deploy their knowledge of real causal events to draw inferences about what is happening in
pretence. For example, two year old children could appreciate that ‘spilling’ pretend tea caused the (dry) surface below to be wet. These findings have been interpreted by Leslie and Harris and Kavanaugh as supporting the common feature in their otherwise differing accounts of children’s pretence - that children’s knowledge of the real world is utilised when they make inferences about changes in objects represented by decoupled or flagged pretend representations. Consequently, these data do not enable any judgement to be made about whether pretence is understood representationally or behaviourally.

However, there is some evidence which does not support the view that pretence is a metarepresentational activity. Hall, Frank and Ellison (1995) directly tested a series of predictions about children’s language that they developed on the basis of Leslie’s (1987, 1988) account of pretence as an early manifestation of the child’s theory of mind. For example, they tested the predictions that children should be adept at linguistically signalling pretend transformations and that given that pretence is thought to precede understanding of other mental states, children should discuss pretence before they begin to use other mental state terms. However, contrary to their predictions, Hall et al found that children tended to discuss activities (what they were going to do) rather than mental representations (what objects symbolised) during pretence, and overall the children’s pretend lexicon was less sophisticated than Leslie’s model had been taken to suggest.

Lillard has conducted a series of studies in which she has directly investigated young children’s appreciation that pretence involves an underlying mental representation (Lillard & Flavell, 1992; Lillard, 1993b, 1996). From these studies, Lillard concludes that children have a very simple understanding of pretence as action and do not understand that in order to pretend about something, the pretender needs to know about it and to mentally represent it. For example, until the age of five years, children claimed that a protagonist was pretending to be a rabbit by hopping even though he did not know that rabbits hopped and was not thinking about rabbits at the time (Lillard, 1993b). For these children, acting like a rabbit was a necessary and sufficient condition for pretence. In an additional study, Lillard (1996) conducted a further test of children’s conceptualisation of pretence. Previously, Johnson and Wellman (1982) demonstrated that children under the age of four years have a very limited understanding of the function of the mind and brain, claiming these were only needed for intellectual, mental activities such as thinking and spelling and that they were not needed for physical activities such as walking. Lillard followed on from this study by
asking children whether a mind was needed for pretending. For children of up to six to eight years old it was not - whilst a person might need a mind to plan the pretence, this plan would apparently then be carried out without any contribution from the mind (Lillard, 1996). Lillard interprets the findings from her studies as providing powerful evidence that children understand pretence as a form of action and do not consider it in terms of any underlying mental activity (Lillard, 1993b, 1994, 1996; Lillard & Flavell, 1992).

However, Custer (1996) has recently criticised Lillard's (1993b) studies, arguing that the experimental design made the action component of pretence considerably more salient than the mental representational component. For example, Custer argues that by saying that the protagonist is hopping like a rabbit, the emphasis is placed on his actions. Custer argues that Lillard's data should therefore not be interpreted as suggesting that children never take mental representations into account when comprehending pretence. Indeed, Custer's own data shows that three year old children could correctly identify a pretender's mental representation when they were directly asked to do so. The idea that children never understand pretence in terms of mental representation is also challenged by Woolley who, like Custer, argues that in pretence the action component is particularly salient, but that children do understand the mental representational component of fictional mental states (Woolley & Wellman, 1990, 1993). In support of this, Woolley (1995b) offers evidence from a study in which children successfully identified the mental representation underlying imagination which she considers to be a fictional mental state which does not have an action component.

Research looking at children's memories for their previous mental states also supports the claim that children have a representational understanding of pretence. Gopnik and Slaughter (1991), for example, found that three year old children were able to remember their previous pretence, even when there was no accompanying action component. This finding was interpreted as suggesting that these very young children were recalling their earlier mental representations. A related study by Amsel, Bobadilla, Coch and Remy (1996) obtained similar findings.

Hickling, Wellman and Gottfried (1997) have directly tested between the competing perspectives that children understand pretence as mental representation or as behaviour. Like Jarrold, Carruthers, Smith and Boucher (1994), these authors point out that the idea that children have no appreciation of the mental representational
underpinnings of pretence is incompatible with the fact that children successfully engage in social pretence in which pretend roles are communicated between children. Hickling et al argue that the dichotomy between pretence as behavioural or representational is misleading and that children should instead be conceived as understanding pretence as a special form of activity that is a product of a particular mental state. In support of this, Hickling et al offer evidence from a study in which three year old children were shown to correctly realise that a pretender who did not observe a pretend transformation would not be pretending about the modified situation but would instead continue to pretend about the pre-transformational state of affairs. Thus even three year old children saw the importance and relevance of the pretender’s mental representation. Hickling et al note that their data do not rule out the possibility that the children could not differentiate pretence from belief and indeed, evidence from Perner, Baker and Hutton (1994) certainly seems to suggest that these mental states are undifferentiated into a single state of ‘prebelief’ by children of a similar age.

Taken together, the evidence obtained in the studies described above seems to suggest that it is unlikely that children have absolutely no understanding that pretence requires mental representation. It is equally unlikely that young children’s understanding is metarepresentational. However, the observation that children have some conceptualisation of the mentalistic underpinnings of pretence is compatible with both the Perner (1988, 1991, 1995; Perner & Astington, 1992; Perner, Baker & Hutton, 1994) and Harris and Kavanaugh (1993a, 1993b) positions, since they acknowledge that although according to their theories children need not have this level of understanding, they may have some conceptualisation that they or other people are responding to hypothetical situations or make-believe objects. At present, however, the data are not sufficient to allow any clear decision to be made between these competing accounts. One possible interpretation of the data is that whilst children are capable of interpreting the mental representations underlying pretence, the salience of the action component and the efficacy of interpreting pretence in terms of behaviour, leads children to sometimes discount mental representational states when comprehending pretend episodes, instead interpreting them behaviourally.

**Children’s understanding of the pretend-reality distinction**

The second key issue in children’s pretence about which there remains an ongoing debate is children’s understanding of the pretend-reality distinction. It is this issue of
whether children are able to consistently and reliably keep objects and situations that are pretend, separate from those that are real, which formed the focus of the current research.

The pretend-reality distinction, also termed the fantasy-reality distinction (for example, Woolley, 1997a; Woolley & Phelps, 1994), comes under the broad heading of the mental-real distinction. The basic question that researchers continue to address here, is whether children divide the world into separate categories of real and mental phenomena and whether they do so on the same basis as adults (Wellman, 1988, 1990). For example, do children understand that mental entities such as thoughts, dreams, memories and imaginings can not be physically acted upon (seen and touched), can not be seen by other people, and do not have a consistency of existence that is independent of the child’s mental processes? For Wellman this basic ontological distinction between internal mental phenomena and external physical phenomena is the foundation from which the child’s theory of mind develops. The specific issue of whether children understand the pretend-reality distinction also has far reaching implications. The question here is whether children ever get so carried away by their pretence that they begin to believe it has somehow, perhaps magically, become true (Harris, 1989, 1994b). In other words, do children ever reach a point in their pretence when they expect features of what has been pretended to ‘seep’ into reality (Lillard, 1993a, 1994)? A failure to differentiate the world of the real from the world of pretence would mean that the child was no longer pretending (Lillard, 1994). The implication of this is that the child might truly believe that the wooden block they are pretending to be a cookie actually is a cookie and thus they might mistakenly attempt to eat it (Woolley, 1995b; Woolley & Wellman, 1990). This failure to differentiate the real and pretend identities of objects could then result in representational abuse, or conceptual confusion about the properties and functions of objects that have been pretended about (Leslie, 1987). To recap, the issue relating to children’s understanding of the pretend-reality distinction centres around questions of whether children have an adult like conceptualisation of the differing characteristics of mental and real entities, and of whether children ever confuse pretence and reality such that what has merely been pretended is assumed to be real.

Piaget (1929) provides one answer to these questions. Piaget argued that under the age of seven to eight years, children are subject to ‘childhood realism’ in that they completely fail to discriminate between mental and real entities. Thus for the young child, the thought of an object, the memory of an object or the pretence of an object is
essentially identical to the corresponding real object. In other words, the Piagetian view on this issue was that young children did not understand the mental-real distinction and were thus subject to a variety of confusions, including confusion between pretence and reality.

However, as Lillard (1994) points out, it seems highly unlikely that children are completely unable to differentiate pretence from reality. For example, Lillard suggests that the ‘knowing smiles’ that children produce during their pretend play must surely signal that the child has at least a basic awareness that they are pretending. Furthermore, Lillard notes that the representational abuse that might be expected if children were totally unable to discriminate pretence and reality simply does not occur - children do not routinely become uncertain of the differing properties and functions of objects they have pretended about. Even more compelling evidence than this has been obtained in the various studies which have directly assessed young children’s understanding of the differing features of mental and real phenomena, and their ability to discriminate between pretence and reality.

The evidence relating to children’s understanding of the mental-real distinction is relatively clear cut and has been obtained primarily from two sources - children’s language and experimental studies. Shatz, Wellman and Silber (1983) studied young children’s spontaneous use of various mental state verbs including know, think, remember, guess and pretend. Using strict criteria and analysis of the conversational context to establish when these terms were used to refer to a mental state rather than, for example, being a repetition of a previous utterance or having a conversational use such as ‘you know’ at the end of a sentence, Shatz et al established that the earliest clear references to mental state functions were produced at the end of the child’s second year. For example, one child made his first explicit contrast between what was real and what he had pretended at the age of two years ten months. Thus on the basis of the Shatz et al results and a replication by Woolley and Wellman (1990) using the CHILDES data base, it would seem that by the age of at least three years, children are capable of linguistically marking the mental-real distinction.

The experimental evidence tends to support the findings from studies of children’s language. Wellman and Estes (1986) argued that there are three basic criteria that can be used to discriminate between mental and real entities. First, whether or not the entity can be seen and touched, and occupies its own physical space (behavioural-sensory evidence). Second, whether the entity is similarly experienced by
other people (public existence). Third, whether the entity continues to exist once an individual ceases to mentally represent it (consistent existence). To establish whether children distinguish mental and real entities on the basis of these characteristics, Wellman and Estes asked children questions about two characters, one who had, for example, a real cookie, and another who was thinking about a cookie, or remembering a cookie, or pretending about a cookie, and so on. The results showed that even three year old children realised that the real entity but not the mental entity could be acted upon by the depicted child, acted upon by other people, and could be further acted upon in the future.

The basic findings from the Wellman and Estes (1986) studies have been found to be highly replicable. In a series of follow up studies, Estes, Wellman and Woolley (1989) demonstrated that even when the real entities very misleadingly shared behavioural-sensory properties with mental entities, children as young as three years old still discussed them as real, physical entities. For example, the children’s performance was unaffected by the fact that shadows and smoke are difficult to touch and do not have a particularly consistent existence. Harris, Brown, Marriott, Whittall and Harmer (1991 - experiments 1 and 2) found that four to six year old children’s ability to comment on the behavioural-sensory properties and reality status of mental entities was unaffected by whether the entities had a supernatural status (for example, a mental image of a witch) or were supernatural and fear arousing (for example, a mental image of a witch chasing the child). Kinoshita (1994) also replicated the Wellman and Estes findings when asking five to six year old children about the properties of pretended about and dreamed about entities.

However, it is not simply the case that children conceive of mental entities in negative terms, that is, only in terms of the fact that they cannot be touched, and that other people cannot see them, and so on. Estes et al (1989) note that there are also some positive features of mental entities compared to real entities - the former, but not the latter, can be manipulated and transformed by mental effort alone. Estes et al’s data demonstrate that three year old children also appreciate this feature of mental entities, realising that they could stretch a balloon they were imagining just by thinking about it, but that they could not do the same thing with a real balloon.

There have, however, been some failures to replicate the Wellman and Estes (1986) findings. In a study investigating Indian children’s ability to differentiate real and mental entities corresponding to concrete items, toy items such as dolls and celestial
items such as stars, Wahi and Johri (1994) found that children of under five years old were not reliable in their judgements. Furthermore, unlike Estes et al (1989) and Harris et al (1991) who found no effect of item type on children's performance, in this study the children were most likely to align real celestial items with mental items. The precise mechanism causing these differing results is not clear, although Wahi and Johri speculate that there may be underlying cultural differences influencing children's performance, particularly with respect to the celestial items. A non-replication which cannot be attributed to cross-cultural differences arises out of a study by Taylor, Cartwright and Carlson (1993) in which they note lower performance levels in their three year old American children compared to those in the Wellman and Estes studies. Taylor et al suggest that these differing results might be attributable to the different sampling techniques used in the two studies. However, even if they do not support the precocious understanding of the mental-real distinction previously observed in three year old children, the findings nevertheless mitigate against the prolonged period of childhood realism proposed by Piaget (1929).

In his summary of the evidence in this domain, Wellman (1990) concluded that children, like adults, categorise the world in terms of a basic ontological distinction between mental entities and real entities. With the possible exceptions of the Wahi and Johri (1994) and Taylor, Cartwright and Carlson (1993) data, the findings obtained since Wellman's summary give no reason to amend this conclusion. Instead, the findings lend themselves to the conclusion that children and adults have remarkably similar tendencies for categorising the world into mental and real phenomena and that they do so on the basis of similar beliefs about the characteristics which differentiate these categories.

There have been numerous studies which have directly assessed children's understanding of the distinction between pretence and reality. In particular, a number of studies have asked children to state the real identity of an object used in pretence and then its pretend identity (for example, Flavell, Flavell & Green, 1987; Harris, Kavanaugh & Meredith, 1994; Lillard & Flavell, 1992; Woolley, 1995b; Woolley & Wellman, 1990). The results obtained in these studies have been highly consistent. Children as young as three years old (and even two and a half years old in Harris, Kavanaugh & Meredith's study) have been found to be able to reliably state what an object really is and what it has been pretended to be. For example, in the Flavell et al study, children correctly stated that although the experimenter was pretending that a sponge was a truck, it was really a sponge. In addition, three to four year old children
can recall the real and pretend identities of items they have used in several different sequences of object substitution pretence (Amsel, Bobadilla, Coch & Remy, 1996; Gopnik & Slaughter, 1991). Furthermore, when told what a character is pretending and what is really the case, children can correctly identify the character's mental representation of the situation and thus demonstrate their ability to clearly identify and differentiate real and pretend states of affairs (Custer, 1996; Hickling, Wellman & Gottfried, 1997). Taken together, these studies strongly suggest that children of three years of age are proficient at distinguishing pretence from reality.

However, a study by Taylor, Cartwright and Carlson (1993) suggested that for some children the distinction between pretence and reality might not always be maintained. These researchers found that many four to five year old children with imaginary companions reported that these companions were real and could therefore be seen or touched. This finding might in itself be taken as suggesting that these children fail to separate what is real from what they are pretending. This possibility was subsequently dismissed by Taylor et al since several of these children spontaneously made additional comments that the friend was not a real one but was a pretend one. Furthermore, the children's good performance on other measures of their understanding of the pretend-reality distinction mitigates against there being any general confusion amongst these children. For example, the children successfully differentiated pretend and real entities on the tasks developed by Wellman and Estes (1986) and accurately categorised pictures of fantasy and real events as such on a task developed by Taylor and Howell (1973). On the basis of these findings, Taylor et al interpreted the children's earlier responses that their imaginary companions were real, as a consequence of their involvement in the pretend play rather than any genuine pretend-reality confusion.

The possibility that there might be a developmental sequence in the extent to which children understand the pretend-reality distinction was investigated in a study by DiLalla and Watson (1988). From their analyses of young children's ability to incorporate interruptions (for example, the experimenter leaving the room) in their pretend play into that play, DiLalla and Watson concluded that children of three years old and under had no understanding of a boundary between pretence and reality. That is, these children equated the worlds of pretence and reality and so were unable to return to their pretence when it had been disrupted. By three and a half years of age, the children had developed a concept labelled a 'fuzzy boundary' between pretence and reality - they realised that the two realms existed separately but were inefficient at
controlling the boundary between them and therefore did not stop the pretence or acknowledge interruptions to it. Children of about four years of age behaved in terms of what DiLalla and Watson termed a 'rigid boundary' between pretence and reality. In dealing with the interruptions to their pretence these children temporarily discontinued the pretence and subsequently re-entered pretend mode. Finally, five year old children were considered to have a concept of an 'integrated boundary' between pretence and reality such that the interruptions were seamlessly incorporated into the pretence from within the pretend mode.

However, by DiLalla and Watson's (1988) own admission, their proposed developmental sequence was based entirely on the child's ability to incorporate interruptions into their play. It could be that this is a specific skill and does not give a full picture of the child's level of understanding. Moreover, it could be that the children did not, rather than could not, incorporate the interruptions into their pretence. Golomb and Kuersten (1996) further criticise the specific details of the interruptions to the pretence, arguing that the experimenter's unexplained departure from the room would be highly disruptive of any ongoing activity, not just pretence and that the changing of the symbolic meaning of a prop and the change in the experimenter's pretend role probably tell us more about the children's responses to unexpected pretend transformations than about their understanding of the boundary between pretence and reality. Golomb and Kuersten addressed these issues in a study based on DiLalla and Watson, but which incorporated reality based intrusions into the pretence. For example, the experimenter stepped into a pretend river and bit into a pretend (play dough) cookie. Overall, the results failed to support the DiLalla and Watson developmental sequence since the majority of children, regardless of age, temporarily stopped pretending to deal with the reality intrusion and then re-commenced the pretend play. In other words, most children displayed what DiLalla and Watson had termed a 'rigid boundary' between pretence and reality. In concluding, Golomb and Kuersten argued that children's ability to distinguish pretence from reality was robust, even at three years of age.

Overall, it seems that children do understand the pretend-reality distinction and that this understanding is empirically testable from an early age. To use Lillard's words, "at least by 3 years of age children appear to have a good grasp of the fact that the pretend world is separate and different from the real world, and that the pretend representation is different from reality" (Lillard, 1994, page 221).
However, all of this evidence highlighting children’s competence at distinguishing mental from real phenomena and pretend from real entities, stands in stark contrast to various pieces of evidence which suggest that children are not always entirely confident of the reality status of objectively imaginary entities and events.

Several studies have investigated children’s ability to label specific entities as pretend or real - the results tend to show that children find these tasks difficult and often incorrectly categorise imaginary entities as real. For example, Taylor and Howell (1973) asked three to five year old children whether a series of depicted events, such as a rabbit baking a cake, could happen in real life. Despite an overall developmental trend of increasingly accurate judgements, even five year old children were prone to mistakenly thinking that the fantasy events could actually take place. Similar results have been observed using the same basic task design in studies by Samuels and Taylor (1994) and Taylor, Cartwright and Carlson (1993). In a slightly different task, Morison and Gardner (1978) showed children sets of three cards showing a mixture of real and imaginary entities including Mickey Mouse, Big Bird, monsters and dragons. The children were asked to identify which two entities went together - on each trial a legitimate fantasy pairing (for example, Big Bird and Mickey Mouse) and an alternative non-fantasy pairing (for example, Big Bird and a real bird) could be made. The incidence of fantasy based pairings did increase over the age range studied (approximately four to eleven years) however, it never reached a point of dominating over alternative pairings. In contrast, when children were asked to sort the cards into the categories of fantasy and real entities, they did rather better, with even the youngest children making correct judgements on about 70% of the trials. Therefore, although these children did not spontaneously use the categories of fantasy and reality, they were able to do so when prompted.

These experimental findings relating to children’s difficulty in making fantasy-reality categorisations are consistent with parental reports that their three to five year old children believe in the genuine existence of imaginary entities such as monsters, witches, dragons, and fairies and event-related entities such as Santa, the Easter Bunny and the Tooth Fairy (Rosengren & Hickling, 1994; Rosengren, Kalish, Hickling & Gelman, 1994). It seems that children’s skill at handling the pretend-reality boundary does not prevent them from believing in certain fantasy figures. However, Woolley (1997a), like Wellman (1990), urges caution in interpreting these data as being suggestive of any generalised confusion about fantasy and reality. Woolley instead argues that children’s beliefs in many of these figures is culturally supported. For
example, at Christmas adults describe Santa’s activities as if he is a real person. Indeed, about half of the parents in Rosengren et al.’s study admitted that they actively encouraged their children to believe in fantasy figures such as Santa, the Easter Bunny and the Tooth Fairy. Similarly, many of the parents in the Rosengren and Hickling survey acknowledged that, if their child asked, whilst they would tell them that entities such as monsters, ghosts and witches were not real, they would tell them that Santa was real. It therefore seems that children’s beliefs in certain fantasy figures are to a certain degree the product of a cultural myth that is perpetuated by the behaviour of adults (Taylor, 1997). Woolley (1997a) goes on to argue that children must learn about the reality status of fantasy figures on a case by case basis and that the fact that children, but not adults, believe in the existence of these figures as reality, is a reflection of a lack of domain specific knowledge and of adult encouragement of these beliefs, rather than being a result of a failure to distinguish fantasy from reality.

A similar line of argument may also explain children's apparent difficulty in distinguishing pretence from reality as depicted on television. Whilst there is evidence to suggest that between the ages of four and six years children come to realise that cartoon or animated programs are only make-believe, children of the same age continue to consider any program involving live, human actors to be real rather than pretend (for example, Brown, Skee; Sk; Osborne, 1979; Downs, 1990; Skee, Brown & Osborne, 1982). In addition, parental reports and interviews with children themselves suggest that many children are frightened by what they see on television (for example, Cantor & Nathanson, 1996; Cantor & Sparks, 1984; Sparks, 1986). Moreover, children of under seven years of age tend to be frightened by impossible events and fantasy programs whereas older children are more likely to be frightened by the depiction of events that have happened, or which could happen in reality (for example, news presentations and the depiction of violence and physical injury). Authors such as Cantor and Nathanson have argued that young children's fears of fantasy events on television reflect their inability to differentiate fantasy from reality.

However, as Skee, Brown and Osborne (1982) point out, learning what is real and what is pretend on television might be particularly problematic for children simply because these differing events tend to be similarly depicted, that is, realistically. For example, news footage of physical injury due to war can be very difficult to distinguish from fictional depictions of similar events. Perhaps Woolley's (1997a) argument can be applied here - that children must learn on a case by case basis the reality status of pretend events as they are portrayed on television in varying genres such as cartoons,
soap operas, dramatic reconstructions and dramas. The speed with which children learn the fantasy-reality distinction here may well also have a cultural component and may depend to some extent on the amount of exposure children have to these programs and parental framing of the reality status of the content.

There remains a considerable amount of evidence of children becoming confused about what is real and what they have merely pretended that is less readily dismissed. Observations of children during pretend play have lead to a number of descriptions of incidents when children seem to have become uncertain about the reality status of what they have pretended. For example, Garvey (1991, page 140) cites the example of children pretending about ghosts who seemed to need to reassure themselves of the status of the pretence, commenting “and by the way, we’re only pretending” and later in the same episode, “there’s no such thing as ghosts”. Garvey and Berndt (1977, page 4) quote the following dialogue between two children aged five years:

>Pretend there’s a monster coming, okay
No, let’s don’t pretend that
Okay, why?
Cause it’s too scary, that’s why”.

DiLalla and Watson (1988) offer the example of a three year old boy who, whilst pretending to be a monster, burst into tears and later explained that he was afraid of the monster. Similarly, Harris, Brown, Marriott, Whittall and Harmer (1991) describe two pre-school children who were pretending there was a monster behind a closed door - whilst one child went to open the door, the other retreated somewhat nervously. Fonagy and Target (1996) describe a three year old boy who, after dressing up in a realistic Batman costume and seeing himself in the mirror, became so frightened that he refused to ever wear the costume again. Taken together, these examples seem to suggest that despite their early competence at distinguishing pretend and real entities, young children do not always seem completely convinced of the reality status of what they are pretending. Importantly, it is not simply the case that all of these incidents involve frightening and/or supernatural pretend entities - Garvey and Berndt (1977) describe two pre-school children who pretended to make a telephone call to each other. One child enquired, “They’re not really real phones, are they?” (page 3). Nevertheless, probably the most striking evidence suggesting uncertainty about the pretend-reality distinction does indeed come from children’s fears of imaginary creatures such as monsters and ghosts. When asked to report what they were frightened of approximately three-quarters of four to six year old children and half of six to eight year old children described their fears of such entities (Bauer,
1976). Several commentators have asked the question of why fears of imaginary creatures should be so prevalent and so persistent even in middle childhood, given the overwhelming evidence that the basic pretend-reality distinction is understood by pre-school children (for example, Astington, 1994; Harris et al, 1991; Johnson & Harris, 1994; Wellman, 1990).

In addition to reports of children’s fears of imaginary creatures and other anecdotal accounts suggesting pretend-reality confusion, there is also a growing body of evidence of children in controlled experimental conditions behaving in ways that indicate confusion about pretence (or fantasy) and reality. These finding will now be discussed in some detail since they relate directly to the issues addressed in the present research.

A number of studies have investigated children’s tendency to engage in magical thinking, or fantastical thinking, whereby outcomes are thought to be caused by a person’s thoughts (control by thinking) or by other supernatural processes, rather than by natural physical causes. The rationale for including these studies in a discussion of children’s understanding of the pretend-reality distinction, is that the magical events and outcomes considered in these studies involve phenomena that are, in reality, impossible but which could conceivably occur in the world of fantasy. For example, magical outcomes include objects spontaneously appearing, disappearing, changing shape or identity, and inanimate objects apparently moving of their own volition (Johnson & Harris, 1994; Woolley, 1997a). The question is the extent to which children consider events such as these to be possible or impossible, and whether they consider them to have a magical cause. The evidence relating to children’s magical thinking thus relates to their ability to differentiate fantasy from reality.

One fundamental issue which has been addressed by research in this domain is whether magic is effectively an empty category for children, or whether they do conceive of some events and phenomena as having magical causes. Furthermore, the selectivity in the types of event and phenomena that children consider to be magical has also been assessed. Johnson and Harris (1994) offer clear evidence that children of three to six years old use the category of magic, and importantly, that they do so in a highly selective manner. In the first of their experiments, Johnson and Harris asked children about a series of transformations, enquiring whether the child thought he or she could bring about the specified outcome or whether it would be magical. For example, children were asked whether they could move a marble with their hands, and whether
they could do so just by thinking about it. The results showed that whilst children were more likely to invoke magical causes for the impossible transformations, they had a tendency to over-extend their use of the category to include some of the possible transformations.

In experiment 2, Johnson and Harris (1994) ruled out the possibility that in the first experiment, the children simply equated magic with things that they did not think could occur. Children were asked to decide which of two characters had brought about an outcome that had already happened. The children were very reliable in attributing the magical events to the magic fairy and the everyday events to a normal boy or girl. However, the results are limited in that they apply to hypothetical transformations (experiment 1) and outcomes that were described rather than experienced (experiment 2). This latter problem also applies to the data obtained by Rosengren, Kalish, Hickling and Gelman (1994) who found that four to five year old children distinguished hypothetical possible (for example, a small animal getting bigger) and impossible (for example, a big animal getting smaller) transformations (experiment 2) but claimed that these transformations could be brought about by a magician (experiment 3).

Taken together, the studies by Johnson and Harris (1994) and Rosengren et al (1994) show that children are willing to use magic to explain hypothetical events that have been described. A study by Phelps and Woolley (1994) offers further data which suggests that children will also attribute a magical cause to events that they actually witness. Four to eight year old children were shown a series of unusual phenomenon such as two (magnetic) discs repelling each other without physical contact, and were then asked to explain what happened. Phelps and Woolley found that the children appealed to magic as an explanation only when they were unable to offer a physical explanation. Consequently, there was a decrease in the number of magical explanations offered with age, and those events that were easier to explain physically were less likely to attract magical explanations than those which were more difficult to explain. Thus, even if they were incorrect, children were more likely to attempt to give a physical explanation for why a picture of a kitten looked bigger when viewed through a piece of (magnifying) glass, than they were for a trick in which a coin inserted into a box apparently disappeared. A similar methodology was used by Rosengren and Hickling (1994) who found that four year old, but not five year old, children explained 'magical' transformations of objects as being caused by magic. Five year old children tended to refer to trickery rather than magic. In both age groups the
everyday transformations rarely attracted magical explanations and the researchers therefore concluded that children are reluctant to use magical explanations unless presented with an extraordinary event.

The use of the concept of trickery as an explanation for unusual events was also observed by Chandler and Lalonde (1994). When shown an impossible event - a screen apparently passing through the space occupied by a solid block - the three to four year old children in this study initially explained what they had seen as having been caused by magic. However, when the event was shown repeatedly and after they had the opportunity to explore the experimental apparatus, the children began to refer to trickery and deception. Chandler and Lalonde note that it is not absolutely clear what the children had meant when they initially described the event as magical. Like Rosengren and Hickling (1994), these authors acknowledge the possibility that whilst the children could take magic to refer to genuine, supernatural magic, they could nevertheless alternatively use the term to refer instead to deception and trickery. The latter possibility in fact seems quite likely given that the children in Chandler and Lalonde's study mentioned magic but started to look for the trick within the apparatus when they had the opportunity to do so.

However, data obtained by Phelps and Woolley (1994) and Rosengren and Hickling (1994) suggest that children's early use of the term magic does indeed refer to genuine magic rather than just trickery. Phelps and Woolley asked children whether magicians do real magic or tricks - 75% of four year old children, 56% of six year old children but only 12% of eight year old children thought that magicians genuinely did magic. Comparable findings were obtained by Rosengren and Hickling who found that whilst four year old children viewed magic as a real phenomenon, produced by people with special powers, five year old children instead saw it as deception and trickery and that as such, magic was a skill that could be learned. A slightly different approach was taken by Woolley, Phelps and Davis (1995) who asked children aged three to six years about their beliefs about wishing. Many of these children discussed wishing as a genuinely magical process. Similarly, Vikan and Clausen (1993) found that over 90% of four to six year old children believed that the thoughts, feelings and behaviours of other people could be controlled by their thoughts. For example, if they wanted someone to be happy this could be achieved through thinking about it.

Taken together, the results of these studies suggest that children do consider some events, hypothetical and observed, to have a magical cause. Importantly, children have
been shown to be highly selective about the types of events they are prepared to consider to be magical - those events which conform to their understanding of physical causality are rarely considered magical, whilst those which violate this understanding are considered magical. Furthermore, for young children at least, this category of magical events describes genuinely fantastical phenomenon rather than magic simply being a label for deception or trickery. The studies considered so far have considered children's explanations of events. There have also been studies considering evidence of magical thinking in children's behaviour.

Evidence that magical thinking sometimes influences children's behaviour has been obtained in a series of studies conducted by Subbotskii (1985; Subbotsky, 1994, 1996, 1997a, 1997b). In the first of these studies (Subbotskii, 1985), children's beliefs about the possibility of certain magical phenomena were assessed before and after they heard a fairy story in which these magical occurrences took place. A feature of the fairy story, that is, the apparatus used in the 'magic' in the story, was then introduced into the child's environment and their behaviour in the experimenter's absence observed. In the 'magic box' experiment, for example, the majority of children initially denied that an object shown in a picture could become real (magical creation). However, after hearing a story in which Masha used her magic box to produce this outcome, not only did more children say that they thought that the outcome could occur, but over 90% of the four to six year old children attempted to reproduce the outcome when left alone with a 'magic box'. Moreover, the children showed signs of being disappointed when the magic was unsuccessful. Similarly, many children tried to replicate Vova's act of making a car move by using magic words although they had previously denied that this magical practise could be effective.

Subbotsky (1994) used a similar paradigm to assess children's beliefs that physical objects are impermeable and that the effects of time are irreversible. The children's earlier beliefs in these principles seemed to be disregarded after they heard a fairy story in which they magically did not apply - most four and five year old children and some six year old children tried to reach through a glass panel in a box after chanting appropriate magic words and similar numbers of children refused to drink 'magic water' that might make them two years younger.

In summarising the findings from these studies, Subbotsky (1994) argued that the children's understanding of what is possible in reality and through magic is not secure and can thus "be attenuated under the influence of a fairy tale and an adult's
instruction” (page 105). However, one problem with this interpretation of these data stems from the rather leading task instructions used in each case - the child is effectively instructed to try out the magical behaviours or to believe in the possibility of the magical phenomena. For example, in the ‘magic box’ experiment, children were told:

“I’m going out to do some things, and meanwhile you can play. If you want you can use the box - only don’t forget that you have to say the magic words aloud; otherwise, the box can’t hear them” (Subbotskii, 1985, page 95).

Similarly, the children’s reticence to drink the ‘magic water’ came after they had been told that:

“If you drink a little bit - you will probably turn into a little boy/girl . . . Now you can try the water, if you want. I just want to see if it works. But if you do not want to try - it is up to you” (Subbotsky, 1994, page 103).

Given such leading instructions, children’s magical behaviours might simply reflect their compliance with the experimenter’s wishes rather than any genuine belief in these magical possibilities. That said, the children’s disappointment when their magical behaviours were unsuccessful, mitigates against this explanation. Alternatively, the task instructions may have led children to expect that something would happen if they followed the experimenter’s instructions and tried the specified behaviours. The children’s disappointment might reflect this expectation not having been fulfilled and should not necessarily be interpreted as disappointment that the magic failed since the children need not have assumed that genuine magic would be causal. However, Subbotsky’s more recent studies are much less vulnerable to this kind of criticism, and yet have generated some comparable findings.

Subbotsky (1996, 1997a) placed a new postage stamp inside a wooden box which, by means of a trap door, transformed it into an old and torn one. This transformation was apparently achieved via a connected ‘magical device’, an unconnected ‘magical device’, through the incantation of a magic spell or through will-power, or mental effort, alone. The children were highly credulous about what they observed and indeed many six year old children (and some nine year old children) were unwilling to allow the experimenter to place a new stamp they had been promised as a reward, inside the box. The same wooden box was used in a further study (Subbotsky, 1997b) in which the experimenter accompanied the transformation of the postage stamp with, for example, drawing a cross on a piece of paper or cutting a piece of paper in half.
When asked, the six and nine year old children said that they believed the experimenter's manipulations had caused the transformation of the postage stamp, and furthermore, that the influence of these manipulations had been magical.

Taken together, the results from Subbotsky's research (Subbotski, 1985; Subbotsky, 1994, 1996, 1997a, 1997b) suggest that children's behaviour can be characterised by magical thinking and that unusual phenomenon are accepted as being the result of magical practices. Add these findings to children's explanations of unusual events, and a picture emerges that children do use the concept of magic to explain certain phenomenon and that they sometimes engage in seemingly magical behaviours. These data suggest that the boundary between fantasy and reality is not always strictly adhered to by children of up to nine years old. That is, children seem to believe that fantastical events really can occur. The discussion will now turn to studies that have directly assessed children's understanding of the pretend-reality distinction.

In a study investigating children's memory for whether they played with a real toy, a substitute object or an imaginary object, Foley, Harris and Hermann (1994) obtained a pattern of results which could be interpreted as reflecting children's confusion between pretence and reality. The children in the study tended to make errors in their recall, often claiming that they had played with a toy when they had in fact pretended - these mistakes were more frequent amongst three year old, than amongst five year old children. Very few children made the reverse type of error in which they claimed to have pretended when they had actually played with a toy. Foley et al interpreted these findings as suggesting that whilst pretending the children had contemplated the real equivalents of the objects represented and had recalled this, rather than the pretence. If this is correct, then the findings probably do not reflect any pretend-reality confusion during the pretence, but instead reflect an error in retrieval from memory. However, the results may suggest that children do not always keep pretence entirely separate from reality.

More direct evidence relating to children's uncertainty about the pretend-reality distinction during, rather than subsequent to their pretence, has been obtained by Woolley and Wellman (1993) who asked three to four year old children a series of questions about characters in stories who imagined something that was not the case. The results showed that the three year old children (but not the four year old children) often mistakenly believed that the character's imagination would reflect reality. For example, when Timmy was pretending there was a bear in a box, about half of the
younger three year old children and about a third of the older three year old children, claimed that the bear was real (experiment 1). In their second experiment, Woolley and Wellman asked children to imagine that an object such as a pencil was inside an empty cardboard box. In this study, over half of the younger three year old children but less than a quarter of the older three year old children claimed that they would find a real object inside the box. The children made what the authors termed a 'true fiction error' (Woolley & Wellman, page 15) or what is termed here, a confusion between pretence and reality. In other words, these children failed to maintain a boundary between what was real and what they had simply imagined and therefore they had come to believe that what they had pretended was real. These data provide striking evidence that young three year old children do not always keep the world of fantasy separate from the world of reality. However, it could conceivably be argued that these very young children are only just learning about the pretend-reality distinction and, as novices, their understanding is a little volatile. This criticism is somewhat implausible given that these children have presumably spent the previous year or two pretending and given the success of children as young as two and a half years old on tasks requiring them to state the real and pretend identities of objects (for example, Harris, Kavanaugh & Meredith, 1994). Nevertheless, even if this evidence was dismissed on the basis of the children's age and inexperience, the same criticism could not be levelled at the studies which follow since these have investigated the behaviours of somewhat older pre-school and school aged children.

Harris, Brown, Marriott, Whittall and Harmer (1991) conducted a series of studies which formed the basis of the experimental paradigm used in the present research. In their first two experiments, Harris et al asked children questions about the characteristics of various real and imagined entities (following from Wellman & Estes, 1986) - these findings were discussed earlier and so will not be repeated here (see page 22). The third and fourth experiments in the series investigated children's behaviour towards empty boxes after they have pretended about the contents. The results of these two experiments provide intriguing evidence to suggest that children of four to six years old are not always entirely certain of the reality status of what they have pretended.

In experiment 3 (Harris et al, 1991) the children were shown two boxes (1 metre$^3$) which each had a small hole in the top through which the child's finger or a stick that had been placed nearby, could be inserted. The four to six year old children were asked to pretend that in one box there was a friendly puppy that wanted to lick their
finger. The second box was populated with an imagined horrible monster who wanted to bite the child’s finger. The children were then asked a hypothetical question - to decide which box they would put their finger in. Subsequently, the children were given the alternative of using the stick rather than their finger, before being asked whether the puppy and monster were real or just pretend. The children’s actual behaviour towards the boxes was then observed. The overall rationale for observing children’s behaviour towards the pretend entities within this paradigm was that, “if children assume that such imaginary creatures have no genuine existence, then they should behave indifferently toward the two boxes. If, on the other hand, children wonder, however fleetingly, whether what they have imagined is actually present inside each box, then this should be reflected in selective behaviour toward the ‘monster’ box as compared with the ‘puppy’ box” (Harris et al, page 113).

The children’s behaviour was indeed selective - they tended to approach the puppy box before the monster box and furthermore, displayed some wariness towards the monster since they preferred to use the stick rather than their finger when approaching that box. These results suggested to Harris et al (1991) that the children had become uncertain about the distinction between pretence and reality. However there are a number of problems in accepting this interpretation of the data due to certain features of the design of the experiment. As Harris et al themselves concede, the children were not invited to check that the boxes were empty before the pretending commenced. The children therefore quite simply had no way of knowing whether the boxes were empty or whether they already contained certain entities. Coupled with the wording of the hypothetical task in which the child must choose between “the one with the monster in or the one with the puppy in” (Harris et al, page 113), it is not entirely surprising that the children responded cautiously towards the box, that for all they knew, may indeed have contained a monster of rather grand proportions. In addition, the child’s hypothetical decision was which box to put their finger in - they were not initially given the stick as an option. It is feasible that the children may have preferred to use the stick in both instances but when asked about putting their finger in one of the boxes, chose the lesser of the two evils and opted for the puppy box. Basically, the task may have confounded two separate issues - which box the child wanted to approach first and which box they wanted to put their finger inside. Finally, a further problem which Harris et al acknowledge is that the children’s selections may simply reflect their interpretation of the task as a game of make-believe in which their role is to act as if the two boxes contained a monster and a puppy. Harris et al consider such
collusion to be an unlikely explanation for the results given the children's spontaneous comments about the whereabouts of the monster, when at the end of the experiment, they looked inside the boxes and found them to be empty. Another reason that this seems an unlikely explanation for the results is that the children really had no way of being certain that the task did only involve pretence - they had not seen that the boxes were empty and the task instructions implied that they were not.

These problems were to some extent resolved in Harris et al's (1991) final experiment. Before asking children to pretend about the boxes, the experimenter asked them to look inside the boxes and to confirm that they were empty. To rule out the collusion explanation, children's behaviour was observed in the experimenter's absence - children would presumably have no reason to continue a game of make-believe that they were playing with the experimenter, when she was no longer in the room. Therefore, in experiment 4, the children checked that the boxes were empty and were then asked to pretend about the contents of one of the boxes - some children were asked to pretend that the box contained a friendly rabbit that wanted to be stroked whilst the remainder were asked to pretend about a scary monster that wanted to chase them. In both conditions, the second box was termed the neutral box and was not populated with an imaginary creature. The experimenter checked the child's memory for the nature and location of the pretend entity, asked the child if the entity was real or pretend and then made an excuse to leave the room. During the two minutes the children were left alone, their behaviour was video recorded.

The results obtained were highly suggestive of pretend-reality confusion amongst some of the four to six year old children involved in the study. Even though the children had seen that the boxes were empty and had reported that the entities were pretend, not real, four children in the monster condition did not want the experimenter to leave because they were scared, and moreover, about half of the children opened one or both of the boxes during the experimenter's absence. Importantly, the children often only opened the pretend box (rabbit or monster) and when they did open the neutral box, this tended to be after they had opened the pretend one. There were no differences in the results of the monster and rabbit conditions. About half of the children admitted to having wondered whether the imagined entity was in the box when they were subsequently asked to explain their behaviour. Harris et al.'s (1991) interpretation of these data was that the children had looked inside the boxes because they were uncertain of the pretend-reality status of the imagined entities. These authors reject the idea that the children might have looked inside the boxes out of idle curiosity - the
pretend box was opened sooner and more frequently than the neutral box and the children had already seen that the boxes were empty.

Similar findings were obtained in a follow up study by Johnson and Harris (1994 - experiment 3) who asked three, five and seven year old children to imagine that there was either a fairy or an ice-cream inside one box - the children were not asked to pretend about a second, neutral box. Again, the data were suggestive of pretend-reality confusion amongst some children. Although the seven year old children were slower to look inside the boxes than either the three or five year old children, in each age group approximately half the children looked inside the boxes. When asked about their beliefs about the box contents in a post-task interview, about three-quarters of the three and five year old children, and just under half of the seven year old children reported having wondered whether the imagined objects were real. Furthermore, this credulity was strongly associated with the children having opened the boxes in the experimenter’s absence, since nearly three-quarters of those children who opened the boxes later admitted to wondering about their contents.

Taken together, the findings obtained by Harris et al (1991) and Johnson and Harris (1994) offer convincing evidence that some children are not always able to keep the realm of fantasy separate from reality. Indeed, Johnson and Harris argue that:

"when some children imagine an outcome it leads them to wonder whether such an outcome has actually occurred even if its occurrence would be magical" (page 45).

Johnson and Harris went on to emphasise the point that pretend-reality confusions are experienced by some, but certainly not all, children by describing individual differences between two main groups of children:

"credulous children wondered if the imagined entity might be in the box, tested that possibility by opening it, and sometimes invoked magic by way of explanation. Sceptical children denied that the imagined entity could be in the box, did not check whether it was, and justified their scepticism in terms of ordinary spatial or physical considerations" (page 46).

Johnson and Harris are committed to the view that their results reflect a temporary breakdown in some children’s ability to differentiate pretence and reality.

Woolley and Phelps (1994) used a modified version of the Harris et al (1991 - experiment 3) task design in order to assess situational influences on children’s
behaviour. Woolley and Phelps presented children with an array of four boxes - one contained a real item such as a pair of socks, the child imagined there was an equivalent item in the second box, the third box was the neutral (empty) box and the fourth was left unopened. A second experimenter entered the room and claimed to need an object because, for example, she had forgotten her socks. Virtually all of the three to four year old children gave the experimenter the box containing the real item in response to her request. Very few children handed the experimenter the box containing the imagined item even though about a third of them claimed it contained a real rather than an imaginary item.

To rule out the possibility that children’s reticence to give the experimenter the imagined item box was due to either an overall reticence to offer more than one box or due to the contrast with the real item, in a second experiment Woolley and Phelps (1994) eliminated the box containing the real item. On this occasion, about one third of the three year old children but only 15% of the four year old children gave the experimenter the imagined entity when she asked for a corresponding item. Furthermore, nearly half of the three year old children but only 13% of the four year old children reported that the imagined item was actually real. Woolley and Phelps argued that the decreased number of children showing signs (behaviourally) of pretend-reality confusion in their studies relative to Harris et al (1991) and Johnson and Harris (1994) was a result of the changed situational factors. Whilst in the earlier studies there were no practical consequences involved in magical thinking and indeed such thinking may have been interpreted as being valued, in Woolley and Phelps’ study a practical response was requested by another person and therefore a response in terms of magical thinking would have real costs for that person. Woolley and Phelps further argued that the changed results across their first and second experiments were a result of the real counterpart of the imagined entity facilitating children’s judgements about the pretend-reality distinction in experiment 1. Overall though, subject to the influence of situational factors, Woolley and Phelps agree that children sometimes believe in the real existence of imagined entities.

However, Golomb and Galasso (1995) seriously question the assumption that children’s behaviour on tasks such as those used by Harris et al (1991 - experiment 4) and Johnson and Harris (1994 - experiment 3) in which children were left alone with boxes containing pretend entities, reflect any uncertainty about the pretend-reality distinction. Golomb and Galasso instead suggest that there are three alternative explanations for children’s behaviour when they opened a box they had pretended
about in the Harris et al experiment. First, box opening in the experimenter’s absence might reflect the child’s continued engagement in the pretence theme which the experimenter had not explicitly ended before she left the room. Second, the behaviour might result from boredom since the children were not provided with any alternative play activities for the period they were left alone. Third, the children may have been suspicious of trickery by the experimenter. In an attempt to test between these possibilities and the possibility that the children were, as Harris et al suggested, uncertain about the pretend-reality distinction, Golomb and Galasso (study 1) conducted a modified replication of Harris et al’s fourth experiment. However, unlike the original experiment, the experimenter in Golomb and Galasso’s version did not leave the room, instead children’s behaviour was observed by the experimenter after she moved to a corner of the room and no longer interacted with the child. In addition, the children were either allocated to a condition in which the pretence was not terminated and there were no alternative play activities provided (nonterminated pretence, no toys - as Harris et al) or to a condition in which the pretence was terminated and there was a box of toys placed conspicuously in the room (terminated pretence, toys provided). Within these experimental conditions half of the children pretended about a rabbit and half pretended about a monster.

The results of Golomb and Galasso’s (1995) experiment were dramatically different to those obtained by Harris et al (1991). Only two of the nineteen participants touched or opened either of the boxes during the period following the pretence. Golomb and Galasso attribute their findings to the children being less suspicious of the experimenter and as being a result of the termination of the pretence and the provision of alternative play activities. They further claim that the two children who opened the boxes did so as a continuation of the pretence theme rather than as a result of pretend-reality confusion.

However, the results from Golomb and Galasso’s (1995) study are in fact totally uninterpretable. Termination of the pretence and the provision of alternative play activities were completely confounded. In the absence of experimental conditions in which the pretence is not terminated but toys are provided (nonterminated pretence, toys provided) and in which the pretence is terminated but no toys are provided (terminated pretence, no toys) it is impossible to determine which of these factors is responsible for the difference in the results across this experiment and that conducted by Harris et al (1991). However, given the failure to obtain different results across the two experimental conditions that were included, it seems more likely that the
experimenter's continued presence in the room is having a constraining effect on the children's behaviour. Although Golomb and Galasso dismiss this possibility, it seems very likely that children's box opening behaviour was suppressed by the fact that the experimenter was in the room and observing their behaviour, albeit surreptitiously (this point is also made by Woolley, 1997a). However, Golomb and Galasso claim that their failure to find differences between the terminated and nonterminated pretence conditions was a result of the children interpreting the experimenter's retreat to a corner of the room as an end to the pretence, regardless of whether or not this was also signalled explicitly by the experimenter's comments. Yet Golomb and Galasso offer no rationale for believing that an experimenter moving to a corner of a room is a clearer signal of the end of the pretence, than is the experimenter actually leaving the room as she had done in Harris et al's experiment. Overall, Golomb and Galasso's first experiment does not provide any convincing evidence to suggest that the original Harris et al data should be reinterpreted.

Golomb and Galasso's (1995) second experiment followed on from their first but with the additional aim of investigating the influence of affectively charged pretence themes on children's behaviour. To this end, children were invited to play a game with the experimenter in which they pretended they were taking a walk in a forest and were going to have a picnic. During the course of the twenty minutes of pretence, one of two empty boxes was populated with a positive or negative pretend entity that was either adult initiated (rabbit or monster) or child initiated (what the child would or would not like to find in the forest). The pretence was then explicitly ended and the child's behaviour observed by the experimenter who, as in experiment 1, moved to a corner of the room and no longer interacted with the child. Unlike previous studies which have observed children's behaviour for two minutes, in this experiment the children were observed for five minutes. Once again, a box of toys was made available to the child. The results showed that only 15% of the children touched or opened the boxes in the period following the pretence - this was unaffected by whether the pretend entity was positive or negative, or was adult or child initiated. Golomb and Galasso argued that since the children who approached the boxes were no more likely to open the pretend than the neutral box, when they did so this reflected a continuation of the pretence theme and not confusion about the pretend-reality distinction.

Again, these data are unconvincing. The possibility that the experimenter's continued presence influenced the children's behaviour should be considered. Furthermore, Golomb and Galasso (1995) fail to discuss the 18% of their three year old children...
who verbally reported that the imagined entity was real rather than pretend (page 806). Instead, Golomb and Galasso claim that:

"not a single child exhibited cognitive uncertainty about the pretend status of the creatures they had imagined in the boxes" (page 808).

Overall, whilst Golomb and Galasso would argue that their data demonstrate that when children open boxes following pretence it is simply a consequence of their continued involvement in the pretence, such a conclusion is not really possible given the data as it stands. The experiments that Golomb and Galasso conducted differ in several important respects from those conducted by Harris et al (1991) and consequently it is not completely clear which experimental manipulation is of most importance. Therefore, although Golomb and Galasso do collect some intriguing data pertaining to the influence of affect on children’s pretence (these findings will be fully discussed in a later section of this chapter), their data do not seriously undermine the earlier conclusions drawn by Harris et al and Johnson and Harris (1994), that some children experience confusion about the pretend-reality distinction.

Taken as a whole, the results of the studies discussed in this section appear paradoxical. On the one hand there is ample evidence to suggest that young pre-school children (three years old) are competent in distinguishing mental and pretend entities from real entities. On the other hand, there is also evidence to suggest that even school age children (seven years old) sometimes exhibit uncertainty about the reality status of what they have pretended, and furthermore, show a genuine belief in the possibility that magic can bring about a variety of ordinarily impossible outcomes. Before moving on to a discussion of the various possible explanations for these paradoxical findings, an account will be given of the evidence which suggests that adults are not entirely different from children in terms of their fantastical thinking.

The literature relating to fantastical thinking in adults can, as with that relating to children, be divided into anecdotal and experimental evidence. The anecdotal evidence is less prolific for adults than for children. However, as authors such as Astington (1994), Lillard (1994), Wellman (1990) and Woolley (1997a) point out, many adults can report instances in which fictional entities or products of their own imagination, have lead them to become fearful. For example, Lillard offers the vivid and very familiar examples of the fear that can be aroused by films such as Psycho and the power this can have to lead to a certain nervousness when subsequently taking a shower, and the unease that can be experienced after having read a horror story late at night. Similarly, many adults believe in and are fearful of supernatural entities such as
ghosts (Bunge, 1991; Woolley, 1997a), believe in magical causality (Lesser & Paisner, 1985), and believe in the efficacy of magical practices such as superstitions, telepathy and witchcraft (Bunge, 1991).

The experimental literature also includes a variety of accounts of adult behaviours that are more consistent with magical or fantastical thinking in which the possible and impossible are not differentiated, than with scientific reasoning or reasoning in terms of everyday causal principles. Some of the clearest evidence that children engage in magical thinking was obtained by Subbotsky whose intriguing experiments revealed that children show signs of believing in the genuine possibility of magic. Recently, Subbotskii (1991; Subbotsky, 1996, 1997a, 1997b) has applied his research methodology to adult participants.

Subbotskii (1991) investigated adult understanding of the principle of object permanence - that an object can not suddenly appear or disappear, or change into a completely different object. The participants were shown a postage stamp which was then placed in a wooden box which, by means of a trap door, apparently transformed an old stamp into a new one, a new stamp into an old one, or transformed it into an entirely different postage stamp. The experimenter accompanied these transformations with a show of mental effort (trembling hands and a look of great concentration). Before seeing the transformation, most of the participants denied that mental effort could bring about any transformation of the stamp. Furthermore, their initial explanations on seeing the transformation referred to tricks and other non-magical mechanisms. However, when directly asked whether the experimenter’s mental effort might have caused the transformation, some adults acknowledged that this was a possibility. Subbotskii interpreted these data as suggesting that the participants were generally committed to the principle of object permanence but in some circumstances could be led to adopt the alternative, magical principle of discontinuity. However, credulity about the possibility of magical transformations was certainly not widespread amongst these adults. Similarly, Subbotsky (1996, 1997a) observed low levels of belief amongst adults that a wooden box could or did cause the destruction of an object via a connected ‘magical device’, an unconnected ‘magical device’, will-power or by a magic spell.

However, in a very recent study, Subbotsky (1997b) has obtained evidence to suggest that adults’ behaviour, even if not their verbal comments, reflects beliefs that magical transformations are possible. In the first experiment, children and adults witnessed the
apparent transformation of a postage stamp, accompanied by the experimenter, for example, cutting a piece of paper in half or drawing a cross on a piece of paper. The children, but not the adults, verbally acknowledged thinking that the experimenter’s actions had magically caused the transformation. In contrast to their verbal comments, the adults’ behaviour in two subsequent experiments (experiments 4 and 5) suggested precisely this type of magical belief. That is, the adults were unwilling to allow the experimenter to repeat the actions that accompanied the transformation of the postage stamp once they had placed their own driving license inside the box. Subbotsky therefore concluded that,

"in their practical actions adult participants were more likely to acknowledge the possibility of phenomenalistic causal connections if the cost of disregarding this possibility increased" (page 29).

A further aspect of adult magical thinking that has attracted considerable research interest is the extent to which adults believe in, and act in accordance with, the principles of ‘sympathetic magic’. There are two main magical laws subsumed under this heading. First, the law of contagion. According to this principle, objects which have been in contact with each other, however briefly, may influence each other through the transfer of their properties (Rozin, Millman & Nemeroff, 1986). For example, wearing an item of clothing previously worn by an enemy might be considered detrimental to the wearer since part of the enemy’s character or ill-intent may be transferred to them via the clothing (Nemeroff, Brinkman & Woodward, 1994). Second, the law of similarity. According to this principle, objects which resemble one another share fundamental properties (Rozin, Millman & Nemeroff).

The extent to which adult behaviour is determined by these magical laws was extensively researched in a series of studies by Rozin, Millman and Nemeroff (1986) who found that in a manner consistent with the principle of magical contagion, the desirability of certain brands of fruit juice could be reduced after a sample glass came into contact with a dead cockroach. Similarly, through the law of similarity, the desirability of foods could be reduced by shaping them such that they resemble disgusting objects such as dog faeces. Studies by Rozin, Millman and Nemeroff and Rozin, Markwith and Ross (1990) have similarly demonstrated that adult subjects are disinclined to drink a sugar solution labelled as ‘cyanide’, or even as ‘not cyanide’, despite the fact that they had themselves attached those labels to sugar solutions that they had produced. In this case, knowledge of reality did not prevent people from responding as if the label reflected the true nature of the sugar solution.
The operation of these magical laws has also been shown to apply in non-experimental settings and in relation to real-life issues. Rozin, Markwith and Nemeroff (1992) and Nemeroff, Brinkman and Woodward (1994) have for example, related people’s beliefs in sympathetic magic to their reactions, indeed their over-reactions, toward people with AIDS. The research shows that despite having a sound factual knowledge of the types of behaviour associated with the transmission of the AIDS virus, many adult respondents to a questionnaire responded in terms that could be interpreted as reflecting the operation of magical contagion (Nemeroff, Brinkman & Woodward). For example, over three-quarters of the respondents reported that they would be less happy about wearing clothing previously worn by an individual with AIDS, than they would be about wearing clothing previously worn by a healthy person. This reaction was unaffected by the degree of contact between the garment and the person with AIDS (number of times they had worn the garment) and by the length of time since that contact (Rozin, Markwith & Nemeroff). These results suggest that adult thinking was influenced by the magical law of contagion, despite an otherwise sound understanding of what is, in reality, possible and impossible.

Taken together, the studies by Subbotskii (1991; Subbotsky, 1996, 1997a, 1997b) and those investigating the operation of the laws of sympathetic magic offer clear evidence that, like children, adults sometimes engage in rather fantastical thinking in which they apparently fail to distinguish between what is possible in reality and what is impossible other than in the realm of fantasy. The circumstances in which adult magical thinking is most likely are, according to Keinan (1994), those in which there are high levels of stress. This is because magical thinking gives an individual a greater sense of control over their world and moreover, allows them to understand phenomena that would otherwise be inexplicable. This is another similarity between adult and childhood magical thinking since several of the studies described earlier found that children invoke magic to explain phenomena for which they can offer no other explanation (see for example, Chandler & Lalonde, 1994; Rosengren & Hickling, 1994; Phelps & Woolley, 1994). Overall then, it seems that children and adults are perhaps not entirely dissimilar in their tendency to engage in fantastical thinking. Indeed, this was the conclusion reached in a recent review article dedicated to this issue (Woolley, 1997a, 1997b). Thus the paradox between children’s ability to distinguish mental or pretend phenomenon from reality and their apparent confusions between fantasy and reality emerges in a comparable fashion for adults. The discussion will now turn to the various explanations that have been offered for these paradoxical findings. These explanations have focused in particular on the evidence relating to children. However,
given that the paradox exists for adults as well as for children, it should be noted that any explanation for why children should engage in magical thinking and experience pretend-reality confusions, must also offer an explanation for the comparable behaviours observed amongst adults.

Explanations of pretend-reality confusions and fantastical thinking

Several explanations have been offered to account for the apparently paradoxical findings that were discussed in the preceding section. These explanations can be broadly divided into two categories. First, explanations which deny that there is any paradox and which instead involve claims that children's success and failures in maintaining the pretend-reality boundary relate to methodological differences between studies. Second, there are explanations which acknowledge that the paradox is a genuine phenomenon and which therefore seek to explain why children should sometimes fail to maintain the pretend-reality distinction despite their otherwise clear competence at doing so.

Dependent measures

Several researchers have raised the possibility that children's apparent successes and failures at maintaining a distinction between pretence and reality might simply reflect a systematic variability in the types of dependent measures used (for example, Harris et al, 1991; Woolley, 1997a; Woolley & Phelps, 1994). Typically, studies highlighting children's competence in this domain have taken verbal measures of children's understanding. For example, Wellman and Estes (1986; and follow up studies by Estes, Wellman & Woolley, 1989; Harris et al, 1991; Kinoshita, 1994) asked children to verbalise the differing characteristics of mental and real phenomena. In addition, children's early competence in distinguishing the real and pretend identities of objects used in pretence have relied on verbal measures (for example, Flavell, Flavell & Green, 1987; Harris, Kavanaugh & Meredith, 1995; Lillard & Flavell, 1992; Woolley, 1995b; Woolley & Wellman, 1990). In contrast, studies offering evidence of pretend-reality confusion and magical thinking have typically relied on behavioural measures. For example, Subbotskii (1985; Subbotsky, 1994) observed children's magical behaviours, whilst Harris et al (1991 - experiments 3 and 4), Johnson and Harris (1994 - experiment 3) and Woolley and Phelps (1994) have observed children's behaviour towards boxes that they were pretending contain certain objects. Interestingly, the data relating to adults fits a similar pattern. For example, the data showing instances
of magical thinking do tend to report the adults' behaviours (Rozin, Markwith & Ross, 1990; Rozin, Millman & Nemeroff, 1986; Subbotsky, 1997b). It is therefore a possibility that there is a difference between what children (and adults) say and what they do. This could perhaps be because verbal measures assess underlying conceptual awareness whereas behavioural measures might assess, or be influenced by, other factors such as emotional reactions to the pretence (Woolley, 1997a).

A closer examination of the data suggests that variations in dependent measures cannot account for all of the findings that have been obtained. As Harris et al (1991) point out, although the children in their studies had initially labelled the box contents as pretend, during subsequent post-task interviews, many children reported that they had wondered whether the imagined entities might actually be inside the boxes. Similar findings have also been obtained in post-task interviews conducted by Johnson and Harris (1994), Subbotskii (1985; Subbotsky, 1994, 1996, 1997a) and Woolley and Phelps (1994). Furthermore, adults also verbally expressed a belief in the possibility of magical transformations in one of Subbotsky’s (1997b) studies. Likewise, children verbally refer to magic when explaining impossible events (for example, Rosengren & Hickling, 1994; Phelps & Woolley, 1994).

However, Woolley (1997a) argues that perhaps when children express credulity in post-task interviews and offer magical explanations for events, this does not reflect fantastical thinking, but instead reflects children struggling to explain what they have done or seen. That is, when asked, children feel compelled to offer some form of explanation and opt for a magical one. Although this seems unlikely given, for example, the close association between verbal reports of credulity and behaviours reflecting pretend-reality confusion observed by Johnson and Harris (1994), this possibility cannot be completely dismissed. However, there are two further pieces of evidence which suggest that the paradoxical findings are not simply a result of children’s differing responses to verbal and behavioural tasks. First, Woolley and Wellman (1993) obtained clear evidence of pretend-reality confusion on verbal measures which did not relate to the children’s behaviour. The children were asked to pretend that there was, for example, a pencil inside a box. A number of children went on to claim that the pencil was real. Thus, evidence of pretend-reality confusion is not strictly limited to behavioural data. Second, Golomb and Kuersten (1996) found clear evidence that children could behaviourally maintain a boundary between pretence and reality even when the experimenter incorporated reality based intrusions into the
pretence by, for example, biting into a pretend cookie. Therefore, not all evidence of pretend-reality competence has been exclusively dependent on verbal measures.

Overall, it seems highly unlikely that the paradox between children’s competence at distinguishing pretence from reality on the one hand, and their experiences of pretend-reality confusion on the other, is simply a methodological artefact relating to the differing dependent measures that have been used to obtain data.

**Type of imaginary entity: supernatural versus everyday**

A further methodological explanation that has been offered to account for children’s pretend-reality confusions is that perhaps children are sensitive to the type of entity they imagine. It could be that children are more confident of the pretend-reality distinction when it relates to everyday items, than they are when it relates to supernatural entities such as monsters or fairies (Woolley, 1995a, 1997a; Woolley & Phelps, 1994). This point relates to Woolley’s (1997a; see also Taylor, 1997) claim that fantasy figures might pose particular difficulties for young children due to certain cultural conventions which tend to support children’s belief in their existence. If the findings obtained relate directly to whether supernatural or everyday imaginary entities have been used, then the paradox described earlier can not be considered genuine - it would simply reflect children’s difficulties with a particular type of entity and this difficulty can be otherwise explained in terms of cultural influences on children’s beliefs.

It does appear that much of the evidence reflecting children’s competence in distinguishing pretence from reality has been obtained when everyday entities have been imagined. For example, Wellman and Estes (1986) asked children to discuss the characteristics of mental entities relating to objects such as cookies, and Flavell, Flavell and Green (1987) asked children to differentiate the pretend and real identities of, for example, a sponge that was used as a truck. Furthermore, many of the findings relating to pretend-reality confusions have involved supernatural entities. For example, anecdotal reports of fears of imaginary creatures typically refer to supernatural entities such as monsters and ghosts. Experimentally, Harris et al (1991) observed pretend-reality confusion in relation to monsters whilst Johnson and Harris (1994) observed such confusion in relation to fairies.

However, this methodological explanation of the findings can be dismissed relatively confidently, since it was directly assessed and rejected by Harris et al (1991 -
experiments 1 and 2) who found that children were as competent at describing the characteristics of imagined supernatural entities as they were at describing the characteristics of imagined everyday items. Furthermore, there is also evidence to suggest that children can experience pretend-reality confusion in relation to everyday entities such as puppies and rabbits (Harris et al - experiments 3 and 4), ice-cream (Johnson and Harris, 1994 - experiment 3) and socks (Woolley & Phelps, 1994).

Type of imaginary entity: animate versus inanimate
A further possible methodological explanation for the paradox between children's competence at differentiating pretence from reality and the findings which indicate pretend-reality confusion also relates to the type of entities that children have imagined. It is possible that children are more able to distinguish pretence from reality when these relate to inanimate items, than when they relate to animate items. There is some evidence to suggest that this might be the case. Much of the evidence demonstrating children's competence in this domain has been obtained when children have pretended about inanimate objects such as cookies (Wellman & Estes, 1986), sponges (Flavell, Flavell & Green, 1987) and milk (Harris, Kavanaugh & Meredith, 1994). In contrast, incidents of pretend-reality confusion often involve animate entities such as imagined monsters, puppies, rabbits (Harris et al, 1991) and fairies (Johnson & Harris, 1994), and children's fears of imagined creatures tend to relate to animate entities such as monsters and ghosts.

However, this explanation can also be dismissed with some certainty. Harris et al (1991 - experiment 2) found no evidence that animate imagery caused children any difficulties - children as readily stated the behavioural-sensory characteristics of an imagined witch that was chasing after them, as they did for an inanimate object such as a cup. Moreover, researchers have observed pretend-reality confusions in relation to a variety of inanimate objects including a pencil (Woolley & Wellman, 1993), ice-cream (Johnson & Harris, 1994) and a pair of socks (Woolley & Phelps, 1994). Clearly, the animacy of the imagined entities does not have a consistent influence on children's judgements about the pretend-reality distinction.

Categorisation of imagined entities
Samuels and Taylor (1994) raise the possibility that the paradoxical findings relate to systematic differences between studies in terms of whether an adult initially categorises an entity as imaginary and then asks the child to discuss it (for example, Wellman & Estes, 1986), or whether it is the child who must make the initial categorisation.
Samuels and Taylor argue that children's apparent pretend-reality confusions might stem from a difficulty in making an initial categorisation of an entity rather than from any conceptual difficulty. In support of this, these authors cite evidence relating to children's difficulties in card sorting tasks (for example, Morison & Gardner, 1978; Taylor & Howell, 1973) which suggest that children have difficulties in differentiating fantasy figures from real ones. However, this evidence is not compelling given the cultural conventions supporting children's beliefs in fantasy figures such as those involved in these studies (Woolley, 1997a). Furthermore, the Morison and Gardner data suggest that whilst children do not spontaneously use the category of pretend in these tasks, once this category has been suggested children use it accurately. Moreover, there is some evidence to suggest that children suffer pretend-reality confusion even when the adult has made the initial categorisation (by instructing the child to pretend or to imagine) and even when the child goes on to verbally confirm their understanding that the entities are not real (Harris et al, 1991; Johnson & Harris, 1994; Woolley & Phelps, 1994).

In summary, this section has reviewed a number of methodological explanations for children's apparent failures to maintain a boundary between pretence and reality, and in light of the research evidence, these explanations have been dismissed. It seems that the paradoxical findings discussed earlier can not simply be attributed to methodological differences between the studies reviewed.

The transmigration hypothesis
The transmigration hypothesis was suggested by Harris et al (1991) as a possible explanation for children's pretend-reality confusions. These authors argued that it is possible that although children can clearly differentiate between pretend and real entities, they are not entirely certain of the causal relationships between the mind and reality. In other words, children are perhaps not aware of the rules that control transformation of entities from the realm of the imaginary into reality. However, Johnson and Harris (1994) later dismissed this hypothesis on the basis of children's responses to a post-task interview - very few children made any comments that might have been interpreted as suggesting any uncertainty about the generative powers of the imagination. That is, very few children suggested that their imagination could create a real entity.
Magical thinking as context specific

Several researchers have noted that children may be more prone to pretend-reality confusions or magical thinking in some situations than in others (Rosengren & Hickling, 1994; Subbotskii, 1985, 1991; Subbotsky, 1994, 1996, 1997a, 1997b; Woolley, 1997a; Woolley & Phelps, 1994). Subbotsky develops this idea by arguing that magical thinking and so-called scientific, or rational thinking, co-exist in the minds of both children and adults - this view has been echoed recently by authors such as Boyer (1997), Harris (1994b, 1997) and Johnson (1997). For example, Harris (1997) argues that magical thinking shares much in common with everyday reasoning that is not typically considered magical. That is, reasoning in terms of beliefs and desires to predict and explain behaviour (theory of mind). Harris argues that humans have a propensity to attribute non-observable causes to observable phenomena and that this mode of thinking has been dominant throughout much of the development of the human species. It is therefore not surprising that magical thinking co-exists with scientific thinking. Subbotskii (1985, 1991; Subbotsky, 1994, 1996, 1997a, 1997b) went on to claim that these two types of thinking rarely conflict since they emerge in quite different sets of circumstances:

“in the domain of everyday reality notions of space and time are based on the structures of mutual impermeability of solid objects and the irreversibility of complex processes . . . in the domain of unusual reality (fairy tales, dreams, fantasies) unusual properties of space and time are attributed a legitimate status” (Subbotsky, 1994, page 98).

The overall tenet of Subbotsky’s argument is that children and indeed adults do engage in magical or fantastical thinking whereby, for example non-existent, imagined objects might be assumed to be real. Subbotsky does not argue that people are generally confused about fantasy and reality - in normal circumstances, rational or scientific reasoning prevails. However, in the face of unusual phenomena or in unusual circumstances, magical reasoning can be called into play.

Woolley and Phelps (1994) make a similar point. They argue that in studies such as those conducted by Subbotskii (1985, 1991; Subbotsky, 1994), Harris et al (1991) and Johnson and Harris (1994), the context of the experiment could be considered supportive of magical or fantastical thinking - there were no real life costs or consequences to be incurred from such thinking. Indeed, as Woolley and Phelps’ own experiment demonstrates, pretend-reality confusion becomes less likely, although not completely eradicated, when magical thinking would have real-life implications for another person. That is, magical thinking is somehow suppressed when there are costs
associated with it. In sum, Woolley and Phelps argue that in experimental settings, and presumably in everyday life,

"a context is created, and when believing in magic or superstition involves little costs, or conversely, when not believing involves a potentially high cost, adults and children both may appear to entertain magical beliefs" (page 65).

The idea that magical thinking may be context specific is consistent with many of the research findings relating to pretend-reality confusions and magical thinking. First, children only invoke magical explanations for events when these are unusual and cannot be explained in terms of the child’s understanding of physical causality (for example, Chandler & Lalonde, 1994; Rosengren & Hickling, 1994; Phelps & Woolley, 1994). Second, children engage in magical practises and verbally acknowledge that magic is possible after hearing a fairy story (Subbotskii, 1985; Subbotsky, 1994). Third, children engage in magical thinking and show signs of pretend-reality confusion in settings where doing so has no real-life consequences (for example, Harris et al., 1991; Johnson & Harris, 1994). Fourth, children engage in magical thinking in circumstances where not doing so might have a potentially high risk. For example, children refuse to drink ‘magic water’ which might make them two years younger (Subbotisky, 1994). Similarly, adults engage in magical thinking by not drinking a sugar solution labelled as cyanide (Rozin, Millman & Nemeroff, 1986; Rozin, Markwith & Ross, 1990) and refusing to place their driving licence in an apparently destructive ‘magic box’ (Subbotsky, 1997b). Finally, Woolley and Phelps (1994) demonstrated that levels of pretend-reality confusion amongst children are reduced when such thinking would have a practical consequence for another person.

Overall, context effects can explain many of the research findings that have been obtained. However, this explanation lacks predictive power. For example, in the studies by Wellman and Estes (1986) there are no obvious consequences of engaging in magical thinking, yet the children did not do so. Furthermore, this account does not explain why, within the same context, not all children and not all adults engage in magical thinking - why should some individuals be resistant to the effects of social context? It seems that there must be some intervening causal factor or mechanism that leads to these individual differences. That is, there must be some additional mechanism which leads to pretend-reality confusion or magical thinking in some individuals and in some circumstances. There are two main candidates for this
additional factor - the influence of increased cognitive availability and the influence of the affect, or emotion, that is evoked within these situations.

The availability hypothesis
This explanation was originally suggested by Harris et al (1991) and was later developed by Johnson and Harris (1994) in an attempt to account for children’s experiences of pretend-reality confusion. The availability hypothesis is based on the ‘availability heuristic’ (Tversky & Kahneman, 1973) which will now be described briefly before returning to a discussion of the availability hypothesis.

Tversky and Kahneman (1973) argued that through experience, individuals learn that it is easier to recall instances from large classes of objects and events, than it is to recall instances from small classes of objects and events, and that objectively likely events are easier to imagine than rare ones. These authors went on to argue that his basic knowledge can be deployed as a short-cut, or heuristic, when evaluating the frequencies and likelihoods of events. This was termed the availability heuristic, whereby an individual estimates frequencies or probabilities in terms of the ease with which they can bring examples of what is to be judged to mind. That is, high cognitive availability is taken, for example, to be an indicator of high frequency. Whilst this availability heuristic can be a very effective means of making these sorts of judgements, cognitive availability is sometimes influenced by factors other than frequency or likelihood – this leads to systematic biases in judgements using the availability heuristic. For example, in one of a series of ten experiments investigating the operation of the availability heuristic, Tversky and Kahneman asked subjects to report whether there were more words in the English language starting with, for example, the letter R, or with this as the third letter. Objectively, there are more words with R in the third position, however, words with R in the first position are more cognitively available – they are easier to bring to mind. Accordingly, the respondents incorrectly judged there to be more words with the target letter in the first than in the third position.

Studies investigating the operation of the availability heuristic have been prolific and have tended to provide further support for its influence. For example, studies such as those by Fitzgerald, Slade and Lawrence (1988), MacLeod and Campbell (1992), Manis, Shedler, Jonides and Nelson (1993) and Williams and Durso (1986) provide evidence to support the claim that judgements of the frequencies of category members are influenced by cognitive availability. Thus for example, in the Manis et al study the frequency of the names of famous men in a list were over-estimated relative to the
frequency of the names of less famous women in the same list. The argument here is that famous names were easier to bring to mind and were thus judged to be more frequent than the less famous names. In terms of the influence of availability on estimates of the probability of future events, studies have shown that these judgements are systematically influenced by imagining the outcome (for example, Carroll, 1978; Levi & Pryor, 1987; Littrell & Magel, 1991), generating reasons why the event is likely or unlikely (for example, Cervone, 1989; Hoch, 1984), personal experience of the outcome (for example, Greening, Dollinger & Pitz, 1996), the amount of information available to the subject when they make their judgement (for example, Agans & Shaffer, 1994) and whether the event is predicted to happen soon or after a long delay (for example, Milburn, 1978). All of these findings have been interpreted as suggesting the operation of the availability heuristic.

The data relating to the use of the availability heuristic by children is very limited. However, a recent study by Davies and White (1994) demonstrated that seven to ten year old children used the availability heuristic when judging whether a list had contained more human or animal characters. As in the original study by Tversky and Kahneman (1973) and the replication by Manis et al (1993) the less frequent category involved famous names, yet the children reported that this category was the more frequent. These findings were interpreted by Davies and White as evidence that children had made their judgements on the basis of the ease of bringing category examples to mind.

Overall, there seems to be much evidence to support the operation of the availability heuristic in a variety of contexts. One notable exception to the overwhelming support for Tversky and Kahneman's (1973) data and arguments is a study by White (1991) which failed to replicate the findings relating to people's judgements of the relative frequency of words with target letters in the first or third position. That said, the overall impression from the evidence in this area is that adult, and perhaps childhood, reasoning is influenced by the use of the availability heuristic. The discussion will now return to how Harris et al (1991) and Johnson and Harris (1994) applied the availability heuristic to the task of explaining pretend-reality confusions.

Harris et al (1991) and Johnson and Harris (1994) argued that the act of imagining an entity causes an increase in the ease with which ideas about such entities can be brought to mind. In other words, the imagination leads to an increase in the cognitive availability of what has been imagined. Consequently, the child experiences an
increase in the subjective likelihood of the imagined entity being real. Therefore children wonder and, in the case of the Harris et al (experiment 4) and Johnson and Harris (experiment 3) studies, test out the possible existence of the imagined entities by investigating the appropriate box. The data obtained by Johnson and Harris further suggested there are individual differences between children in relation to this - some, but not all children investigated a box containing an imaginary entity and reported wondering about the possible existence of this entity. These individual differences between ‘credulous’ children who opened the boxes and reported having wondered about the contents and ‘sceptical’ children who did neither of these things, were then related to Subbotski’s (1985, 1991; Subbotsky, 1994, 1996, 1997a, 1997b) argument that magical thinking co-exists in children’s minds with everyday reasoning in terms of normal physical causality. Whilst Subbotsky, and Woolley and Phelps (1994) argue that there are contextual influences on the operation of these methods of reasoning, Johnson and Harris further claim that some children are more likely than others to engage in magical thinking. Johnson and Harris propose that children experience an increase in the subjective likelihood of the pretence and can then further judge the likelihood of the entity being real in terms of either the everyday principle of non-creation or the alternative principle of magical creation. For sceptical children, reasoning in terms of physical causality prevails - they use their understanding of object permanence to reassure themselves that the empty box they have pretended about will continue to be empty. These children therefore do not investigate the boxes. In contrast, amongst credulous children, magical thinking prevails and they do not dismiss the possibility that the imagined entity might become real. These children then open the boxes and later admit to having wondered whether the imagined entity had really been inside the box.

It is not the case that Harris et al (1991) and Johnson and Harris (1994) are claiming that children are generally confused about the distinction between pretence and reality. Instead they argue that,

“the imagination provides a breeding ground for magical fantasies: these fantasies may be opposed by the child’s common-sense principles, or bolstered by latent magical principles” (Johnson & Harris, page 47).

Johnson and Harris add to this the idea that activities other than pretence may also lead to these magical fantasies, for example, hearing a fairy story or watching a cartoon may have a similar effect on the cognitive availability for certain magical outcomes.
The availability hypothesis appears to provide a sound explanation for much of the research evidence relating to children's failures to maintain a boundary between pretence and reality. First, the data obtained by Woolley and Wellman (1993), Harris et al (1991 - experiments 3 and 4), Johnson and Harris (1994 - experiment 3) and Woolley and Phelps (1994) in which children pretend about the contents of empty boxes and subsequently show verbal or behavioural signs of believing the contents to be real, are consistent with the effects of availability on credulous children in certain situations. Second, Subbotskii's data (1985; Subbotsky, 1994, 1996, 1997a, 1997b) can be interpreted in terms of the availability hypothesis. For example, children engaged in magical behaviours after hearing a fairy story involving these activities (Subbotskii, 1985; Subbotsky, 1994). Presumably, the fairy story made the magical outcomes easier to bring to mind, and given that the children were involved in a context which supported magical thinking, the resultant shifts in the subjective likelihood of magical outcomes were further bolstered by reasoning in terms of magical principles. In the later studies (Subbotsky, 1996, 1997a, 1997b), witnessing an event such as the impossible transformation of a postage stamp could also have lead to increased cognitive availability. Third, anecdotal accounts of children's pretend-reality confusions tend to be consistent with the overall principle that imagining an outcome makes it seem more likely.

Importantly, the evidence relating to magical thinking amongst adults can also be interpreted in terms of the availability hypothesis. The studies by Subbotskii (1991; Subbotsky, 1997b) involved showing the adult participants a magical transformation - this could act as a prompt which leads to an increase in the cognitive availability for these magical possibilities. In addition, the studies by Rozin, Millman and Nemeroff (1986) and Rozin, Markwith and Ross (1990) can be similarly interpreted. For example, perhaps the cognitive availability for the idea of the sugar solution actually being cyanide became so great that the subjects could not risk drinking that solution.

The availability hypothesis can be seen to have clear explanatory power for the literature relating to magical thinking and pretend-reality confusion in children and adults. Indeed, coupled with Woolley and Phelps' (1994) and Subbotskii's (1985, 1991; Subbotsky, 1994, 1996, 1997a, 1997b) claims that such thinking is more likely in some circumstances than in others, and with the idea of individual differences between children (Johnson & Harris, 1994), the availability hypothesis provides what seems to be a very convincing explanation for the observed phenomenon.
However, there remain some unresolved issues relating to the availability hypothesis. If, as Johnson and Harris (1994) claim, a wide variety of activities including pretence can lead to increased cognitive availability, then surely pretend-reality confusions should be more widespread than they actually are. In other words, if hearing a fairy story or any act of pretence can lead to an increase in the subjective likelihood of an outcome, wondering about the reality status of fantastical outcomes should be extremely prevalent. Yet very few children confuse pretence and reality during their everyday play activities, and anecdotal accounts of pretend-reality confusion are not commonplace (Lillard, 1994). One possibility is that there are mechanisms which serve to limit, or to constrain the effects of increased cognitive availability. Two such mechanisms already discussed are individual differences and situational or contextual constraints. However, an additional possibility is that empirical evidence of reality, or visual confirmation of the outcome of the pretence (Woolley, 1995a, 1997a) can contribute by reassuring children of the reality status of what they have imagined. That is, being able to see that an object is pretend should reduce the subjective probability of the possibility that it is real. There is some evidence to support this claim. Woolley and Wellman (1993) observed that whilst some children made pretend-reality confusions about the imagined contents of a box, very few children had done so on a warm-up example where they had imagined there was an ice-cream in the room with them. Perhaps the increased probability of the ice-cream being real had been offset by the fact that the children could not see any ice-cream. In contrast, no such empirical evidence was available when the children later pretended about a box - the effects of availability were not constrained and the children therefore wondered if the contents were real. One of the primary aims of the present research was to directly test the possibility that empirical evidence of reality constrains the effects of increased cognitive availability during pretence.

The second problem with the availability hypothesis is that although Johnson and Harris (1994) claim that availability operates for innocuous as well as frightening imaginary creatures, a full account of how the effects of availability might relate to the emotional content of the pretence has not been offered. Arguments relating to the possible role of affect in children’s understanding of the pretend-reality distinction will be discussed in the section which follows, however it is worth noting here that the effects of increased cognitive availability may be more or less easy to discount when the pretence has a positive or negative affective content. At present the availability hypothesis is silent on this issue. Therefore a further primary aim of the current
research was to explore the influence of affect on the effects of increased cognitive availability on children’s beliefs about the pretence.

To recap, the availability hypothesis suggests that children’s imagination can lead to an increase in the cognitive availability of certain outcomes and that this can lead to the imagined outcomes seeming increasingly likely. Whether or not this leads children to question the reality status of what they have imagined seems to be contingent on a combination of context effects and individual differences between children. However, whilst the availability hypothesis has sound explanatory power when applied to evidence of magical thinking and pretend-reality confusion in children and adults, there are some unresolved issues which will be investigated during the course of the research to be reported here.

**Emotional involvement in the pretence**

The possibility that the affect evoked during pretence might lead children to become uncertain about the pretend-reality distinction has been noted by several authors (for example, Bretherton, 1989; Bretherton & Beeghly, 1989; Garvey, 1991; Samuels & Taylor, 1994; Woolley & Phelps, 1994). For example, Garvey (1991) comments that, “in the heightened excitement of good fantasy play, children may suddenly feel uneasy and in need of reassurance about matters that in a cooler moment they would probably judge as ‘just make-believe’ or ‘not real’” (page 140). This impact of affect could result from children’s inability to reassure themselves with the knowledge that the source of their emotion is only pretend (Woolley, 1997a), or may result from children assuming that because the emotion experienced during affectively charged pretend play feels real (Bretherton, 1989; Bretherton & Beeghly, 1989; Fein, 1989; Lillard, 1994; Marjanovic-Shane, 1989) it must have a real source (Taylor, 1990).

The data available certainly seem to suggest that affect may play a role in at least some instances of magical thinking and pretend-reality confusion. Anecdotal evidence typically reports children experiencing fear of the products of their own imagination and similarly, those relating to adults tend to relate to fear evoking fictional material such as ghost stories and horror movies. In terms of the experimental literature, Harris et al (1991) observed pretend-reality confusion regarding a scary monster and Subbotskii (1985; Subbotsky, 1994, 1996, 1997a, 1997b) reports magical thinking about desirable and undesirable outcomes. For example, children attempted to
magically defy the laws of physical impermeability of solid objects by putting their hand through the side of a box to reach a desired object and showed a belief in the possibility of the magical reversibility of time when refusing to drink 'magic water' which could have the undesirable outcome of making them two years younger (Subbotskii, 1985). The experimental literature relating to adults is also consistent with the influence of affect. Subbotskii (1991; Subbotsky, 1997b) observed adult magical thinking in relation to the undesirable outcome of the destruction of the subjects’ driving license. In terms of sympathetic magic, reticence to eat a piece of fudge shaped as dog faeces and to drink a sugar solution labelled as cyanide can certainly be explained in terms of the negative affect these stimuli might provoke (Rozin, Markwith & Ross, 1990; Rozin, Millman & Nemeroff, 1986).

However, there are also data which suggest that pretend-reality confusions sometimes occur in the absence of any obvious emotional content to the pretence. For example, Woolley and Phelps (1994) observed some uncertainty about the reality status of an imagined pair of socks and Garvey and Berndt (1977) cite the example of the child who was not entirely convinced that a telephone was pretend. Furthermore, although Prawat, Anderson and Hapkiewicz (1985) found no relationship between the scariness of monsters and how real children judged them to be, Samuels and Taylor (1994) found that young children were likely to claim that even real frightening events could not happen in real life, despite their accuracy when categorising emotionally neutral events as real or imaginary. Therefore it is not the case that affect always leads to true fiction errors.

The relationship between children’s experience of affect and their understanding of the pretend-reality distinction is clearly not straightforward. However, it seems highly unlikely that affect is a completely unrelated aspect of the pretence. One aim of the present research was therefore to explore the relationship between affect and children’s understanding of pretence in relation to the availability hypothesis (discussed above) and in relation to the pretence continuation account which will now be discussed.

**The pretence continuation account**

In drawing parallels between the emotional reactions of children and adults to frightening fantasy content, several authors have argued that behaviours which may appear to reflect pretend-reality confusion are in fact simply a reflection of these emotions (for example, Lillard, 1994; Taylor, 1997; Taylor, Cartwright & Carlson,
For example, adult fear whilst watching a horror movie should not be taken as reflecting any uncertainty about the reality status of the movie. Likewise, a child becoming fearful of a monster should be interpreted as an emotional reaction to the fantasy and not as a confusion between pretense and reality. In other words, according to some commentators, the observed behaviours which have been interpreted as reflecting a breakdown in children's understanding of the pretend-reality distinction are actually only a product of the child's emotional reactions to the pretence. So for example, when the children in Harris et al's (1991 - experiment 3) showed wariness towards the scary monster, this was a product of their fear and was not because they thought the monster might be real. According to this view, the paradox between children's competence at distinguishing pretence from reality and the behaviours that indicate pretend-reality confusion is not a paradox at all. Children do not experience pretend-reality confusion.

Golomb and Galasso (1995) have developed these ideas into what will be termed here the 'pretence continuation account', in their attempt to explain the relationship between the child's experience of affect and their behaviour during pretence. Golomb and Galasso argue that during pretence with an emotional theme, children constantly monitor their experience of affect to ensure that it does not exceed a certain level but also to ensure that they are sufficiently involved in the pretence for it to be enjoyable. Thus in Golomb and Galasso's studies,

"children modified or transformed the pretence theme if it became too emotionally intense . . . when children became uncomfortable or felt threatened, they modified the pretence theme to diminish their fear and remain engaged in the game . . . In the positive condition, children tended to modify the theme to enhance their pleasure" (page 808).

Thus children hid behind the experimenter's skirt, claimed that the monster had no teeth and claimed that a genie would grant them three wishes, all as ways of modulating their emotional involvement in the pretence and all as part of a continuation of the pretence theme. Golomb and Galasso caution against the misinterpretation of behaviours such as these as pretend-reality confusion - these behaviours should instead be interpreted as testimony to children's skill at managing their emotional reactions when pretending.

The importance of children's emotional involvement in pretence was also highlighted by Fein (1989) who made the very similar claim that,
“the child shuttles back and forth between emotives of varying intensity; when the intensity of one emotive is too great, the child can shift to a lesser one, thereby maintaining play at an affectively tolerable level” (page 360).

It seems that Golomb and Galasso (1995) are not alone in believing that children’s degree of emotional involvement in their pretence is of paramount importance.

In terms of the existing literature, Golomb and Galasso’s (1995) claims probably do have some explanatory power but they certainly can not account for all of the findings. The children in Subbotskii’s (1985; Subbotsky, 1994, 1996, 1997a, 1997b) studies could perhaps be viewed as continuing some form of pretence. This assumes that the children had interpreted either the fairy story (Subbotskii, 1985, 1994) or the experimenter’s activities (Subbotsky, 1996, 1997a, 1997b) as some form of pretending game which they then continued. The affective component would presumably have been the child’s excitement about the possibility of the magical transformations. However, the idea that the children were pretending is not consistent with the fact that they showed overt signs of disappointment when the ‘magic’ did not work and verbally reported believing that the magical transformations were possible. Some of the findings obtained by Harris et al (1991 - experiment 3) can perhaps be interpreted in terms of pretence continuation - the children may have used their finger to approach the puppy box to increase their positive affect and used the stick for the monster box as an avoidant behaviour designed to reduce negative affect. However, if this is pretence continuation, why should the children have spontaneously commented on the whereabouts of the monster when they found the box to be empty? Similarly, although children’s approach to a box containing an imagined rabbit could be a means of increasing positive affect (Harris et al - experiment 4), once again, children’s verbal comments suggest pretend-reality confusion rather than pretence continuation. Even more importantly, some children approached the box containing an imagined monster - a behaviour that does not seem to be consistent with the motivation to reduce negative affect. Furthermore, although children in Johnson and Harris (1994 - experiment 3) might have approached boxes containing an imagined fairy or ice-cream out of pretence continuation, this certainly does not offer any explanation for why these children reported having wondered about the possible existence of the imagined entities. Overall, the experimental findings are difficult to explain their entirety in terms of pretence continuation.
A further problem with Golomb and Galasso's (1995) pretence continuation account is in its underlying assumption that children will be motivated to reduce negative affect and to increase positive affect. This assumption is not completely unreasonable – Frijda (1988) argues the same point in relation to emotions with real causes when claiming that positive affect is associated with approach and negative affect is associated with avoidance. The difficulty arises when this principle is applied to emotions evoked by fantasies. As noted above, in Harris et al.'s (1991 - experiment 4) study, some children behaved in ways that might have actually increased their negative affect. Furthermore, research has shown that some children and adults report enjoying the fear they experience when watching horror movies and indeed this fear motivates them to watch those films (for example, Allerton, 1995; Johnston, 1995; Murry & Dacin, 1996; Sparks, 1986; Tamborini, Stiff & Heidel, 1990). It seems that the negative affect elicited by fantasy is not always aversive. This possibility is not considered by Golomb and Galasso. One aim of the current research was therefore to fully assess the influence of negative affect. In addition, the claim that children simply do not experience pretend-reality confusion was tested directly.

In this section a number of explanations for children’s pretend-reality confusions have been considered. From this discussion it should be clear that none of the accounts described were able to explain all of the findings obtained in this area. The primary, over-riding aim of the present research was to assess these explanations in an attempt to more fully specify the factors influencing children’s understanding of the pretend-reality distinction. This section which follows is a summary of the aims of this research and the primary issues investigated.

**Aims of the current research**

The primary aim of the present research was to resolve the conflicting views posed by the availability hypothesis and the pretence continuation account of children’s understanding of the pretend-reality distinction. Whilst the pretence continuation account proposes that children never become uncertain about what is pretend and what is real, the availability hypothesis poses the alternative view that some children, in some circumstances, do experience this type of uncertainty. The primary aim of this research was therefore to test between these competing views and to establish whether or not there are separable groups of children who do and do not experience pretend-reality confusion.
An additional aim of the research reported here was to attempt to resolve some outstanding issues relating to the availability hypothesis and the pretence continuation account. First, this research investigated the possible influence of empirical evidence of reality on the effects of increased cognitive availability. In other words, the possibility that being able to see the outcome of the pretence might reassure children of the pretend-reality distinction was explored. Second, the relationship between differing forms of affect, children's understanding of the pretend-reality distinction and their consequent behaviour was investigated. Third, developmental trends in children's behaviour towards, and beliefs about, pretend entities were investigated.

In sum, the research reported here investigated children's understanding of the pretend-reality distinction and the relationship between this understanding and the emotional content of the pretence. Moreover, this research investigated both developmental and individual differences in children's understanding. The chapters which follow report a series of seven related experiments designed to address these issues.
Chapter 2: Experiment 1

Monsters, ghosts and witches revisited: The influence of affect and empirical evidence on children’s pretence

Introduction

The aim of the present experiment was to begin to resolve some of the unanswered questions about the availability hypothesis (Harris, Brown, Marriott, Whittall & Harmer, 1991; Johnson & Harris, 1994) and the pretence continuation account (Golomb & Galasso, 1995) of children’s behaviour towards pretend entities that were discussed in the first chapter.

The first issue to be addressed relates specifically to the availability hypothesis — although it does offer a plausible explanation for instances when children appear to have become confused about the distinction between pretence and reality, a major limitation of the hypothesis is that it would actually predict many more such instances than are reported. According to Johnson & Harris’ (1994) discussion of the availability hypothesis, any act of pretence or of the imagination might be sufficient to cause an increase in cognitive availability which leads the child to question the reality status of the pretence. So for example, in the same way that a child who pretends about a monster might begin to wonder if the imagined creature is actually real, a child who pretends that a stick is a sword might come to doubt the true identity of the stick. However, pretend-reality confusions during object substitution pretence such as this are extremely rare and children are instead very competent at distinguishing the real and pretend identities of objects (for example, Flavell, Flavell & Green, 1987; Harris, Kavanaugh & Meredith, 1994; Lillard & Flavell, 1992; Woolley, 1995b; Woolley & Wellman, 1990). Why?

One possible explanation is that there are mechanisms that serve to limit or to constrain the effects of availability. In addition to the situational constraints suggested by Subbotskii (1985; Subbotsky, 1994, 1996, 1997a, 1997b) and Woolley and Phelps (1994) and the individual differences between credulous and sceptical children proposed by Johnson and Harris (1994), a likely candidate for one such limiting mechanism is direct empirical evidence, or visual confirmation, of the outcome of the pretence (Woolley, 1997a). In other words, when the pretender is confronted with evidence pertaining to reality, the effects of the cognitive availability for the pretence
should be limited and pretend-reality confusion should be unlikely. For example, being able to see the true identity of an item used in object substitution pretence could be sufficient to eliminate any doubts about the reality status of the pretence. In contrast, in circumstances where reality is in some way hidden pretend-reality confusions may be more likely - the effects of availability for the pretence are not constrained.

The present experiment was designed to test the possible role of empirical evidence as a constraint on the effects of availability. To this end, children's behaviour under conditions of differing levels of empirical evidence was compared in a situation in which there were no real life consequences of engaging in magical thinking. In the design used by Harris et al (1991 - experiment 3) the children made their first box selection without being able to see the box contents. The cognitive availability for the pretence would not have been constrained and therefore the children may have wondered about the reality status of the pretend objects. However, when they actually opened the first box the child obtained visual confirmation that it was empty and the contents only pretend. This could have caused a reduction in the effects of availability for subsequent boxes and thus led to a change in the child's beliefs and their behaviour towards the remaining boxes. Unfortunately, with the two box design used by Harris et al these changes could not be detected - having approached one of the boxes, the child's second selection was pre-determined and may therefore have been independent of their beliefs. In contrast, by using a three box design it becomes possible to measure any change in the children's behaviour as they gain experience of finding the boxes to be empty - the second choice is not determined by the first. In this experiment children were asked to pretend about the contents of three boxes and then to predict the order in which they would open them (hypothetical task) before being asked to do so (actual task). The decision not to use the stick versus finger task used by Harris et al relates to the inclusion of the discarding task and the changed pretend entities. By comparing children's performance on the hypothetical and actual versions of the task it was possible to assess the impact of differential levels of empirical evidence. During the hypothetical task the child made all three box selections without evidence about the contents. In contrast, the second and third actual selections were made after the child had seen that the first box was empty.

Due to logical constraints the hypothetical task always preceded the actual one - children were asked to predict their behaviour before carrying it out. Consequently, any differences in children's box selection patterns might simply be attributable to a task order effect. To test this possibility a second set of tasks were introduced in
which levels of empirical evidence were held constant across the hypothetical and actual versions. When they selected boxes to throw away, rather than to open, the children never obtained empirical evidence that the boxes were empty. Any differences between the hypothetical and actual discarding tasks must be attributable to an order effect rather than differential levels of empirical evidence. The inclusion of these additional tasks therefore facilitated the interpretation of any differences observed across the hypothetical and actual opening tasks.

To summarise, the likely role of empirical evidence in limiting the effects of availability led to the prediction that children’s behaviour would vary across the hypothetical and actual opening tasks but not the hypothetical and actual discarding tasks. In contrast, Golomb and Galasso’s (1995) pretence continuation account can be taken to generate very different predictions about children’s performance across hypothetical and actual tasks due to the very different role that empirical evidence is likely to have. According to the pretence continuation account, children should never question the reality status of the pretence. Therefore empirical evidence of reality should have little or no effect on children’s behaviour - there are no effects of increased cognitive availability to be constrained. Consequently, children should respond by continuing their pretence similarly irrespective of whether the task is presented hypothetically or actually.

The second issue to be addressed in this experiment relates to the impact of affect on children’s behaviour towards pretend objects. Golomb and Galasso (1995) have argued that children continue their pretence in ways that increase positive affect and decrease negative affect. This explanation does seem to be consistent with Golomb and Galasso’s own findings and some of those from Harris et al (1991). For example, children tended to avoid a box they were pretending contained a negative entity (experiment 3). However, some children (Harris et al - experiment 4) were found to approach a box that they were pretending contained a scary monster. The Golomb and Galasso account does not offer any explanation for why these children spontaneously engaged in a behaviour that would presumably have increased the negative affect evoked by the monster. In addition, whilst the effects of availability are said to apply to innocuous creatures such as rabbits as well as frightening ones such as monsters, Johnson and Harris (1994) do not offer an account of the differential impact that varying forms of affect might have on these effects. Thus questions of the influence of affect on children’s behaviour and how this might be related to the effects of availability are far from resolved.
As a first step towards resolving these outstanding issues, this experiment was designed to compare children’s behaviour towards desired, feared and affectively neutral pretend entities on a within subject basis. Unlike previous experiments which have used adult selected positive pretend objects such as puppies (Harris et al, 1991 - experiment 3), rabbits (Harris et al - experiment 4; Golomb & Galasso, 1995 - experiment 1), fairies and ice-cream (Johnson & Harris, 1994 - experiment 3), in this experiment the children were asked to pretend about a positive item of their own choosing. However, unlike Golomb and Galasso (experiment 2) in which the child’s selection of a positive pretend object was embedded in a pretend scenario in which the child and adult encountered various creatures whilst in a forest, here the children were asked to pretend about their preferred Christmas present. This experimental manipulation ensured that all children were pretending about something that they would find desirable. Ideally, the negative pretend entity should also have been child selected to ensure that all the children feared, or at least disliked, this entity. However there are clear ethical concerns about asking children to think about items that they find extremely frightening. Therefore, like previous experiments (Harris et al, 1991; Golomb & Galasso, 1995) the children were asked to pretend about a scary monster - an entity which is typically associated with negative emotional reactions. To address the confounding of object pretence and affective neutrality that has occurred in previous experiments (Harris et al, 1991; Johnson & Harris, 1994; Golomb & Galasso, 1995), the neutral box was populated with a pretended object which was neither desired nor feared. Furthermore, to minimise the possibility that any child might embellish the pretence to make the neutral entity desirable, the children were prompted by showing them an empty cup and asking them to pretend that it was inside one of the boxes.

The use of a three box design including positive, neutral and negative affect on a repeated measures basis was an important feature of the experimental design. In Harris et al (1991 - experiment 3) children may have selected the positive box first simply because they were avoiding the negative pretend entity. With Harris et al’s two box design it is not possible to determine whether this is the case. However, the present three box design minimises this ambiguity. If when faced with positive and negative affect together children are concerned both to approach the positive entity and to avoid the negative entity, they should open the positive box first and the negative box last. If on the other hand, children are only concerned to approach the positive entity and disregard the negative one, they should open the positive box first and behave unsystematically towards the remaining boxes. Similarly, if children are
only concerned with the avoidance of the negative entity they should open the negative box last and behave unsystematically towards the positive and neutral boxes.

These predictions assume that children are likely to be motivated to decrease negative affect. However, this assumption is inconsistent with Harris et al’s (1991 - experiment 4) observation that some children chose to approach a box containing a monster. One possible explanation for this striking behaviour is that the children either were not afraid of the monster or actually enjoyed the fear associated with the monster. Alternatively, it could be that the interpretation of box opening behaviour may be less straightforward than it at first seems. Although the most typical motivation for opening a box is desire for the contents, there are several alternative motivations that might lead a child to open one box rather than another. A child might open a box out of curiosity (wanting to find out what is inside), they might open a box when they fear the contents (to relieve their fear or because they enjoy the fear), and they might even open a box simply through avoidance of an alternative. To overcome the ambiguity inherent in interpreting box opening behaviours, an additional measure of children’s affective stance towards the pretend objects was included in this experiment. When a child chooses to throw a box away, it is most certainly out of avoidance or dislike of the contents. That is, discarding is motivated by negative affect. Through comparison of children’s behaviour across opening and discarding tasks it became possible to determine whether children’s motivation during the pretence was to increase positive affect, decrease negative affect or to do both.

To recap, the fundamental experimental manipulations included in the design of this experiment were:
- a comparison of hypothetical and actual tasks
- a comparison of opening and discarding tasks
- a three box design, and
- the inclusion of positive, neutral and negative pretend objects.

Taken together these manipulations allowed an assessment of the influence of empirical evidence of reality on children’s behaviour towards pretend entities. If the effects of availability do influence children’s beliefs about pretend objects and if this influence is constrained by direct empirical evidence, marked differences should emerge between the hypothetical and actual opening tasks (but not the discarding tasks). However, if as Golomb and Galasso (1995) argue availability is not implicated and children are simply continuing their pretence, no such differences should emerge.
Furthermore, this experimental design allowed a preliminary exploration into the possible differential influence of competing forms of affect.

Method

Subjects
Forty-nine children (19 boys and 30 girls) aged between 5 years 4 months and 6 years 3 months (mean age 5 years 11 months) were recruited from two predominantly middle class schools in Hampshire and Middlesex. This age group was selected to correspond to the elder children in Harris et al (1991 - experiment 3 and experiment 4) and the middle age group in Johnson & Harris (1994 - experiment 3).

Procedure
The children were tested individually by the author in a quiet area of their school. When the child arrived three identical cardboard boxes (measuring 17 x 24 x 27 cm) were situated in a row on a table. When the child had settled she/he was asked to look inside all three boxes and to confirm that they were empty.

The order of introduction to the pretend objects was counterbalanced. Whilst introducing the pretend objects the experimenter used appropriate intonation in her voice (as in Harris et al, 1991) - enthusiastic for the positive object (the child’s preferred Christmas present), dramatic for the negative object (monster) and normal for the neutral object (empty cup). The order of the hypothetical and actual tasks was fixed such that the child was always asked to predict their behaviour before actually carrying it out.

Task introduction.¹ The task and pretend objects were introduced, "It doesn’t matter that the boxes are empty because we are going to play a game of pretend. I expect you’re good at pretend games aren’t you? . . . Is there something that you would really, really like for Christmas this year? . . . What is it? . . . OK, I want you to pretend that the {named object} you want for Christmas is in this box. Now look, this is my coffee cup (child shown a plain cup) it’s empty now but that doesn’t matter, I want you to pretend that my empty coffee cup is in this box. And, I want you to

¹The introduction, memory checks and reality checks were based where possible on those used in Harris et al (1991).
pretend that there is a horrible, mean monster that wants to come out and chase you, in this box". The boxes were indicated left to right.

**Memory check.** The child’s memory for the nature and location of the pretend objects was then checked, “OK, now can you tell me what you are pretending is in this box?”. This question was repeated for each box indicated left to right. If the child responded incorrectly to any of the memory check questions they were reminded of the objects to be pretended and the memory checks repeated.

**Reality check.** The child’s understanding of the pretend-reality status of the entities was checked, “Is the {name of object} really in this box or are you pretending?”. This question was repeated for each box indicated right to left. Incorrect responses were not corrected.

**Opening tasks.** (1) **Hypothetical opening.** The child was asked, “If I asked you to open one of the boxes, which one of the boxes would you open?”.
(2) **Actual opening.** Once the child had nominated all three boxes they were asked to act, “OK, you show me now, you open one of the boxes now”. This was repeated until the three boxes had been opened.

Before moving on to the discarding tasks the child was reminded of the nature and location of the pretend objects.

**Discarding tasks.** (1) **Hypothetical discarding.** The child was asked, “If I asked you to throw away one of the boxes, which one of the boxes would you throw away?”. This was repeated until all three boxes had been nominated.
(2) **Actual discarding.** The child was then asked to actually discard the boxes, “OK, you show me now, you throw away one of the boxes now”. This was repeated until the three boxes had been discarded.

**Debrief.** Before returning to their classroom the child was asked to check that the boxes were empty and thanked for their help.

Overall, the children made three box selections on each of four tasks, therefore producing a twelve trial response pattern reflecting the order of box opening and discarding. The order of box selections was recorded in writing along with any verbal comments the children made.
Results

Nine children failed the memory checks and so were not included in the analyses. Of the remaining 40 children, 39 (98%) responded correctly to the reality checks.

The data were subjected to Configural Frequency Analysis (CFA). This form of non-parametric, multivariate analysis of association identifies response patterns that are over-represented (types) and under-represented (anti-types) given the null hypothesis that these patterns are normally and randomly distributed (Krauth, 1985; VonEye, 1988, 1990). The results of the CFA for the patterns of box selections on each of the four experimental tasks are shown in Table 2.1.

Table 2.1: Results of Configural Frequency Analysis on children's response patterns for each of the experimental tasks analysed separately (positive = Christmas present, neutral = cup, negative = monster) (n = 40)

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Opening Tasks</th>
<th>Discarding Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hypothetical</td>
<td>Actual</td>
</tr>
<tr>
<td></td>
<td>frequency</td>
<td>z</td>
</tr>
<tr>
<td>+ N -</td>
<td>20 (17)</td>
<td>*T 5.66 (*T 4.38)</td>
</tr>
<tr>
<td>+ - N</td>
<td>8 (9)</td>
<td>0.57 (0.99)</td>
</tr>
<tr>
<td>N + -</td>
<td>3 (4)</td>
<td>-1.56 (-1.13)</td>
</tr>
<tr>
<td>N - +</td>
<td>2 (3)</td>
<td>-1.98 (-1.56)</td>
</tr>
<tr>
<td>- N +</td>
<td>4 (4)</td>
<td>-1.13 (-1.13)</td>
</tr>
<tr>
<td>- + N</td>
<td>3 (3)</td>
<td>-1.56 (-1.56)</td>
</tr>
</tbody>
</table>

*T significant response type at p < .001
*A significant response anti-type at p < .01

On the hypothetical opening task the significant response type was selection of the positive box first, neutral box second and negative box last ($z = 5.66$, $p < .001$, Bonferroni adjustment for $p$ at $0.05 = 0.08$). This response pattern accounted for the behaviour of 20 children. An additional 8 children were also represented by a single (but not statistically significant) response pattern - positive box first, negative box second and neutral box last. The remaining 12 children were distributed between 4 low frequency (non-significant) response patterns.
The results for the actual opening task were very similar to those for the hypothetical version - the same response pattern emerged as significant (z = 4.38, p < .001, Bonferroni adjustment for p at .05 = .008) and accounted for the behaviour of a similar number of children (n = 17). There were no other significant results as the remaining 23 children were represented by 5 non-significant response patterns:
  - neutral - negative - positive (n = 3)
  - negative - positive - neutral (n = 3)
  - neutral - positive - negative (n = 4)
  - negative - neutral - positive (n = 4)
  - positive - neutral - negative (n = 9)

On the hypothetical discarding task only 5 of the 6 possible response patterns were observed - none of the children nominated the positive box first, negative box second and neutral box last. One pattern of box selections emerged as a significant response type - 32 children nominated the negative box first, neutral box second and positive box last (z = 9.49, p < .001, Bonferroni adjustment for p at .05 = .01). The remaining 8 children were distributed between 4 response patterns of which 3 emerged as significant response anti-types:
  - positive - neutral - negative (n = 1 - anti-type, z = -2.77, p < .01)
  - neutral - positive - negative (n = 1 - anti-type, z = -2.77, p < .01)
  - neutral - negative - positive (n = 2 - anti-type, z = -2.37, p < .01)
  - positive - neutral - neutral (n = 9)

The results for the actual discarding task were very similar to those for the hypothetical task - the same response pattern emerged as the significant response type (z = 9.09, p < .001, Bonferroni adjustment for p at .05 = .01) and accounted for the behaviour of a similar number of children (n = 31). The remaining 9 children were distributed between 4 response patterns (1 of the 6 possible response patterns was not observed) of which 3 emerged as significant response anti-types:
  - positive - neutral - negative (n = 1 - anti-type, z = -2.77, p < .01)
  - neutral - positive - negative (n = 2 - anti-type, z = -2.37, p < .01)
  - neutral - negative - positive (n = 2 - anti-type, z = -2.37, p < .01)
- negative - positive - neutral (n = 4)
- positive - negative - neutral (n = 0)

Inspection of the results of the CFA suggests that a group level, children’s behaviour across the hypothetical and actual versions of the tasks was very similar. The significant response types were the same and emerged with similar prevalence regardless of whether the task was presented hypothetically or actually. Further analyses were conducted to establish whether individual children responded similarly across the two versions of each task (Table 2.2). On the opening tasks the majority of children either produced the response type (positive - neutral - negative) both hypothetically and actually (n = 16) or produced non-significant response patterns on both occasions (n = 19, 17 of whom generated the same non-significant response pattern across the two versions of the task). However, four children changed from producing the response type on the hypothetical task to another response pattern on the actual task. Two of these children went on to actually open the positive, negative and then the neutral box, one actually opened the neutral box first, positive box second and negative box last and the remaining child actually opened the neutral box first, negative box second and positive box last. One child changed from selecting the positive, negative and then the neutral box on the hypothetical task, to the response type on the actual task. The variability in children’s behaviour was not significant (McNemar exact significance, p = .38).

A comparison of children’s behaviour across the hypothetical and actual discarding tasks also revealed no significant differences (McNemar exact significance, p = 1.00). Only one child changed from producing the response type (negative - neutral - positive) to producing another response pattern (neutral - negative - positive) on the actual task. The remaining children either produced the response type on both (n = 31) or on neither version of the discarding task (n = 8, 7 of whom produced the same non-significant response pattern on both occasions).
Table 2.2: Comparison of children’s response patterns across hypothetical and actual opening tasks (response type: positive - neutral - negative) - figures in brackets are for discarding tasks (response type: negative - neutral - positive) (n = 40)

<table>
<thead>
<tr>
<th>Actual Task</th>
<th>Type</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>16</td>
<td>(31)</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>(1)</td>
</tr>
</tbody>
</table>

A further measure of the consistency in children’s behaviour across the tasks was obtained by performing CFA on the orders of box selections across all four experimental tasks taken together. This produced a single 12 trial response pattern for each child. The results are summarised in Table 2.3. Of the 1296 possible response patterns, 17 were observed. One pattern of box selections emerged as a significant response type (z = 7.83, p < .001, Bonferroni adjustment for p at .05 = .003). Fourteen children opened (hypothetically and actually) the positive box first, neutral box second and negative box last and then went on to discard (hypothetically and actually) the negative box first, neutral box second and positive box last. This response type reflects the high level of consistency in children’s behaviour.

There were 4 additional (non-significant) response patterns that were produced by more than one child. The behaviour of 7 children was represented by 2 perseverative response patterns such that 4 children selected the negative box first, neutral box second and positive box last on all tasks and a further 3 children selected the negative box first, positive box second and neutral box last on all tasks. Five children opened (hypothetically and actually) the positive box first, negative box second and neutral box last and then went on to discard (hypothetically and actually) the negative box first, neutral box second and positive box last. Two children opened (hypothetically and actually) the boxes in the order neutral, positive and then negative and went on the discard the negative box first, neutral box second, and positive box last (hypothetically and actually). The remaining 12 children each produced a unique response pattern.
Table 2.3: Summary of results of Configural Frequency Analysis of children’s response patterns across all experimental tasks taken together (positive = Christmas present, neutral = cup, negative = monster) (n = 40)

<table>
<thead>
<tr>
<th>Response Pattern</th>
<th>Opening Tasks</th>
<th>Discarding Tasks</th>
<th>Frequency</th>
<th>z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive = +; Neutral = N; Negative = -</td>
<td>Hypothetical (Actual)</td>
<td>Hypothetical (Actual)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ N -</td>
<td>(+ N -)</td>
<td>- N +</td>
<td>(- N +)</td>
<td>14</td>
</tr>
<tr>
<td>+ - N</td>
<td>(+ - N)</td>
<td>- N +</td>
<td>(- N +)</td>
<td>5</td>
</tr>
<tr>
<td>- N +</td>
<td>(- N +)</td>
<td>- N +</td>
<td>(- N +)</td>
<td>4</td>
</tr>
<tr>
<td>- + N</td>
<td>(- + N)</td>
<td>- N +</td>
<td>(- + N)</td>
<td>3</td>
</tr>
<tr>
<td>N + -</td>
<td>(N + -)</td>
<td>- N +</td>
<td>(- N +)</td>
<td>2</td>
</tr>
</tbody>
</table>

The remaining 12 children each produced a unique response pattern different from each other and the above.

*T significant response type at p < .001

Throughout the experimental procedure, children’s spontaneous comments were recorded. Although none of the children objected when they found the boxes to be empty, 11 (28%) spontaneously remarked that they would prefer not to discard the positive box. Analysis of the behaviour of these children on the hypothetical opening task revealed that 7 had produced the response type (positive - neutral - negative), 3 had selected the positive box first, negative box second and neutral box last and 1 had selected the negative, neutral and then the positive box.

To recap, three main findings emerged from this experiment. First, the children accurately verbally labelled the entities as pretend rather than real. Second, the children tended to open (hypothetically and actually) the positive box first, neutral box second and the negative box last and to discard (hypothetically and actually) the negative box first, neutral box second and the positive box last. Third, children’s behaviour did not differ across the hypothetical and actual versions of either the opening or discarding tasks.
Discussion

The findings obtained in this experiment were clear. Consistent with previous research (Harris et al., 1991; Johnson & Harris, 1994; Woolley & Phelps, 1994), the vast majority of children showed no difficulty or uncertainty when they were initially asked to verbally categorise the box contents as pretend or real. However, these children went on to respond in a highly systematic manner when they were asked to behave towards the boxes.

On each of the experimental tasks a single order of box selections emerged with statistically significant frequency. On the hypothetical and actual opening tasks the significant response type was selection of the box containing the pretend Christmas present first, the cup second and the monster box last. The significant response type that emerged on the hypothetical and actual discarding tasks was the reverse of that obtained on the opening tasks. A significant proportion of the children discarded the negative box first, the neutral box second and the positive box last. On the discarding tasks one of the possible response patterns did not emerge and some were generated by so few children that they emerged as significant response anti-types. However, this is likely to result from the dominance of the significant response type rather than being a psychologically meaningful effect in its own right. When children's responses across all of the tasks taken together were considered, once again, a single response pattern emerged with statistically significant frequency - a significant number of children repeatedly opted to open the positive box first and discard it last and to discard the negative box first and open it last.

It was predicted that if the effects of increased cognitive availability were the cause of children's systematic behaviour towards pretend objects, and if these effects could be constrained by empirical evidence of reality, there would be differences in children's behaviour across the hypothetical and actual versions of the opening task. Actually opening the first box and finding it to be empty was expected to lead to a reduction in the effects of availability and that this would lead to a change in children's beliefs about and behaviour towards the remaining boxes. However, several findings from this experiment suggested that this was not the case.

First, the same response pattern emerged as statistically significant on the hypothetical and actual opening tasks. Second, these response types emerged with approximately the same frequency on both occasions. Third, only seven children produced a different
order of box selections on the actual opening task than they had done on the hypothetical version of that task. Finally, the consistency in children's behaviour across the tasks was so great that a single response pattern, reflecting a combination of the significant response types on the individual tasks, emerged as significant when all of the tasks were analysed together. Taken together, these four related findings show that the empirical evidence of box contents obtained on actually opening the first box did not alter the children's second and third choices relative to the hypothetical version of the task. There are several possible explanations for this finding. It could be the case that once children have predicted their behaviour, they feel committed to that particular course of action and carry it out regardless of any changes in their beliefs. That is, the consistency across the hypothetical and actual tasks might simply reflect children's reticence to change their minds. An alternative possibility is that empirical evidence does not function as a constraint on the effects of availability and that seeing that the first box is empty is not sufficient to reassure children of the pretend status of the remaining entities. Alternatively, it could be the case that availability is not the primary cause of the children's behaviour. Finally, it remains a possibility that the children did not experience any confusion about the pretend-reality distinction and were thus unaffected by the empirical evidence of reality. One additional finding that might be taken to support this latter explanation of the findings is the fact that none of the children showed any overt signs of surprise, relief or disappointment when they opened the boxes and found them to be empty during the actual opening task. Surely if children had begun to wonder about the possible existence of the objects at least some of them would have made some comment.

However, an intriguing finding which might indicate some weakening of the pretend-reality distinction emerged from the analysis of children's spontaneous comments. Approximately one third of the children in this experiment spontaneously remarked that they would prefer not to discard the box they were pretending contained their desired Christmas present. However, none of the children made any comparable comments regarding the monster or the cup. Why? There are several possibilities.

The first possible explanation is that the children who made these comments had begun to question the reality status of the Christmas present due to the effects of availability. The disparity between the comments relating to the Christmas present but not the monster or cup would be entirely consistent with this interpretation. This experiment was conducted very shortly before Christmas - the festivities and general levels of excitement about Christmas could of course contribute to the increased cognitive
availability of the Christmas present but not the monster or cup. Intriguingly, ten of these eleven children who were reticent to discard the positive box had elected to open that box first (hypothetical task), suggesting that the verbal comments and response patterns on the box selection task could be linked with each other and perhaps also to the effects of availability. A less prosaic alternative explanation for these spontaneous comments relates to a methodological artefact in this experiment. The positive object was the only one of the three that the child was involved in selecting - perhaps children’s reticence to discard the Christmas present but not the cup or monster reflected the differential levels of the child’s involvement. Another alternative is that although children respond systematically towards positive and negative pretend objects they might perhaps be somewhat more concerned with increasing their positive affect than with decreasing their negative affect. Unfortunately, with the data as given it is not possible to distinguish between these possibilities.

The second issue addressed in this experiment related to the influence of differing forms of affect on children’s behaviour and how children respond when positive and negative affect are both evoked by the pretence. The findings relating to this issue are very clear. As Golomb and Galasso (1995) would suggest, the children behaved in ways which could be interpreted as increasing their positive affect (they opened the positive box first and discarded it last) and decreasing their negative affect (they discarded the negative box first and opened it last). These results suggest that children are concerned both to approach the positive pretend entity and to avoid the negative pretend entity. Had children been only concerned to avoid the negative entity, they should not have responded so systematically towards the positive and neutral ones. Similarly, if children were solely concerned to approach the positive entity, their responses to the others should have been less systematic. The finding that children respond systematically to positive and negative entities suggests that in Harris et al (1991 - experiment 3) the children had both sought the puppy and avoided the monster.

However, there was a sizeable number of children whose responses did not fit the modal response pattern described above, and whose behaviour therefore does not fit a straightforward interpretation of the Golomb and Galasso (1995) account. Some of these children could be discounted through having produced a perseverative response pattern - they selected the boxes in precisely the same order irrespective of the demands of the task. For example, these children may simply have shown a directional bias and selected the boxes from left to right. Yet perseverative response patterns
accounted for the behaviour of a relatively small proportion of the children sampled. A more interesting group of children were the sizeable group who elected to open the positive box first and then the negative box before the neutral box. Taking this finding in isolation would result in two alternative interpretations of the motivation underlying this response pattern. First, that these children had not experienced the negative affect that is presumably associated with the monster. Or second, that contrary to Golomb and Galasso's predictions, these children were deliberately behaving in a way that would increase negative affect. These conflicting possibilities emerge, at least in part, as a result of the ambiguity of opening tasks. A comparison of the behaviour of these children on the opening tasks with their behaviour on the less ambiguous discarding tasks clarifies their motivations. Seven of these eight children went on to discard the negative box first. Thus these children may indeed have wanted to avoid the monster and so presumably did experience the negative affect associated with it, but nevertheless they behaved in a way that increased their negative affect. The behaviour of these children is comparable to the behaviour of the children in Harris et al (1991 - experiment 4) who spontaneously opened the box they had pretended contained a monster. It is possible that these are children who enjoy the negative affect that is evoked by their pretence.

Taken together the results of this experiment show that during pretence tasks children are responsive to positive and negative affect such that they consistently respond in a way that increases positive affect and decreases negative affect. However, the behaviour of some children was not consistent with this model. In addition the findings suggest that either the availability hypothesis is not an adequate explanation of children’s behaviour, or that the effects of availability persist even after children have experienced empirical evidence that the objects are only pretend. The children’s spontaneous comments are highly suggestive however, that some children had experienced pretend-reality confusion and therefore that the influence of increased cognitive availability can not yet be ruled out. In other words, it is not yet possible to determine whether the significant response patterns observed here were the result of pretence continuation, or were instead the behaviour of children who were uncertain about the pretend-reality status of the box contents, or both.
A developmental study of children’s sensitivity to the influence of affect and empirical evidence on pretence

Introduction

The results from experiment 1 suggested that children’s behaviour towards pretend objects was systematically influenced by the differing forms of affect evoked. Although there were some interesting exceptions, the children tended to prioritise their approach towards positive pretend entities and delay their approach towards negative ones. However, it was not possible to draw any firm conclusions regarding whether children’s responses reflected a continuation of the pretence (Golomb & Galasso, 1995) or were instead indicative of pretend-reality confusion, nor whether any such confusion was caused by the effects of availability (Harris, Brown, Marriott, Whittall & Harmer, 1991; Johnson & Harris, 1994). The differential levels of empirical evidence across the hypothetical and actual opening tasks did not influence children’s behaviour in the way that had been expected. Nevertheless, a sizeable number of children made comments that could be interpreted as reflecting pretend-reality confusion.

However, experiment 1 was conducted using a group of children within a very limited age range (five to six years old). The aim of the present experiment was to extend the findings obtained in experiment 1 across a broader age range (four to seven years old) in order to establish whether children’s sensitivity to empirical evidence and their responses to varying forms of affect differ developmentally. The failure to find differences between the hypothetical and actual opening tasks in experiment 1 does not preclude the possibility that such effects might emerge amongst differently aged children. It is possible, for example, that older children are more sensitive to the influence of empirical evidence on availability effects and are thus less susceptible to pretend-reality confusions. Older children are perhaps better able to use the information gained from seeing the outcome of the pretence to offset the increase in cognitive availability that the pretence causes. Furthermore, the differential effects of positive and negative affect might vary according to the child’s age - perhaps younger children are more concerned with negative affect than with positive affect. To explore these and other possibilities the present experiment followed the design used in experiment 1 across three groups of children:
The younger group of children (four to five years old) sampled here were comparable to the younger children sampled by Harris et al (1991 - experiment 3 and experiment 4) and the elder children in Golomb and Galasso (1995 - experiment 1 and experiment 2). The middle group of children (five to six years old) were equivalent to those who participated in experiment 1, the elder children in Harris et al (experiment 3 and experiment 4) and the middle group of children in Johnson and Harris (1994 - experiment 3). The older children (six to seven years old) sampled here were comparable to the eldest children who participated in Johnson and Harris (experiment 3). Thus the range of children who participated in the present experiment subsumed the most frequently sampled ages in previous experimental work using a similar paradigm.

There were two minor modifications to the design of this experiment compared to experiment 1. First, the order of the opening and discarding tasks was counterbalanced (as in experiment 1, the order of the hypothetical and actual versions of each task remained fixed such that children predicted their behaviour before carrying it out). Second, a series of additional memory checks were included. After making each box selection children were asked to confirm the pretend contents of the chosen box. This was to ensure that variability in children's behaviour did not occur as a function of a box selection error caused by, for example, children forgetting what they had been asked to pretend was in each box.

Method

Subjects
Three groups of children (N = 98) were recruited from a predominantly middle class school in Hampshire. The younger group were 35 children (21 boys and 14 girls) aged between 4 years 6 months and 5 years 6 months (mean age 5 years). The middle group consisted of 33 children (20 boys and 13 girls) aged between 5 years 6 months and 6 years 6 months (mean age 6 years 1 month). The older group were 30 children (14 boys and 16 girls) aged between 6 years 7 months and 7 years 6 months (mean age 7 years).
Procedure
The procedure used was identical to experiment 1 (see page 69) with two exceptions. First, the order of the opening and discarding tasks was counterbalanced (the order of the hypothetical and actual tasks remained constant as before). Second, after each box selection children were asked a memory check question - “Which one is that?” - the data were coded to reflect the child’s memory for the location of the pretend objects.

Results
Eight children failed the memory checks and so were not included in the analyses. The data for an additional child were lost due to an interruption which required her to leave before completing the experimental procedure. Of the remaining 90 children (30 in each age group), 87 (97 %) responded correctly to the reality checks. Two of the 3 children who incorrectly reported that the objects were real came from the younger age group, the other came from the middle age group.

The results of the CFA for the patterns of box selections on each of the experimental tasks are shown in Table 3.1.

Table 3.1: Results of Configural Frequency Analysis on children’s response patterns for each of the experimental tasks analysed separately (positive = Christmas present, neutral = cup, negative = monster) (n = 90)

<table>
<thead>
<tr>
<th>Pattern</th>
<th>frequency</th>
<th>z</th>
<th>Hypothetical (Actual)</th>
<th>frequency</th>
<th>z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive = +</td>
<td>Neutral = N</td>
<td>Negative = -</td>
<td>Opening Tasks</td>
<td>Discarding Tasks</td>
<td></td>
</tr>
<tr>
<td>+ N -</td>
<td>47 (44)</td>
<td>*T 9.05 (*T 8.20)</td>
<td>3 (2)</td>
<td>*A -3.39 (*A -3.68)</td>
<td></td>
</tr>
<tr>
<td>+ - N</td>
<td>18 (14)</td>
<td>0.85 (-.28)</td>
<td>4 (5)</td>
<td>*A -3.11 (*A -2.83)</td>
<td></td>
</tr>
<tr>
<td>N + -</td>
<td>8 (13)</td>
<td>-1.98 (-.57)</td>
<td>3 (3)</td>
<td>*A -3.39 (*A -3.39)</td>
<td></td>
</tr>
<tr>
<td>- N +</td>
<td>8 (4)</td>
<td>-1.98 (*A -3.11)</td>
<td>69 (58)</td>
<td>*T 15.27 (*T 12.16)</td>
<td></td>
</tr>
<tr>
<td>- + N</td>
<td>5 (10)</td>
<td>*A -2.83 (-1.41)</td>
<td>5 (10)</td>
<td>*A -2.83 (-1.41)</td>
<td></td>
</tr>
</tbody>
</table>

*T significant response type at p < .001
*A significant response anti-type at p < .01
On the hypothetical opening task the significant response type was selection of the positive box first, neutral box second and negative box last \((z = 9.05, \ p < .001, \ \text{Bonferroni adjustment for } p \text{ at } .05 = .008)\). This response pattern represented the behaviour of 47 children. The second most frequent (but non-significant) response pattern, generated by 18 children, was selection of the positive box first, negative box second and neutral box last. The remaining 25 children were distributed between four response patterns of which two emerged as significant response anti-types (see Table 3.1). The results for the actual task were very similar to those for the hypothetical task - the same response pattern emerged as the significant response type \((z = 8.20, \ p < .001, \ \text{Bonferroni adjustment for } p \text{ at } .05 = .008)\) and accounted for the behaviour of a similar number of children \((n = 44)\). Two significant response anti-types emerged, accounting for the behaviour of 9 children and the remaining 37 children were distributed between 3 non-significant response patterns (see Table 3.1).

On the hypothetical discarding task one pattern of response emerged as a significant response type and the remaining 5 response patterns emerged as significant response anti-types (see Table 3.1). The significant response type was for the negative box to be nominated first, neutral box second and the positive box last \((z = 15.27, \ p < .001, \ \text{Bonferroni adjustment for } p \text{ at } .05 = .008)\). This response pattern represented the behaviour of 69 children. A slightly different pattern of results emerged on the actual task compared to the hypothetical discarding task. The same response pattern emerged as the significant response type \((z = 12.16, \ p < .001, \ \text{Bonferroni adjustment for } p \text{ at } .05 = .008)\) but accounted for the behaviour of slightly fewer children \((n = 58)\). In addition, only 3 of the remaining 5 response patterns emerged as significant response anti-types (see Table 3.1).

Analyses comparing children’s responses across the hypothetical and actual versions of the tasks were conducted. Inspection of Table 3.2 revealed that on the opening tasks the majority of children either produced the response type (positive - neutral - negative) on both versions of the task \((n = 38)\) or on neither \((n = 37)\). Nine children changed from producing the response type on the hypothetical task to producing a different response pattern on the actual task. A further 6 children changed from producing one of the other response patterns to producing the response type. This degree of variability across the tasks was not significant (McNemar exact significance, \(p = .607\)). Further analysis of children’s performance across the two tasks (Table 3.3) revealed that of the 9 children who produced the response type on the hypothetical but not the actual task, 6 actually opened the positive box first, negative box second and
neutral box last, 2 actually opened the negative, positive and then the neutral box and the last actually opened the neutral, positive and then the negative box. Of the 6 children who produced the response type on the actual but not the hypothetical task, 4 had hypothetically opened the positive box first, negative box second and neutral box last. There were 37 children who produced non-significant response patterns on both versions of the task - 25 of these children generated the same response pattern on both tasks. Overall, 27 children (30%) produced different response patterns across the hypothetical and actual opening tasks. These children were equally distributed between the three age groups.

Table 3.2: Comparison of children’s response patterns across hypothetical and actual opening tasks (response type: positive - neutral - negative) - figures in brackets are for discarding tasks (response type: negative - neutral - positive) (n = 90)

<table>
<thead>
<tr>
<th>Actual Task</th>
<th>Type</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>38 (56)</td>
<td>6 (2)</td>
</tr>
<tr>
<td>Other</td>
<td>9 (13)</td>
<td>37 (19)</td>
</tr>
</tbody>
</table>

On the discarding tasks (Table 3.2) there was a significant degree of change in children’s behaviour (McNemar exact significance, p = .007). Although 56 children produced the response type (negative - neutral - positive) both hypothetically and actually and a further 19 children produced other response patterns on each occasion, 13 children produced the response type on the hypothetical task but produced a different response pattern when actually discarding the boxes and the 2 remaining children produced the response type on the actual but not the hypothetical task. To investigate fully the nature of this variability in children’s behaviour, further analyses comparing children’s response patterns across the two versions of the task were performed. As can be seen from Table 3.3, of the 13 children who produced the response type on the hypothetical but not the actual task, 6 actually discarded the neutral box first, negative box second and positive box last, 5 actually discarded the negative, positive and then the neutral box, one discarded the positive, neutral and then the negative box and the last discarded the positive, negative and then the neutral box. Of the 19 children who produced the response type on neither task, 15 produced identical response patterns across the two versions of the discarding task. Overall, 19
children (21\%) produced different response patterns across the hypothetical and actual discarding tasks. Only one of these children was from the older age group, the remainder (n = 18) were equally represented by younger and middle children.

Table 3.3: Analysis of the relationship between children’s response patterns across the hypothetical and actual opening tasks - figures in brackets are for discarding tasks (positive = +, neutral = N, negative = -) (n = 90)

<table>
<thead>
<tr>
<th>Hypothetical Opening Task</th>
<th>(Hypothetical Discarding Task)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Task</td>
<td>+ N -</td>
</tr>
<tr>
<td>+ N -</td>
<td>38 (1)</td>
</tr>
<tr>
<td>+ - N</td>
<td>6 (1)</td>
</tr>
<tr>
<td>N + -</td>
<td>1 (-)</td>
</tr>
<tr>
<td>N - +</td>
<td>1 (-)</td>
</tr>
<tr>
<td>- N +</td>
<td>1 (-)</td>
</tr>
<tr>
<td>- + N</td>
<td>2 (-)</td>
</tr>
</tbody>
</table>

Analysis of the frequencies of each response profile on the hypothetical opening task according to age group (Table 3.4) revealed that whilst the response type was generated by similar numbers of younger (n = 12) and middle (n = 14) children, it was generated by more children from the older age group (n = 21). A slightly different age related trend was observed on the actual opening task. The response type was generated by similar numbers of middle (n = 17) and older (n = 16) children but somewhat fewer younger children (n = 11). Inspection of Table 3.5 suggests a more linear developmental trend for the children’s behaviour on the discarding tasks. On the hypothetical discarding task, 17 children from the younger age group produced the response type, 23 children from the middle age group did so, and amongst the older age group this response pattern was approaching ceiling - 29 of the 30 children responded in this manner. A similar trend also emerged on the actual discarding task. No other age related trends were apparent.
Table 3.4: Summary of response patterns produced on the hypothetical opening task (actual opening task in brackets) presented according to age group (positive = +, neutral = N, negative = -) (n = 90)

<table>
<thead>
<tr>
<th>Age</th>
<th>+N</th>
<th>-N</th>
<th>+N</th>
<th>-N</th>
<th>+N</th>
<th>-N</th>
<th>+N</th>
<th>-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger</td>
<td>12 (11)</td>
<td>5 (5)</td>
<td>3 (4)</td>
<td>2 (2)</td>
<td>5 (3)</td>
<td>3 (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle</td>
<td>14 (17)</td>
<td>9 (3)</td>
<td>1 (4)</td>
<td>2 (2)</td>
<td>2 (0)</td>
<td>2 (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Older</td>
<td>21 (16)</td>
<td>4 (6)</td>
<td>4 (5)</td>
<td>0 (1)</td>
<td>1 (1)</td>
<td>0 (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>47 (44)</td>
<td>18 (14)</td>
<td>8 (13)</td>
<td>4 (5)</td>
<td>8 (4)</td>
<td>5 (10)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.5: Summary of response patterns produced on the hypothetical discarding task (actual discarding task in brackets) presented according to age group (positive = +, neutral = N, negative = -) (n = 90)

<table>
<thead>
<tr>
<th>Age</th>
<th>+N</th>
<th>-N</th>
<th>+N</th>
<th>-N</th>
<th>+N</th>
<th>-N</th>
<th>+N</th>
<th>-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger</td>
<td>3 (2)</td>
<td>3 (4)</td>
<td>3 (2)</td>
<td>2 (6)</td>
<td>17 (13)</td>
<td>2 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle</td>
<td>0 (0)</td>
<td>1 (1)</td>
<td>0 (1)</td>
<td>3 (4)</td>
<td>23 (17)</td>
<td>3 (7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Older</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (2)</td>
<td>29 (28)</td>
<td>0 (0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3 (2)</td>
<td>4 (5)</td>
<td>3 (3)</td>
<td>6 (12)</td>
<td>69 (58)</td>
<td>5 (10)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To further investigate these apparent age related trends in children’s behaviour a series of CFA were performed across the twelve trial response patterns generated across all four experimental tasks taken together. The results of these analyses which were performed taking each age group separately are summarised in Table 3.6. Irrespective of age, the same, single response type emerged - a significant number of children opened (hypothetically and actually) the positive box first, neutral box second and negative box last and discarded (hypothetically and actually) the negative box first, neutral box second and positive box last. Amongst the younger age group this response type accounted for the behaviour of 6 children (z = 4.20, p < .001, Bonferroni adjustment for p at .05 = .002). A further 3 children produced a single (non-significant) response pattern by opening (hypothetically and actually) the positive box first, negative box second and neutral box last and discarding (hypothetically and
actually) the negative box first, neutral box second and positive box last. The remaining 21 children produced unique response patterns.

Nine children from the middle age group behaved according to the significant response type \(z = 6.28, p < .001\), Bonferroni adjustment for \(p \text{ at } .05 = .003\) and there were an additional 2 response patterns (non-significant) that were produced by more than one child. Two children opened (hypothetically and actually) the positive box first, neutral box second and negative box last and hypothetically discarded the negative box first, neutral box second and positive box last. However, when actually discarding the boxes these children selected the negative box first, positive box second and neutral box last. A further 2 children also opened (hypothetically and actually) the positive box first, neutral box second and negative box last and hypothetically discarded the negative box first, neutral box second and positive box last. However, these children actually discarded the neutral box first, negative box second and positive box last. The remaining 17 children in this age group produced unique response patterns.

Of the older age group, 15 children produced the significant response type \(z = 6.78, p < .001\), Bonferroni adjustment for \(p \text{ at } .05 = .006\). A further 5 children hypothetically opened the positive box first, neutral box second and negative box last but actually opened the positive box first, negative box second and neutral box last. These children hypothetically and actually discarded the boxes in the same order - negative box first, neutral second, and positive last. Four children responded by opening (hypothetically and actually) the neutral box first, positive second and negative last and discarded (hypothetically and actually) the negative box first, neutral second and positive last. The remaining 6 children produced unique response patterns.

The overall trend which is apparent from the CFA across all tasks taken together is that with increasing age, more children respond to the tasks by opening (hypothetically and actually) the positive box first, neutral box second and negative box last, and discarding (hypothetically and actually) the negative box first, neutral box second and positive box last. This trend is shown clearly in Table 3.7 which presents the numbers of children producing the response type compared to the other response patterns taken together, according to age group. This distribution of frequencies was significant \(\chi^2 = 6.3, df = 2, p < .05\).
Table 3.6: Summary of results of Configural Frequency Analysis of response patterns across all experimental tasks taken together, presented according to age group (positive = Christmas present, neutral = cup, negative = monster) (n = 90)

<table>
<thead>
<tr>
<th>Response Pattern</th>
<th>Age Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Younger</td>
</tr>
<tr>
<td><strong>Opening</strong></td>
<td><strong>Discarding</strong></td>
</tr>
<tr>
<td>+ N -</td>
<td>- N +</td>
</tr>
<tr>
<td>+ - N</td>
<td>+ N -</td>
</tr>
<tr>
<td>+ N -</td>
<td>+ N -</td>
</tr>
<tr>
<td>+ N -</td>
<td>+ N -</td>
</tr>
<tr>
<td>N + -</td>
<td>N + (-)</td>
</tr>
<tr>
<td>+ N -</td>
<td>(+ - N)</td>
</tr>
<tr>
<td>N + -</td>
<td>N + (-)</td>
</tr>
<tr>
<td>N + -</td>
<td>N + (-)</td>
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<tr>
<td>N + -</td>
<td>N + (-)</td>
</tr>
<tr>
<td>N + -</td>
<td>N + (-)</td>
</tr>
<tr>
<td>N + -</td>
<td>N + (-)</td>
</tr>
</tbody>
</table>
| The remaining 15 younger children, 20 middle children and 3 older children each produced a unique response pattern different from each other and the above.

* T significant response type at p < .001

Table 3.7: Children producing the response type across all tasks presented according to age group (n = 90)

<table>
<thead>
<tr>
<th>Response Pattern</th>
<th>Age Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Younger</td>
</tr>
<tr>
<td>Type</td>
<td>6</td>
</tr>
<tr>
<td>Other</td>
<td>24</td>
</tr>
</tbody>
</table>

An analysis of the spontaneous comments that children made during the experimental procedure revealed that 8 children (9%) remarked that they would prefer not to open or to discard one of the boxes. Two of these children did not want to discard the positive box, one did not want to open the negative box and 5 neither wanted to open the negative box nor to discard the positive box. Interestingly, 7 of these 8 children
had produced the response type (positive - neutral - negative) on the hypothetical opening task and the other had selected the positive box first, negative box second and then the neutral box. Only one child commented about the boxes being empty, remarking that she was relieved not to find a monster in the negative box. This child had hypothetically opened the positive box first, negative box second and then the neutral box but did not comment that she would prefer not to open or discard any of the boxes. An additional child, after discarding the boxes and returning them to the table in preparation for the opening tasks remarked, "Phew! At least I get my presents back". This child opened the negative, positive and then the neutral box (hypothetical task).

**Discussion**

The results from this experiment were very similar to those obtained in experiment 1. Although the vast majority of children accurately labelled the objects as pretend and not real, they tended to respond in a highly systematic manner when asked to behave towards those objects. On the opening tasks (hypothetical and actual) children most frequently selected the positive box first, the neutral box second and the negative box last, whilst on the discarding tasks (hypothetical and actual) the majority of children selected the negative box first, neutral box second and the positive box last. When the tasks were analysed together a single response pattern reflecting a combination of these individual response patterns was significant. That is, a significant number of children consistently opened the positive box first and discarded it last, and discarded the negative box first and opened it last, across all tasks. These significant response types were identical to those observed in experiment 1.

In the first experiment, it was argued that if the effects of availability caused children’s systematic behaviour towards the pretend objects and that if these effects could be constrained by empirical evidence of reality, then there should be differences between the children’s behaviour on the hypothetical and actual opening tasks but not the hypothetical and actual discarding tasks. In experiment 1 these differences did not emerge. Likewise, the children’s behaviour in this experiment did not differ significantly across the hypothetical and actual opening tasks. Indeed regardless of age, less than one third of the children actually opened the boxes in a different order to the one they had predicted on the hypothetical task. Interestingly, of these children one third changed between opening the positive, neutral and then the negative box and
opening the positive, negative and then the neutral box. Why should some children say that they will open the monster box last (hypothetical task) but change their mind and actually open it second, and why should some children say that they will open the monster box second but actually open it last?

It is possible that the changes in the children’s behaviour across the hypothetical and actual opening tasks reflect the influence of empirical evidence on the effects of availability. That is, when the children actually open the positive box and find it to be empty, this influences their beliefs about the remaining pretend objects and their behaviour changes relative to the hypothetical task. In other words, those children who actually open the monster box second after saying they would open it last may have gained confidence about the pretend status of the monster after opening the first (positive) box and finding it empty. It seems very unlikely that these changing patterns of behaviour are merely a reflection of box selection errors - the data were coded to reflect the child’s memory of which object was in the chosen box. Furthermore, the only other sizeable cluster of response patterns across the two versions of the opening task involved those children who said that they would open the positive, negative and then the neutral box but who actually opened the negative box first, and then the positive and neutral boxes. Thus the variability in children’s behaviour does not appear to be randomly distributed between the observed response patterns.

In contrast to the opening tasks, there were significant differences between children’s responses on the hypothetical and actual discarding tasks. Less than a quarter of the children actually discarded the boxes in a different order to that which they had predicted on the hypothetical task. However, the vast majority of these children changed from saying that they would discard the negative box first, neutral box second and positive box last, to actually discarding the boxes in a different order (it is this consistency in the direction of change that lead to the significant result being obtained). Most of these children either actually discarded the neutral, negative and then the positive box, or the negative, positive and then the neutral box. Thus like the opening tasks, there appears to be a systematic pattern to the changes in children’s behaviour. However, these variations across the hypothetical and actual discarding tasks are not suggestive of an effect of empirical evidence on availability since children do not obtain visual confirmation of the box contents on either version of the task. Therefore it is likely that these differences reflect an effect of task order on children’s behaviour - the actual task always followed the hypothetical one. This being the case, the possibility that the differences between the hypothetical and actual opening tasks also merely
reflected a task order effect can not be ruled out. That said, the greater degree of variability across the opening tasks compared to the discarding tasks suggests that it is unlikely that there is absolutely no effect of empirical evidence on children's behaviour during the actual opening task.

In experiment 1 it was argued that the children had behaved in ways which may have served to increase their positive affect and to decrease their negative affect. The children had selected the positive pretend object first and the negative one last on the opening tasks and discarded the negative pretend object first and the positive one last. The children in the present experiment seem to have been similarly motivated - the same patterns of results emerged amongst all three age groups. Despite the similarities between the age groups there did appear to be a developmental trend in the children's behaviour. Whilst only a fifth of the four to five year old children consistently behaved such as to increase positive and decrease negative affect across all tasks, nearly one third of the five to six year old children and half of the six to seven year old children did so. This seems to suggest that children's motivation to increase positive affect and to decrease negative affect becomes more consistent with age. It is unlikely that this finding merely reflects children becoming more accurate or reliable in their box selections - similar age related trends were also apparent from the analysis of each task separately.

It seems from the present results that, as Golomb and Galasso (1995) would argue, children might have been continuing their pretence with affectively appropriate behaviours when they made their box selections. Perhaps it is the tendency to do this which increases with age. However, there were three findings obtained in this experiment which are not consistent with such an interpretation. First, Golomb and Galasso's pretence continuation account would predict that children would behave in ways that decrease rather than increase their negative affect. However, in this experiment, like experiment 1, a sizeable group of children opened the positive box first, and then the negative box second rather than leaving it until last. These children behaved in ways which may have increased their negative affect as well as their positive affect. Interestingly, although the frequencies were too low for statistical analysis, this response pattern was more frequent amongst five to six year old children (middle age group) than amongst either the younger or older groups of children.

Second, contrary to Golomb and Galasso's (1995) expectation that affectively appropriate pretence continuation would occur without pretend-reality confusion,
there was some evidence of a possible breakdown of the pretend-reality distinction for a minority of children. A small group of children in this experiment spontaneously commented that they would prefer not to discard the Christmas present box, or to open the monster box, or to do both of these things. There were no comments referring to the affectively neutral pretend entity.

In experiment 1 the children’s spontaneous comments had exclusively focused on the Christmas present. This could have been attributable to the additional increased cognitive availability of this pretend object and not the monster or cup, that may have been generated by the ongoing Christmas festivities. This disparity between the levels of availability for the positive pretend entity compared to the negative and neutral pretend entities was eliminated in the present experiment which was conducted several months after Christmas (during March), thus cognitive availability for the Christmas present was reduced to a level equivalent to that for the monster and the cup – all three were elevated only by the pretence. In this experiment children’s comments referred to both the positive and negative objects, and furthermore, they were of markedly reduced prevalence compared to experiment 1. Taken together these changed findings suggest that the children’s spontaneous comments were attributable to the effects of increased cognitive availability and were perhaps suggestive of some uncertainty about the pretend-reality distinction. It may be that the children had begun to wonder if the objects were inside the boxes and so made additional attempts to retain the desirable object and avoid the feared one. The children’s comments also perhaps suggest that availability effects are more pronounced for affectively loaded pretend entities – no child made any comments about the neutral pretend object despite a presumably equivalent increase in cognitive availability. Interestingly, the vast majority of the children making these comments opened the positive, neutral and then the negative box (hypothetical opening). If these comments do reflect uncertainty about reality then it is interesting to note their association with this particular response pattern. It is possible that some of the other children who opened the boxes in this order had also become uncertain about the reality status of the pretence but did not make any comments.

The third finding that is difficult to reconcile with the Golomb and Galasso (1995) pretence continuation account was the observation that two children showed overt signs of having expected to find objects inside the boxes. One child described being relieved not to have found the monster in the negative box and yet when opening the boxes she had selected the positive box first and the negative box second rather than
last. Similarly, another child expressed his relief at retrieving the positive box after having discarded it. These comments were made entirely spontaneously and do seem to suggest that these children had become uncertain about the pretend-reality distinction.

Overall, some aspects of the findings from this experiment were consistent with the Golomb and Galasso (1995) pretence continuation account. The children tended to behave in ways that could be interpreted as increasing their positive affect and decreasing their negative affect. However, there were also findings that were difficult to interpret using this account and which seemed to suggest some uncertainty in children’s understanding of the pretend-reality distinction. Yet empirical evidence of reality did not significantly influence children’s behaviour. The predicted hypothetical versus actual differences on the opening tasks did not emerge. Thus there is a paradox within these findings - the data do not fully support the pretence continuation account but are also not fully consistent with the availability hypothesis (Harris et al., 1991; Johnson & Harris, 1994). This raises the possibility that the pretence continuation account offers an explanation for the behaviour of some children and that the behaviour of other children is best explained in terms of the effects of increased cognitive availability on their beliefs. In other words, perhaps these findings indicate individual differences between at least two separable groups of children. These data therefore perhaps support the Johnson and Harris dichotomy between credulous and sceptical children. However, whereas Harris et al had assumed that sceptical children would behave indifferently in box selection tasks, it may actually be the case that sceptical children are those who respond by moderating their experience of affect in the ways Golomb and Galasso suggest.

However, the prediction of differences between the hypothetical and actual opening tasks was dependent on two assumptions - that availability effects were the cause of children’s behaviour and that these effects could be constrained by providing empirical evidence of reality. That is, that being able to see that an object is only pretend would reduce the cognitive availability for the idea that the imagined object might be inside one of the boxes. The failure to find hypothetical and actual differences despite other indications of pretend-reality confusion suggests two things. First, that empirical evidence does not constrain the effects of availability. Second, that empirical evidence does influence children’s beliefs, but the evidence provided by the actual opening task was not sufficient to do so. This possibility is plausible - perhaps the children in these experiments opened the first box and saw that it was empty and experienced a
corresponding reduction in availability for the pretence. The children were then asked to make a second selection - at this point they might have disregarded the evidence about the first box and so experienced increased cognitive availability for the pretend contents of the second and third boxes. That is, perhaps children treat each box as an independent pretend episode (Harris, 1996). This possibility was explored in experiment 3.
Chapter 4: Experiment 3
Children’s behaviour under conditions of minimal availability

Introduction

The findings from experiment 1 and experiment 2 were difficult to completely reconcile with either the pretence continuation account (Golomb & Galasso, 1995) or the availability hypothesis (Harris, Brown, Marriott, Whittall & Harmer, 1991; Johnson & Harris, 1994). Contrary to the prediction that the effects of availability would be constrained by the visual confirmation of the box contents obtained on actually opening the first box, the children tended to respond consistently across the hypothetical and actual versions of the opening task. This would seem to suggest that either the effects of increased cognitive availability were not influencing children’s behaviour and that they were perhaps simply continuing their pretence, or alternatively, that the effects of availability were not constrained by empirical evidence in the manner predicted. The first of these possibilities seems unlikely given that a number of children spontaneously made comments that were suggestive of pretend-reality confusion. However, it is possible that finding the first box to be empty was not sufficient to constrain the effects of increased cognitive availability because each box selection functioned as an independent pretend episode (Harris, 1996). That is, perhaps after the first box had been opened, levels of availability for the remaining pretend entities increased - the children were therefore not reassured of the status of all of the objects by finding that one of them was only pretend.

The simple but dramatic experimental manipulation of asking children to pretend about the contents of transparent rather than opaque boxes minimises the effects of availability and rules out the effects of children treating each box as independent. When transparent boxes are used, children are continually confronted with visual confirmation of the fact that the boxes are empty before, during and after every box selection, regardless of whether the task requires selection of a box to open or to discard, and regardless of whether the task is presented hypothetically or actually. Consequently, the increase in cognitive availability for the pretend which might have occurred between the end of one box selection (pretend episode) and the beginning of the next with opaque boxes, should not occur. The use of transparent boxes maximises empirical evidence of reality and hence, the possibility for children to become uncertain about the reality status of the pretence is minimised. Put simply, the
constant sight of the empty boxes must surely reassure children that the contents are pretend, not real.

If the effects of availability were the sole cause of children's behaviour towards the pretend objects in the preceding experiments, the results observed in this experiment where the potential for availability to influence children's beliefs is inhibited, should be different. When children no longer wonder about the box contents they should be indifferent, or at least less systematic, in choosing between them. In contrast, if pretence continuation without pretend-reality confusion led to the results of the preceding experiments, the present experiment should obtain very similar results since empirical evidence of reality should not impinge on children's pretence behaviours. To test between these predictions, the present experiment followed the design and procedure used in experiment 2 but with a single modification - transparent rather than opaque boxes were used in the pretence tasks.

Method

Subjects
Three groups of children (N = 92) were recruited from a predominantly middle class school in Middlesex. The younger group were 32 children (16 boys and 16 girls) aged between 4 years 6 months and 5 years 5 months (mean age 4 years 11 months). The middle group consisted of 30 children (16 boys and 14 girls) aged between 5 years 6 months and 6 years 5 months (mean age 5 years 11 months). The older group were 30 children (16 boys and 14 girls) aged between 6 years 6 months and 7 years 4 months (mean age 6 years 11 months).

Procedure
The procedure used was identical to experiment 2 (see page 82) with the exception that the opaque boxes were replaced by three identical transparent (perspex) boxes of the same size (17 x 24 x 27 cm).
Results

Two younger children failed the memory checks and so were not included in the analyses. Of the remaining 90 children (30 in each age group), 4 children from the younger group failed the reality checks (96% correct).

The results of the CFA for the pattern of box selections on each of the experimental tasks are shown in Table 4.1.

Table 4.1: Results of Configural Frequency Analysis on children’s response patterns for each of the experimental tasks analysed separately (positive = Christmas present, neutral = cup, negative = monster) (n = 90)

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Frequency</th>
<th>Hypothetical</th>
<th>Actual</th>
<th>Hypothetical</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ N -</td>
<td>53 (47)</td>
<td>T 10.75 (T 9.05)</td>
<td>4 (3)</td>
<td>A -3.11 (A -3.39)</td>
<td></td>
</tr>
<tr>
<td>+ - N</td>
<td>14 (16)</td>
<td>-2.8 (-2.8)</td>
<td>3 (4)</td>
<td>A -3.39 (A -3.11)</td>
<td></td>
</tr>
<tr>
<td>N + -</td>
<td>8 (7)</td>
<td>-1.98 (-2.26)</td>
<td>2 (3)</td>
<td>A -3.68 (A -3.39)</td>
<td></td>
</tr>
<tr>
<td>N - +</td>
<td>4 (3)</td>
<td>A -3.11 (A -3.39)</td>
<td>6 (14)</td>
<td>A -2.55 (-2.8)</td>
<td></td>
</tr>
<tr>
<td>- N +</td>
<td>3 (7)</td>
<td>A -3.39 (-2.26)</td>
<td>68 (60)</td>
<td>T 14.99 (T 12.73)</td>
<td></td>
</tr>
<tr>
<td>- + N</td>
<td>8 (10)</td>
<td>-1.98 (-1.41)</td>
<td>7 (6)</td>
<td>-2.26 (A 2.55)</td>
<td></td>
</tr>
</tbody>
</table>

*T significant response type at p < .001
*A significant response anti-type at p < .01

On the hypothetical opening task the significant response type was selection of the positive box first, neutral box second and the negative box last (z = 10.75, p < .001, Bonferroni adjustment for p at .05 = .008). This response pattern represented the behaviour of 53 children. The remaining 37 children were distributed between 2 significant response anti-types and 3 non-significant response patterns (see Table 4.1). On the actual opening task the same response pattern emerged as the significant response type (z = 9.05, p < .001, Bonferroni adjustment for p at .05 = .008) and accounted for the behaviour of a similar number of children (n = 47) as on the hypothetical opening task. However, amongst the remaining response patterns there
was only one significant response anti-type - none of the other response patterns were significant (see Table 4.1).

On the hypothetical discarding task one pattern of response emerged as a significant response type and 4 of the remaining 5 response patterns emerged as significant response anti-types (see Table 4.1). The significant response type was selection of the negative box first, neutral box second and positive box last (z = 14.99, \( p < .001 \), Bonferroni adjustment for \( p \) at .05 = .008). This response pattern accounted for the behaviour of 68 children. A similar pattern of results emerged on the actual discarding task - the same pattern of response emerged as the significant response type (z = 12.73, \( p < .001 \), Bonferroni adjustment for \( p \) at .05 = .008) and accounted for the behaviour of a similar number of children as it had on the hypothetical discarding task (n = 60). The remaining 30 children were distributed across 4 significant response anti-types and one non-significant pattern of response (see Table 4.1).

A comparison of children's responses across the hypothetical and actual tasks is shown in Table 4.2. Forty-one children generated the response type (positive - neutral - negative) on both versions of the opening task and 31 did so on neither (23 of these 31 children produced the same response pattern on both occasions). Twelve children changed from producing the response type on the hypothetical task to a different response pattern on the actual task - 8 of these children actually opened the positive box first, negative box second and neutral box last, 2 actually opened the neutral, negative and then the positive box and the remaining 2 children actually opened the negative, positive and then the neutral box. A further 6 children produced the response type on the actual task after having produced a different response pattern hypothetically. The variability in children's behaviour was not significant (McNemar exact significance, \( p = .238 \)).

Similarly, the degree of change in children's response patterns on the hypothetical and actual discarding tasks was not significant (McNemar exact significance, \( p = .077 \)). The majority of children either produced the significant response type (negative - neutral - positive) on both versions of the task (n = 56) or on neither (n = 18, 12 of these children produced the same response pattern on both versions of the task). Sixteen children changed their responses - 12 produced the response type hypothetically but actually discarded the boxes in a different order - 8 of these children actually discarded the neutral box first, negative box second and the positive box last, 3 discarded the negative, positive and then the neutral box and the last discarded the
positive, negative and then the neutral box. Four children actually discarded the boxes according to the response type after having generated a different pattern on the hypothetical task.

**Table 4.2:** Comparison of children’s response patterns across the hypothetical and actual opening tasks (response type: positive - neutral - negative) - figures in brackets are for discarding tasks (response type: negative - neutral - positive) (n = 90)

<table>
<thead>
<tr>
<th>Actual Task Type</th>
<th>Type</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>41 (56)</td>
<td>6 (4)</td>
</tr>
<tr>
<td>Other</td>
<td>12 (12)</td>
<td>31 (18)</td>
</tr>
</tbody>
</table>

Inspection of the frequencies of each response pattern produced on the hypothetical opening task according to age group (Table 4.3) revealed that amongst the younger children the overall response type was not the most frequently produced pattern. Whilst 8 younger children selected the positive, neutral and then the negative box, 10 selected the positive box, then the negative box and then the neutral box. In both of the other age groups, the response type was the most frequently produced order of box selections having been generated by 24 middle children and 21 older children.

**Table 4.3:** Summary of response patterns produced on the hypothetical opening task (actual opening task in brackets) presented according to age group (positive = +, neutral = N, negative = -) (n = 90)

<table>
<thead>
<tr>
<th>Response Pattern on Hypothetical Task</th>
<th>Hypothetical (Actual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>+ N - + N</td>
</tr>
<tr>
<td>Younger</td>
<td>8 (10) 10 (7) 5 (4) 0 (0) 2 (4) 5 (5)</td>
</tr>
<tr>
<td>Middle</td>
<td>24 (20) 2 (3) 0 (1) 2 (2) 1 (2) 1 (2)</td>
</tr>
<tr>
<td>Older</td>
<td>21 (17) 2 (6) 3 (2) 2 (1) 0 (1) 2 (3)</td>
</tr>
<tr>
<td>Total</td>
<td>53 (47) 14 (16) 8 (7) 4 (3) 3 (7) 8 (10)</td>
</tr>
</tbody>
</table>

The frequency data for the discarding tasks produced a slightly different pattern of results. As can be seen from Table 4.4, the response type was the most frequent
response pattern in each age group and did not appear to be subject to any developmental trends - similar numbers of children produced the response type amongst the younger age group (n = 21), as in the middle (n = 24) and older (n = 23) age groups. No other age related trends were apparent on either the opening or discarding tasks.

Table 4.4: Summary of response patterns produced on the hypothetical discarding task (actual discarding task in brackets) presented according to age group (positive = +, neutral = N, negative = -) (n = 90)

<table>
<thead>
<tr>
<th>RESPONSE PATTERN</th>
<th>Hypothetical (Actual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>+ N -</td>
</tr>
<tr>
<td>Younger</td>
<td>2 (1) 1 (3) 0 (1) 2 (3) 21 (19) 4 (3)</td>
</tr>
<tr>
<td>Middle</td>
<td>2 (2) 2 (1) 0 (1) 1 (5) 24 (20) 1 (1)</td>
</tr>
<tr>
<td>Older</td>
<td>0 (0) 0 (0) 2 (1) 3 (6) 23 (21) 2 (2)</td>
</tr>
<tr>
<td>Total</td>
<td>4 (3) 3 (4) 2 (3) 6 (14) 68 (60) 7 (6)</td>
</tr>
</tbody>
</table>

To further investigate the consistency in children's behaviour across the hypothetical and actual versions of the tasks and the apparent age related changes in children's behaviour, a series of CFA were performed across the twelve trial response patterns generated across all four experimental tasks taken together. The results of these analyses, which were performed taking each age group separately, are summarised in Table 4.5. The results of these analyses revealed that irrespective of age, the same pattern of response emerged as the only significant response type - a significant number of children opened (hypothetically and actually) the positive box first, neutral box second and negative box last and discarded (hypothetically and actually) the negative box first, neutral box second and positive box last. Amongst the younger age group this response pattern accounted for the behaviour of 5 children (z = 3.06, p < .001, Bonferroni adjustment for p at .05 = .002). There were a further 5 response patterns that were produced by 2 children each (see Table 4.5). The remaining 15 children each produced unique response patterns. The same significant response type was produced by 14 children from the middle age group (z = 8.78, p < .001, Bonferroni adjustment for p at .05 = .003) and 16 children from the older age group (z = 8.92, p < .001, Bonferroni adjustment for p at .05 = .004). In each of these age groups only 2 other response patterns were generated by more than one child - the
remaining children produced unique response patterns. There were no other significant response types and no significant response anti-types in any of the age groups.

**Table 4.5:** Summary of results of Configural Frequency Analysis of response patterns across all experimental tasks taken together presented according to age group (positive = Christmas present, neutral = cup, negative = monster) (n = 90)

<table>
<thead>
<tr>
<th>Response Pattern</th>
<th>Age Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive = +; Neutral = N; Negative = -</td>
<td></td>
</tr>
<tr>
<td>Opening Discarding</td>
<td>Younger</td>
</tr>
<tr>
<td>Hypothetical (Actual)</td>
<td>f</td>
</tr>
<tr>
<td>+ N -</td>
<td>5</td>
</tr>
<tr>
<td>- N</td>
<td>2</td>
</tr>
<tr>
<td>N + -</td>
<td>2</td>
</tr>
<tr>
<td>- N</td>
<td>2</td>
</tr>
<tr>
<td>+ N</td>
<td>2</td>
</tr>
<tr>
<td>N -</td>
<td>2</td>
</tr>
<tr>
<td>N N</td>
<td>1</td>
</tr>
<tr>
<td>N -</td>
<td>2</td>
</tr>
<tr>
<td>N N</td>
<td>1</td>
</tr>
<tr>
<td>N +</td>
<td>1</td>
</tr>
<tr>
<td>N N</td>
<td>1</td>
</tr>
</tbody>
</table>

The remaining 11 younger children, 9 middle children and 6 older children each produced a unique response profile different from each other and the above.

*T significant response type at p < .001

The overall trend that is apparent from the CFA across all four experimental tasks taken together is that the response type is produced in approximately equal frequencies amongst middle (n = 14) and older (n = 16) children but less frequently amongst the younger children (n = 5). This trend is shown clearly in Table 4.6 which shows the numbers of children producing the response type according to age group. This distribution of frequencies was significant ($\chi^2 = 9.63$, df = 2, p < .01).
Table 4.6: Number of children producing the response type across all tasks taken together, presented according to age group (n = 90)

<table>
<thead>
<tr>
<th>Response Pattern</th>
<th>Younger</th>
<th>Middle</th>
<th>Older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>5</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Other</td>
<td>25</td>
<td>16</td>
<td>14</td>
</tr>
</tbody>
</table>

To establish whether the use of transparent boxes led to a difference in children’s performance on the box selection tasks compared to when opaque boxes were used, a series of chi-squared analyses were performed. Table 4.7 shows the number of children from the younger age group who produced the response type (positive - neutral - negative) on the hypothetical opening task in the present experiment and in experiment 2 where opaque boxes were used. There was no significant difference between the results of the two experiments ($\chi^2 = 1.20, \text{df} = 1, p = .273$). However, it is interesting to note that the response type was not the most frequently produced response pattern amongst younger children in the transparent box experiment - as previously noted, selection of the positive box first, negative box second and neutral box last was slightly more prevalent. There were no statistically significant differences in the younger children’s performance on the hypothetical discarding task across the two experiments ($\chi^2 = 1.14, \text{df} = 1, p = .284$). Thus box transparency did not have a statistically significant effect on the behaviour of the four to five year old children.

Table 4.7: Younger children’s response patterns on the hypothetical opening task presented according to box type - figures in brackets are for the hypothetical discarding task (n = 30)

<table>
<thead>
<tr>
<th>Box Type</th>
<th>Response Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opaque</td>
<td>Type</td>
</tr>
<tr>
<td></td>
<td>12 (17)</td>
</tr>
<tr>
<td>Transparent</td>
<td>* 8 (21)</td>
</tr>
</tbody>
</table>

* The response type (+ N -) was not the most frequent response pattern - 10 children selected the positive box first, negative box second and neutral box last.
In contrast, the behaviour of the middle group of children differed across the two experiments (Table 4.8). Significantly more children in the transparent boxes experiment produced the response type on the hypothetical opening task than had done so in the opaque boxes experiment ($\chi^2 = 7.18$, df = 1, p < .01). There were no differences in the middle children’s behaviour on the hypothetical discarding tasks across the two experiments ($\chi^2 = 0.98$, df = 1, p = .754).

**Table 4.8:** Middle children’s response patterns on the hypothetical opening task presented according to box type - figures in brackets are for the hypothetical discarding task (n = 30)

<table>
<thead>
<tr>
<th>Box Type</th>
<th>Response Pattern</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Opaque</td>
<td>14 (23)</td>
<td>16 (7)</td>
</tr>
<tr>
<td>Transparent</td>
<td>24 (24)</td>
<td>6 (6)</td>
</tr>
</tbody>
</table>

The results for the older group of children were non-significant for the hypothetical opening task ($\chi^2 = .00$, df = 1, p = 1.00) but significant for the hypothetical discarding task (Fisher’s exact probability, p = .05) since more children discarded the boxes according to the response type in the opaque boxes experiment than in the transparent boxes experiment (Table 4.9).

**Table 4.9:** Older children’s response patterns on the hypothetical opening task presented according to box type - figures in brackets are for the hypothetical discarding task (n = 30)

<table>
<thead>
<tr>
<th>Box Type</th>
<th>Response Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
</tr>
<tr>
<td>Opaque</td>
<td>21 (29)</td>
</tr>
<tr>
<td>Transparent</td>
<td>21 (23)</td>
</tr>
</tbody>
</table>

Thus the three age groups were differentially influenced by the use of transparent boxes in this experiment. This is shown very clearly in Figure 4.1 which graphically represents the effect of transparency on the number of children in each age group.
producing the response type (positive - neutral - negative) on the hypothetical opening task. Given the prevalence of the positive - negative - neutral response pattern amongst the younger group of children, these figures have also been included for all age groups. The graph highlights how the main effect of transparency was to increase the prevalence of the response type amongst all age groups of children, but most strikingly so amongst middle children. In addition, the prevalence of the positive - negative - neutral response pattern was differentially influenced by box transparency according to age. Amongst the younger group of children this response pattern appeared more frequently, whereas in the middle age group it was dramatically reduced when transparent boxes were used. The prevalence of this response pattern was relatively stable amongst older children who rarely produced this order of box selections in either experiment.

Figure 4.2 presents the comparison results for the actual opening task. Whilst the profile of frequencies for the significant response type by age is similar to that shown in Figure 4.1, the differences generated by the use of transparent boxes were much less dramatic. Thus it would seem that box transparency was more influential on the hypothetical than on the actual version of the opening task.

An analysis of the spontaneous comments that children made throughout the experiment revealed that 7 children (8%) remarked that they would prefer not to open or to discard one of the boxes. Three children did not want to discard the positive box, 2 did not want to open the negative box and a further 3 neither wanted to discard the positive box nor open the negative box. Of these children, 4 had produced the response type on the hypothetical opening task, 2 had opened the positive box first, negative box second and neutral box last and the remaining child selected the neutral box first, positive box second and negative box last.
Figure 4.1: Numbers of children producing the response type (+ N -) and the positive - negative - neutral (+ - N) response pattern on the hypothetical opening task according to age and box type (n = 180)
Figure 4.2: Numbers of children producing the response type (+ N -) and the positive-negative-neutral (+ - N) response pattern on the actual opening task according to age and box type (n = 180)

Discussion

The design of this experiment allowed a direct test between the predictions made by the availability hypothesis (Harris et al., 1991; Johnson & Harris, 1994) and the pretence continuation account (Golomb & Galasso, 1995) of children's behaviour towards pretend objects. By confronting children with continual empirical evidence
that they were making decisions about empty boxes it was possible to measure children's behaviour patterns when potential uncertainty about the reality status of the pretend entities was minimised. This experimental manipulation controlled for the effects of children treating each box as an independent pretend episode. It was predicted that if children's responses in experiment 2 were generated by the effects of availability then the results of this experiment should be different in comparison. However, there should be no differences between the two experiments if the children were simply continuing their pretence according to the affect it evoked - whether or not the children were provided with empirical evidence of the pretence should be irrelevant.

In this experiment, the vast majority of children accurately reported that the contents of the boxes were pretend, not real. However, as in previous experiments the children went on to behave in highly consistent ways - they tended to open (hypothetically and actually) the positive box first and the negative box last and to discard (hypothetically and actually) the negative box first and the positive box last. The neutral box repeatedly emerged as the children's second selection. There were no differences between the hypothetical and actual versions of the tasks.

The significant response types which emerged in this experiment were identical to those which emerged in experiment 2 (the age related differences between the two experiments will be discussed separately). This similarity between the present experiment and that in which opaque boxes were used might be taken to suggest that children's behaviour was unaffected by empirical evidence of reality and that the findings are therefore consistent with the Golomb and Galasso (1995) pretence continuation account. That is, in the absence of any confusion or uncertainty about the pretend-reality distinction, children behave towards pretend objects in ways which may increase their positive affect and decrease their negative affect.

However, in the preceding experiments a sizeable but non-significant group of children elected to open the positive box first, then the negative box second rather than leaving it until last. This response pattern also emerged frequently in this experiment. Thus the Golomb and Galasso (1995) pretence continuation account perhaps needs to be modified to include the possibility that although many children may indeed continue their pretence by acting in ways that increase their positive affect and decrease their negative affect, others may do so by behaving in ways that actually increase their negative affect as well as their positive affect. As Harris et al (1991 - experiment 4)
also observed, some children prefer to approach rather than to avoid negative pretend entities.

Importantly, there were clear differences in the emergence of the negative box second response pattern across experiment 2 and experiment 3 which seem to represent both individual and developmental differences between children. Although it was slightly more prevalent amongst the middle group of children, in experiment 2 this pattern of box selections was relatively equally distributed across the three age groups. In contrast, in the present experiment opting to open the positive, negative and then the neutral box was noticeably more frequent amongst children from the younger age group. Despite the obvious similarities in the findings from the two experiments, this difference suggests that empirical evidence of reality did influence at least some children's behaviour. Further analyses confirmed that this was the case and that the magnitude and type of change in the children's behaviour when transparent boxes were used were subject to developmental differences. The evidence for the effects of availability and empirical evidence on children's behaviour will now be discussed taking each age group in turn.

A comparison of the behaviour of the four to five year old children (younger age group) revealed no statistical differences in the results of the present experiment compared to experiment 2. However, the children's behaviour was not identical in the two experiments. When opaque boxes were used (experiment 2) just under half of the children selected the positive, neutral and then the negative box on the hypothetical opening task. In the present experiment where transparent boxes were used, this changed such that just under one third of the children produced this response pattern (this difference was not statistically significant). Moreover, when transparent boxes were used, the positive - neutral - negative response pattern was not the most frequent response pattern - over one third of the younger children selected the positive box first, the negative box second and then the neutral box. In experiment 2 this response pattern had been the second most frequently produced but had accounted for the behaviour of less than one fifth of the children. This change in the children's behaviour is intriguing. Why should more children approach the monster box second when transparent boxes were used compared to when opaque boxes were used?

The evidence seems to suggest that four to five year old children are sensitive to the effects of increased cognitive availability and that furthermore, these children are influenced by empirical evidence of reality. When the effects of availability are
minimised by continual reassurance of the reality status of the pretence, such children continue the pretence in one of two ways. As Golomb and Galasso (1995) would predict, some children behave in ways that can be interpreted as increasing positive affect and decreasing negative affect. Other children behave in a manner which may increase their negative affect as well as their positive affect. In contrast, when there is potential for uncertainty about the status of the pretence, these children avoid the monster - selecting it second may be too ‘risky’ or too frightening for any child who had begun to wonder if there really was a monster inside the box. Thus, selecting the negative box second was noticeably less frequent when opaque boxes were used. These results strongly suggest that some of the younger children in experiment 2 were subject to the effects of increased cognitive availability. However, when the effects of availability were constrained by empirical evidence of reality they continued their pretence in predictable ways. In other words, the present findings suggest that amongst four to five year old children, at least some children experience pretend-reality confusion during pretence tasks.

The results for the middle age group of children (five to six years old) also differed across the two experiments. However, these differences were not the same as those observed for the younger children. The number of five to six year old children opening the positive box first, neutral box second and negative box last increased significantly in the present experiment compared to experiment 2. Whilst just under half of the children generated this response pattern when opaque boxes were used, over three quarters did so when transparent boxes were used. In addition, whilst in experiment 2, one third of the children opened the positive, negative and then the neutral box, very few (less than 10%) did so in this experiment. The increase in the number of children selecting the positive box first, neutral box second and negative box last is of the same magnitude as the decrease in the number of children selecting the positive box first, negative box second and neutral box last. It therefore seems reasonable to suggest that these changes are related.

It would appear that amongst five to six year old children, selection of the negative box second and not last reflects some uncertainty about the pretend-reality status of the imagined entities. When such uncertainty was minimised by the use of transparent boxes, this response pattern was inhibited. It seems therefore that unlike younger children, when middle children select the negative box second they do so out of wondering about the pretend-reality status of the contents and not out of continuation of the pretence. Those middle children who do continue their pretence, do so by
increasing their positive affect and decreasing their negative affect - this response pattern increases in prevalence when possible doubts about the reality status of pretend entities are minimised.

Interestingly, with the two box design used by Harris et al (1991 - experiment 3) the behaviour of the younger and middle children would have looked identical. These children would have all selected the positive then the negative box irrespective of their differing beliefs. Without the inclusion of a third, neutral, pretend object as a repeated measure, the relative position of the positive and negative objects would have been difficult to interpret. This might help to explain why Harris et al failed to observe consistent developmental trends in their experiments.

The behaviour of the older children (six to seven years old) was similar in the present experiment compared to experiment 2. The same number of children opened the positive, neutral and then the negative box regardless of levels of empirical evidence of reality. This supports the idea that these children experience little or no uncertainty about the pretend-reality distinction and indeed continue their pretence by increasing their positive affect and decreasing their negative affect in the way that Golomb and Galasso (1995) have suggested. Furthermore, very few six to seven year old children in either experiment responded by opening the negative box second rather than last.

However, to argue that none of the children in any age group who selected the positive, neutral and then the negative box in experiment 1 and experiment 2 had wondered about the pretend-reality status of the objects would be premature. In experiment 2 this response pattern could well have been generated by some children due to genuine uncertainty about the pretend-reality distinction. The same response pattern could be differently motivated in this experiment compared to experiment 2, and could be differently motivated for different children within that experiment. Further empirical work is needed to establish the meaning of the positive, neutral, negative response pattern when it emerges under conditions of potentially high availability, such as when opaque boxes were used in experiment 2.

To recap, in this experiment children were confronted with continual empirical evidence that they were pretending about empty boxes. The potential for the effects of availability to lead to pretend-reality confusion were therefore minimal. The comparison of the results of the present experiment with experiment 2 where empirical evidence of box contents was limited and thus the potential for availability was high,
suggests that both the availability hypothesis (Harris et al, 1991; Johnson & Harris, 1994) and the pretence continuation account (Golomb & Galasso, 1995) can explain children's behaviours and that there are also developmental effects as well as individual differences in children's understanding of the pretend-reality distinction.

Several important findings have emerged from the three experiments conducted to date. First, when children pretend about separate boxes these are treated as independent pretend episodes and thus the influence of empirical evidence on children's beliefs and behaviour can be minimal. For example, in experiment 1 the differential empirical evidence across hypothetical and actual opening tasks was not influential but in this experiment, empirical evidence had considerable impact on the children's behaviour since it was continual. Second, the effects of availability do influence some children's beliefs about pretend objects. Children's sensitivity to these effects is age sensitive and thus four to six year old children (younger and middle age groups) were more subject to pretend-reality confusion than six to seven year old children (older group). This evidence supports the developmental progression observed by Johnson and Harris (1994). Third, the effects of availability are constrained by empirical evidence of reality when this is provided continually, throughout the pretence. Finally, there are age related differences in the ways that children continue their pretence. Four to five year old children's treatment of negative affect is rather different to that of five to seven year old children. Overall, these findings suggest that there are individual and developmental differences between at least two separable groups of children - some who are subject to the effects of increased cognitive availability and others who are not, and who instead continue their pretence in terms of their reactions to the affect that the pretence evokes. In other words, credulous children who experience pretend-reality confusion due to the effects of availability exist alongside sceptical children who continue the pretence theme when choosing between boxes.
Chapter 5: Experiment 4a

The hierarchical organisation of affect in pretence

Introduction

In the preceding experiments, the task design allowed children to simultaneously approach positive pretend entities and avoid negative ones. In Golomb and Galasso's (1995) terms, it was possible for children to behave in ways that could both increase their positive affect and decrease their negative affect. The most frequently generated response patterns across these experiments were indeed those in which children appeared to simultaneously approach positive pretend entities and avoid negative ones. An issue relating to the influence of affect on children’s pretence which emerges from these findings, is whether the children were literally simultaneously approaching positive pretend entities and avoiding negative ones, or whether these affective concerns were hierarchically organised such that one was prioritised over and above the other. Clearly the children were concerned with both types of affect (the neutral object was repeatedly placed as the children’s second selection), however it is possible that the children were most concerned to reduce negative affect and that the decision to increase positive affect was made as a second and separate decision. Alternatively, children might have been most concerned to increase positive affect and only decided to respond to negative affect after having dealt with their primary concern. With the three box serial selection task design used in experiments 1 to 3, it is not possible to distinguish between these alternatives.

The present experiment was designed to assess the hierarchical organisation of affect in pretence by forcing children to prioritise a response to either positive or negative affect. In this experiment the children were asked to pretend that one box contained their preferred Christmas present and that a second box contained a scary monster. The children were then invited to choose to either open both of the boxes or to discard both of the boxes. This forced the children to decide between approaching the positive entity or avoiding the negative one - they could not do both.

Why might children in this experiment choose to open both of the boxes? There are several possibilities. First, this response might indicate that children prioritise their approach towards positive pretend entities over and above any motivation that they may have to avoid negative ones. This possibility can be sub-divided into two further
interpretations - that this response is a result of pretence continuation, or that it is a result of pretend-reality confusion. Second, some children might open the boxes because they want to increase their negative affect. For example, some children in Harris, Brown, Marriott, Whittall and Harmer (1991 - experiment 4) chose to open the box that they were pretending contained a monster. Likewise, in the present research a sizeable group of children chose to open the negative box second rather than leaving it until last. Third, children might simply open the boxes due to task demands - boxes are more typically associated with opening than discarding. Finally, children may feel self-conscious about discarding a box that they know to be empty and therefore open it. There are also several possible explanations for why children might choose to discard both boxes. First, children might prioritise the reduction of negative affect. Second, children might be truly credulous and discard the boxes out of avoidance of a 'real' monster. Third, children might discard the boxes because they are empty - they know there is nothing to be gained by opening them.

To overcome the problems in interpreting children's behaviour, two additional measures were included in the design of this experiment. First, the task was presented to some children using opaque boxes and to others using transparent boxes. The use of transparent boxes in pretence tasks affords an opportunity to explore children's behaviour when the effects of increased cognitive availability are minimised. The continual empirical evidence of box contents that confronts the child throughout the pretence should be sufficient to reassure them that the imagined entities are not real. It is highly unlikely that any child should wonder about the pretend-reality status of the objects. In this experiment the comparison of children's responses according to box type (opaque or transparent) should provide some indication of whether the hierarchical organisation of affect differs according to potential levels of availability and uncertainty about the pretend-reality distinction.

Second, children were asked to explain the reasons for their decisions. In this experiment the children were asked to decide whether to open or discard the boxes (hypothetical task) and then to carry out their decision (actual task). Subsequently, the children were asked to explain their behaviour. Although previous researchers have asked children to justify their behaviour towards pretend objects (Harris et al, 1991; Johnson & Harris, 1994) it has not yet been possible to do so in this research. When serial box selection tasks are used there is an inherent problem in asking children to explain their behaviour. If children are asked to explain their first choice, they might become self-conscious about their behaviour and how they can explain it, and thus
respond differently on subsequent selections. However, if children are asked about their behaviour on the last selection they may find the question impossible to respond to - the box they have just chosen was the only one available to them. The present experiment was therefore designed as a single trial task to allow children to be interviewed about their behaviour without risk of influencing their subsequent behaviour.

Johnson and Harris (1994 - experiment 3) asked children to justify their behaviours towards pretend objects using a closed ended question. This enabled Johnson and Harris to categorise children into one of three groups:
- credulous - children who wondered if the objects were inside the boxes
- sceptical - children who were certain that the objects were merely pretend
- unsure - children whose responses indicated both credulity and scepticism.

In the present experiment an open ended question format was used. This allowed the credulous-sceptical dichotomy to be generated from the children's responses but also ensured that any subtle differences in the children's responses according to age, box type (opaque or transparent) or task response (opening or discarding the boxes) could be detected. For example, unlike the closed ended question, the open ended version allowed children to report uncertainty about the status of one pretend object but not the other. Analysis of the children's justifications for their behaviour should therefore assist in the interpretation of the children's motivations for electing to open or discard both of the boxes and thus clarify the hierarchical organisation of affect in pretence.

Method

Subjects
Three groups of children (N = 133) were recruited from two predominantly middle class schools in Middlesex and Surrey. The younger group were 41 children (21 boys and 20 girls) aged between 4 years 4 months and 5 years 5 months (mean age 4 years 11 months). The middle group consisted of 53 children (21 boys and 32 girls) aged between 5 years 5 months and 6 years 6 months (mean age 5 years 11 months). The older group were 39 children (18 boys and 21 girls) aged between 6 years 6 months and 7 years 7 months (mean age 7 years). The children were allocated to either the opaque boxes condition or the transparent boxes condition.
Procedure

The procedure was identical in the two conditions with the single exception that in the opaque boxes condition two identical cardboard boxes (measuring 17 x 24 x 27 cm) were used whereas in the transparent boxes condition two identical transparent (perspex) boxes (measuring 17 x 24 x 27 cm) were used.

The children were tested individually by the author in a quiet area of their school. When the child arrived the boxes were situated in a row on a table. When the child had settled she/he was asked to look inside both boxes and to confirm that they were empty.

The order of introduction to the pretend objects was counterbalanced. Whilst introducing the pretend objects the experimenter used appropriate intonation in her voice - enthusiastic for the positive object (Christmas present) and dramatic for the negative object (monster). The order of the hypothetical and actual tasks was fixed such that the children were always asked to predict their behaviour before actually carrying it out. The order of mention of the decision options (open or throw away) was counterbalanced between children, remaining constant for each child.

Task introduction. The task and pretend objects were introduced, “It doesn’t matter that the boxes are empty because we are going to play a game of pretend. I expect you’re good at pretend games aren’t you? . . . Is there something that you would really, really like for Christmas this year? . . . What is it? . . . OK, I want you to pretend that the {named object} you want for Christmas is in this box. And, I want you to pretend that there is a horrible, mean monster that wants to come out and chase you, in this box”. The boxes were indicated left to right.

Memory check. The child’s memory for the nature and location of the pretend objects was then checked, “OK, now can you tell me what you are pretending is in this box?”. This question was repeated for both boxes indicated left to right. If the child responded incorrectly to either of the memory checks they were reminded of the objects to be pretended and the memory checks repeated.

Reality check. The child’s understanding of the pretend-reality status of the entities was checked, “Is the {name of object} really in this box or are you pretending?”. This question was repeated for each box indicated right to left. Incorrect responses were not corrected.
**Hypothetical task.** The child was asked, “If you could choose to either open all of the boxes or throw away all of the boxes, what would you do, would you open them all or throw them all away?”

**Actual task.** Once the child had made their hypothetical decision they were asked to act, “OK, you show me now, you either open all of the boxes or throw all of the boxes away”.

**Justification question.** Children were asked to give the reasons for their decision, “Why did you choose to open/throw away all of the boxes?”.

**Debrief.** Before returning to their classroom the child was asked to check that the boxes were empty and thanked for their help.

The children’s decisions were recorded in writing along with any verbal comments that were made.

**Results**

Eight children failed the memory checks and so were not included in the analyses. In addition one child refused to participate in the experiment. Of the remaining 124 children (54 in the opaque boxes condition and 70 in the transparent boxes condition) one younger child from each condition failed the reality checks (98 % correct).

**Opaque boxes condition**

The results from the hypothetical version of the task for the children in the opaque boxes condition are presented in Table 5.1. These results show that the majority of children (n = 43, 80 %) responded that they would open the boxes rather than discard them. The dominance of this opening bias appeared to be unaffected by age, however the frequencies were too low to permit statistical analysis.

The same pattern of results was observed in the actual version of the task - the majority of children (n = 45, 83 %) opened both boxes. There were very few children who changed their response across the two versions of the task (Table 5.2) - 42 children predicted that they would open both boxes and went on to actually do so and 8 children opted to discard the boxes both hypothetically and actually. Four children...
changed their response - 3 said that they would discard the boxes (hypothetical task) but actually opened them and the other actually discarded the boxes after saying that they would open them. This variability in children’s behaviour was not significant (McNemar exact significance, \( p = .625 \)).

Table 5.1: Children’s responses to the hypothetical task presented according to age group - opaque boxes condition (percentages in brackets) (n = 54)

<table>
<thead>
<tr>
<th>Response</th>
<th>Younger</th>
<th>Middle</th>
<th>Older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opened</td>
<td>15 (79%)</td>
<td>16 (76%)</td>
<td>12 (86%)</td>
</tr>
<tr>
<td>Discarded</td>
<td>4 (21%)</td>
<td>5 (24%)</td>
<td>2 (14%)</td>
</tr>
</tbody>
</table>

Table 5.2: Comparison of children’s responses across hypothetical and actual tasks - opaque boxes condition (n = 54)

<table>
<thead>
<tr>
<th>Hypothetical Task</th>
<th>Actual Task</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Opened</td>
</tr>
<tr>
<td>Opened</td>
<td>42</td>
</tr>
<tr>
<td>Discarded</td>
<td>1</td>
</tr>
</tbody>
</table>

The children’s verbal responses to the question of why they had opened or discarded the boxes were allocated to one of the following mutually exclusive categories:

- object presence
- statements of pretend status of objects or lack of box contents
- uncertainty
- don’t know
- other reasons unrelated to the pretence.

Responses categorised as ‘object presence’ were those in which the child referred to one or both of the objects actually being inside the boxes. In the opaque boxes condition, such responses were given by 5 younger children, 11 middle children and 5 older children. Of these 21 children, 16 had opened the boxes - when justifying their decision to open the boxes, 6 (38 %) of these children referred to the Christmas present only:

“... To get the toy out...”
“. . . So I can get my racing car track. . .”
“. . . Because I’m so desperate to have the Pocahontas Barbie doll. . .”
“. . . Because there’s presents in them. . .”
“. . . Because I wanted to get the dolly out. . .”
“. . . Because my scalextrics was in one of them. . .”

Five children (31 %) referred to both the Christmas present and the monster:
“. . . It was a very nice thought to have a vegetable patch. I like it very much. I thought I could keep the vegetable patch and put up with the monster in case it ate up my vegetable patch. . .”
“. . . Because there’s a monster inside and a baby inside. . .”
“. . . I wanted to see if the monster was still in that one and the Lion King still in that one. . .”
“. . . I could get the gun and shoot the monster. . .”
“. . . Because the dragon was in one and the toy was in the other. . .”

Only one of the children giving object presence justifications for opening the boxes (6 %) referred only to the negative entity when explaining their behaviour:
“. . . A good question. Because I wasn’t afraid of the monster in that box. . .”

Several children, 4 (25 %) did not refer specifically to any object:
“. . . Because I’ve seen something in it. . .”
“. . . Because I thought something was really inside it. . .”
“. . . Because I thought that there was something in there. . .”
“. . . I thought it was in there. . .”

Thus clearly, those children who opened the boxes and who then referred to the presence of objects in the boxes tended not to refer to the monster alone. Instead, such children tend to refer either exclusively to the Christmas present, or to both pretend objects. In contrast, of the remaining 5 children who gave object presence justifications for their behaviour, all of whom discarded the boxes, 4 (80 %) explained that their behaviour was due to the presence of the negative pretend entity:
“. . . Because the monster’s inside one and I didn’t want the monster to come out. . .”
“. . . I don’t want to open them because one had an ugly monster in. . .”
“. . . Because there is an ugly monster in one. . .”
“. . . Because I didn’t want the monster to chase me. . .”

One child who discarded the boxes did not specify the object but referred to it being the negative one in generic terms:
“. . . I didn’t like something in there. . .”
Responses categorised as restating the pretence or commenting on the lack of box contents accounted for just 2 younger children who both opened the boxes:

"... Because there isn’t anything in it..."
"... Because I knew I was just pretending..."

Children categorised as showing ‘uncertainty’ were those whose responses indicated that they were not sure whether the objects were inside the boxes and were checking to see if this was the case. Two younger children, 3 middle children and 4 older children gave such responses. All 9 of these children had opened the boxes:

"... Because I didn’t know what was inside..."
"... To see what’s in there..."
"... To see if there was something inside it..."
"... Because I wanted to see what’s in them..."
"... Because there might be something good in there, so it’s best not to throw them away, it’s best to open them to see if there’s something little in there..."
"... Because you don’t know if there was anything in there..."
"... Because there might be a teddy in there..."
"... To see if there was anything in them..."
"... Because I wondered what was in there..."

A sizeable group of children (n = 22) gave justifications for their behaviour that were unrelated to the task. These children included 2 younger children, 1 middle child and 1 older child who simply said that they didn’t know why they had opened/discard the boxes. However, 8 younger children, 6 middle children and 4 older children gave reasons that either related to some literal use or property of the boxes, or claimed that they had simply done what they had wanted to do:

"... Because they were horrible..."
"... Because it’s not very nice to throw..."
"... Because I like colouring the outside and I could string them up and pretend it’s a train and put people in it..."
"... Because they would be good to hide in..."
"... Because if I moved house I might need them..."
"... Because they aren’t much use..."
"... Because we wouldn’t have another one..."
"... Because I like to..."
"... Because I wanted to... (n = 4)
"... Because I like opening boxes..."
"... Because I like opening presents..."
"... Because I don’t want them..."
"... Because I don’t want to throw them away..."
"... Because I think it’s a better thing than throwing them away..."
"... I just wanted to open them..."

Transparent boxes condition
The results for the children in the transparent boxes condition were similar to those obtained in the opaque boxes condition. As can be seen from Table 5.3, the majority of children (n = 62, 89%) responded to the hypothetical version of the task by electing to open rather than discard the boxes. Within the younger and middle age groups this opening bias was virtually at ceiling - 94% and 97% of the children respectively. Amongst the older children a somewhat smaller proportion (n = 18, 75%) elected to open the boxes. However, given the small cell sizes it was not possible to further investigate this apparent age related trend.

<table>
<thead>
<tr>
<th>Response</th>
<th>Younger</th>
<th>Middle</th>
<th>Older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opened</td>
<td>15 (94%)</td>
<td>29 (97%)</td>
<td>18 (75%)</td>
</tr>
<tr>
<td>Discarded</td>
<td>1 (6%)</td>
<td>1 (3%)</td>
<td>6 (25%)</td>
</tr>
</tbody>
</table>

Table 5.4 shows a comparison of children’s responses across the hypothetical and actual versions of the task. The majority of children (n = 60) elected to open the boxes hypothetically and actually and 4 discarded the boxes on both versions of the task. Six children varied their response - 4 responded that they would discard the boxes (hypothetical task) but actually opened them and 2 actually discarded the boxes after having said that they would open them. This variability in children’s behaviour was not significant (McNemar exact significance, p = .688).
Table 5.4: Comparison of children's responses across hypothetical and actual tasks - transparent boxes condition (n = 70)

<table>
<thead>
<tr>
<th>Actual Task</th>
<th>Hypothetical Task</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Opened</td>
</tr>
<tr>
<td>Opened</td>
<td>60</td>
</tr>
<tr>
<td>Discarded</td>
<td>2</td>
</tr>
</tbody>
</table>

A comparison of the number of children electing to open and discard the boxes on the hypothetical task according to experimental condition (Table 5.5) revealed no significant differences ($\chi^2 = 1.88$, df = 1, $p = .171$). Analyses taking each age group separately also revealed no significant differences for the younger (Fisher's exact probability, $p = .347$) and older (Fisher's exact probability, $p = .684$) age groups. The results for the middle age group were approaching significance (Fisher's exact probability, $p = .07$).

Table 5.5: Comparison of children's responses across the opaque and transparent boxes conditions (hypothetical task) (n = 124)

<table>
<thead>
<tr>
<th>Box Type</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Opened</td>
</tr>
<tr>
<td>Opaque</td>
<td>43</td>
</tr>
<tr>
<td>Transparent</td>
<td>62</td>
</tr>
</tbody>
</table>

In terms of the children's justifications for their behaviour, object presence responses were the most frequent type in the transparent boxes condition (3 younger children, 7 middle children and 13 older children). Amongst these 23 children, 18 had opened the boxes. Of these children, 11 (61%) explained their behaviour in terms of the Christmas present:

"... Because I wanted to get my fly dancer out..."
"... Because if I threw them both away I wouldn't get the roller blades - it seems as they're really in the box, they're so clearly in my mind..."
"... To get my rabbit out..."
"... Because I wanted my Lego..."
"... Because it would be really nice to play with Shelley..."
"... Because if I threw the Nintendo game away I wouldn't get it..."
“... I would like the roller skates and didn’t want to throw them away...”
“... Because I wanted the rabbit...”
“... Because I’ve always wanted a doll...”
“... Because I want the computer and I don’t have the choice to open one...”
“... Because I could get my skateboard...”

Two children referred to the positive and negative entities:
“... So I could get my favourite thing to chop the monster up so it couldn’t chase me...”
“... Because I really wanted to get my sabre tooth and tiger sabre so I took the monster and put somewhere so it wouldn’t come out...”

Four children did not specify a particular object:
“... Because there are things in them...”
“... So I could get it out of there...”
“... To get it out...”
“... Because I wanted to get my things out...”

A further child referred only to the negative object:
“... Because I want to break that monster up, that’s why...”

Of the 5 children who discarded the boxes and then went on to refer to the presence of objects in the boxes, 3 referred to the negative entity:
“... Because I don’t want the monster to come out...”
“... Because there’s a monster in one of them...”
“... Because if I opened both of them the monster would just jump out and try chase me...”

The remaining 2 children referred to the positive and negative entities:
“... Because one has the monster in and one has the mouse-trap in...”
“... Because I didn’t want the monster wrecking my new toy...”

Uncertainty was expressed by 8 children (1 younger, 4 middle and 3 older). All of these children had opened the boxes:
“... Because I like to see what’s in there...”
“... Because it, to see if it worked...”
“... Because you might get something good in them...”
“... Because I wanted to see what’s inside them...”
“... Because that’s the best way to do it, just to see if it’s just pretend or if there’s something in it or nothing in it...”
“... To see what was in there...”
“... Because there might have been something in it...”
Because there might be something exciting in them. . .

The lack of any objects in the boxes was mentioned by just 2 children, both of whom opened the boxes:

Because I knew there was nothing in it to hurt me. . .
Because there's nothing in there. . .

Once again, a sizeable group of children (n = 17) responded that they did not know why they had opened or discarded the boxes. A further 20 children gave other reasons that were unrelated to the pretence:

Because we don't like people throwing things away. . .
Because it would be horrible if you threw them in the bin and I don't want to be horrible in this school. . .
If I threw them away then they would have crashed. . .
Because if you throw them away they might break. . .
Because then it wouldn't be a waste of glass or money. . .
Because if I put them in the bin they won’t fit in there because the bin’s too small. . .
If I threw them away they will smash. . .
Because I don’t like throwing things away. . .
Because I did. . .
Because I wanted to. . . (n = 3)
Because I wanted to and I like to. . .
Because I don’t want to throw them away. . . (n = 2)
Because I like opening boxes. . .
Because they could be handy. . .
Because I wanted to keep things in them. . .
To give them away. . .
So they could get fresh air. . .

Table 5.6 summarises these data according to age group and experimental condition. The main age related differences in children’s responses were the decrease in the number of children giving reasons not related to the pretence with age, and the increase in references to the objects being inside the boxes. Across conditions, the main difference is in the greater number of children giving reasons unrelated to the pretence for their behaviour in the transparent than in the opaque boxes condition.
Table 5.6: Summary of children’s responses to being asked why they had opened or discarded the boxes presented according to age group and experimental condition (n = 124)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Justifications Related to Pretense</th>
<th>Justifications Unrelated to Pretence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Object Presence</td>
<td>Uncertainty</td>
</tr>
<tr>
<td></td>
<td>Opaque (Transparent)</td>
<td>Opaque (Transparent)</td>
</tr>
<tr>
<td>Younger</td>
<td>5 26% (3 18%)</td>
<td>2 10.5% (1 6%)</td>
</tr>
<tr>
<td>Middle</td>
<td>11 52% (7 23%)</td>
<td>3 14% (4 13%)</td>
</tr>
<tr>
<td>Older</td>
<td>5 36% (13 54%)</td>
<td>4 28.5% (3 13%)</td>
</tr>
</tbody>
</table>
Throughout the experiment, children’s spontaneous comments were recorded. Five children (9%) in the opaque boxes condition and 11 children (16%) in the transparent boxes condition spontaneously commented that they would prefer to treat each box independently. That is, these children wanted to open the positive box and discard the negative box, rather than opening or discarding both. Thirteen (81%) of these children went on to actually open the boxes, the remaining 3 children discarded the boxes.

**Discussion**

The aim of this experiment was to investigate the influence of affect on children’s pretence. The preceding experiments demonstrated that children behave in ways which are consistent with the motivation to increase positive affect and to decrease negative affect. In the present experiment these two motivations were placed in direct conflict in order to establish which would be prioritised when children were prevented from responding to both. Will children open both boxes, thus increasing their positive and their negative affect, or will they instead discard both boxes thus decreasing positive as well as negative affect?

The majority of children in each age group and in each experimental condition elected to open rather than to discard the boxes. This behaviour could have any one of a number of possible underlying causes. However, the children’s justifications for their behaviour and the comparison of the opaque and transparent boxes conditions in which levels of empirical evidence of reality varied, allowed a fuller interpretation of the children’s behaviour.

First, the children could have opened the boxes because they prioritised positive affect over negative affect due to pretend-reality confusion. That is, the children may have become uncertain about the pretend-reality status of one or both of the pretend objects and consequently decided to seek the positive one, somehow managing to dismiss their uncertainty or feelings about the negative object. The children’s justifications suggest that this could be the case. Many children explained their decision to open the boxes solely in terms of the presence of the Christmas present inside the box. Furthermore, those children who did refer to the negative entity often did so in the context of explaining how they could evade it, or in terms of dismissing the negative affect that it could potentially have evoked. An additional group of children explained their
decision to open the boxes in terms of their uncertainty about what might have been inside them. This relationship between the children's behaviour and their verbal justifications supports the claim that some children were credulous about the possible existence of the pretend objects.

Second, the children might have opened both boxes in order to prioritise positive affect as part of a continuation of the pretence. In other words, some children, particularly those in the transparent boxes condition where the effects of availability were severely constrained, may have been entirely sceptical and never questioned the reality status of the pretend entities. Instead, these children simply responded in terms of their enjoyment of the positive affect evoked by the pretence. Indeed the prevalence of comments relating to objects being inside the boxes amongst children in the transparent box condition suggests that for at least some children this is the case. Even though these children could see that there was nothing inside the boxes, they often spoke of their wish to obtain the contents.

Third, children might have opened the boxes due to task demands, i.e. that boxes are more frequently associated with opening rather than with discarding. Once again, this does seem to be true for some children - a sizeable proportion of the children explained their behaviour in terms unrelated to the pretence. For example, some children described how the boxes might be useful (or not) in a literal (non-pretence) setting such as moving house.

How can the behaviour of those children who elected to discard both of the boxes be explained? These children tended to refer to the presence of the monster inside the box and often they described their desire to avoid it. Interestingly, somewhat (but not statistically significantly) more children in the opaque boxes condition, than in the transparent boxes condition, discarded the boxes. There are two possible explanations for this finding. First, that discarding is most commonly associated with credulity, or uncertainty about the pretend-reality distinction - children are most concerned to avoid a scary entity when they are uncertain about whether or not it is real. Thus in the transparent boxes condition when the effects of availability are reduced, this behaviour becomes less frequent. Second, it is possible that this difference between the conditions is related to a feature of the experimental design - that children are reticent to discard transparent boxes for fear of breaking them. This could be because the perspex looked rather like glass. Indeed, several children reported that they could not discard the transparent boxes for this reason.
Overall, even if those children who seem to be responsive to task demands are excluded, the fact remains that the children in this experiment were most likely to open both boxes and to explain their behaviour in terms of the contents of those boxes, in particular, their preferred Christmas present. In contrast, those children who discarded the boxes tended to refer to the monster and their wish to avoid it. Overall, it would seem that for most children, when they are forced to prioritise positive or negative affect, they prioritise positive affect regardless of their age and relatively independent of the potential for availability to lead to wondering about the box contents.

One important feature of the design of this experiment was the use of an open-ended question for eliciting children's justifications for their behaviour. This was in contrast to the Johnson and Harris (1994) closed ended question which forced children into responding credulously (admitting to wondering) or sceptically (claiming to be certain the boxes were empty). One drawback of the closed ended question is that it does not allow children to express the full possible range of reasons for their behaviour. For example, those children who refer to their excitement about one object or how they will use the positive pretend object to overcome the negative one, would simply not emerge from a closed ended question. Clearly the use of an open ended question elicits a greater proportion of ambiguous and don't know responses and makes the credulous-sceptical distinction less easy to identify, but as this experiment has shown, a straightforward dichotomy between credulous and sceptical children cannot readily accommodate all the children's reported belief states. Furthermore, this variety in children's responses to the open ended question assists in the interpretation of the observed behaviours.

Overall, this experiment has demonstrated that affect in pretence is hierarchically organised such that positive over-rides negative. The issue of how this relates to children's performance on the serial box selection tasks will be considered in experiment 5. In the meantime, experiment 4b returns to the issue of developmental effects in children's response to affect in pretence.
Experiment 4b
The hierarchical organisation of affect in pretence:
A developmental comparison

Introduction

The preceding experiments have shown that whilst some children are sensitive to the effects of increased cognitive availability and are therefore subject to pretend-reality confusion during pretence tasks, others simply continue the pretence in affectively appropriate ways, remaining confident of the pretend-reality distinction. Furthermore, these experiments suggest a developmental trend in children’s sensitivity to availability whereby four to six year old children (younger and middle age groups) show more signs of credulity than six to seven year old children (older age group).

However, there remains an empirical question regarding the prevalence of pretend-reality confusion amongst pre-school children. Previous research (Golomb & Galasso, 1995; Harris et al, 1991; Johnson & Harris, 1994; Woolley & Phelps, 1994) has used participants as young as three years old but due to the differing methodologies and research questions across these experiments, no consistent developmental trends can be detected. Thus the question remains, is pretend-reality confusion more prevalent amongst pre-school children than amongst four to five year old children? In addition, possible developmental changes in the way in which children hierarchically organise affect during pretence have yet to be investigated.

To address these questions the present experiment was a direct replication of experiment 4a using a sample of three and a half to four and a half year old children. The forced choice task design was used in preference to the serial box design used in experiment 2 and experiment 3 for two main reasons. First, the forced choice design is simpler and required less prolonged attention than the twelve trials of the serial box selection tasks - pilot work indicated that the attentional and memory demands of the serial tasks were too great for pre-school children. Second, the single trial design of the forced choice task allowed children to be interviewed about their behaviour. Thus like experiment 4a, in this experiment it was possible to relate the children’s behaviour in two experimental conditions (opaque boxes and transparent boxes) to their expressed beliefs about the pretend-reality distinction.
Method

Subjects
Thirty-eight children (23 boys and 15 girls) aged between 3 years 6 months and 4 years 6 months (mean age 4 years) were recruited from a nursery group based in a predominantly middle class school in Middlesex. The children were allocated to either the opaque boxes or the transparent boxes condition such that there were 20 children (12 boys and 8 girls) aged between 3 years 6 months and 4 years 6 months (mean age 4 years) in the opaque boxes condition and 18 children (11 boys and 7 girls) aged between 3 years 7 months and 4 years 5 months (mean age 4 years) in the transparent boxes condition.

Procedure
The procedure was identical to that used in experiment 4a (see page 115).

Results
Five children failed the memory checks and so were not included in the analyses. Of the remaining 33 children (18 in the opaque boxes condition and 15 in the transparent boxes condition) 8 failed the reality checks (76 % correct). Six of these children were from the opaque boxes condition and 2 from the transparent boxes condition.

Opaque boxes condition
On the hypothetical version of the task, 11 children (61 %) decided to open the boxes and the remaining 7 children (39 %) decided to discard them. This opening bias was also evident in the actual version of the task (Table 5.7) since only 2 children changed their responses - both of these children said that they would discard the boxes (hypothetical task) but actually opened them. This variability in the children’s behaviour was not significant (McNemar exact significance, p = .500).
Table 5.7: Comparison of children’s responses across hypothetical and actual tasks - opaque boxes condition (n = 18)

<table>
<thead>
<tr>
<th>Actual Task</th>
<th>Hypothetical Task</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Opened</td>
</tr>
<tr>
<td>Opened</td>
<td>11</td>
</tr>
<tr>
<td>Discarded</td>
<td>0</td>
</tr>
</tbody>
</table>

Transparent boxes condition
The results from the children in the transparent boxes condition also showed an opening bias. On the hypothetical version of the task, 13 children (87%) decided to open the boxes and the remaining 2 children (13%) decided to discard them. Three children changed their responses across the two versions of the task - one child said that they would open the boxes (hypothetical task) but actually discarded them and 2 children opened the boxes after having said they would discard them (Table 5.8). This variability in the children’s behaviour was not significant (McNemar exact significance, $p = 1.00$).

Table 5.8: Comparison of children’s responses across hypothetical and actual tasks - transparent boxes condition (n = 15)

<table>
<thead>
<tr>
<th>Actual Task</th>
<th>Hypothetical Task</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Opened</td>
</tr>
<tr>
<td>Opened</td>
<td>12</td>
</tr>
<tr>
<td>Discarded</td>
<td>1</td>
</tr>
</tbody>
</table>

Inspection of the results (hypothetical task) suggests that the number of children discarding the boxes was higher in the opaque boxes condition (39%) than in the transparent boxes condition (13%). However, further analyses revealed that this difference was not statistically significant (Fisher’s exact probability, $p = .134$).

Justification Questions
Table 5.9 shows the results of the analysis of children’s responses to being asked why they had opened or discarded the boxes. Like experiment 4a, the children’s justifications were categorised into five categories:
- object presence
- statements of the pretend status of the objects of the lack of box contents
- uncertainty
- don't know
- other reasons unrelated to the pretence.

In the opaque boxes condition, 3 children gave justifications relating to specific objects being inside the boxes:
   “... Because I like the boomerang and the monster...”
   “... For the watch...”
   “... Because I wanted them, the Christmas tree...”
Such responses were also given by one child in the transparent boxes condition:
   “... Because Pocahontas was in...”
Uncertainty about whether or not there were objects in the boxes was expressed by none of the children in the transparent boxes condition and just one child from the opaque boxes condition:
   “... Because I wanted to see if there was a video inside...”
Responses categorised as re-stating the pretence, or referring to the lack of box contents were offered by one child from each condition:
   “... I was pretended...”
   “... Because there’s things in, I’m pretending there’s a monster in this box and I’m pretending there’s a tricycle in this box...”
All of the remaining responses (13 in each condition) were unrelated to the pretence. Four children in the opaque boxes condition and 5 in the transparent boxes condition simply said that they did not know why they had opened or discarded the boxes. The remaining children gave a variety of other reasons:
   “... Because...”
   “... I wanted to...” (n = 3)
   “... Because that way you get them out...”
   “... Because I did...”
   “... Because I wanted to play another game...”
   “... Because I wanted to...” (n = 5)
   “... Because when I’m at home, my mummy’s got boxes at home and I open mummy’s boxes...”
   “... I just wanted to...”
   “... Because I just did...”
   “... I just did...”
   “... Because I like that...”
It was not possible to further analyse these data in terms of task response (opening versus discarding) or experimental condition given that the majority of responses (72% in the opaque boxes condition and 86% in the transparent boxes condition) involved reasons not related to the pretence.

Table 5.9: Summary of children’s responses to being asked why they had opened or discarded the boxes presented according to experimental condition (figures in brackets are percentages) (n = 33)

<table>
<thead>
<tr>
<th>Experimental Condition</th>
<th>Justifications Related to Pretence</th>
<th>Justifications Unrelated to Pretence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Object Presence</td>
<td>Uncertainty Presence</td>
</tr>
<tr>
<td></td>
<td>Object Absence</td>
<td>Don’t Know</td>
</tr>
<tr>
<td></td>
<td>Other Reasons</td>
<td></td>
</tr>
<tr>
<td>Opaque boxes</td>
<td>3 (17%)</td>
<td>1 (5.5%)</td>
</tr>
<tr>
<td>Transparent boxes</td>
<td>1 (7%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Analysis of the children’s spontaneous comments revealed that three children (2 from the opaque boxes condition and one from the transparent boxes condition) remarked that they would prefer to open the positive box and discard the negative box rather than acting on them simultaneously.

Discussion

In this experiment, like experiment 4a, the majority of children elected to open rather than to discard the boxes, regardless of whether or not the effects of availability had been constrained by empirical evidence. Thus, these pre-school children behaved in ways that can be interpreted as suggesting that the motivation to approach the positive pretend entity was greater than any motivation that the children may have had to avoid the negative pretend entity.

However, there were indications that at least some of the children in this experiment were subject to the effects of increased cognitive availability for the pretence and as a result had experienced some confusion over the pretend-reality distinction. First, nearly a quarter of the children responded incorrectly to the reality check questions. This is a dramatic contrast to the preceding experiments in which over 90% of the
children correctly labelled the objects as pretend, not real. This finding could be interpreted in one of two ways. It is possible that the pre-school children in this experiment responded incorrectly due to a failure to understand either or both of the terms 'pretend' and 'real'. However, if this was the case then children who failed the reality check questions should have been equally divided between the two experimental conditions. They were not. Instead, these children were predominantly (over three quarters) from the opaque boxes condition. Therefore the alternative interpretation of these reality check failures seems more likely. That is, that these children had indeed become uncertain about the reality status of the pretend objects even before they had been asked to act towards them. This interpretation is consistent with the difference between the two experimental conditions - when children were faced with continual empirical evidence that the box contents were not real they were reassured of the reality status of the objects and therefore responded correctly to the reality check questions. This finding is similar to an earlier result obtained by Woolley and Wellman (1993) who found that many three year old children verbally reported that an imagined entity would be real.

The second finding that is suggestive of some weakening of the pretend-reality distinction was the difference in the results for the two experimental conditions. Although this difference failed to reach statistical significance it was striking. In the opaque boxes condition, over a third of the children elected to discard the boxes. However, when children were provided with continual empirical evidence that the boxes were empty and the contents only pretend (transparent boxes condition) very few children (13 %) discarded the boxes. This suggests that for at least some children, discarding the boxes is motivated by uncertainty about the reality status of the pretend objects - when such uncertainty is minimised this response is dramatically reduced.

The number of children discarding the boxes was greater in this experiment than in any of the age groups sampled in experiment 4a. This suggests that with decreasing age, the proportion of children who are sensitive to the effects of increased cognitive availability increases. This experiment has therefore demonstrated a continuing developmental trend in children's sensitivity to increased cognitive availability for the pretence. However, this experiment has also demonstrated the problems associated with studying very young children's understanding of pretence. Pre-school children are more likely than even the youngest school aged children to fail the memory check questions. Furthermore, very few of these young children gave interpretable responses when asked to explain their behaviour. Therefore, the remaining experiments in this
thesis focused on school aged children (four to seven years old) who have already been
demonstrated to be subject to the effects of availability but who experience very few
difficulties in answering the memory checks and can quite competently provide
justifications for their behaviours.
Chapter 6: Experiment 5
The relationship between beliefs, behaviour and the hierarchical organisation of affect in pretence

Introduction

The results of experiment 2 showed that the most frequent response patterns were those in which children opened the positive box first and discarded it last, and discarded the negative box first and opened it last. Thus the children seemed to be motivated both to approach the positive pretend entity and to avoid the negative one. In experiment 4a, where they were prevented from responding to both of these motivations, children tended to prioritise their approach towards the positive pretend entity over their avoidance of the negative entity - they opened rather than discarded the boxes. Furthermore, whilst some children explained their behaviour in terms unrelated to the pretence, others responded in ways that could be interpreted in terms of either pretend-reality confusion or pretence continuation.

The aim of the present experiment was to explore the relationship between how children hierarchically organise affect in pretence and their beliefs about the pretend-reality distinction. This experiment was therefore designed to investigate possible associations between children's behaviour on the serial box selection tasks (experiment 2), their behaviour on the forced choice task (experiment 4), and the children's justifications for their behaviours. If the variations in children's behaviour on the tasks used in this research do, as has been assumed, reflect underlying individual and developmental differences in children's understanding of the pretend-reality distinction, there should indeed be relationships between the two types of task and the justifications that children subsequently offer for their behaviour, when these are assessed on a within-subject basis. Evidence of associations between the various methodologies used in this research is vital in validating the claim that there are identifiable groups of children who differ in terms of their susceptibility to pretend-reality confusions. What form might these associations take?

On the serial box selection tasks, some children generated random and perseverative response patterns. Similarly, on the forced choice task some children opened the boxes and explained their behaviour in terms that were unrelated to the pretence. It is possible that these two findings represent the behaviour of comparable children - a
group of children who are so sceptical that they respond indifferently or in terms of
task demands during pretence tasks. In contrast, those children who selected the
boxes according to the most frequent response pattern, whereby positive entities were
approached whilst negative ones were avoided, may correspond to those children who
opened the boxes during the forced choice task and explained their behaviour in terms
of pretence continuation or pretend-reality confusion.

There are a further two particularly interesting groups of children to be considered in
this experiment. First, during the box selection tasks a sizeable (although
non-significant) group of children opened the negative box after the positive box,
rather than leaving it until last. However, amongst five to six year old children (middle
age group), this response pattern was of considerably reduced prevalence when the
effects of availability were constrained by the use of transparent boxes (experiment 3).
It was argued that these children were perhaps those who were uncertain of the
pretend-reality distinction. If so, how will these children behave on the forced choice
task - will they continue to approach the monster box earlier than is absolutely
necessary and therefore open the boxes? Furthermore, will they explain their
behaviour in terms of their uncertainty about the pretend-reality distinction? Second,
in experiment 4a some children discarded the boxes when faced with the choice to
open or discard both of them. Although it was not statistically significant, there was a
trend towards less children discarding the boxes when these were transparent. It could
therefore be the case that for some children discarding the boxes is motivated by
pretend-reality confusion which is reduced by the empirical evidence of reality
provided by the transparent boxes. How will such children respond on the serial box
selection task and how will they explain their behaviour?

To explore these issues, the children in this experiment were asked to pretend about
the contents of opaque boxes and then to predict the order in which they would open
and discard those boxes (serial box selection tasks). The children were also asked to
decide to either open all of the boxes or to throw them all away (forced choice task).
The actual versions of the tasks were omitted to simplify them by reducing the number
of trials presented to each child. Subsequently, the children were asked to explain why
they had chosen to open or discard all of the boxes. However, the order of the serial
and forced choice tasks was counterbalanced - to avoid interference with the serial box
selection task the justification questions were only addressed to children who
completed the forced choice task last.
The justification questions were asked using two formats - the open-ended question format used in experiment 4a, and the closed-ended format used by Harris, Brown, Marriott, Whittall and Harmer (1991) and Johnson and Harris (1994). Thus the children were asked why they had opened or discarded the boxes and then whether they had wondered if the objects were inside the boxes or if they knew that the boxes were empty. The order of the open and closed ended questions was fixed to avoid the children's responses to the open ended question being influenced by their responses to the closed ended version. The match or mismatch between the children's responses to the open and closed ended versions of the question should help to reduce the ambiguity in interpreting the beliefs of children who report that they opened or discarded the boxes due to the presence of objects inside them. It was possible that these children were either reporting genuine uncertainty about the reality status of the pretend objects or alternatively that they were reporting the pretend contents of the boxes and thus responding in pretend mode. The children were also asked a short series of follow up questions assessing their understanding of the generative powers of pretence. These questions were based on those used by Harris et al (experiment 4) and Johnson and Harris (experiment 3).

Method

Subjects
Three groups of children (N = 90) were recruited from a predominantly middle class school in Hampshire. The younger group were 35 children (16 boys and 19 girls) aged between 4 years 7 months and 5 years 5 months (mean age 5 years). The middle group were 27 children (13 boys and 14 girls) aged between 5 years 6 months and 6 years 6 months (mean age 6 years). The older group were 28 children (13 boys and 15 girls) aged between 6 years 6 months and 7 years 6 months (mean age 7 years).

Procedure
The procedure was based on Experiment 2 and Experiment 4a (see pages 82 and 115 respectively). The children were tested individually by the author in a quiet area of their school. When the child arrived the identical cardboard boxes (measuring 17 x 24 x 27 cm) were situated in a row on a table. When the child had settled she/he was asked to look inside all the boxes and to confirm that they were empty.
The order of introduction to the pretend objects was counterbalanced. In addition, half the subjects completed the serial opening and discarding tasks first (the order of these was counterbalanced), the remainder completed the forced choice task first. At the end of the first task (serial or forced choice) the child checked once more that the boxes were empty and these were then placed to one side. The experimenter then commented “OK, now let’s do something a bit different” and placed an appropriate number of boxes for the second task on the table (3 for the serial task or 2 for the forced choice task). The second task commenced with the standard task introduction with the exception that the Christmas present the child had nominated for the previous task was used - the child was not asked to make a second selection. As in all previous experiments, whilst introducing the pretend objects the experimenter used appropriate intonation in her voice - enthusiastic for the positive object (Christmas present), dramatic for the negative object (monster) and normal for the neutral object (cup).

Task introduction (serial tasks). The task and pretend objects were introduced using the procedure used in experiment 2, “It doesn’t matter that the boxes are empty because we are going to play a game of pretend. I expect you’re good at pretend games aren’t you? . . . Is there something that you would really, really like for Christmas this year? . . . What is it? . . . OK, I want you to pretend that the {named object} you want for Christmas is in this box. Now look, this is my coffee cup (child shown a plain cup) it’s empty now but that doesn’t matter, I want you to pretend that my empty coffee cup is in this box. And, I want you to pretend that there is a horrible, mean monster that wants to come out and chase you, in this box”. The boxes were indicated left to right.

Memory and reality checks. The wording and procedure for the memory and reality checks was identical to that used in previous experiments.

Hypothetical opening task. The child was asked, “If I asked you to open one of the boxes, which one of the boxes would you open?”. This was repeated until the three boxes had been nominated.

Hypothetical discarding task. The child was asked, “If I asked you to throw away one of the boxes, which one of the boxes would you throw away?”. This was repeated until all three boxes had been nominated.
Task introduction (forced choice task). The task introduction followed the procedure used in experiment 4 - “It doesn’t matter that the boxes are empty because we are going to play a game of pretend. I expect you’re good at pretend games aren’t you? . . . Is there something that you would really, really like for Christmas this year?. . . What is it? . . . OK, I want you to pretend that the {named object} you want for Christmas is in this box. And, I want you to pretend that there is a horrible, mean monster that wants to come out and chase you, in this box”. The boxes were indicated left to right.

Memory and reality checks. These were identical to those used in the serial task.

Hypothetical task. The child was asked, “If you could choose to either open all of the boxes or throw away all of the boxes, what would you do, would you open them all or throw them all away?”.

Justification questions. These questions were only presented to children who completed the forced choice task second. Question 1 was identical to the justification question used in experiment 4. Questions 2, 3, 4 and 5 were based on Harris et al (1991 - experiment 4) and Johnson and Harris (1994 - experiment 3).
1) “Why did you choose to {open/throw away} all of the boxes?”
2) “Did you think there would be nothing inside the boxes or did you think to yourself ‘I wonder if there’s a {Christmas present} or a monster inside?’”
3a) “How did you think the {Christmas present}/monster would get inside the box?” or,
3b) “How did you know the {Christmas present}/monster wouldn’t be inside the box?”
4) “What would happen if you pretended very, very hard that there was a {Christmas present}/monster in that box there? Would there suddenly be a {Christmas present}/monster inside the box if you pretended very hard?”
5a) “Why?” or,
5b) “Why not?”

Debrief. Before returning to their classroom the child was asked to check that the boxes were empty and thanked for their help.

Overall, children made 3 box selections on two serial box selection tasks, therefore producing a 6 trial response pattern reflecting the order of box opening and discarding.
In addition, children made a single forced choice decision. All of the children’s responses were recorded in writing along with any verbal comments they made.

Results

Five children failed the memory checks and so were not included in the analyses. Of the remaining 85 children (31 in the younger age group, 26 in the middle age group and 28 in the older age group), 8 failed the reality checks (91% correct). Two of these children were from the younger group, 4 from the middle group and 2 from the older group.

Serial tasks

The results of the CFA for the patterns of box selections on the hypothetical opening and hypothetical discarding tasks are presented in Table 6.1.

Table 6.1: Results of Configural Frequency Analysis on children’s response patterns for the hypothetical opening task and the hypothetical discarding task analysed separately (positive = Christmas present, neutral = cup, negative = monster) (n = 85)

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Hypothetical Opening Task</th>
<th>Hypothetical Discarding Task</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>frequency</td>
<td>z</td>
</tr>
<tr>
<td>+ N -</td>
<td>44</td>
<td>*T 8.68</td>
</tr>
<tr>
<td>+ - N</td>
<td>17</td>
<td>.83</td>
</tr>
<tr>
<td>N + -</td>
<td>6</td>
<td>-2.38</td>
</tr>
<tr>
<td>N - +</td>
<td>2</td>
<td>*A -3.54</td>
</tr>
<tr>
<td>- N +</td>
<td>10</td>
<td>-1.21</td>
</tr>
<tr>
<td>- + N</td>
<td>6</td>
<td>-2.38</td>
</tr>
</tbody>
</table>

*T significant response type at p < .001
*A significant response anti-type at p < .01

On the hypothetical opening task the significant response type was selection of the positive box first, neutral box second and the negative box last (z = 8.68, p < .001,
Bonferroni adjustment for p at .05 = .008). This response pattern represented the behaviour of 44 children. The remaining 41 children were distributed between one significant response anti-type and 4 non-significant response patterns (see Table 6.1).

On the hypothetical discarding task only 5 of the 6 possible response patterns were observed - none of the children said that they would discard the positive box first, neutral box second and negative box last. The significant response type was selection of the negative box first, neutral box second and the positive box last ($z = 12.2$, $p < .001$, Bonferroni adjustment for $p$ at .05 = .01). This response pattern accounted for the behaviour of 62 children. The remaining 23 children were distributed between 3 significant response anti-types and one non-significant response pattern (see Table 6.1).

Further analyses were performed to compare the results of the present experiment with those obtained in the hypothetical tasks in experiment 2. This was to ensure that the methodological differences between the two experiments (addition of the forced choice task and omission of the actual tasks) had not caused a change in the children’s responses. As can be seen from Table 6.2 the results of the opening task appear to replicate those from experiment 2, showing a similar trend of increasing prevalence of the response type (positive - neutral - negative) with age. Statistical analyses confirmed that there were no significant differences between the numbers of children producing the response type in the two experiments for the younger ($\chi^2 = .11$, df = 1, $p = .918$), middle ($\chi^2 = .68$, df = 1, $p = .41$), or older children ($\chi^2 = .55$, df = 1, $p = .457$).

Table 6.2: Summary of response patterns produced on the hypothetical opening task presented according to age and experiment (positive = +, neutral = N, negative = -) (n = 175)
The numbers of children producing each response pattern on the hypothetical discarding task for the present experiment and experiment 2 are shown in Table 6.3 according to age group. The number of children producing the response type (negative - neutral - positive) was very similar across these experiments and again shows a trend of increasing prevalence with age. Statistical analyses confirmed that there were no differences in the numbers of children producing the response type across the two experiments for the younger ($\chi^2 = .02, df = 1, p = .886$), middle ($\chi^2 = .001, df = 1, p = .986$), or older (Fisher's exact probability, $p = .344$) age groups.

Table 6.3: Summary of response patterns produced on the hypothetical discarding task presented according to age and experiment (positive = +, neutral = N, negative = -) ($n = 175$)

<table>
<thead>
<tr>
<th>RESPONSE PATTERN</th>
<th>Experiment 5</th>
<th>Experiment 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>+  N</td>
<td>+  -  N</td>
</tr>
<tr>
<td>Younger</td>
<td>0  (3)</td>
<td>3  (3)</td>
</tr>
<tr>
<td>Middle</td>
<td>0  (0)</td>
<td>2  (1)</td>
</tr>
<tr>
<td>Older</td>
<td>0  (0)</td>
<td>1  (0)</td>
</tr>
<tr>
<td>Total</td>
<td>0  (3)</td>
<td>6  (4)</td>
</tr>
</tbody>
</table>

Forced choice task

Children's responses to being asked to either open or discard both boxes are presented according to age group in Table 6.4. Overall, the majority of children ($n = 58, 68\%$) said that they would open, rather than discard, both boxes. Two younger children were unable to decide between the two alternatives, insisting that they would open the positive box and discard the negative one. From inspection of these results there appears to be an age related trend whereby more children from the younger age group ($n = 13, 42\%$) chose to discard the boxes than did so amongst either the middle ($n = 5, 19\%$) or older ($n = 7, 25\%$) groups of children. This trend approached statistical significance ($\chi^2 = 4.79, df = 2, p < .1$).

To ensure that there was no effect on children's responses to the forced choice task from having completed the serial task, further analyses were performed in which the numbers of children opening and discarding the boxes in this experiment were compared with the corresponding age groups from experiment 4a (Table 6.5).
Statistical analyses revealed no significant differences for the middle (Fisher’s exact probability, p = .734) or older (Fisher’s exact probability, p = .692) groups of children. The results for the younger age group were approaching significance ($\chi^2 = 2.84, \text{df} = 1, p < .1$) as a result of more children discarding the boxes in the present experiment ($n = 13, 42\%$) than in experiment 4a ($n = 4, 21\%$).

**Table 6.4**: Children’s responses to being asked to either open or discard both boxes presented according to age group ($n = 85$)

<table>
<thead>
<tr>
<th>Response</th>
<th>Younger</th>
<th>Middle</th>
<th>Older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>16</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Discard</td>
<td>13</td>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

* 2 younger children were unable to reach a decision on this task, preferring instead to open the positive box and discard the negative box.

**Table 6.5**: Children’s responses to being asked to either open or discard both boxes (hypothetical task) presented according to experiment (percentages in brackets) ($n = 137$)

<table>
<thead>
<tr>
<th>Response</th>
<th>Experiment 4a</th>
<th>Experiment 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>43 (80%)</td>
<td>58 (70%)</td>
</tr>
<tr>
<td>Discard</td>
<td>11 (20%)</td>
<td>25 (30%)</td>
</tr>
</tbody>
</table>

The aim of this experiment was to explore the relationship between children’s responses on the serial box selection tasks, their behaviour on the forced choice task, and their subsequent justifications for that behaviour. These analyses, which were conducted analysing each age group separately, were conducted in two stages. First, the relationship between children’s behaviour across the two task types was explored. This analysis was conducted taking children’s response patterns across the opening task only. The data from the discarding task were not included given that the response type was approaching ceiling levels of frequency amongst the middle and older groups of children. Second, the relationship between children’s behaviour and verbal justifications were explored for the sub-group for whom these data were available.
The relationship between the two behavioural tasks for the younger group of children are presented in Table 6.6 which shows that the children were relatively equally distributed between the observed response patterns on the serial box selection task regardless of whether they had elected to open or to discard the boxes on the forced choice task. Unfortunately the cell sizes were too small to permit statistical analysis of these data.

Table 6.6: Younger children’s responses on the forced choice task presented according to their response pattern on the hypothetical opening (serial) task (positive = +, neutral = N, negative = -) (n = 31)

<table>
<thead>
<tr>
<th>Response pattern on hypothetical opening task</th>
<th>Open</th>
<th>Discard</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ N -</td>
<td>6*</td>
<td>4</td>
</tr>
<tr>
<td>+ - N</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>N + -</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>N - +</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>- N +</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>- + N</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

* 2 children who produced this response pattern (+ N -) on the serial box selection task were unable to reach a decision in the forced choice task.

The results for the middle group of children (Table 6.7) suggest a somewhat different relationship between children’s responses on the two tasks. Although too few children discarded the boxes for statistical analysis, there appears to be a trend such that those children who discard the boxes on the forced choice task are most likely to have opened the positive box first, negative box second and neutral box last.

Table 6.7: Middle children’s responses on the forced choice task presented according to their response pattern on the hypothetical opening (serial) task (positive = +, neutral = N, negative = -) (n = 26)

<table>
<thead>
<tr>
<th>Response pattern on hypothetical opening task</th>
<th>Open</th>
<th>Discard</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ N -</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>+ - N</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>N + -</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>N - +</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>- N +</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>- + N</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 6.8 presents the results for the older group of children across the two types of task. Once again, the frequencies are too low for full statistical analysis. However, it is interesting to note that 6 of the 7 children who discarded the boxes are accounted for by just two patterns of box selection - 4 of these children opened the positive box first, neutral box second and negative box last and 2 opened the positive box and then the negative box, leaving the neutral box until last.

Table 6.8: Older children’s responses on the forced choice task presented according to their response pattern on the hypothetical opening (serial) task (positive = +, neutral = N, negative = -) (n = 28)

<table>
<thead>
<tr>
<th>Response pattern on hypothetical opening task</th>
<th>Forced Choice Response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+ N -</td>
</tr>
<tr>
<td>Open</td>
<td>13</td>
</tr>
<tr>
<td>Discard</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>- N</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>N +</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>N -</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>N +</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>N -</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**Justification questions**

The children were asked a series of questions designed to elicit their reasons for deciding to open or discard the boxes in the forced choice task and to assess their beliefs about the pretend objects. These questions were only addressed to children who completed the forced choice task after the serial tasks, thus leaving a sub-sample of 44 children - 17 from the younger age group (of whom 6 opened and 9 discarded the boxes on the forced choice task - the remaining 2 children were unable to reach a decision), 13 from the middle age group (of whom 9 opened and 4 discarded the boxes on the forced choice task) and 14 from the older age group (of whom 9 opened and 5 discarded the boxes on the forced choice task).

**Question 1.** The results from asking children why they had decided to open or discard the boxes were classified using the same response categories as were used in experiment 4a:
- object presence
- statements of the pretend status of objects or lack of box contents
- uncertainty
- don’t know
- other reasons unrelated to the pretence
Responses in which references were made to the pretend objects being inside the boxes (object presence) were given by 20 children (45%). Of these children, 4 referred to the positive object:

"... Because the power rangers are in one..."
"... Because I want the barbie..."
"... Because I was excited it was in there..."
"... Because I don’t want to throw the scatelectrics away..."

Ten children referred specifically to the negative object:

"... Because I did, because I don’t like the monster..."
"... Because of the monster coming to chase me..."
"... So the monster wouldn’t chase after me..."
"... Because the monster’s in the box..."
"... Because of the monster..."
"... I would rather throw both away than get chased because I don’t like getting chased, it might make a spell..."
"... Because if I keep them the monster will always want me..."
"... Because I wouldn’t want the monster to chase me..."
"... Because I wouldn’t like the monster..."
"... Because the monster might go in the other box..."

The remaining 6 children whose responses fell into this category referred to both the positive and negative object:

"... Because I don’t want to throw the boxes away and waste them because that wouldn’t be nice for the mouse, hamster and the monster..."
"... Because I could scare the monster and I could play with my Sylvania...s..."
"... Because I’ve got a teddy I can play with and a monster that can chase me and I can play a game with it..."
"... Because I don’t want to throw the new bike out and I don’t want to throw the horrible monster out because I’m not scared of monsters..."
"... Because of my action man, I didn’t want to throw that away and the monster, I wanted to throw that away, so that way I opened it..."
"... Because that one’s the skates and I would have chucked the monster away..."

Explanations indicating uncertainty about whether or not the objects were in the boxes were offered by 7 children (16%):

"... To see what’s in them..."
"... Because I wanted to see if they are in there..."
“... To see what’s inside...”
“... To see if they’re real...”
“... To see if there’s anything inside them before I throw them away...”
“... Because it’s good to open it to see what’s in there...”
“... Because there might be something inside it...”

Only one child was classified as referring to the lack of box contents:
“... Because monsters are not really alive...”

Sixteen children (36%) explained their behaviour in terms unrelated to the pretence. One child said they did not know why they had behaved in the way they had. The remaining 15 children gave a variety of other reasons:
“... Because I wanted to...” (n = 3)
“... I wanted to, they’re nice boxes...”
“... Because of magic...”
“... Because I would like to...”
“... Because my mum keeps throwing them away...”
“... I take them outside because they’re muddy...”
“... Because they are nasty - the boxes...”
“... I don’t want them...”
“... Because I want to...” (n = 2)
“... Because I did want to...”
“... I wanted to...”
“... Because it’s my idea...”

As can be seen from Table 6.9, the main age related trend in children’s responses to this open-ended question was the decrease in the number of reasons unrelated to the pretence according to age and the corresponding increase in the number of children referring to specific objects.
Table 6.9: Summary of children’s responses to being asked why they had opened or discarded the boxes (forced choice task) presented according to age group - figures in brackets are percentages within each age group (n = 44)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Objective Presence</th>
<th>Uncertainty</th>
<th>Objective Absence</th>
<th>Don’t Know</th>
<th>Other Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger</td>
<td>5 (29 %)</td>
<td>1 (6 %)</td>
<td>0 (0 %)</td>
<td>1 (6 %)</td>
<td>10 (59 %)</td>
</tr>
<tr>
<td>Middle</td>
<td>5 (38 %)</td>
<td>3 (24 %)</td>
<td>0 (0 %)</td>
<td>0 (0 %)</td>
<td>5 (38 %)</td>
</tr>
<tr>
<td>Older</td>
<td>10 (71 %)</td>
<td>3 (21 %)</td>
<td>1 (8 %)</td>
<td>0 (0 %)</td>
<td>0 (0 %)</td>
</tr>
</tbody>
</table>

The relationship between the children’s verbal responses and their response to the forced choice task was explored. For the purposes of these analyses the ‘don’t know’ and ‘other reasons’ categories were combined into a single category of justifications unrelated to pretence (see Table 6.10). Amongst younger children, those who opened the boxes tended to give reasons unrelated to the pretence for doing so. In contrast, those who discarded the boxes were equally divided between describing the presence of objects in the boxes and unrelated justifications. Amongst middle and older children, those who opened the boxes tended to explain their behaviour in terms of the objects they contain or in terms of their uncertainty about the contents. However, amongst older but not middle children discarding appeared to be related to justifications in terms of the presence of objects inside the boxes.

In light of the rather complicated differences according to age and the small numbers of children involved in the analyses, these data were also considered taking the sample as a whole. Overall, children seem to be almost equally likely to explain opening and discarding in terms of the presence of objects inside the boxes. However, uncertainty about the possible contents of the boxes was only expressed by children who opened the boxes. Justifications unrelated to the pretence were more frequent amongst children who discarded the boxes than amongst those who opened them.

The relationship between children’s justifications for their behaviour and their responses on the serial box selection tasks was explored. These results are summarised in Table 6.11 which presents children’s response patterns on the hypothetical opening task according to their response to the open ended justification question. From these results, two findings are of particular interest. First, selection of
the positive, neutral and then the negative box is strongly associated with responses in terms of the presence of objects in the boxes - over half (55%) of the children generating this response pattern justified their behaviour in these terms. Second, of the 7 children who verbally expressed uncertainty about whether or not there were objects in the boxes, 5 (71%) opened the positive, neutral and then the negative box. No other trends were readily apparent due to the high prevalence of justifications that were unrelated to the pretence.

Table 6.10: Summary of children’s responses to being asked why they had opened or discarded the boxes in the forced choice task presented according to age group and their behavioural response on the forced choice task (n = 42)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Open (Discard)</th>
<th>Open (Discard)</th>
<th>Open (Discard)</th>
<th>Open (Discard)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger</td>
<td>1 (4)</td>
<td>1 (0)</td>
<td>0 (0)</td>
<td>4 (5)</td>
</tr>
<tr>
<td>Middle</td>
<td>4 (1)</td>
<td>3 (0)</td>
<td>0 (0)</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Older</td>
<td>5 (5)</td>
<td>3 (0)</td>
<td>1 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Total (n)</td>
<td>10 (10)</td>
<td>7 (0)</td>
<td>1 (0)</td>
<td>6 (8)</td>
</tr>
<tr>
<td>(%)</td>
<td>42% (56%)</td>
<td>29% (0%)</td>
<td>4% (0%)</td>
<td>25% (44%)</td>
</tr>
</tbody>
</table>

Table 6.11: Summary of children’s justifications presented according to their behavioural response on the hypothetical opening (serial) task (positive = +, neutral = N, negative = -) (n = 44)

<table>
<thead>
<tr>
<th>Response Pattern on Serial Task</th>
<th>Object Presence</th>
<th>Object Uncertainty</th>
<th>Object Absence</th>
<th>Don’t Know/Other Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>+  N -</td>
<td>12</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>+ -  N</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>N + -</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>-  N +</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>- + N</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Question 2. The justification question was also asked using a closed ended format in which children could either report having wondered about the box contents or having
known that the boxes were empty. The most frequent response to this question was that the child thought the objects would not be inside the boxes - this response was given by 27 children (61%) of whom 13 were from the younger, 8 from the middle and 6 from the older groups of children. However, 25% (n = 11) of the children admitted that they had wondered if the objects were inside the boxes - 3 of these were younger children, 4 middle children and 4 older children. Six children (14%) gave uninterpretable responses or said that they didn’t know.

To explore the relationship between the open and closed ended versions of the justification question and the children’s behaviour, further analyses were performed. To simplify these analyses, once again, ‘don’t know’ and ‘other reasons’ were combined into a single category of reasons unrelated to the pretence. These analyses were conducted combining all three age groups due to the small frequencies involved. The 6 children who did not give interpretable responses to the closed ended version of the justification question and the 2 children who were unable to reach a decision on the forced choice task were excluded from these analyses, thus leaving a reduced sub-sample of 38 children. The results of these analyses are summarised in Table 6.12.

The 11 children who admitted to wondering if there were objects inside the boxes (closed ended question) were not randomly distributed across the possible permutations of the four categories of response to the open-ended question and the two possible responses on the forced choice task. First, 8 of these children (73%) opened rather than discarded the boxes. Second, 6 children (55%) had indeed previously explained their behaviour in terms of the presence of objects inside the boxes. A further 3 of these children (27%) had expressed some uncertainty about the reality status of the box contents. Thus some children do indeed appear to respond towards pretend objects whilst uncertain about their reality status. Of the 27 children who reported that they were certain the boxes were empty 13 (48%) had given reasons that were unrelated to the pretence when previously asked to explain their behaviour. Twelve (44%) of these children had described the presence of objects in the boxes. There were no trends associated with the children’s response on the forced choice task. One interesting finding not shown in Table 6.12 is that 2 of the 7 children who expressed uncertainty about the box contents on the open ended question were unable to give interpretable responses on the forced choice question.
Table 6.12: A comparison of children's responses to the forced choice task according to their responses on the closed ended ('wondered' if there was something inside the boxes or 'knew' the boxes were empty) and open ended formats of the justification question (n = 38)

<table>
<thead>
<tr>
<th>Justifications Related to Pretence</th>
<th>Justifications Unrelated to Pretence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object Presence</td>
<td>Object Absence</td>
</tr>
<tr>
<td>Wonder (Knew)</td>
<td>Wonder (Knew)</td>
</tr>
<tr>
<td>Wonder (Knew)</td>
<td>Wonder (Knew)</td>
</tr>
<tr>
<td>Wonder (Knew)</td>
<td>Wonder (Knew)</td>
</tr>
<tr>
<td>Open Choice</td>
<td></td>
</tr>
<tr>
<td>Discard</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
</tr>
<tr>
<td>6 (12)</td>
<td></td>
</tr>
<tr>
<td>3 (2)</td>
<td></td>
</tr>
<tr>
<td>1 (0)</td>
<td></td>
</tr>
<tr>
<td>1 (6)</td>
<td></td>
</tr>
</tbody>
</table>

The relationship between reporting wondering on the closed ended question and response pattern on the serial box selection tasks was also explored (see Table 6.13). The 11 children who admitted wondering on the closed ended question were distributed between just 2 of the 5 response patterns observed on the hypothetical opening task. Eight of these 11 children (73%) selected the positive box first, neutral box second and negative box last. The remaining 3 children (27%) selected the negative, neutral and then the positive box. The 27 children who reported having been certain that the boxes were empty were divided across the observed response patterns.

Table 6.13: Children's responses to the closed ended justification question ('wondered' if there was something inside the box or 'knew' that the boxes were empty) according to their response pattern on the hypothetical opening (serial) task (positive = +, neutral = N, negative = -) (n = 38)

<table>
<thead>
<tr>
<th>Response Pattern on Serial Box Selection Task</th>
<th>Closed Ended Justification Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ N - + - N</td>
<td>Wondered</td>
</tr>
<tr>
<td>N + - + N</td>
<td>Knew</td>
</tr>
<tr>
<td>Wondered</td>
<td>8</td>
</tr>
<tr>
<td>Knew</td>
<td>12</td>
</tr>
<tr>
<td>Wondered</td>
<td>8</td>
</tr>
<tr>
<td>Knew</td>
<td>3</td>
</tr>
<tr>
<td>Wondered</td>
<td>3</td>
</tr>
<tr>
<td>Knew</td>
<td>2</td>
</tr>
<tr>
<td>Wondered</td>
<td>2</td>
</tr>
</tbody>
</table>

Question 3. As a follow-up question, the children were asked to explain either how they knew that there would be nothing inside the boxes or how they thought that the
objects had got inside the boxes. These data were analysed using the categories developed by Johnson & Harris (1994 - experiment 3):

- magical explanations - responses referring to the use or possibility of magic
- mental explanations - responses referring to the child's mental state
- physical explanations - responses referring to the possibility or impossibility of an entity entering the box, or in which the child remarked on the previous lack of box contents, and
- other explanations.

The results of this analysis (summarised in Table 6.14) showed that the most frequent responses (n = 26, 59%) amongst all three age groups were 'physical explanations' in which the child referred to the possibility or impossibility of the object entering the box (with or without them noticing) or which referred to the empty state of the box:

- "... I know, he jumped in the box..."
- "... Using his hands..."
- "... It nibbled through the hole..."
- "... Because there can't be anything, there's no such thing as a monster and my barbie car wouldn't fit in the box..."
- "... When someone put them in..."
- "... Because my mum or my sister or one of my family might have put it in there..."
- "... If it was the climbing action man it would get onto the wall, get its parachute out and jump down..."
- "... When I weren't looking..."
- "... Because I remember when I looked in there last time the cup couldn't walk and the Sylvanian's couldn't walk so there won't be anything in there..."
- "... Because it was invisible...
- "... Because he was getting in the box...
- "... Because it's got no things in it...
- "... Because there's no bike and no monster because it's empty...
- "... Because there's no toys...
- "... Because there ain't nothing in them...
- "... Because I looked...
- "... Because when I first looked at them there was nothing in...
- "... Because they're just empty boxes...
- "... It's empty, see!..." (child opened a box and showed the experimenter that it was empty)
“... Because it weren’t in there...”
“... Because I put my hand in there...”
“... Because I’ve looked already...”
“... I had a look before we started the game...”
“... Because I looked in them...”
“... Well, in real life if there’s nothing inside, if you close your eyes and there’s something inside but when I first looked inside there was nothing in there...”
“... Because I looked...”

Twelve children (27%) gave one of the 'other explanations' - these included don’t know and uninterpretable responses:
“... Because I didn’t...”
“... He wants to chase after me...”
“... My mum told me that long, long ago...”
“... Don’t know...” (n = 6)
“... Because I guessed...”
“... Because everybody would fight over it...”
“... Because I do...”

A small number of children gave ‘magical explanations’ (n = 3, 7%):
“... Because I done it with magic...”
“... Because I was magic...”
“... It might be his house or he did a spell and he went in there, or he could be a ghost...”

The remaining 3 children (7%) gave ‘mental explanations’ in which they referred to their mental state or the efficiency (or inefficiency) of that mental state at generating the pretend objects:
“... Because I’ve been thinking, I was thinking that there was nothing in the boxes...”
“... Because they’re only pretend...”
“... Because they were pretended...”

As can been seen from Table 6.14 there were no clear age trends in the nature of children’s explanations.
Table 6.14: Summary of children’s responses to being asked how they knew that the object was not inside the box or how they thought the object had got inside the box - figures in brackets are percentages of children within each age group (n = 44)

<table>
<thead>
<tr>
<th>RESPONSE CATEGORY</th>
<th>Magical Explanation</th>
<th>Mental Explanation</th>
<th>Physical Explanation</th>
<th>Other Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Group</td>
<td>Younger</td>
<td>Middle</td>
<td>Older</td>
<td>All children</td>
</tr>
<tr>
<td></td>
<td>1 (6%)</td>
<td>1 (8%)</td>
<td>1 (7%)</td>
<td>3 (7%)</td>
</tr>
<tr>
<td></td>
<td>2 (12%)</td>
<td>1 (8%)</td>
<td>0 (0%)</td>
<td>3 (7%)</td>
</tr>
<tr>
<td></td>
<td>8 (47%)</td>
<td>9 (69%)</td>
<td>9 (64%)</td>
<td>26 (59%)</td>
</tr>
<tr>
<td></td>
<td>6 (35%)</td>
<td>2 (15%)</td>
<td>4 (29%)</td>
<td>12 (27%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Question 4 and question 5: The children were asked whether or not pretending very hard would ever lead to an object being inside the box and why (or why not) this was the case. The majority of children (n = 35, 80%) denied this possibility. The analysis of children’s explanations is summarised in Table 6.15, according to age group.

The most frequent explanations (n = 22, 50%) were those referring to the physical possibility or impossibility of an object entering the boxes or in which the child re-stated the empty status of the boxes:

- "... I can’t see an action man in the box..."
- "... It would just climb in and I wouldn’t see it go in..."
- "... Because monsters don’t be alive any more..."
- "... Because the monster can’t fit in the box..."
- "... Because if there was one in there, the painted bit would stick out..."
- "... Because there’s no such thing as ghosts..."
- "... Skateboard’s can’t fit inside the box..."
- "... They thought it was a nice thing so they put it in there..."
- "... Because you couldn’t fit two presents in one box..."
- "... It was hiding and it clawed in there..."
- "... Because there’s not real barbies..."
- "... Because no monsters are real, they’re not alive, that’s only for Halloween, for dressing up..."
- "... Because they died..."
- "... People put them in there..."
- "... Because there’s nothing in here..."
- "... Because they’re empty..."
"... Because there's nothing there now...
"... Because it's not true, because they're just empty boxes...
"... Because there isn't a barbie car in school...
"... There ain't anything in there...
"... Because it ain't in there...
"... Because it's just an empty box...

'Mental explanations' accounted for the responses of 8 children (18 %):
"... Because we be just thinking there's a monster in there but there's not really...
"... Because you're just pretending...
"... Because it's just my imagination...
"... Because they're not real...
"... Because they're not real, they're only pretend...
"... Because it's just pretending for toys...
"... Because I know something's not in it...
"... Because they were only pretend...

Very few children (n = 3, 7 %) gave 'magical explanations':
"... Because the Sylvanians aren't magic...
"... Because you have to go to Manchester and get the tickets, you can't just magic it there...
"... We had a look inside the boxes first and the boxes aren't magic...

However a relatively large number of children (n = 11, 25 %) gave 'other' explanations which included don't know and uninterpretable responses:
"... Because there's no steam...
"... Don't know..." (n = 2)
"... Because it would nick my bike...
"... Because there won't...
"... Because there would...
"... Because it's shiny...
"... He wants to eat me up...
"... Because when there was my birthday there wasn't nothing inside the box"
"... Because it would...
"... Because I do..."
Frequencies were too low to identify any age trends beyond the observation that the younger children appear to be more likely to give an 'other' explanation and less likely to give a physical explanation than either of the other two age groups (see Table 6.15).

Table 6.15: Summary of children’s responses to being asked whether pretending very hard would ever lead to an object really being inside the box - figures in brackets are percentages of children within each age group (n = 44)

<table>
<thead>
<tr>
<th>RESPONSE CATEGORY</th>
<th>Magical Explanation</th>
<th>Mental Explanation</th>
<th>Physical Explanation</th>
<th>Other Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger</td>
<td>0 (0 %)</td>
<td>4 (24 %)</td>
<td>5 (29 %)</td>
<td>8 (47 %)</td>
</tr>
<tr>
<td>Middle</td>
<td>1 (8 %)</td>
<td>2 (15 %)</td>
<td>8 (62 %)</td>
<td>2 (15 %)</td>
</tr>
<tr>
<td>Older</td>
<td>2 (14 %)</td>
<td>2 (14 %)</td>
<td>9 (64 %)</td>
<td>1 (8 %)</td>
</tr>
<tr>
<td>All children</td>
<td>3 (7 %)</td>
<td>8 (18 %)</td>
<td>22 (50 %)</td>
<td>11 (25 %)</td>
</tr>
</tbody>
</table>

Throughout the experimental procedure children’s spontaneous comments were recorded. Fourteen (16 %) children commented that they would prefer not to open or to discard one or more of the boxes during the serial task. Of these children 12 produced the response type (positive - neutral - negative) on the opening task. Ten (12 %) children remarked that they would prefer to open the positive box and discard the negative box rather than opening or discarding both on the forced choice task. Four of these children went on to open the boxes, 4 discarded them and the remaining 2 (younger) children remained unable to reach a decision.

Summary of results
The results of this experiment can be summarised in terms of six main findings. First, the results obtained here were directly comparable to those obtained in previous experiments. As in experiment 2, the children in this experiment tended to open the positive box first, the neutral box second and the negative box last, and tended to discard the negative box first, neutral box second and the positive box last. When faced with the choice of either opening or discarding the boxes, the children in this experiment, like those in experiment 4a, tended to choose to open them. These systematic behaviours emerged after the vast majority of children had labelled the box contents as pretend and not real.
Second, the children’s behaviour on the forced choice task was associated with particular patterns of response on the serial box selection task. Furthermore, this relationship differed in terms of the children’s age. Amongst four to five year old children (younger age group) there was no clear relationship between the two behaviours. In contrast, amongst five to seven year old children (middle and older age groups) discarding the boxes appeared to be associated with electing to open the positive box first, neutral box second and negative box last. Amongst six to seven year old children (older age group), discarding the boxes also appeared to be associated with opening the positive box first, negative box second and neutral box last.

Third, the children’s behaviours on the forced choice task were related to their differing responses to the open ended question in which they were asked why they had opened or discarded the boxes. Amongst four to five year old children, those who opened the boxes were most likely to give reasons unrelated to the pretence when explaining their behaviour. In contrast, the children in this younger age group who discarded the boxes tended to either discuss the presence of objects inside the boxes or to give reasons unrelated to the pretence when explaining their decision. Amongst five to seven year old children (middle and older age groups), opening the boxes was associated with object presence responses as well as those reflecting uncertainty about the box contents. Discarding the boxes was associated with comments about the objects being inside the boxes amongst the six to seven year old (older) children.

Fourth, the comparison of children’s responses to the open ended justification question and their response patterns on the serial box selection task showed that uncertainty was most likely to be expressed by those children who opened the positive, neutral and then the negative box. In addition, selecting the positive, neutral and then the negative box was also associated with justifications referring to the objects being inside the boxes.

Fifth, when asked directly whether they had wondered if the objects had really been inside the boxes, a quarter of the children admitted having done so. These children tended to have either opened the positive, neutral and then the negative box, or the positive, negative and then the neutral box on the serial box selection task, to have elected to open both boxes on the forced choice task and to have explained this decision in terms of their uncertainty about the box contents or in terms of the presence of objects inside the boxes.
Finally, the majority of children denied that it was possible for pretend entities to become real and explained this in terms of physical reasons why the objects would not or could not appear inside the boxes.

Discussion

The results obtained in the present experiment were very similar to those found in previous experiments. As before, although the majority of children correctly labelled the objects as pretend and not real, they behaved systematically towards them. These children tended to open the positive box first and the negative box last and to discard the negative box first and the positive box last. The neutral box repeatedly emerged as the children’s second selection. When positive and negative affect were placed in direct conflict such that children could not simultaneously approach the positive entity and avoid the negative one, they tended to open both of the boxes. In addition, the children tended to justify their behaviour in terms of the presence of objects inside the boxes. Although this type of response could indicate pretence continuation, some of the children’s comments were very clearly suggestive of a breakdown in their understanding of the pretend-reality distinction. For example, it is highly unlikely that those children who expressed uncertainty about whether or not there were objects inside the boxes were responding as a continuation or re-statement of the pretence theme. Overall, the present experiment obtained three separate types of evidence relating to children’s understanding of pretence - their behaviour in serial box selection tasks, their behaviour in a forced choice task, and the children’s subsequent explanations for their behaviour. The aim of this experiment was to explore the relationships between each of these aspects of children’s beliefs and behaviour.

The relationship between the serial and forced choice tasks suggested some developmental and individual differences in children’s responses towards pretend objects. Amongst four to five year old (younger) children there were no direct relationships between the two tasks - each of the observed response patterns on the serial box selection task was equally represented by children who opened or discarded the boxes when confronted with the forced choice task. However, given that there are a plethora of reasons why children might open or discard both boxes in the forced choice task (see experiment 4a, page 112, for a full discussion of these reasons), the failure to find a straightforward relationship between this task and the serial box selection task was not entirely surprising.
In contrast, amongst five to seven year old (middle and older) children there were clear relationships between the two types of task but these relationships differed across the two age groups. Those middle children who opened both of the boxes (forced choice task) were most likely to have selected the positive box first, neutral box second and the negative box last on the hypothetical opening (serial) task. In contrast, although there were rather few children who did so, those middle children who discarded both boxes (forced choice task) tended to have selected the positive box first, negative box second and the neutral box last on the hypothetical opening (serial) task. Taken together these findings are highly suggestive of individual differences between children within this single age group. Some of these five to six year old children approached the positive entities and avoided the negative ones, organising affect in pretence such that approaching the positive pretend entity was prioritised. However, other children of the same age approached negative entities sooner than was absolutely necessary and yet prioritised the avoidance of the negative pretend entity.

Those children within the middle age group who approach negative entities second rather than last in serial box selection tasks have previously been identified as an intriguing sub-group. Where opaque boxes have been used (experiment 1 and experiment 2) these children have emerged in relatively large (but not significant) numbers. However, when the potential for availability to lead children to wonder about the possible box contents was minimised by the use of transparent boxes (experiment 3), a comparably sized group of children did not emerge. Thus it was assumed that within this age group at least, selecting the negative box earlier than is absolutely necessary is perhaps motivated by pretend-reality confusion. A similar argument was developed with regards to those children who elected to discard both boxes in the forced choice task (experiment 4a) - in each age group more children did so in the opaque boxes condition than in the transparent boxes condition. The co-occurrence of these two types of behaviour on a repeated measures basis supports the suggestion that they are similarly motivated and furthermore, supports the argument that there are stable groups of children who are susceptible to pretend-reality confusion during pretence tasks.

Within the older group of children (six to seven years old) there were also observable relationships between children’s responses on the serial and forced choice tasks. Specifically, children who discarded both boxes (forced choice task) either opened the positive box first, neutral box second and the negative box last, or the positive box first, negative box second and the neutral box last on the hypothetical opening (serial)
task. Thus there seems to be two groups of differently motivated children within this age group - both groups hierarchically organise affect such that the avoidance of the negative entity is prioritised, but these groups differ in terms of their treatment of negative affect during the serial task such that whilst some children avoid it, others deal with it sooner than is absolutely necessary. These two groups of children are not identical to those observed amongst middle children. Whilst the association between discarding both boxes and opening the negative box second rather than last is common to both age groups, the organisation of affect amongst children who select the positive, neutral and then the negative box differs. Amongst five to six year old (middle) children approaching the positive pretend entity is prioritised whereas amongst six to seven year old (older) children, avoiding the negative entity is prioritised. However, given the small numbers of children involved, this developmental difference should be interpreted cautiously.

To summarise, despite the ambiguity in interpreting children’s motivations when responding to the forced choice task, some clear relationships between this task and the serial tasks emerged. These relationships differed according to the age group considered and between children within each age group. Therefore there seem to be both developmental and individual differences in children’s behavioural responses towards pretend objects and in the way in which children prioritise differing forms of affect in pretence. A key question addressed in this experiment was the extent to which these differing groups of children verbally reported uncertainty about the reality status of the pretend entities. This issue was explored by interviewing the children about their beliefs and their understanding of the pretend-reality distinction. Interview data is available for only a sub-sample of the children who participated in this experiment due to the problems associated with interviewing children about their behaviour on serial tasks - only those children who completed the forced choice task after the serial box selection tasks were asked to discuss their beliefs about the pretend-reality distinction.

Children’s responses to being asked why they had opened or discarded both boxes were categorised into two broad response types - reasons unrelated to the pretence (don’t know and ambiguous comments) and reasons related to the pretence (object presence, uncertainty and object absence). Those children who described the contents of the boxes (object presence) in their answers were equally divided between opening and discarding both boxes (forced choice task). However, object presence responses were most frequent amongst children who had opted to open the positive box first,
neutral box second and negative box last (serial task). Uncertainty about whether or not there were objects inside the boxes was only expressed by children who had elected to open both boxes and was most frequently associated with opening the positive box, neutral box and then the negative box. Thus it would seem that children’s behaviour on the serial box selection task is highly predictive of their justifications for their behaviour. Children’s verbal expressions of uncertainty about the pretend entities corresponds very closely with behaviours which can be interpreted as reflecting pretend-reality confusion. However, as noted previously, object presence responses could be interpreted as either reflecting genuine pretend-reality confusion or pretence continuation - these children could mention box contents because they believe these may have become real, or they may be simply restating the pretence whilst certain that the boxes are empty. The credulous-sceptical dichotomy is not readily derived from comments about the objects being inside the boxes. Therefore the children were asked directly whether they had wondered whether the objects were inside the boxes or whether they had been certain that the boxes were empty.

In their experiments, Harris et al (1991 - experiment 4) and Johnson and Harris (1994 - experiment 3) found that approximately half of the children interviewed reported that they had wondered whether the pretend objects were inside the boxes. In contrast, only a quarter of the children in this experiment responded similarly. Why should these results differ? One possibility relates to a methodological difference between the experiments. In the present experiment children were asked about their behaviour in a task which is subject to a strong task demand (opening the boxes because of the association between boxes, containment of objects and box opening). In contrast, Harris et al and Johnson and Harris interviewed children about their spontaneous behaviours in the experimenter’s absence. Perhaps the task demands in the present experiment lead children to respond in literal mode rather than in terms of their beliefs about the pretend objects. In addition, the closed-ended question in this experiment followed an open-ended question. It is also possible that children became more certain of the pretend-reality distinction, or more self-conscious about reporting pretend-reality confusion, as the questioning continued.

Nevertheless, a quarter of the children in this experiment reported that they had wondered about the reality status of the box contents. Interestingly, the behaviour of these children on the behavioural tasks and their responses to the open-ended justification question supported the earlier suggestions that certain behaviours and comments reflected uncertainty about the pretend-reality distinction. First, nearly
three quarters of these children opened the boxes on the forced choice task. Second, over half of them had reported that they opened the boxes due to the objects being inside them (open-ended question). Thus for at least some children, object presence comments are not a continuation of the pretence theme. Third, nearly one third of these children reported uncertainty about the box contents on the open-ended justification question. Finally, nearly three quarters of these children had selected the positive, neutral and then the negative box on the hypothetical opening (serial) task. Taken together, these findings suggest that children’s behaviour on the forced choice and serial tasks and justifications in terms of object presence and uncertainty indicate genuine uncertainty about the pretend-reality distinction.

The children in this experiment were also asked some general questions about their understanding of pretence. Initially they were asked either how they had known the boxes were empty or how they thought that the objects had got inside the boxes. Children’s responses were categorised into the response types developed by Johnson and Harris (1994 - experiment 3). Like the children in Johnson and Harris, over half of the children in this experiment responded in terms of the physical possibility or impossibility of an object entering the boxes or re-stated the empty status of the boxes. In this research it has been argued repeatedly that empirical evidence of the non-existence of pretend entities constrains the effects of availability. Indeed, these children seem to be describing the way that they use their knowledge of reality to reassure themselves of the pretend-reality distinction. For example, having not seen a monster enter the box seemed to be sufficient to confirm the pretend status of that imagined entity for some children. Interestingly, fewer children in this experiment explicitly mentioned magic in their explanations than in Johnson and Harris, whereas a similarly small number of children mentioned the generative power of their mental states. As in Johnson and Harris, there were no clear age trends in the children’s responses to this question.

Following the procedure developed by Harris et al (1991 - experiment 4) the children were also asked whether pretending could ever lead to an object appearing inside the box and why (or, why not). Over three quarters of the children denied this possibility. This is comparable to the number of children in Harris et al who responded similarly. Again, the children tended to appeal to physical explanations to account for this. In addition, some children referred to the impossibility of such mental (imaginative) or magical feats, but in general the children tended to discuss the generative powers of their imagination in terms of direct empirical evidence that pretending does not cause
objects to become real. In other words, many children report that they know that pretending does not cause imagined entities to become real based on the evidence that they have never seen it happen. This finding provides direct evidence against the transmigration hypothesis (Harris et al) since it demonstrates that children are not unduly uncertain of the generative powers of the imagination.

Taken together, the results obtained in this experiment support the findings obtained in previous experiments, confirming that there are individual and developmental differences in children’s behaviour towards pretend entities, in the way in which they organise affect during pretence and in terms of their beliefs about the pretend-reality distinction. Furthermore, the evidence obtained in this experiment suggests that to confidently interpret their behaviour, children’s explanations for that behaviour should be obtained. In addition, this experiment has gathered independent evidence from children’s responses to interview questions, that empirical evidence of reality is a vital factor in constraining the effects of increased cognitive availability. Overall, this experiment has further demonstrated the existence of three separable groups of children:

- credulous children who experience pretend-reality confusion
- sceptical children who continue the pretence in terms of the affect it evokes
- other children who respond indifferently or in terms of task demands.
Chapter 7: Experiment 6
Evidence of pretend-reality confusion:
Children's spontaneous behaviour in the absence of the experimenter

Introduction

To date, this program of research has relied on the analysis and interpretation of children's behaviour within pretence tasks during which the experimenter has prompted the child to act towards pretend entities. The observed similarities and differences in children's behaviours within and between experiments have been interpreted as indicating both individual and developmental differences in children's understanding of the pretend-reality distinction. Thus whilst some children behave systematically towards pretend entities as a continuation of the pretence theme (Golomb & Galasso, 1995), others do so because they have become uncertain about the reality status of the pretence due to the effects of increased cognitive availability (Harris, Brown, Marriott, Whittall & Harmer, 1991; Johnson & Harris, 1994).

However, it could be argued that children's behaviours in pretence tasks are perhaps not completely dependent on the pretence and thus might not be particularly informative about children's understanding of the pretend-reality distinction. One possibility is that children disregard the instruction to pretend and then simply respond in terms of task demands when asked to behave towards the pretend entities. For example, children might respond in terms of some form of elaborate collusion with the experimenter whereby they act as if they believe that there are objects inside the boxes. Alternatively, the children could perhaps respond by approaching the positive entity and avoiding the negative one merely as a response to the affect that is associated with the label attributed to the box contents, independent of their own affective states and without ever engaging in the pretence or considering the pretend-reality distinction. Yet, even if it is assumed that children engage in pretence when instructed to do so, there remains the possibility that all of the children's responses are in pretend mode. That is, given that there is no break in the pretence before the children are asked to make their selections of boxes to open and discard, it could be that the children respond in terms of the hypothetical (pretend) situation that they have created with the experimenter, without any contemplation of the reality status of that situation. In other words, the failure to end the pretence might lead children to respond entirely as a
continuation of the pretending game (Golomb & Galasso, 1995). There are several findings from the present research which mitigate against each of these possibilities.

First, the various knowing smiles and giggles that were evident during the task introduction suggest that at least some of the children engaged in the pretence when they were asked to do so. Second, a number of the children in these experiments spontaneously commented that they would prefer not to discard the box they were pretending contained their preferred Christmas present or that they would prefer not to open the box they were pretending contained a scary monster. These comments are difficult to reconcile with the idea of the children responding entirely in terms of task demands and indeed, one of Harris et al’s (1991) reasons for arguing against collusion with the experimenter as a possible explanation of their results was the nature of the children’s spontaneous comments about the pretend entities. Third, experiment 5 demonstrated that there were relationships between children’s behaviours on the pretence tasks and their justifications for those behaviours in terms of their beliefs about the pretence. For example, children who verbally expressed uncertainty about the pretend-reality distinction tended to open both boxes (forced choice task) and to select to open the positive box first, neutral box second and negative box last (serial box selection task). Thus children’s behaviours on the pretence tasks do not appear to be completely independent of their verbally expressed beliefs about the reality status of what has been pretended. Fourth, there is no good reason to suppose that the manner in which children respond to task demands, or that the manner in which children continue the pretence, should vary according to empirical evidence of box contents. However, the findings from experiments 3, 4a and 4b suggest that the use of transparent boxes which provide continual visual confirmation that the boxes are empty and the contents only pretend, influenced some children’s behaviour. Finally, the developmental trends which have been observed in this research are easier to reconcile with the idea that children’s susceptibility to the effects of availability and their response to affect during pretence undergo age related changes, than with the idea that the manner in which children respond to task demands varies according to the child’s age.

Taken together these findings suggest that children’s behaviour in pretence tasks is not totally independent of the pretence, nor merely a response to task demands. Instead, children’s behaviour does seem to reflect their beliefs about the pretence. However, there remains a more direct manner of validating the use of pretence tasks as a way of investigating children’s understanding of the pretend-reality distinction - a comparison
of children's behaviour on the pretence tasks with their spontaneous behaviours towards pretend objects.

Harris et al (1991 - experiment 4) and Johnson and Harris (1994 - experiment 3) argued that observing children's spontaneous behaviour towards boxes containing pretend objects, in the absence of the experimenter, rules out the possibility that children are merely colluding with the experimenter. With the experimenter no longer in the room there is no need for children to continue to act as if the boxes contain real objects. However, even without an adult prompting them to act, Harris et al and Johnson and Harris observed that around half (45% and 63% respectively) of the children opened one or both of the boxes during the two minute period that they were left alone. These researchers argued that the increased cognitive availability for the objects being in the boxes that was caused by the pretence had lead the children to wonder about the reality status of the imagined contents of the boxes. As a result of this uncertainty about the pretend-reality distinction, the children opened the boxes.

However, Golomb and Galasso (1995) were very critical of this methodology and argue that there are at least two features of the Harris et al (1991 - experiment 4) design that might have led children to open the boxes in the experimenter's absence despite having a full appreciation of the pretend status of the contents. First, Golomb and Galasso argue that Harris et al did not explicitly end the pretence. Instead, the children were asked to pretend about the box contents and then the experimenter made an excuse to leave the room. Golomb and Galasso argue that the children believed that the pretending game was to be continued, and indeed that the children do so, whilst the experimenter is out of the room. Second, these authors argue that the failure to offer children alternative play activities is an important factor. In other words, Golomb and Galasso argue that the children's spontaneous behaviours were a result of boredom and merely represent a continuation of the pretence theme which had not been concluded.

In support of their claims, Golomb and Galasso (1995 - experiment 1) offer evidence from an experiment in which children were allocated to one of two conditions - either the pretence was explicitly concluded and a box of toys conspicuously placed in the room (terminated pretence - toys condition), or the pretence was not concluded and no toys were provided (non-terminated pretence - no toys condition, as Harris et al, 1991). The children's behaviour was observed by the experimenter who, rather than leaving the room as in Harris et al, simply moved to a corner of the room to do some
work and no longer interacted with the child. The results showed that very few children in either condition approached the boxes during the period following the pretence.

However, there are aspects of the Golomb and Galasso (1995) methodology that make the differences between their findings and those obtained by Harris et al (1991) and Johnson and Harris (1994) impossible to interpret. First, termination of the pretence and the provision of alternative play activities were confounded. It is not possible to determine which of these factors influenced the children’s behaviour without experimental conditions in which the pretence was ended and there were no toys (terminated pretence - no toys condition) and in which the pretence was not ended but toys were provided (non-terminated pretence - toys condition). Second, and arguably most important, the experimenter in Golomb and Galasso’s study remained in the room with the child throughout the experiment rather than leaving the room as she had done in the Harris et al experiment (Woolley, 1997a). Although Golomb and Galasso dismiss this possibility, it seems likely that children would be reticent to explore the boxes due to concern about being ‘naughty’ when they were being watched, albeit surreptitiously, by an adult. Independent of the children’s beliefs, their possible exploratory behaviour towards the boxes might have been suppressed by the experimenter’s continual presence. For these reasons, Golomb and Galasso’s non-replication of Harris et al’s results does not provide compelling evidence against the study of children’s spontaneous behaviours towards pretend objects as a way of investigating children’s understanding of the pretend-reality distinction.

The aim of the present experiment was to validate the claim that children’s behaviour on pretence tasks reflects individual and developmental differences in children’s understanding of pretence. To this end, the relationship between children’s spontaneous behaviour in the experimenter’s absence and their patterns of response on the serial box selection tasks used in the preceding experiments was explored. If both of these measures assess children’s understanding of the pretend-reality distinction, then there should be associations between certain response patterns on the pretence tasks and the children’s subsequent behaviour towards the boxes in the experimenter’s absence.

The children in this experiment were therefore asked to pretend about the contents of three opaque boxes and then to make hypothetical and actual selections of the order in which they wanted to open and discard the boxes. In this respect, the experiment
followed the design used in experiment 2. However, the particular entities to be pretended were different to those used in the preceding experiments. In previous experiments the experimenter determined the neutral (cup) and negative (monster) entities to be pretended, whereas the positive entity was of the child’s own choosing (their preferred Christmas present). Thus the child’s involvement in selecting the objects was not held constant across differing forms of affect. In the present experiment the child was asked to select all three entities. In addition, the animacy of the pretended entities and whether they were of supernatural origins was also held constant by asking the children to choose the entities to be pretended from a selection of pictures of familiar animals. The children selected the animal that they liked the most (positive entity), the one that they liked the least (negative entity) and the one which they neither liked nor disliked (neutral entity). The possibility that in previous experiments the children had been responding to the assumed preferences of the experimenter was also eliminated in this experiment since the affective loading of the experimenter’s voice remained neutral whilst the children made their animal selections. Previous research suggests that it is unlikely that children’s beliefs are influenced by features of imagined entities such as their animacy, supernatural or everyday origins (for example, Harris et al, 1991 - experiments 1 and 2) and adult versus child selection (for example, Golomb & Galasso, 1995). However, the design of this experiment held these factors constant across all types of affect to rule out this possibility.

Another key feature of the design of this experiment was that the pretence task was compared with a non-pretence control task which followed the same design but with one major modification. The children were not asked to engage in any pretence but instead the pictures of the selected animals were attached to the lids of the boxes. According to Johnson and Harris’ (1994) account of the availability hypothesis, pretence is just one of many possible mechanisms which can potentially lead to increased cognitive availability. However, the precise nature of these availability increasing cues remains relatively untested at present. Research by Subbotskii (1985; Subbotsky, 1994) suggests that hearing a fairy story can increase the cognitive availability of certain magical outcomes. Another possibility is that placing a picture of an object on the lid of a box might lead children to think about the possibility of the depicted object being in the box. This could cause an increase in cognitive availability and ultimately result in the child wondering if the object is indeed really inside the box. This possibility is tested by the design of the non-pretence condition. Furthermore, the inclusion of a non-pretence control task also allowed an investigation of whether children’s behaviour when they are pretending differs fundamentally to their behaviour.
when it is not in pretend mode and is instead being generated by the mere labelling of the boxes.

The children’s spontaneous behaviour towards the boxes was observed. To rule out the possibility that the children’s behaviour was merely a continuation of the pretence theme, the pretence (and non-pretence) task was explicitly terminated prior to the experimenter’s departure. In addition, like Golomb and Galasso (1995), the design of this experiment provided children with a range of alternative play activities. However, rather than conspicuously placing a box of toys in the room (as in Golomb & Galasso), the present experiment was conducted in the school library. Thus the children were given a range of available alternative activities which they had implicit permission to engage in and which formed an intrinsic part of the setting. Therefore any spontaneous behaviour towards the boxes could not be interpreted as simply being due to boredom. The children were left alone after completion of the box selection tasks for two minutes and their behaviour video recorded (as Harris et al, 1991; Johnson & Harris, 1994). On the experimenter’s return the children were asked what they had done during the period they were left alone. Those children who admitted opening one or more of the boxes were asked to explain why they had done so.

An important feature of the design of this experiment is the fact that the children were left alone with positive, neutral and negative entities. In previous experiments (Harris et al, 1991; Johnson & Harris, 1994) children were left alone with two boxes, one which they had pretended about, and one which was the empty control box - affect was varied on a between subjects basis. Thus this experiment affords the first opportunity to consider the selectivity in children’s spontaneous behaviour when positive, neutral and negative affect have been evoked by the pretence on a within subject basis. The availability hypothesis as it stands does not allow any clear predictions to be made pertaining to this issue.

How might children behave in the experimenter’s absence? Golomb and Galasso (1995) attribute their results to the termination of the pretence and the provision of alternative play activities rather than the continued presence of the experimenter. If this is correct, in this experiment where the pretence is ended and alternative activities offered, but where the experimenter leaves the room, there should also be very few children who spontaneously open the boxes. In contrast, if as is suspected, it was the continued presence of the experimenter that suppressed children’s behaviour towards the boxes, then in this experiment the rates of spontaneous box opening should be
comparable to those observed by Harris et al (1991) and Johnson and Harris (1994). In addition, if the children's spontaneous behaviour is merely a continuation of the pretence, more children should approach the boxes after the pretence tasks than the non-pretence tasks since in the latter there is no pretence to be continued. In contrast, the availability hypothesis might predict similar rates of spontaneous box opening across the experimental conditions if the pictures, like the pretence, serve to increase the cognitive availability of the idea of the objects being inside the boxes.

Overall, the design of this experiment allows a direct test of the predictions made by the availability hypothesis and by the pretence continuation account of children's spontaneous behaviours towards pretend entities. By comparing children's behaviours during the pretence tasks and when subsequently left alone with the empty boxes, this study offers an opportunity to validate the claim that children's behaviour towards pretend objects in the experimenter's presence reflects pretend-reality confusion. Furthermore, the inclusion of a non-pretence control task enabled an investigation of the differing sorts of prompts that might lead to an increase in cognitive availability and whether mode (pretence or not) influences the effect this increase in availability has on the children's behaviour.

Method

Subjects
Twenty-six younger children (16 boys and 10 girls) aged between 4 years 10 months and 5 years 8 months (mean age 5 years 3 months) and 19 middle children (8 boys and 11 girls) aged between 5 years 9 months and 6 years 7 months (mean age 6 years 2 months) were recruited from a predominantly middle class school in Surrey (N = 45).

Design
This experiment followed the basic design used in experiment 2, incorporating two additional experimental manipulations. First, children were allocated to either the pretence condition or the non-pretence condition. The procedure used in these conditions was identical with one exception - whereas the children in the pretence condition were asked to pretend about the contents of the boxes, children in the non-pretence condition did not. Instead, these children opened and discarded boxes that had been labelled with pictures. Second, the children were left alone with the boxes for 2 minutes after they had completed the opening and discarding tasks. A
concealed video camera recorded the children's behaviour during the experimenter’s absence - children were not informed that they were being filmed.

Materials
The same materials were used in both experimental conditions. The three identical cardboard boxes measured 17 x 24 x 27 cm. The pictures used in the object selection procedure (both conditions) and for labelling the boxes (non-pretence condition) were 12 black and white line drawings of familiar animals - shown in Appendix 1. The animals represented were: a budgerigar (referred to as a budgie), cat, dog, guinea pig, ladybird, mouse, rabbit, scorpion, snake, tarantula, toad and tortoise. Appendix 2 shows the picture given to children at the end of the experiment.

Procedure
As in previous experiments, the order of introduction to the pretend objects and the order of the opening and discarding tasks was counterbalanced. Before moving on to the second pair of tasks children were reminded of the nature and location of the pretend entities (pretence condition) or box labels (non-pretence condition). The order of the hypothetical and actual tasks was fixed such that children were always asked to predict their behaviour before actually carrying it out. Whilst introducing the pretend objects and attaching the pictures to the box lids, the experimenter used appropriate intonation in her voice - enthusiastic for the positive object (the animal that the child would most like to hold), dramatic for the negative object (the animal that the child would least like to hold) and normal for the neutral object (the animal that the child would not mind holding). However, the experimenter’s voice remained neutral throughout the object selection procedure.

The children were tested individually by the author in their school library. When the child arrived the boxes were situated in a row on a table. When the child had settled she/he was asked to look inside all three boxes and to confirm that they were empty.

Task introduction and object selection (pretence condition). The task and pretend objects were introduced, "It doesn’t matter that the boxes are empty because we are going to play a game of pretend. I expect you’re good at pretend games aren’t you? .  . . Here are some pictures of animals. I would like you to sort these cards into three piles - one for animals that you would like to hold and one for animals that you would not like to hold and one for animals that you would not mind if you held them or not”. The pictures were then presented in random order - “So here’s a {name animal}. 171
Would you like to hold a [name animal], would you not like to hold a [name animal] or would you not mind if you held a [name animal] or not? This question was repeated for all 12 pictures.

Once the child had produced 3 piles of cards, the positive and negative animals were ranked (this was counterbalanced). The pictures were spread out in front of the child who was asked to select which of the animals shown they would most (positive object) or least (negative object) like to hold. This was repeated until all the pictures had been selected. The neutral object was selected randomly by shuffling the neutral cards and spreading them out face down in front of the child - "OK, let's just pick any one of these animals, any one will do as you don't mind about these ones". A minority of children failed to produce a selection of neutral animals therefore the least positive animal was selected and re-labelled by the experimenter as one that the child would not mind holding. The pictures were then placed out of sight.

The pretending task was then introduced, "OK, I want you to pretend that the [name of animal] that you would really, really like to hold is in this box. And I want you to pretend that the [name of animal] that you would really, really not like to hold is in this box. And I want you to pretend that the [name of animal] that you would not mind if you hold it or not is in this box". The boxes were indicated left to right.

Memory and reality checks. The wording and procedure for the memory and reality checks was identical to that used in previous experiments.

The task introduction and object selection in the non-pretence condition differed only in that the pretend game was referred to only as a 'game' and the pretence instructions were replaced - "OK, I'm going to put the picture of the [name of animal] that you would really, really like to hold on this box. And I'm going to put the picture of the [name of animal] that you would really, really not like to hold on this box. And I'm going to put the picture of the [name of animal] that you would not mind if you hold it or not is in this box". The pictures were attached to the lids of the boxes, working from left to right. There were no memory or reality checks in the non-pretence condition.

Opening tasks. (1) Hypothetical opening. The child was asked, "If I asked you to open one of the boxes, which one of the boxes would you open?".
(2) Actual opening. Once the child had nominated all three boxes they were asked to act, “OK, you show me now, you open one of the boxes now”. This was repeated until the three boxes had been opened.

Discarding tasks. (1) Hypothetical discarding. The child was asked, “If I asked you to throw away one of the boxes, which one of the boxes would you throw away?”. This was repeated until all three boxes had been nominated.
(2) Actual discarding. The child was then asked to actually discard the boxes, “OK, you show me now, you throw away one of the boxes now”. This was repeated until the three boxes had been discarded.

Experimenter’s departure. The child was then left alone with the boxes for 2 minutes after the experimenter remarked - “Oh aren’t I silly, I’ve just realised that I was going to give you a picture to thank you for your help but I’ve forgotten to bring it. I’ll just go and get it. You wait here for me until I get back”.

Interview after experimenter’s return. The child was asked a series of questions (based on Harris et al, 1991 - experiment 4) about their behaviour when left alone:
1) “OK, what did you do while I was gone? Did you look inside any of the boxes?”. If the child denied looking inside any of the boxes subsequent questions were omitted and the child debriefed.
2) “Which box did you look inside? ... Any others?”
3) “And what did you think when you went to open the box? ... Did you think there was nothing inside the box or did you think to yourself I wonder if there’s a [name of animal] inside?” This question was repeated for each box the child had opened.

Debrief. Before returning to their classroom the child was asked to check that the boxes were empty, thanked for their help and given the picture to colour in at home.

Children’s rank ordering of the animals, responses to the memory and reality checks and the orders of box selection were recorded in writing during the experiment. Children’s behaviour during the experimenter’s absence, verbal comments and responses to the interview questions were transcribed from the video recordings.
Results

Animal Selections
All of the children happily selected liked and disliked animals and the majority (n = 34, 76%) generated a selection of animals that they would not mind holding. The median rankings for each animal were calculated - the most liked animal for each child was given a ranking of 1 and the least liked animal a ranking of 12. The neutral selection of animals were given a tied ranking where appropriate. These median rankings and the frequency with which each animal was selected as the positive, neutral and negative entities are presented in Table 7.1. Inspection of the median rankings for the animals revealed that the median rankings were spread across the full continuum - the highest ranking was 3 and the lowest was 11. The animals most frequently selected as the positive, neutral and negative entities were the rabbit (n = 13, 29%), tortoise (n = 14, 31%) the tarantula (n = 16, 36%) respectively.

Table 7.1: Median rankings of animals (1 represents the most positive ranking and 12 represents the most negative ranking) and frequency of selection as the positive, negative and neutral entities (n = 45)

<table>
<thead>
<tr>
<th>Animal</th>
<th>Median Ranking</th>
<th>Positive</th>
<th>Neutral</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rabbit</td>
<td>3</td>
<td>13</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Dog</td>
<td>4</td>
<td>9</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Cat</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Guinea pig</td>
<td>4</td>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ladybird</td>
<td>4.5</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Mouse</td>
<td>6</td>
<td>2</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Budgie</td>
<td>6</td>
<td>0</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Tortoise</td>
<td>7</td>
<td>0</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>Toad</td>
<td>9</td>
<td>0</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Snake</td>
<td>9</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Scorpion</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Tarantula</td>
<td>11</td>
<td>1</td>
<td>0</td>
<td>16</td>
</tr>
</tbody>
</table>

Memory and reality checks
All of the children in the pretence condition responded correctly to the memory and reality checks (children in the non-pretence condition were not asked these questions).
Box selection tasks

The children's response patterns across each of the experimental tasks were subjected to CFA. The results of these analyses are summarised in Table 7.2.

Table 7.2: Results of Configural Frequency Analysis on children's response patterns for each of the experimental tasks analysed separately (positive = animal the child would most like to hold, neutral = animal the child would not mind holding, negative = animal the child would least like to hold) (n = 45)

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Frequency</th>
<th>Positive</th>
<th>Neutral</th>
<th>Negative</th>
<th>Frequency</th>
<th>Positive</th>
<th>Neutral</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ N -</td>
<td>31 (23)</td>
<td>*T 8.20</td>
<td>*T 4.05</td>
<td>- (1)</td>
<td>- (*A -2.60)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ - N</td>
<td>7 (14)</td>
<td>-0.75</td>
<td>(.95)</td>
<td>- (2)</td>
<td>- (-2.20)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N + -</td>
<td>3 (4)</td>
<td>-2.24</td>
<td>(*A -2.50)</td>
<td>- (1)</td>
<td>- (*A -2.60)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N - +</td>
<td>3 (4)</td>
<td>-2.24</td>
<td>(*A -2.50)</td>
<td>4 (8)</td>
<td>*A -3.48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- N +</td>
<td>- (-)</td>
<td>-</td>
<td>(-)</td>
<td>37 (29)</td>
<td>*T 6.96</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- + N</td>
<td>1 (-)</td>
<td>*A -2.98</td>
<td>(-)</td>
<td>4 (4)</td>
<td>*A -3.48</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*T significant response type at p < .001
*A significant response anti-type at p < .01

On the hypothetical opening task only 5 of the 6 possible response patterns were observed - none of the children nominated the negative box first, neutral box second and positive box last. Of the 5 observed response patterns, one emerged as a significant response type and one as a significant response anti-type (see Table 7.2). The significant response type was selection of the positive box first, neutral box second and negative box last (z = 8.2, p < .001, Bonferroni adjustment for p at .05 = .01). This response pattern accounted for the behaviour of 31 children. The results for the actual opening task were similar to those obtained in the hypothetical version. The same response pattern emerged as the significant response type (z = 4.05, p < .001, Bonferroni adjustment for p at .05 = .013) although it represented the behaviour of fewer children (n = 23). Of the remaining 5 possible response patterns, 2 were not observed, 2 emerged as significant response types and there was one non-significant response pattern (see Table 7.2).
The results for the hypothetical discarding task were very clear. Only 3 of the 6 possible response patterns were observed. The significant response type was the order negative box first, neutral second and positive last ($z = 6.96$, $p < .001$, Bonferroni adjustment for $p$ at $.05 = .017$) and this accounted for the behaviour of 37 children. The remaining 8 children were equally distributed between 2 significant response anti-types (see Table 7.2). The significant response type for the actual discarding task was to discard the negative box first, neutral box second and positive box last ($z = 8.60$, $p < .001$, Bonferroni adjustment for $p$ at $.05 = .008$). This response pattern accounted for the behaviour of 29 children. The remaining 16 children were distributed between 2 significant response anti-types and 3 non-significant response patterns (see Table 7.2).

The results of these CFA suggested that there were fewer children generating the response type on the actual than on the hypothetical versions of the tasks. To establish whether these apparent differences were statistically significant, further analyses were conducted. A comparison of children’s responses across the hypothetical and actual opening tasks (Table 7.3) revealed that whilst 21 children produced the response type on both occasions and 12 children did so on neither task, 12 children changed their responses. Ten children produced the response type on the hypothetical task but went on to actually open the boxes in a different order and 2 children actually opened the boxes according to the response type after having said that they would open them in a different order. This variability in children’s behaviour was statistically significant (McNemar exact significance, $p = .039$).

Table 7.3: Comparison of children’s responses across hypothetical and actual opening tasks (response type: positive - neutral - negative) - figures in brackets are for discarding tasks (response type: negative - neutral - positive) ($n = 45$)

<table>
<thead>
<tr>
<th>Actual Task</th>
<th>Response Pattern on Hypothetical Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Type 21 (29) ! 2 (0) Other 10 (8) , 12 (8)</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

To explore the nature of the change in children’s behaviour, the response patterns that children changed to and from across the two versions of the opening task were
considered (Table 7.4). These analyses revealed that 9 of the 10 children who changed from the response type (hypothetical task) to a different response pattern, actually opened the positive, then the negative and then the neutral box. The remaining child actually opened the neutral, negative and then the positive box. There were 2 children who actually opened the boxes according to the response type after having hypothetically selected the boxes in a different order - both of these children had selected the positive, negative and then the neutral box on the hypothetical opening task. Of the 12 children who produced one of the other response patterns on both versions of the task, 4 selected the positive, negative and then the neutral box on both occasions, 2 selected the neutral, positive and then negative boxes and 2 selected the neutral, negative and then positive boxes on both occasions. The remaining 4 children produced different response patterns on each version of the task.

Table 7.4: Comparison of children's response patterns across hypothetical and actual opening tasks - figures in brackets are for discarding tasks (positive = +, neutral = N, negative = -) (n = 45)

<table>
<thead>
<tr>
<th>Actual Task</th>
<th>Hypothetical Opening Task</th>
<th>(Hypothetical Discarding Task)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ N -</td>
<td>+ N - 21 (-)</td>
<td>+ N - 21 (-)</td>
</tr>
<tr>
<td>+ - N</td>
<td>- N - 2 (-)</td>
<td>- N - 2 (-)</td>
</tr>
<tr>
<td>N + +</td>
<td>N + + 9 (-)</td>
<td>N + + 9 (-)</td>
</tr>
<tr>
<td>N - +</td>
<td>- N + 1 (-)</td>
<td>- N + 1 (-)</td>
</tr>
<tr>
<td>- N +</td>
<td>- N + 1 (-)</td>
<td>- N + 1 (-)</td>
</tr>
<tr>
<td>- + N</td>
<td>- + N 1 (-)</td>
<td>- + N 1 (-)</td>
</tr>
</tbody>
</table>

Returning now to the data presented in Table 7.3, 29 children produced the response type on both the hypothetical and actual versions of the discarding task and 8 children did so on neither. Eight children changed their responses across the 2 versions of the task - all of them produced the response type on the hypothetical task but actually discarded the boxes in a different order. This variability in the children's behaviour was statistically significant (McNemar exact significance, p = .008). The changes in children's behaviour were more fully analysed - Table 7.4. These results revealed that of the 8 children who produced the response type on the hypothetical but not the actual task, 4 actually discarded the neutral box first, negative box second and then the positive box. The remaining 4 children each actually discarded the boxes in a different order. Of the 8 children who did not produce the response type on either version of
the task, 4 discarded the neutral box first, negative box second and positive box last on both versions of the task and 3 discarded the negative box first, the positive box and then the neutral box hypothetically and actually. The remaining child hypothetically discarded the negative box first, positive box second and neutral box last but went on to actually discard the positive box first, negative box second and neutral box last.

Due to the significant differences between the hypothetical and actual versions of the opening and discarding tasks, a comparison of the results from the pretence and non-pretence conditions was performed considering the four experimental tasks individually. The aim of these analyses was to establish whether children's behaviour on the box selection tasks differed according to experimental condition.

The frequencies for each response pattern observed on the opening tasks are presented according to experimental condition in Table 7.5. On the hypothetical opening task a similar number of children from the pretence condition \( (n = 17, 71\%) \) as from the non-pretence condition \( (n = 14, 67\%) \) responded according to the response type (positive - neutral - negative). Analyses comparing the frequencies of the response type and all other response patterns taken together confirmed that there was no statistically significant difference between the two conditions \( (\chi^2 = .09, \text{df} = 1, p = .763) \). However, slightly more children responded by nominating the positive, negative and then the neutral box in the pretence condition \( (n = 5, 21\%) \) than in the non-pretence condition \( (n = 2, 10\%) \). A similar pattern of results was obtained for the actual opening task (figures in brackets in Table 7.5) - a similar number of children generated the response type in the pretence condition \( (n = 13, 54\%) \) as in the non-pretence condition \( (n = 10, 48\%) \). Statistical analysis confirmed that there was no significant difference in the number of children generating the response type according to condition \( (\chi^2 = .19, \text{df} = 1, p = .661) \). However, once again somewhat more children from the pretence condition \( (n = 9, 38\%) \) than from the non-pretence condition \( (n = 5, 24\%) \) opened the positive box first, negative box second and neutral box last.

The frequencies for each response pattern generated on the discarding tasks are presented according to condition in Table 7.6. Slightly more children from the pretence condition \( (n = 22, 92\%) \) than from the non-pretence condition \( (n = 15, 71\%) \) generated the response type (negative - neutral - positive) on the hypothetical discarding task. However, statistical analyses comparing the frequencies of the response type with those for all other response patterns taken together revealed that
this difference did not reach statistical significance (Fisher's exact probability, \( p = .121 \)). A similar discrepancy in the numbers of children producing the response type was observed on the actual discarding task. Whilst 17 children (71\%) from the pretence condition produced the response type, only 12 children (57\%) from the non-pretence condition did so. This difference was also not statistically significant (\( \chi^2 = 9.2, \text{df} = 1, p = .338 \)).

Table 7.5: Summary of response patterns generated on the hypothetical opening task (actual opening task in brackets) presented according to experimental condition (positive = +, neutral = N, negative = -) (n = 45)

<table>
<thead>
<tr>
<th>RESPONSE PATTERN</th>
<th>Hypothetical (Actual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition</td>
<td>+ N -</td>
</tr>
<tr>
<td>Pretence</td>
<td>17 (13)</td>
</tr>
<tr>
<td>Non-Pretence</td>
<td>14 (10)</td>
</tr>
<tr>
<td>Total</td>
<td>31 (23)</td>
</tr>
</tbody>
</table>

Table 7.6: Summary of response patterns generated on the hypothetical discarding task (actual discarding task in brackets) presented according experimental condition (positive = +, neutral = N, negative = -) (n = 45)

<table>
<thead>
<tr>
<th>RESPONSE PATTERN</th>
<th>Hypothetical (Actual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition</td>
<td>+ N -</td>
</tr>
<tr>
<td>Pretence</td>
<td>0 (1)</td>
</tr>
<tr>
<td>Non-Pretence</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Total</td>
<td>0 (1)</td>
</tr>
</tbody>
</table>

The response patterns produced over the twelve trials across the four experimental tasks taken together were subjected to CFA. The results of this analysis are summarised in Table 7.7 which reveals that overall there were two significant response types. First, a significant number of children (n = 17) responded by opening (hypothetically and actually) the positive box first, neutral box second and negative box last and by discarding (hypothetically and actually) the negative box first, neutral box second and positive box last (\( z = 10.7, p < .001 \), Bonferroni adjustment for \( p \) at
The second significant response type was generated by the 7 children who said that they would open the positive box first, negative box second and neutral box last (hypothetical task) but actually opened the positive box, then the negative box and then the neutral box. These children discarded (hypothetically and actually) the negative box first, neutral box second and positive box last ($z = 3.55, p < .001$, Bonferroni adjustment for $p$ at $0.05 = 0.002$). Two children opened (hypothetically and actually) the positive box first, negative box second and neutral box last and discarded (hypothetically and actually) the negative box first, neutral box second and positive box last. The remaining 19 children each produced unique response patterns. There were no significant response anti-types.

Table 7.7: Summary of results of Configural Frequency Analysis of response patterns across all experimental tasks taken together (positive = animal the child would most like to hold, neutral = animal the child would not mind holding, negative = animal the child would least like to hold) ($n = 45$)

<table>
<thead>
<tr>
<th>Response Pattern</th>
<th>Opening Tasks</th>
<th>Discarding Tasks</th>
<th>Frequency</th>
<th>$z$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$+$ $N$ $-$</td>
<td>$+$ $N$ $-$</td>
<td>$N$ $+$</td>
<td>17</td>
<td>*$T$ 10.70</td>
</tr>
<tr>
<td>$+$ $N$ $-$</td>
<td>$+$ $N$ $-$</td>
<td>$N$ $+$</td>
<td>7</td>
<td>*$T$ 3.55</td>
</tr>
<tr>
<td>$+$ $N$ $-$</td>
<td>$+$ $N$ $-$</td>
<td>$N$ $+$</td>
<td>2</td>
<td>-.75</td>
</tr>
</tbody>
</table>

The remaining 19 children each produced a unique response profile different from each other and the above.

*$T$ significant response type at $p < .001$

To establish whether this new, second significant response type was specific to one or other of the experimental conditions, further analyses were conducted. CFA were again performed on the twelve trial response patterns but on this occasion the data from the pretence and non-pretence conditions were analysed separately. The results of these analyses are summarised in Table 7.8 which shows that only one response type emerged in each condition.

In the pretence condition, 9 children opened (hypothetically and actually) the positive box first, neutral box second and negative box last and discarded (hypothetically and
actually) the negative box first, neutral box second and positive box last (z = 4.49, p < .001, Bonferroni adjustment for p at .05 = .005). Six children said that they would open the positive box first, neutral box second and negative box last but actually opened the positive, then the negative and then the neutral box and discarded (hypothetically and actually) the positive box first, neutral box second and positive box last. This response pattern, which had reached statistical significance with the experimental conditions combined, just failed to reach statistical significance (z = 2.25, p = .007, Bonferroni adjustment for p at .05 = .005). Two children opened (hypothetically and actually) the positive box first, negative box second and neutral box last and discarded (hypothetically and actually) the negative box first, neutral box second and positive box last. There were no significant response anti-types and the remaining 7 children each produced unique response patterns.

In the non-pretence condition the significant response type was generated by 8 children and reflected opening (hypothetically and actually) the positive box first, neutral box second and negative box last and discarding (hypothetically and actually) the negative box first, neutral box second and positive box last (z = 5.51, p < .001, Bonferroni adjustment for p at .05 = .004). The remaining 13 children each produced unique, non-significant response patterns.

Table 7.8: Summary of results of Configural Frequency Analysis of response patterns across all experimental tasks taken together presented according to experimental condition (positive = animal the child would most like to hold, neutral = animal the child would not mind holding, negative = animal the child would least like to hold) (n = 45)

<table>
<thead>
<tr>
<th>Response Pattern</th>
<th>Experimental Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive = +; Neutral = N; Negative = -</td>
<td>Pretence</td>
</tr>
<tr>
<td>Opening</td>
<td>Discarding</td>
</tr>
<tr>
<td>+ N - ( + N )</td>
<td>- N + ( - N + )</td>
</tr>
<tr>
<td>+ N - ( + - N )</td>
<td>- N + ( - N + )</td>
</tr>
<tr>
<td>+ - N ( + - N )</td>
<td>- N + ( - N + )</td>
</tr>
</tbody>
</table>

The remaining 7 children in the pretence condition and 12 children in the non-pretence condition each produced a unique response pattern different from each other and the above.

*T significant response type at p < .001
The results of the CFA, presented in Table 7.8, suggest a subtle difference in children’s behaviour across the two experimental conditions. Although in each condition the same, single significant response type emerged and was produced by the same proportion of children in the pretence condition (n = 9, 38%) as in the non-pretence condition (n = 8, 38%) (χ² = .002, df = 1, p = .967), the behaviour of the remaining children does appear to vary. When the experimental conditions were combined a second significant response type emerged - a significant number of children (n = 7, 16%) said that they would open the positive, neutral and then the negative box but actually opened the positive, negative and then the neutral box. These children hypothetically and actually discarded the negative box first, neutral box second and positive box last. Six of the children responding in this manner were from the pretence condition and just one came from the non-pretence condition. Statistical analysis was performed comparing these frequencies with those of the children producing all other response patterns combined (Table 7.9) - a 3 by 2 chi-square comparing the frequencies of the 2 response types and other response patterns was not possible due to small expected frequencies. The distribution of frequencies shown in Table 7.9 failed to reach significance for a 2-tailed test (Fisher’s exact probability, p = .101) but was approaching significance for a 1-tailed test (Fisher’s exact probability, p = .07) which was conducted under the hypothesis that this response pattern would be produced by more children from the pretence, than from the non-pretence condition.

Table 7.9: Children’s responses across all tasks (hypothetical and actual opening then hypothetical and actual discarding) presented according to experimental condition (positive = +, neutral = N, negative = -) (n = 45)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Response Pattern</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretence</td>
<td>+ N - (+ - N) - N + (- N +)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>18</td>
</tr>
<tr>
<td>Non-Pretence</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Children’s behaviour during the experimenter’s absence

Due to an equipment failure the video data for 4 children were lost, thus leaving the data for 41 children (21 in the pretence condition and 20 in the non-pretence condition). The data from the video recordings were analysed such that children were classified into 1 of 3 mutually exclusive activity categories:

- did nothing (including sitting or standing still, fidgeting and nose picking)
The numbers of children engaging in each of these activities are presented according to experimental condition in Table 7.10. Inspection of these frequencies shows that the children were approximately equally distributed across each category of activity apparently independently of experimental condition.

Table 7.10: Summary of children’s behaviour during experimenter’s absence presented according to experimental condition (n = 41)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Opened box(es)</th>
<th>Did nothing</th>
<th>Other Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretence</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Non-Pretence</td>
<td>7</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

The behaviour that was of particular interest in this experiment was box opening behaviour during the experimenter’s absence. Inspection of Table 7.11 revealed that, overall, 13 children (32 %) opened one or more of the boxes. The rates of box opening did not differ according to experimental condition - whilst 6 children (29 %) from the pretence condition opened one or more of the boxes, 7 children (35 %) from the non-pretence condition did so ($\chi^2 = .2$, df = 1, p = .658). In the pretence condition, of the 6 children who opened the boxes during the experimenter’s absence, 3 children opened just one box, 2 children opened all 3 boxes and 1 child opened 2 boxes. In the non-pretence condition, 4 children opened 1 box and the other 3 children opened all 3 boxes. Interestingly, all 7 children who opened just one box opened the positive box. The child who opened 2 boxes opened the neutral and then the negative box. There were 6 possible orders in which children could have opened all 3 boxes, however, only 2 of these were observed:
- positive - negative - neutral (n = 3)
- neutral - positive - negative (n = 2).

Analyses were conducted to explore the relationship between children’s response patterns on the experimental tasks and whether or not they opened the boxes during the experimenter’s absence (Table 7.12). These analyses were conducted taking the children’s 6 trial response patterns across the hypothetical and actual opening tasks. This was to ensure that the two significant response types that emerged overall were
reflected but without setting unduly strict criteria for children's inclusion into these groups - any variability across the discarding tasks was ignored.

Of the 13 children who opened the boxes in the experimenter's absence, the majority (n = 9, 69%) had both hypothetically and actually elected to open the positive box first, neutral box second and negative box last. However, the children producing this response pattern were equally split between opening (n = 9, 47%) and not opening (n = 10, 53%) the boxes during the experimenter's absence. Of the 8 children who hypothetically selected the positive box first, neutral box second and negative box last but who actually opened the positive box first, negative box second and neutral box last, 6 (75%) did not open the boxes during the experimenter's absence. All other combinations of response pattern were categorised together as other response patterns, the majority of these children (n = 12, 86%) did not approach the boxes during the experimenter's absence. Given that there were no obvious differences between the two experimental conditions, the frequencies were combined to give a 2 by 2 chi-square comparing the number of children generating the response type with those producing all other response patterns combined ($\chi^2 = 4.011, df = 1, p < .05$).

**Table 7.11**: Number of children opening the boxes during the experimenter's absence presented according to experimental condition (n = 41)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Opened box(es)</th>
<th>Did not open box(es)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretence</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Non-Pretence</td>
<td>7</td>
<td>13</td>
</tr>
</tbody>
</table>

**Table 7.12**: Numbers of children opening the boxes during the experimenter's absence presented according to response pattern across hypothetical and actual opening tasks - pretence condition (figures in brackets are for non-pretence condition) (n = 41)

| Opened Box(es) | Response Pattern
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>+ N - / + N -</td>
</tr>
<tr>
<td></td>
<td>All other response patterns</td>
</tr>
<tr>
<td>Yes</td>
<td>4 (5)</td>
</tr>
<tr>
<td>No</td>
<td>6 (4)</td>
</tr>
</tbody>
</table>

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To establish whether these patterns of relationship between box opening and response patterns on the experimental task was sensitive to age, further analyses were conducted. There were no significant differences between the pretence and non-pretence conditions on the numbers of children opening the boxes for either the younger (Fisher's exact probability, $p = .586$) or middle children (Fisher's exact probability, $p = .179$). Therefore the results for the two experimental conditions were combined. As can be seen from the frequencies presented in Table 7.13, more children from the middle ($n = 9, 47\%$) age group, than from the younger ($n = 4, 18\%$) age group, opened one or more boxes. This difference was statistically significant ($\chi^2 = 4.01, df = 1, p < .05$). The relationship between the children's response patterns from the experimental tasks and box opening behaviour during the experimenter's absence is summarised in Table 7.14. These results show that amongst the younger children, all 4 children who opened the boxes in the experimenter's absence had opened the positive, neutral and then the negative box on the (hypothetical and actual) opening tasks. This was also true of 5 of the 9 children (56\%) from the middle age group who had opened one or more of the boxes during the experimenter's absence. Of the remaining 4 children, 2 selected the positive box first, neutral box second and negative box last on the hypothetical opening task but actually opened the positive box first, negative box second and neutral box last and the remaining 2 children produced other response patterns on both tasks.

Table 7.13: Number of children opening the boxes during the experimenter's absence presented according to age group ($n = 41$)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Opened box(es)</th>
<th>Did not open box(es)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>Middle</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 7.14: Numbers of children opening the boxes during the experimenter's absence presented according to response pattern across hypothetical and actual opening tasks - younger age group (figures in brackets are for middle age group) (positive = +, neutral = N, negative = -) ($n = 41$)

<table>
<thead>
<tr>
<th>Response Pattern</th>
<th>Opened Box(es)</th>
<th>+ N - / + N -</th>
<th>All other response patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>4</td>
<td>5 (5)</td>
<td>0 (4)</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>5 (5)</td>
<td>13 (5)</td>
</tr>
</tbody>
</table>
Interview after experimenter’s return

Following to the experimenter’s return the children were asked whether they had opened any of the boxes whilst the experimenter was out of the room, which one(s) and why. These responses were then compared with the evidence from the video recordings. Of the 13 children who opened the boxes, 8 (62%) admitted to having done so. Three children who did not open any of the boxes said that they had done so. The remaining 25 children accurately denied having looked inside the boxes. Given that so few (n = 8) children accurately reported having looked inside the boxes, the data from the justification questions were not analysed fully. However, for information the comments of those children who accurately described their behaviour are listed below. The children in the pretence condition commented:

“... I think there was a tarantula, the dog - the dog turned into a tarantula. You know, when you are dead you turn into a skeleton...”
“... Don’t know...”
“... There was nothing inside them...”

The children in the non-pretence condition made similar comments:
“... I thought one of them were in there...”
“... Nothing...”
“... Nothing in them so I might as well sit down...”
“... I thought I’d like this one here - the rabbit one...”
“... There was a mouse in it - the picture - not a real one...”

Discussion

The children in this experiment, whether in the pretence or non-pretence condition, behaved in a highly systematic manner towards the empty boxes when the experimenter prompted them to open and discard those boxes. Like those in previous experiments, these children tended to open the positive box first and discard it last, and to discard the negative box first and open it last. However, unlike previous experiments, in this experiment statistically significant differences emerged in the children’s behaviour across the hypothetical and actual versions of the opening and discarding tasks. There are two alternative explanations for these differences.

First, it is possible that the empirical evidence of box contents obtained on actually opening the first box influenced children’s beliefs about, and consequently their behaviour towards, the remaining boxes. However, these hypothetical versus actual
differences emerged on the discarding tasks as well as the opening tasks. When discarding the boxes, neither the hypothetical nor the actual task affords visual confirmation of the box contents. Therefore it is not possible for empirical evidence to be the causal mechanism for the differences between the discarding tasks. The second possible interpretation of these hypothetical versus actual differences is that they represent an order effect - a consequence of repeated presentation of what is essentially the same task.

However, across the two versions of the opening task a large proportion of the variability in children's behaviour was accounted for by changes between just two responses patterns - positive box first, neutral box second, negative box last and positive box first, negative box second, neutral box last. A simple effect of task order would not have caused such systematic variability but would instead have led to changes between all of the observed response patterns - the effects of task order should be random. An alternative explanation for these hypothetical versus actual task differences is that whilst some of the variability may well be accounted for by a task order effect (including the variability on the discarding tasks), some might be due to the effects of empirical evidence of box contents on the children's beliefs about the pretence. Thus for some children opening the positive box first and finding it to be empty seems to change their beliefs about the remaining entities such that their behaviour towards them alters relative to the hypothetical task.

When the four experimental tasks were analysed separately, the results from the pretence and non-pretence conditions were very similar - the same significant response types emerged with comparable prevalence in each condition. However, evidence of differences between the experimental conditions did emerge when children's patterns of response across all experimental tasks taken together were analysed. As in previous experiments the most frequent response pattern was to open (hypothetically and actually) the positive box first and negative box last and to discard (hypothetically and actually) the negative box first and open it last. The neutral box was repeatedly placed as the children's second selection. This response pattern emerged with almost identical frequency in the pretence and non-pretence conditions. However, unlike previous experiments a second statistically significant response pattern emerged. A significant number of children said that they would open the positive, neutral and then the negative box (hypothetical task) but actually opened the positive box and then the negative box, leaving the neutral box until last. These children discarded (hypothetically and actually) the negative, neutral and then the positive box. This
second significant response pattern reflects the systematic nature of the variability in children’s behaviour across the hypothetical and actual opening tasks that was discussed earlier.

Amongst some children in the previous experiments, selecting the negative box second rather than last was shown to reflect uncertainty about the pretend-reality distinction (experiments 2 and 3). It is therefore feasible that the second significant response type observed in this experiment, similarly represents the behaviour of children who wonder about the possible existence of the pretend objects. It is possible that due to pretend-reality confusion these children say that they will approach the positive pretend entity and avoid the negative pretend entity when making their hypothetical decisions, but after actually opening the positive box and finding it empty, elect to open the negative box second rather than leaving it until last since they have been reassured of the pretend status of the box contents. In other words, the significant differences between the hypothetical and actual opening tasks might be attributable to the influence of empirical evidence of box contents on this group of credulous children. If this new significant response type is representative of the behaviour of children who are uncertain of the pretend-reality distinction, why has this response pattern not emerged significantly in other experiments? Furthermore, given the assumption that the pictures and pretence both prompt an increase in cognitive availability, why was this response pattern generated by six children from the pretence condition but only one child from the non-pretence condition?

There are several possible explanations that relate to the differences in the design of this experiment compared to previous ones. First, in previous experiments whilst the positive and neutral entities have been everyday objects (Christmas presents and cups), the negative object was of supernatural origin - a monster. Perhaps children’s certainty about the pretend-reality distinction is influenced by the supernatural status of the pretence. However, evidence obtained by Harris et al (1991 - experiments 1 and 2) demonstrates that this is not likely to be the case. Second, unlike previous experiments where the children were only involved in selecting the positive entity (their preferred Christmas present), in this experiment children were asked to choose all three objects from a pre-determined selection of alternatives. However, the possibility that children’s understanding of the pretend-reality distinction varies according to whether the pretend objects are child or adult selected seems unlikely given the evidence obtained by Golomb & Galasso (1995). Therefore, although these two possibilities cannot be ruled out, a third possibility seems more likely.
In both conditions in this experiment, the animal pictures were used in the object selection procedure. In the non-pretence condition the selected pictures were then used to label the boxes. Importantly, these pictures were the only cue that could directly increase the cognitive availability for the idea of the animals being inside the boxes. In the pretence condition the pictures were only used in the object selection procedure. Availability for the animals should therefore only have been increased by the act of pretending that they were in the boxes. However, perhaps the pictures themselves made the pretence easier since the child has already been provided with an example of what the animals would look like. This might make the animal even easier to bring to mind and to pretend about. Consequently there might have been a greater increase in cognitive availability in the pretence condition than in the non-pretence condition and therefore, perhaps the number of children who became uncertain of the reality status of the box contents was greater in the pretence condition. Similarly, availability levels might be higher here than in the pretence tasks used in previous experiments in which the children have had to conjure up for themselves what the entities would look like. This interpretation of the differential role of the pictures across conditions is consistent with the availability hypothesis and would predict the different results across the experimental conditions in this experiment and between this experiment and previous ones using a similar design (experiments 1, 2 and 5). However, further empirical work would be required to empirically test between these alternative explanations for the emergence of this new second significant response type and the related differences between the hypothetical and actual tasks.

A key aspect of this experiment was analysis of children’s spontaneous behaviours in the experimenter’s absence. After they had completed the pretence or non-pretence tasks the children were left alone for two minutes. During this time approximately equal numbers of children sat and did nothing, opened one or more of the boxes, and engaged in other activities (such as picking their nose, singing, jumping up and down and looking at books). Overall, a similar number of children in this experiment as in Harris et al (1991) and Johnson and Harris (1994) approached the boxes when left alone, even though the pretence had been terminated by the experimenter and there were alternative activities in which the children could, and indeed did, engage. These findings suggest that Golomb and Galasso’s (1995) failure to replicate the Harris et al findings was simply a consequence of the experimenter remaining in the room with the children and not of explicitly concluding the pretence or providing alternative play activities. Furthermore, contrary to Golomb and Galasso’s claims, when the children in this experiment opened the boxes in the experimenter’s absence this did not seem to
be through pretence continuation - not only had the pretence been terminated, but also equal numbers of children approached the boxes in the two experimental conditions even though there was no pretence to be continued in the non-pretence condition. Thus Golomb and Galasso’s critique of this method of assessing children’s understanding of the pretend-reality distinction has been shown to be incorrect and based on inadequate evidence from an experiment in which key variables were confounded.

The results obtained in this experiment support the Harris et al (1991) and Johnson and Harris (1994) claims that children open boxes containing pretend objects during the experimenter’s absence due to uncertainty about the possible contents of the boxes. The results are also consistent with the idea that the pretence and non-pretence tasks increased the cognitive availability of the animals being inside the boxes - this led some children to become uncertain about the true contents of the boxes and consequently, to check out their possible contents by opening one or more of them. However, these findings do not simply replicate those obtained by Harris et al and Johnson and Harris, but have extended them. In Harris et al and Johnson and Harris, the affect evoked by the box contents was varied on a between subjects basis - whilst some children pretended about frightening creatures (monsters), others had pretended about desirable or innocuous entities (rabbits, ice-cream or fairies). In contrast, in the present experiment every child pretended about or labelled the boxes with positive, neutral and negative affect evoking animals - affect was varied on a within subjects basis. This experimental manipulation lead to some intriguing findings. Although cognitive availability was presumably equivalent across all three entities, over half of the children who approached the boxes in the experimenter’s absence opened just one box - all of these children opened the positive box.

This finding is suggestive of an interaction between the effects of increased cognitive availability and affect. Under conditions of equivalent levels of availability, these children prioritised a response to their positive affect over and above any response to neutral or negative affect. In other words, these children may well have been uncertain about the reality status of all three entities, but their behaviour was focused on checking out the possible existence of the object associated with positive affect. This finding is compatible with the results of experiments 4a and 4b in which children appeared to prioritise positive affect by opening the boxes despite the consequences this behaviour might have had on their levels of negative affect. Children seem to be highly sensitive to the differential types of affect evoked by their pretence and respond
in a highly selective manner even when they are not being prompted to behave towards the boxes by an adult experimenter - they appear to continue to seek positive entities. Of course, that so few children opened the negative box could be taken as suggesting that the children were somehow able to dismiss their negative affect and prioritise positive (as suggested by the results of experiments 4a and 4b) or alternatively, that the children were continuing to avoid the negative entity. The data do not permit differentiation between these possibilities.

An intriguing finding obtained here was the evidence of a developmental trend in children's spontaneous behaviour - significantly more middle children than younger children approached the boxes in the experimenter's absence. This age effect was not mediated by any effects of experimental condition nor the number of boxes opened. This developmental difference might be taken to suggest that more five to six year old than four to five year old children are credulous, or alternatively, that their credulity is equivalent but emerges differently in behavioural terms. That is, whilst younger children do not check out the possible box contents, middle children do so, despite equivalent levels of uncertainty. This interpretation is consistent with the results of experiments 2 and 5 which also demonstrated age related differences in children's responses to the pretend entities under conditions of potential pretend-reality uncertainty.

The results of this experiment support Harris et al.'s (1991) and Johnson and Harris' (1994) argument that children's spontaneous behaviour in the absence of the experimenter can be interpreted as being a result of their uncertainty about the reality status of certain objects. Furthermore, the nature of this uncertainty about objects that have been suggested by either acts of the imagination or by pictures seems to be consistent with the operation of the effects of increased cognitive availability. Therefore, it is meaningful to move on to the main aim of this experiment - to validate the use of pretence tasks by exploring the relationship between children's spontaneous behaviours and their response patterns on the box selection tasks. This analysis revealed clear associations between the two measures of children's behaviour. All of the younger children who spontaneously opened the boxes when left alone had (hypothetically and actually) opened the positive box first, neutral box second and negative box last. Likewise, just over half of the middle children who spontaneously opened the boxes had also opened (hypothetically and actually) the positive box first, neutral box second and negative box last. The significant response type whereby children said they would open the neutral box second but actually open it last, and
instead open the negative box second was produced by a quarter of the middle children who opened the boxes in the experimenter's absence.

The association between opening the positive, neutral and then the negative box and the children's spontaneous box opening is consistent with the claims made at the end of experiment 5. Although some children might select the boxes in this order on the pretence tasks out of pretence continuation, some children's verbal comments, and indeed their spontaneous behaviour, are suggestive of pretend-reality confusion. In other words, selecting the boxes such as to seek positive entities and avoid negative entities seems to be generated by two separable and differently motivated groups of children - those who engage in pretence continuation and those who suffer pretend-reality confusion. This finding supports the argument that children's behaviour on the pretence task is motivated by their beliefs about the reality status of the pretend entities. Thus it seems that pretence tasks are a valid indicator of children's beliefs about the pretend-reality distinction and that they are indeed a useful methodology for assessing developmental and individual differences therein.

However, given that it has been argued that the pretence condition might actually elicit higher levels of availability than the non-pretence condition, it is striking that there were no differences in the children's spontaneous behaviour across the two conditions. Furthermore, if selecting the positive, negative and then the neutral box is indicative of pretend-reality confusion, it is interesting that so few of these children spontaneously open the boxes when left alone with them. This raises the possibility that the children's spontaneous behaviours are not fully dependent on the effects of availability. Perhaps the children who open the boxes in the experimenter's absence do so simply as a response to the affect evoked by the pretence and those children who are truly uncertain of the pretend status of the entities (and who perhaps therefore open the positive, negative and then the neutral box) do not open them. The possibility that there may be alternative explanations for children's spontaneous behaviours during the experimenter's absence is investigated in experiment 7.
Chapter 8: Experiment 7
Exploring children’s behaviour in the experimenter’s absence

Introduction

In experiment 6 equal numbers of children from the pretence and non-pretence conditions spontaneously opened one or more of the boxes during the experimenter’s absence. This similarity between the two experimental conditions was interpreted as supporting the prediction that both the act of pretending about the box contents and the labelling of the boxes with pictures could lead to an increase in cognitive availability. As a consequence, some of the children in each condition became uncertain about the reality status of the box contents and looked inside the boxes when left alone with them. The findings from experiment 6 therefore broadly replicated those obtained by Harris, Brown, Marriott, Whittall and Harmer (1991 - experiment 4) and Johnson and Harris (1994 - experiment 3) and furthermore, clarified the reasons underlying the rather different results obtained by Golomb and Galasso (1995 - experiment 1).

However, within the serial box selection tasks the children’s behaviour seemed to vary according to whether they had been asked to pretend about the box contents, or to label the boxes with pictures. Although equal numbers of children in each condition opened (hypothetically and actually) the positive box first, neutral box second and the negative box last and discarded (hypothetically and actually) the negative box first, neutral box second and positive box last, a second significant response type emerged which was sensitive to experimental condition. More children from the pretence than from the non-pretence condition said that they would open the positive box first, neutral box second and negative box last (hypothetical task) but actually opened the positive box first and then the negative box, leaving the neutral box until last. This difference between the two experimental conditions led to the claim that the pretence might have caused a greater increase in cognitive availability than the pictures. It was argued that this second significant response pattern perhaps reflected pretend-reality confusion and that the change in the children’s behaviour across the hypothetical and actual opening tasks reflected the influence of empirical evidence of reality on the children’s beliefs about the box contents. If this interpretation of the difference in the results of the two experimental conditions is correct, the children’s behaviour in the experimenter’s absence should also have been sensitive to the different levels of
availability for the box contents across conditions. In other words, if spontaneous box opening is a result of the effects of increased cognitive availability, and if the pretence leads to a higher increase in cognitive availability than box labelling, the number of children opening the boxes in the experimenter’s absence should have been higher in the pretence condition than in the non-pretence condition. This was not the case.

One possible explanation for the similarity in the children’s spontaneous behaviours across the two experimental conditions is that the box opening in the experimenter’s absence was not totally dependent on the effects of availability on the children’s beliefs about the box contents. That is, perhaps neither the pictures nor the pretence were instrumental in children’s decision to open the boxes when the experimenter was out of the room and instead some other factor was causal. For example, there might simply be a baseline number of children who open boxes when left alone with them, due to general curiosity, or due to suspicions about the experimenter’s intentions. Total independence of the children’s spontaneous behaviours from the effects of availability seems unlikely for two main reasons. First, the observed relationship between children’s spontaneous behaviours and their response patterns on the box selection tasks would not be expected if the cause of children’s spontaneous behaviours was entirely separate from their beliefs about the box contents. Second, the fact that so many children only opened the positive box when they had been left alone with positive, neutral and negative entities, seems to be a very clear indication that the suggested box contents had influenced the children’s behaviour. However, the possibility that at least some children’s spontaneous behaviours were motivated by factors other than the effects of availability cannot be completely ruled out. The aim of the present experiment was to test this possibility.

This experiment followed the design and procedure used in experiment 6 but with a single modification. In experiment 6 the experimenter’s departure came after the box selection tasks had been completed and after the pretence (or pictures game) had been explicitly terminated (post-task). In the present experiment the children were left alone with the boxes on two occasions. The children were left alone for the first time immediately after they had checked that the boxes were empty, before any mention had been made of animals or other possible box contents (pre-task). That is, the children entered the experimental setting, were asked to confirm that the boxes were empty and then the experimenter immediately made an excuse to leave the room. If the children’s spontaneous behaviour in experiment 6 was a result of the effects of availability, then during this pre-task experimenter’s absence very few children should
open the boxes since there are no specific box contents for which cognitive availability can be increased. However, if children's spontaneous behaviour towards the boxes was differently motivated, rates of box opening may be comparable to those observed in experiment 6. The experimenter's second departure came after the box selection tasks and after explicit termination of the pretence (or pictures game). This post-task departure was identical to the single departure in experiment 6. If the effects of availability are causal, then children should open the boxes here in approximately the same numbers as they had done in experiment 6, irrespective of the results from the first departure (pre-task). As in experiment 6 the children were asked what they had done during the experimenter's absence and where appropriate, to explain why they had looked inside the boxes. To avoid interference with their subsequent behaviour, children were only interviewed about their behaviour following the post-task departure.

By obtaining a baseline measure of children's behaviour in the experimenter's absence independent of any suggested box contents, the design of this experiment allowed a test of the extent to which the children's spontaneous behaviours in experiment 6 had been a result of the effects of the increased cognitive availability for the possible box contents, or a result of other factors that were not related to availability.

Method

Subjects
Twenty-five younger children (13 boys and 12 girls) aged between 4 years 9 months and 5 years 8 months (mean age 5 years 3 months) and 21 middle children (11 boys and 10 girls) aged between 5 years 9 months and 6 years 8 months (mean age 6 years 1 month) were recruited from a predominantly middle class school in Surrey (N = 46). The children were allocated to either the pretence or the non-pretence condition.

Procedure
The design and materials used were identical to experiment 6 (see page 171) and the procedure varied only in that the children were left alone twice. The additional, pre-task departure came immediately after the child had checked the boxes were empty and before any mention of animals was made. The experimenter commented, "Oh dear, we can't start yet because I've forgotten my paper. I'll just go and get it. You
wait here for me until I get back’. After 2 minutes the experimenter returned and began the task introduction and object selection.

Results

Animal selections

All of the children readily selected liked and disliked animals and the majority \( (n = 36, 78\%\) ) generated a selection of neutral animals. The median rankings for each animal and the frequency with which each animal was selected as the positive, neutral and negative entities are presented in Table 8.1. The median rankings show a very similar distribution and rank ordering of the animals compared to those observed in experiment 6 and the same animals were the most frequent positive, neutral and negative entities - rabbit \( (n = 13, 28\%\) ), tortoise \( (n = 8, 17\%\) ) and tarantula \( (n = 16, 35\%\) ) respectively.

Table 8.1: Median rankings of animals (1 represents the most positive ranking and 12 represents the most negative ranking) and frequency of selection as the positive, negative and neutral entities \( (n = 46)\)
Memory and reality checks
All of the children in the pretence condition responded correctly to the memory checks and just one failed the reality checks (96% correct). The children in the non-pretence condition were not asked these questions.

Box selection tasks
The orders of box selections across each of the four experimental tasks were subjected to CFA - the results of these analyses are shown in Table 8.2.

Table 8.2: Results of Configurational Frequency Analysis on children’s response patterns for each of the experimental tasks analysed separately (positive = animal the child would most like to hold, neutral = animal the child would not mind holding, negative = animal the child would least like to hold) (n = 46)

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Opening Tasks</th>
<th>Discarding Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hypothetical (Actual)</td>
<td>Hypothetical (Actual)</td>
</tr>
<tr>
<td></td>
<td>Frequency</td>
<td>z</td>
</tr>
<tr>
<td>+ N -</td>
<td>30 (22)</td>
<td>*T 7.67 (3.57)</td>
</tr>
<tr>
<td>+ - N</td>
<td>9 (12)</td>
<td>-0.07 (1.71)</td>
</tr>
<tr>
<td>N + -</td>
<td>4 (6)</td>
<td>-1.92 (-0.69)</td>
</tr>
<tr>
<td>N - +</td>
<td>1 (3)</td>
<td>*A -3.02 (-1.85)</td>
</tr>
<tr>
<td>- N +</td>
<td>2 (2)</td>
<td>*A -2.65 (-2.24)</td>
</tr>
<tr>
<td>- + N</td>
<td>1 (1)</td>
<td>-</td>
</tr>
</tbody>
</table>

* T significant response type at p < .001
* A significant response anti-type at p < .01

On the hypothetical opening task only 5 of the 6 possible response patterns were observed - none of the children selected the negative box first, positive box second and neutral box last. One significant response type emerged - 30 children selected the positive box first, neutral box second and negative box last (z = 7.67, p < .001, Bonferroni adjustment for p at .05 = .01). The remaining 16 children were distributed between 2 significant response anti-types and 2 non-significant response patterns (see Table 8.2). On the actual opening task all 6 possible response patterns were observed - one emerged as a significant response type and one as a significant response anti-type
(see Table 8.2). The significant response type was selection of the positive box first, neutral box second and negative box last ($z = 5.67, p < .001$, Bonferroni adjustment for $p$ at $.05 = .008$). This response type accounted for the behaviour of 22 children.

On the hypothetical discarding task only 3 of the 6 possible response patterns were observed and there were 2 significant response anti-types (see Table 8.2). The behaviour of 38 children was represented by the one significant response type which emerged - these children nominated the negative box first, neutral box second and positive box last ($z = 7.09, p < .001$, Bonferroni adjustment for $p$ at $.05 = .017$). On the actual discarding task none of the children discarded the positive box first, neutral box second and negative box last. The significant response type was the order negative, neutral and then positive ($z = 8.04, p < .001$, Bonferroni adjustment for $p$ at $.05 = .01$) - this response pattern accounted for the behaviour of 31 children. The remaining 15 children were distributed between 2 significant response anti-types and 2 non-significant response patterns (see Table 8.2).

A comparison of children’s performance across the hypothetical and actual versions of the tasks is shown in Table 8.3. On the opening task, 21 children generated the response type (positive - neutral - negative) on both versions and 15 did so on neither. There were 10 children who changed their responses - 9 children nominated the boxes according to the response type (hypothetical task) but actually opened the boxes in a different order and one child actually opened the boxes according to the response type after having said that they would open them in a different order. This variability in the children’s behaviour was statistically significant (McNemar exact significance, $p = .021$). Further analyses were conducted to establish the nature of the variability in children’s behaviour (Table 8.4). The 9 children who produced the response type on the hypothetical task but not the actual task, were distributed across the following response patterns on the actual opening task:

- neutral - positive - negative ($n = 4$)
- positive - negative - neutral ($n = 3$)
- neutral - negative - positive ($n = 1$)
- negative - neutral - positive ($n = 1$)

Of the 15 children who produced other response patterns on both versions of the task, 8 selected the positive box first, negative box second and neutral box last on both occasions and 2 children selected the neutral box first, positive box second and negative box last on both occasions. The remaining 5 children produced different response patterns on each occasion.
Table 8.3: Comparison of children’s responses across hypothetical and actual opening tasks (response type: positive - neutral - negative) - figures in brackets are for discarding tasks (response type: negative - neutral - positive) (n = 46)

<table>
<thead>
<tr>
<th>Actual Task</th>
<th>Type</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>21 (30)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Other</td>
<td>9 (8)</td>
<td>15 (7)</td>
</tr>
</tbody>
</table>

Table 8.4: Comparison of children’s response patterns across hypothetical and actual opening tasks - figures in brackets are for discarding tasks (positive = +, neutral = N, negative = -) (n = 46)

<table>
<thead>
<tr>
<th>Hypothetical Opening Task</th>
<th>(Hypothetical Discarding Task)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Task</td>
<td>+ N -</td>
</tr>
<tr>
<td>+ N -</td>
<td>21 (-)</td>
</tr>
<tr>
<td>+ - N</td>
<td>3 (-)</td>
</tr>
<tr>
<td>N + -</td>
<td>4 (-)</td>
</tr>
<tr>
<td>N - +</td>
<td>1 (-)</td>
</tr>
<tr>
<td>- N +</td>
<td>1 (-)</td>
</tr>
<tr>
<td>- + N</td>
<td>- (-)</td>
</tr>
</tbody>
</table>

The comparison of children’s behaviours across the hypothetical and actual discarding tasks (figures in brackets in Table 8.3) showed that whilst 30 children produced the response type (negative - neutral - positive) on both versions of the task, 7 did so on neither. Eight children generated the response type on the hypothetical task but actually discarded the boxes in a different order and one child produced the response type on the actual task after nominating the boxes in a different order on the hypothetical task. This variability in the children’s behaviour was statistically significant (McNemar exact significance, p = .039). To examine the nature of the variations in children’s responses across the discarding tasks, further analyses were performed (figures in brackets in Table 8.4). The 8 children who generated the response type on the hypothetical but not the actual task were distributed between the following response patterns on the actual discarding task:

- negative - positive - neutral (n = 4)
- neutral - negative - positive (n = 3)
- positive - negative - neutral (n = 1)
The child who produced the response type on the actual but not the hypothetical task had nominated the neutral box first, negative box second and positive box last. Five children hypothetically and actually discarded the neutral, negative and then the positive box and one child selected the negative, positive and then the neutral box on both versions of the task. The remaining child produced a different response pattern on each version of the task.

Given that there were significant differences between the hypothetical and actual versions of the opening and discarding tasks, analyses to compare the pretence and non-pretence conditions were conducted taking each task separately. Table 8.5 presents the frequencies for each response pattern generated on the opening tasks according to experimental condition. On the hypothetical opening task, 17 children (74%) from the pretence condition generated the response type (positive - neutral - negative). Slightly less children (n = 13, 57%) from the non-pretence condition did so. However, the number of children producing the response type compared to all other response patterns combined showed no significant difference according to experimental condition ($\chi^2 = 1.53$, df = 1, p = .216). All of the other response patterns also showed very similar frequencies across the two experimental conditions. On the actual opening task a very similar number of children from the pretence condition (n = 10, 43%) as from the non-pretence condition (n = 12, 52%) produced the response type. Statistical analysis confirmed that there was no significant difference in the number of children generating the response type compared to all other response patterns combined on the actual opening task according to condition ($\chi^2 = .35$, df = 1, p = .555). Once again, none of the other response patterns showed any clear differences according to experimental condition.

Table 8.5: Summary of response patterns generated on the hypothetical opening task (actual opening task in brackets) presented according to experimental condition (positive = +, neutral = N, negative = -) (n = 46)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Hypothetical</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretence</td>
<td>17 (10)</td>
<td>10 (6)</td>
</tr>
<tr>
<td>Non-Pretence</td>
<td>13 (12)</td>
<td>12 (6)</td>
</tr>
<tr>
<td>Total</td>
<td>30 (22)</td>
<td>22 (12)</td>
</tr>
</tbody>
</table>
Table 8.6 presents the frequencies of each of the response patterns generated on the discarding tasks according to experimental condition. A very similar number of children from the pretence condition (n = 20, 87%) as from the non-pretence condition (n = 18, 78%) hypothetically discarded the negative box first, neutral box second and positive box last. Statistical analyses confirmed that there was no difference in the number of children producing this response pattern according to experimental condition (Fisher's exact probability, p = .699). Similarly there was no significant difference in the number of children who generated the response type in the pretence condition (n = 17, 74%) and non-pretence condition (n = 14, 61%) on the actual discarding task ($\chi^2 = .89$, df = 1, p = .345). There were no clear differences according to experimental condition in the frequencies of any of the other response patterns on either the hypothetical or actual discarding tasks.

Table 8.6: Summary of response patterns generated on the hypothetical discarding task (actual discarding task in brackets) presented according experimental condition (n = 46)

<table>
<thead>
<tr>
<th>RESPONSE PATTERN</th>
<th>Hypothetical (Actual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition</td>
<td>+ N -</td>
</tr>
<tr>
<td>Pretence</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Non-Pretence</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Total</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

To establish whether the experimenter's pre-task absence influenced children's behaviour on the subsequent opening and discarding tasks, further analyses were performed. Statistical analyses were conducted comparing the numbers of children generating the response type for each task in experiment 6, where there was no pre-task absence, with the present experiment. In these analyses the pretence and non-pretence conditions were combined as there had been no statistically significant differences found between them in previous analyses for either experiment. These analyses revealed no significant differences between the two experiments for any of the tasks:

- hypothetical opening task: $\chi^2 = .14$, df = 1, p = .139
- actual opening task: $\chi^2 = .1$, df = 1, p = .754
- hypothetical discarding task: $\chi^2 = .002$, df = 1, p = .961

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The twelve trial response patterns that were produced over the series of four experimental tasks were subjected to CFA (Table 8.7). This analysis generated one significant response type - 18 children opened (hypothetically and actually) the positive box first, neutral box second and negative box last and discarded (hypothetically and actually) the negative box first, neutral box second and positive box last ($z = 11.26$, $p < .001$, Bonferroni adjustment for $p$ at .05 = .002). Five children opened (hypothetically and actually) the positive box first, negative box second and neutral box last and discarded (hypothetically and actually) the negative box first, neutral box second and positive box last. There were a further 3 response patterns produced by 2 children each (see Table 8.7) and the remaining 17 children produced unique response patterns. Thus unlike experiment 6 where there were 2 significant response types, only one emerged in this experiment. There were no significant response anti-types.

Table 8.7: Summary of results of Configural Frequency Analysis of response patterns across all experimental tasks taken together (positive = animal the child would most like to hold, neutral = animal the child would not mind holding, negative = animal the child would least like to hold) (n = 46)

<table>
<thead>
<tr>
<th>Response Pattern</th>
<th>Opening Tasks</th>
<th>Discarding Tasks</th>
<th>Frequency</th>
<th>$z$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive = +; Neutral = N; Negative = -</td>
<td>Hypothetical (Actual)</td>
<td>Hypothetical (Actual)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ N -</td>
<td>(+ + -)</td>
<td>- N +</td>
<td>(- - +)</td>
<td>18</td>
</tr>
<tr>
<td>+ - N</td>
<td>(+ - N)</td>
<td>- N +</td>
<td>(- - +)</td>
<td>5</td>
</tr>
<tr>
<td>+ N -</td>
<td>(+ + -)</td>
<td>- N +</td>
<td>(- - +)</td>
<td>2</td>
</tr>
<tr>
<td>+ N -</td>
<td>(+ + -)</td>
<td>N - +</td>
<td>(- - +)</td>
<td>2</td>
</tr>
<tr>
<td>+ - N</td>
<td>(+ - N)</td>
<td>N - +</td>
<td>(- - +)</td>
<td>2</td>
</tr>
</tbody>
</table>

The remaining 17 children each produced a unique response pattern different from each other and the above.

*T significant response type at $p < .001$

Further analyses were performed to establish whether any of the response patterns observed over the twelve trials were specific to either of the experimental conditions. In these CFA the data for the two conditions were analysed separately. The results,
summarised in Table 8.8, revealed that 9 children from each condition generated the same single significant response type. Significant numbers of children in the pretence condition \((z = 5.96, p < .001, \text{Bonferroni adjustment for } p \text{ at } .05 = .004)\) and non-pretence condition \((z = 5.34, p < .001, \text{Bonferroni adjustment for } p \text{ at } .05 = .004)\) hypothetically and actually opened the positive box first, neutral box second and negative box last and hypothetically and actually discarded the negative box first, neutral box second and positive box last. Two children from the pretence condition opened (hypothetically and actually) the positive box first, negative box second and neutral box last and discarded the negative box first, neutral box second and positive box last (hypothetically and actually). The remaining 12 children in the pretence condition each produced unique response patterns. Three children from the non-pretence condition opened (hypothetically and actually) the positive box first, negative box second and neutral box last and discarded the negative box first, neutral box second and positive box last (hypothetically and actually). The remaining 9 children from the pretence condition produced unique response patterns. There were no additional significant response types nor any significant response anti-types in either condition.

Table 8.8: Summary of results of Configural Frequency Analysis of response patterns across all experimental tasks presented according to experimental condition (positive = animal the child would most like to hold, neutral = animal the child would not mind holding, negative = animal the child would least like to hold) \((n = 46)\)

<table>
<thead>
<tr>
<th>Opening</th>
<th>Discarding</th>
<th>Pretence</th>
<th>Non-Pretence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive = +; Neutral = N; Negative = -</td>
<td>Hypothetical</td>
<td>(Actual)</td>
<td>f</td>
</tr>
<tr>
<td>+ N -</td>
<td>(+ N -)</td>
<td>- N +</td>
<td>(- N +)</td>
</tr>
<tr>
<td>+ - N</td>
<td>(+ - N)</td>
<td>- N +</td>
<td>(- N +)</td>
</tr>
<tr>
<td>+ N -</td>
<td>(+ N -)</td>
<td>N - +</td>
<td>(N - +)</td>
</tr>
<tr>
<td>+ - N</td>
<td>(+ - N)</td>
<td>N - +</td>
<td>(N - +)</td>
</tr>
<tr>
<td>The remaining 10 children in the pretence condition and 7 children in the non-pretence condition each produced a unique response pattern different from each other and the above.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*T significant response type at \(p < .001\)
Although when the four experimental tasks were treated separately the results from this experiment were very similar to those from experiment 6, when the twelve trial response patterns across the four tasks were considered together, the results appeared to differ. Whilst in experiment 6 there were two significant response types, there was only one in the present experiment. Statistical analysis confirmed that the number of children generating the response type in this experiment compared with experiment 6 was not significantly different for either the pretence condition ($\chi^2 = .013, df = 1, p = .908$) or the non-pretence condition ($\chi^2 = .005, df = 1, p = .944$). In addition, whilst the behaviour of the remaining children differed according to condition in experiment 6 (a second significant response type emerged having been generated almost exclusively by children in the pretence condition), it did not appear to do so in the present experiment.

**Children's behaviour during the experimenter's absence: Pre-task**

Due to an equipment failure the video data for 2 children were lost, thus leaving the data for 44 children (22 in the pretence condition and 22 in the non-pretence condition). The data from the video recordings were analysed such that the children were classified into one of the 3 mutually exclusive behaviour categories developed in experiment 6:

- did nothing
- other activity
- opened box(es)

At the point of the experimenter's pre-task departure the two groups of children were equivalent, therefore the data for the conditions were combined. Eight children (18%) did nothing for the entire period that they were left alone and 17 children (39%) engaged in some other activity. The behaviour of particular interest in this experiment was looking inside the boxes - 19 children (43%) did so (10 from the pretence condition and 9 from the non-pretence condition). Of these 19 children, 15 (79%) opened all 3 boxes, 2 (10.5%) opened 2 boxes and the remaining 2 children (10.5%) opened one box each.

Analyses were conducted to explore whether box opening was related to the child's age. Of the 25 younger children, 9 (36%) opened one or more of the boxes in the experimenter's. Similarly, of the 21 middle children 10 (48%) did so. This distribution of opening the boxes according to age was not significant ($\chi^2 = .64, df = 1, p = .425$).
To explore the possible relationship between box opening during the experimenter’s pre-task absence and children’s subsequent response patterns on the box selection tasks, further analyses were conducted. In these analyses the children’s response patterns across the hypothetical and actual opening tasks were considered and the comparison taken between children who produced the response type (positive - neutral - negative) across both of these tasks with those children who produced any other combination of response patterns. As can be seen from Table 8.9, the 19 children who opened the boxes during the experimenter’s absence were relatively equally represented by children who opened the positive box first, neutral box second and negative box last (n = 8, 42 %) and those children who produced other combinations of response patterns (n = 11, 58 %). Statistical analysis confirmed that this distribution of frequencies was not significant ($\chi^2 = .15$, df = 1, p = .697).

Table 8.9: Numbers of children opening the boxes during the experimenter’s pre-task absence presented according to response pattern across the hypothetical and actual opening tasks (positive = +, neutral = N, negative = -) (n = 44)

<table>
<thead>
<tr>
<th>Response Pattern</th>
<th>+ N -</th>
<th>+ N -</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opened box(es)</td>
<td>8</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Did not open</td>
<td>12</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

Children’s behaviour during the experimenter’s absence: Post-task
The children’s behaviour during the two minutes that they were left alone following completion of the pretence or non-pretence tasks were categorised into the 3 behavioural categories used previously. The results of this analysis are presented according to experimental condition in Table 8.10. These results showed that irrespective of experimental condition, the majority of children either did nothing for the entire period that the experimenter was absent (n = 18, 41 %) or engaged in some other activity (n = 23, 52 %). Only 3 children opened one or more of the boxes - 2 from the non-pretence condition and one from the pretence condition.

Comparison of the children’s behaviours across the two separate periods (pre- and post-task) during which they were left alone (Table 8.11) revealed that only one child opened one or more of the boxes on both occasions and only 2 children opened the boxes during the post-task absence but not the pre-task absence. The majority of
children opened the boxes on neither occasion (n = 23, 52%) or on the first but not the second occasion (n = 18, 41%) that they were left alone. This variability in the children's behaviour was statistically significant (McNemar exact significance, p = .000).

Table 8.10: Summary of children’s behaviour during experimenter’s post-task absence presented according to experimental condition (n = 44)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Opened box(es)</th>
<th>Did nothing</th>
<th>Other activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretence</td>
<td>1</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Non-Pretence</td>
<td>2</td>
<td>8</td>
<td>12</td>
</tr>
</tbody>
</table>

Table 8.11: Comparison of children’s behaviours during the experimenter’s pre-task absence and post-task absence (n = 44)

<table>
<thead>
<tr>
<th>Behaviour during post-task absence</th>
<th>Opened box(es)</th>
<th>Did not open box(es)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opened box(es)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Did not open box(es)</td>
<td>18</td>
<td>23</td>
</tr>
</tbody>
</table>

Further analyses were conducted to consider children’s behaviour on the first occasion that they were left alone with the boxes. In experiment 6 the children’s first (and only) experience of being left alone came after the opening and discarding tasks and in the present experiment it came before the same tasks. Thus these analyses allowed an exploration of the influence of suggesting possible box contents and of the opening and discarding tasks on children’s behaviour when they were left alone with the boxes. As can be seen from Table 8.12, 13 children (32%) opened the boxes when left alone after the tasks and a similar number (n = 19, 43%) did so when left alone before the tasks. The distribution of frequencies shown in Table 8.12 was not statistically significant ($\chi^2 = .01, df = 1, p = .914$).

Table 8.13 shows the number of boxes that children opened when they were left alone for the first time. In the pre-task departure (experiment 7) the majority of those children (n = 15, 79%) who opened any of the boxes, opened all three. The remaining 4 children either opened one (n = 2, 10.5%) or two (n = 2, 10.5%) boxes. In
contrast, in the post-task departure (experiment 6) the children were relatively equally divided between opening just one box \((n = 7, 54\%\)) and all 3 boxes \((n = 5, 38\%)\).

For the purposes of statistical analysis, the frequencies shown in Table 8.13 were re-categorised to give the 2 x 2 contingency table shown in Table 8.14, in which the comparison is made between children who open one box and those who open two or more. This distribution of frequencies was statistically significant (Fisher's exact probability, \(p = .015\)).

Table 8.12: Comparison of numbers of children opening the boxes during the first occasion they are left alone according to experiment (post-task departure from experiment 6 and pre-task departure from experiment 7) \((n = 85)\)

<table>
<thead>
<tr>
<th>Behaviour during experimenter's absence</th>
<th>Opened box(es)</th>
<th>Did not open box(es)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-task departure (Experiment 6)</td>
<td>13</td>
<td>28</td>
</tr>
<tr>
<td>Pre-task departure (Experiment 7)</td>
<td>19</td>
<td>25</td>
</tr>
</tbody>
</table>

Table 8.13: Number of boxes opened during the first occasion children were left alone for the first time, according to experiment (post-task departure from experiment 6 and pre-task departure from experiment 7) \((n = 85)\)

<table>
<thead>
<tr>
<th>Number of boxes opened</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-task departure (Experiment 6)</td>
<td>28</td>
<td>7</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Pre-Task departure (Experiment 7)</td>
<td>25</td>
<td>2</td>
<td>2</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 8.14: Comparison of the number of boxes that children opened during the experimenter's pre-task absence and post-task absence \((n = 32)\)

<table>
<thead>
<tr>
<th>Period of Experimenter's Absence</th>
<th>Number of Boxes Opened</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Task (Experiment 7)</td>
<td>2</td>
</tr>
<tr>
<td>Post-Task (Experiment 6)</td>
<td>7</td>
</tr>
</tbody>
</table>
Interview after experimenter’s return

Subsequent to the post-task departure the children were asked whether they had opened any of the boxes during the experimenter’s absence, which ones and why. Of the 3 children who opened one or more of the boxes, one admitted doing so but 2 denied having done so. These results were not analysed further given that so few children were given the opportunity to discuss their behaviour.

Discussion

The results from this experiment showed that children in both the pretence and non-pretence conditions tended to open (hypothetically and actually) the positive box first, neutral box second and negative box last and to discard (hypothetically and actually) the negative box first, neutral box second and positive box last. However, given that a number of children nominated the boxes according to the response type but went on to act on them in a different order, there were statistically significant differences between the hypothetical and actual versions of both the opening and discarding tasks. These differences are most likely to be attributable to the fixed order of presentation of the two versions of the tasks and are unlikely to reflect the impact of empirical evidence of boxes contents on the effects of availability given that unlike the opening tasks, neither version of the discarding task afforded visual confirmation of the box contents. Thus in terms of the analysis of children’s behaviour on the four separate tasks, the findings obtained in the present experiment were directly comparable to those obtained in experiment 6. However, the results from analysing all four experimental tasks together suggest important differences between the two experiments.

In experiment 6 when the children’s response patterns across all four experimental tasks taken together were considered, two significant response types emerged. First, equal numbers of children in the pretence and non-pretence conditions opened (hypothetically and actually) the positive box first, neutral box second and negative box last and discarded (hypothetically and actually) the negative box first, neutral box second and positive box last. This response pattern also emerged as statistically significant in this experiment, having been generated by similar numbers of children in each condition and by a similar number of children as in experiment 6. Second, in experiment 6 a significant number of children said that they would open the positive box first, neutral box second and negative box last (hypothetical task) but actually
opened the positive box first and then the negative box, leaving the neutral box until last. These children discarded (hypothetically and actually) the negative box first, neutral box second and positive box last. Interestingly, this second significant response type was sensitive to experimental condition since all but one of the children who generated this response pattern were from the pretence condition. In contrast, in the present experiment just one child from each experimental condition generated this response pattern and hence it did not emerge as statistically significant. Why should the results of the box selection tasks differ in this experiment compared to experiment 6?

The only methodological difference between the present experiment and experiment 6 was the introduction of the pre-task period in which the children were left alone with the boxes. The implication must surely be that this experimental manipulation somehow caused the difference in the children’s behaviour on the box selection tasks. It is possible that the mere experience of being left alone with the boxes led to this change. However, it is also possible that the children whose behaviour was affected were those who looked inside the boxes during experimenter’s absence. This latter possibility seems rather more likely than the former given that the pre-task period of experimenter’s absence does not appear to have had an equivalent influence on all children. The prevalence of the response pattern whereby the positive box was opened first and discarded last and the negative box was discarded first and opened last remained unchanged in the present experiment relative to experiment 6. This suggests that the only children who were affected by the experimenter’s pre-task absence were those who would otherwise have nominated the positive, neutral and then the negative box on the hypothetical opening task but who actually opened the negative box second, leaving the neutral box until last. The reduction in the prevalence of this response pattern was the only systematic change in the children’s behaviour across the two experiments. It was argued (experiment 6) that the children who generated this second significant response type were reassured of the reality status of the box contents on actually opening the first box and finding it to be empty, hence the change in their behaviour on the actual task relative to the hypothetical one. It is possible that in the present experiment a comparable group of children looked inside the boxes during the experimenter’s pre-task absence, found no objects inside them and no obvious means of generating box contents through trickery. This empirical evidence might then have reassured them that nothing untoward would happen in the experiment and thus their behaviour changed such that they produced one of the other response patterns on the box selection tasks. However, one problem with this
interpretation of the data is the fact that in experiment 6 when the experimenter’s departure came after the task, the children producing this second significant response pattern did not look inside the boxes when left alone. One possible explanation for this is that the empirical evidence obtained on actually opening the boxes during the box selection tasks was sufficient to completely reassure these children and to stop them wondering about the boxes contents. In other words, this might be a group of children who are highly sensitive to the constraining influence of empirical evidence of reality on the effects of increased cognitive availability.

The main aim of this experiment was to test between two competing explanations for the behaviour of those children in experiment 6 who, whilst the experimenter was out of the room, spontaneously opened one or more of the boxes that had previously been used in the box selection tasks. It was possible that these children had opened the boxes because they had become uncertain about the reality status of their contents (availability hypothesis) or that they had done so for reasons that were unrelated to the effects of availability and the suggestion of possible box contents. The results from the analysis of children’s behaviour during the two periods that they were left alone were striking and quite unexpected.

In the pre-task period the children were left alone before any possible box contents were mentioned. Therefore there were no specific objects for which cognitive availability could increase and about which the children could start to wonder. Furthermore, no child should have been uncertain about what was inside the boxes since immediately prior to the experimenter’s departure the children had looked inside all three boxes and confirmed that they were empty. Nevertheless, just under half of the children opened one or more of the boxes and the majority of these children opened all three. There were no age related differences in the number of children opening the boxes and there were no clear relationships between the children’s spontaneous behaviours and their subsequent response patterns on the box selection tasks. Those children who did not look inside the boxes were approximately equally divided between doing nothing for the entire period that they were left alone and engaging in alternative activities such as reading library books.

The children in this experiment were also left alone after explicit termination of the pretence or non-pretence tasks (post-task - as in experiment 6). On this occasion very few children opened any of the boxes. Instead, the vast majority of children (93 %) were content to do nothing or to otherwise occupy themselves during the
experimenter’s absence. Thus there was a dramatic change in the children’s behaviour across the two periods during which they were left alone with the boxes such that just one child looked inside the boxes on both occasions, and those children who opened the boxes did so during the pre- but not the post-task period.

To explore the influence of the suggestion of possible box contents on children’s spontaneous behaviours, the results from the pre-task departure in this experiment were compared with those from the post-task departure in experiment 6. The only difference in the circumstances surrounding these two departures was whether or not possible box contents had been suggested and the box selection tasks completed - in both instances this was the child’s first experience of being left alone. The differences in the children’s behaviours on these two occasions were striking. Although a very similar number of children looked inside the boxes on each occasion, in the pre-task period they tended to look inside all three of the boxes whilst in the post-task period the children were divided between looking inside just one box (always the positive box) and all three. Furthermore, the developmental differences observed in the post-task period did not emerge in the pre-task period and the clear relationship observed between children’s spontaneous behaviours and their response patterns in the box selection tasks in the post-task period also did not emerge from the pre-task period.

How can these results be explained? There are several possible explanations for the high prevalence of spontaneous box opening during the experimenter’s pre-task absence. It could be argued that the children open the boxes out of a rather generalised curiosity or interest in the boxes and/or their contents. However, the fact that immediately prior to the experimenter’s departure the children had looked inside the boxes and found them to be empty should have satisfied the children’s general curiosity about the boxes and their contents. This point was also made by Harris et al. (1991) when dismissing this explanation of their data. An alternative possibility is that the children became suspicious about the experimenter’s motives for leaving the room, perhaps wondering if she had left in order to surreptitiously populate the boxes with some unspecified entities. This also seems unlikely - there were no overt signs of disbelief of the experimenter’s excuse for leaving the room, even at the second point of departure. Furthermore, a small minority of children offered to help the experimenter to find her forgotten note-paper. Although this suggests that the children believed the experimenter’s reason for leaving the room to be genuine, the possibility that the
children had become suspicious about the adult’s intentions cannot be completely ruled out.

A related, but separable possibility is that the ambiguity of the role of the boxes was an important factor. At the point of the pre-task departure whilst the children might have inferred that the empty boxes were relevant to the forthcoming proceedings, the precise nature of their function remained ambiguous. The children might have inferred that the boxes were to be used to contain some objects. Perhaps therefore, the children looked inside the boxes in the experimenter’s absence in an attempt to work out what the boxes were to be used for. In other words, the children’s spontaneous behaviours could have been an attempt to make sense of the experimental situation. This interpretation is entirely consistent with the finding that the children looked inside all three boxes - failing to discover the function of the boxes from looking inside the first one, would presumably not preclude the possibility that this information could be gained from looking inside the remaining boxes. This possible role of the ambiguity of the function of the boxes is also consistent with the failure to find developmental differences and relationships with the children’s response patterns on the box selection tasks - there is no reason to suppose that particular types of children (in terms of their susceptibility to availability or in terms of their age) should be more or less likely to try to work out what is about to happen in a slightly unusual and ambiguous situation.

Overall, it seems most likely that the high rates of box opening during the pre-task period of experimenter’s absence are attributable to some factor other than the effects of availability on the children’s beliefs about the contents of the boxes. However, further empirical work will be required before firm conclusions can be drawn about the precise nature of the causal factor here. For the purposes of the present research, it is however, important to determine whether this means that the spontaneous behaviours observed in experiment 6 (post-task departure) were also a result of some factor unrelated to the effects of availability.

A comparison of the children’s behaviours on the first occasion that they were left alone with the boxes (pre-task in experiment 6 and post-task in experiment 7) suggests that it is unlikely that the two sets of behaviours were motivated by the same factors. Prior to the suggestion of the possible box contents (pre-task) the children predominantly looked inside all three boxes. In contrast, subsequent to the introduction of possible box contents (post-task) the children were divided between looking in one or in all of the boxes. Furthermore, those children who looked inside
just one box, all looked inside the positive box. Thus there were fundamental differences in the children's spontaneous behaviours before and after the box contents had been suggested. Therefore, whilst it could perhaps be argued that those children who, during the post-task period look inside all three boxes, do so due to some factor unrelated to the effects of availability, it seems highly unlikely that this could also be true of those children who simply looked inside the positive box. This latter behaviour seems instead to be related to the effects of increased cognitive availability for the suggested box contents. The present experiment therefore seems to have very clearly demonstrated that children's spontaneous behaviours in the experimenter's absence are not totally independent of the effects of availability. When the effects of availability for specific objects are ruled out, the children's spontaneous behaviours are very different compared to when availability for specific objects could potentially be quite high.

An intriguing and somewhat inexplicable finding from this experiment was the dramatic reduction in the number of children looking inside the boxes in the experimenter's post-task absence relative to the number of children who did so in the equivalent period in experiment 6. If children's pre-task box opening is a result of spurious factors and their post-task box opening is due to the effects of availability, why should so few children have looked inside the boxes during the post-task departure when this arose as the second occasion when they were left alone? In other words, if children's pre- and post-task spontaneous behaviours are differently motivated why should one have influenced the other? The only logically possible explanation is that the experience of being left alone with the boxes prior to the task changed the children's behaviour, perhaps by changing their understanding of the task such that the effects of availability no longer led children to open the boxes when they were left alone for the second time. Whether it is the case that availability no longer leads children to wonder about the box contents, or that children still become uncertain but no longer act on that uncertainty, requires further investigation.

Overall, the results of this experiment confirm that whilst some children's spontaneous behaviours in the experimenter's absence might be attributable to factors unrelated to the effects of availability, this is certainly not true of all children's behaviours. It might therefore be preferable not to interpret the behaviour of children who open all three boxes in the experimenter's absence in terms of the effects of availability whether this occurs pre- or post-task. However, the post-task spontaneous behaviours of those children who are somewhat more selective in their box opening, for example, they only open one box, should perhaps be interpreted in terms of the children's beliefs about the
box contents. Thus this experiment has validated the use of observing children’s spontaneous behaviours as a means of assessing their susceptibility to the effects of availability. However, quite how the behaviour of children who do not spontaneously open boxes in the experimenter’s absence should be interpreted is a separate issue - it remains possible that these children are sufficiently uncertain of the reality status of the box contents that they avoid these objects and that therefore this behavioural silence could in itself be indicative of pretend-reality confusion.
Chapter 9: General Discussion

Overview

The aim of this final chapter is to summarise the results obtained in the experiments reported here and to then discuss how these findings relate to the issues raised in the introduction. Specifically, this chapter will discuss how the present findings contribute to our understanding of the influence of empirical evidence of reality on children's understanding of pretence, of the differential influence of varying forms of affect on children's behaviour during pretence, and most importantly, how the present findings contribute to our understanding of developmental and individual differences these domains. A further aim of this chapter is to go beyond a description of children's behaviours and to offer a theoretical account of the developmental and individual differences that have been observed. Finally, this chapter will offer some directions for future research.

Summary of results

Experiment 1 was designed to explore two main issues. First, whether empirical evidence, or visual confirmation of reality, could constrain the effects of increased cognitive availability such that children would be reassured of the pretend-reality status of imagined objects. Second, the nature of the influence of different forms of affect on children's behaviour was assessed. These issues were investigated by asking five to six year old children to pretend that one empty box contained a positive entity, that the second contained a negative entity and that the third box contained a neutral entity. The children's orders of box selections were then observed across a series of hypothetical and actual box opening and discarding tasks within a context whereby there would be no real life, practical consequences of engaging in magical thinking. Importantly, the level of empirical evidence of box contents was greater on the actual than the hypothetical opening task and thus it was expected that children's behaviour would vary across these tasks.

The results did not reveal any dramatic changes in the children's behaviour according to empirical evidence of box contents. This could be interpreted as suggesting that the effects of availability did not cause pretend-reality confusion. However, the
spontaneous comments made by some children suggested that they had become uncertain about the reality status of the box contents. In terms of affect, the results were broadly consistent with the Golomb and Galasso (1995) claim that children behave in ways which increase their experience of positive affect and decrease their experience of negative affect - the children opened the positive box first and discarded it last and opened the negative box last and discarded it first. The neutral box was repeatedly selected second by these children. However, there was a sizeable group of children whose behaviour did not fit this pattern - some children opened the negative box second rather than leaving it until last.

The second experiment followed the design of experiment 1 but included a sample of children aged four to seven years old in order to investigate the nature of any developmental trends in children's responses. Overall, the results obtained replicated those from experiment 1. However, the children's behaviour did differ developmentally in two main ways. First, the tendency to consistently approach the positive pretend entity and avoid the negative one increased with age. Second, the number of children who did not avoid the negative pretend entity by opening that box last, but who instead opened the negative box second, peaked at around five to six years of age.

The aim of experiment 3 was to directly assess the impact of empirical evidence of reality on children's behaviour. To this end, the experiment followed the procedures used in experiment 2 but using transparent boxes - the children were continually provided with visual confirmation that the boxes were empty. This experimental manipulation thus allowed a direct test between the predictions made by the availability hypothesis (Harris, Brown, Marriott, Whittall & Harmer, 1991; Johnson & Harris, 1994) and the pretence continuation account (Golomb & Galasso, 1995). The way in which children continued the pretence should have been unaffected by the sight of the empty box, however, children who had begun to wonder about the reality status of the box contents should have been reassured by this sight and perhaps have responded differently compared to experiment 2.

Overall, the results from experiment 3 were very similar to those obtained in experiment 2 - the most frequent response patterns were those in which children selected the positive box first and the negative box last on the opening tasks, and selected the negative box first and the positive box last on the discarding tasks. However, there were marked differences in the results of the two experiments which
indicated that for at least some children, the effects of increased cognitive availability for the pretence had been constrained by the empirical evidence of reality provided by the continual sight of the empty box. The changed behaviour of the four to five year old children in experiment 3 relative to experiment 2 suggested that when the possible effects of availability were minimised by empirical evidence of reality, these children continued their pretence by responding to affect in one of two ways. These children tended to approach the positive pretend entity and whilst some of them avoided the negative pretend entity, others approached it sooner than was absolutely necessary by opening that box second rather than leaving it until last. In contrast, when the effects of increased cognitive availability were not constrained, four to five year old children tended to approach the positive entity and avoid the negative one. The behaviour of the five to six year old children also changed in experiment 3 relative to experiment 2 - a marked increase in the number of children opening the positive box first and the negative box last was matched by a decrease in the number of children who approached the negative pretend entity by opening that box second rather than leaving it until last. Thus in this middle age group, like the younger group, there were clear signs that some children were sensitive to empirical evidence of reality during pretence.

A slightly different pattern of results emerged amongst the six to seven year old children - there were no clear systematic differences in their behaviours across the two experiments.

Experiment 4 changed focus slightly to address a particular issue about the influence of affect on children's behaviour during pretence. Specifically, the hierarchical organisation of the motivations to approach the positive entity and to avoid the negative entity was assessed by placing these motivations in direct conflict. The children in this experiment could respond to one or the other of these motivations, but not both since they were asked to either open or to discard two boxes when they had pretended that one contained a positive entity and the other, a negative entity. To assist in the interpretation of children's decisions, and in order to explore the relationship between the hierarchical organisation of affect and the children's beliefs about the reality status of the pretend entities, children's responses were compared according to different levels of empirical evidence (opaque and transparent box conditions) and the children were interviewed about their behaviour.

Overall, the children tended to open rather than discard both boxes, thus prioritising their approach to the positive pretend entity over their avoidance of the negative one. This tendency to open both boxes was greatest when the children were provided with
continual evidence of box contents. This finding suggests that for at least some children, prioritising avoidance of the negative entity was associated with uncertainty about its pretend-reality status. The children tended to explain their behaviour in terms of the box contents, for example, by describing how they had wanted the positive entity or how they had discarded the boxes in order to avoid the monster. Other children explained their behaviour in terms of their uncertainty about the reality status of the box contents.

Experiment 5 turned directly to the issue of developmental and individual differences in children’s understanding of the pretend-reality distinction by exploring the relationship between children’s behaviours on the pretence tasks and their verbally expressed beliefs about the reality status of the imagined objects. Thus in this experiment, children’s behaviour on the serial box selection tasks, their behaviour on the forced choice task and the children’s justifications for their behaviours were examined on a repeated measures basis. Amongst four to five year old children there were no clear relationships between the children’s behaviours on the two pretence tasks. However, amongst five to seven year old children, opening both boxes on the forced choice task was associated with opening the positive box first and the negative box last on the serial box selection task. Furthermore, discarding both boxes on the forced choice task was associated with opening the positive box first and then the negative box second (neutral box last). In addition, amongst six to seven year old children, discarding both boxes was associated with opening the positive box first and the negative box last on the serial box selection task. There were also relationships between children’s behaviours and their verbal justifications for those behaviours. Amongst five to seven year old children, those who opened both boxes tended to explain their decision in terms of the presence of objects in the boxes or their uncertainty about the reality status of those objects. In contrast, those four to five year old children who opened both boxes tended to give explanations that were not related to the pretence. The minority of children who discarded both boxes tended to explain this in terms unrelated to the pretence (four to five year old children), or in terms of the contents of the boxes (four to five year old and six to seven year old children). In terms of their behaviour on the serial box selection task, those children who selected the positive box first and negative box last tended to explain their subsequent behaviours in terms of the box contents or their uncertainty about the box contents.

The two final experiments turned to measures of children’s spontaneous behaviours towards pretend entities as a way of validating the use of pretence tasks to assess
children's understanding of the pretend-reality distinction. To this end, experiment 6 investigated the relationship between children's behaviours on the serial box selection tasks and their subsequent spontaneous behaviour towards the boxes whilst the experimenter was out of the room. Importantly, the design of this experiment afforded an opportunity to assess children's spontaneous behaviours towards positive, negative and neutral pretend entities. Furthermore, the design included a control task to explore the impact of a non-pretence based cue for increasing cognitive availability on children's beliefs and behaviour.

In terms of the children's behaviour on the box selection tasks, children in the pretence condition and in the non-pretence condition tended to open the positive box first and discard it last, and open the negative box last and discard it first. However, a number of children from the pretence condition, but not the non-pretence condition, nominated the neutral box second on the hypothetical opening task but actually opened it last, instead opening the negative box second. In terms of the children's spontaneous behaviours, the same number of children from the pretence condition as from the non-pretence condition opened one or more of the boxes during the period they were left alone with them. Intriguingly, half of these children opened just one of the boxes, all of these children choosing to open the positive box but not the neutral box or the negative box. Those children who looked inside the boxes tended to have selected the positive, neutral and then the negative box on the hypothetical and actual opening tasks, and were more likely to be aged five to six years old than four to five years old.

Thus the increased cognitive availability for the box contents caused by the pictures (non-pretence condition) and the pretence appeared to have caused a particular sub-group of children to become uncertain about the reality status of the box contents and therefore to open the boxes in the experimenter's absence.

Experiment 7 followed on from these results by testing the possibility that the spontaneous behaviours observed in experiment 6 were caused by factors unrelated to the effects of availability. In this final experiment children were left alone with the boxes before there had been any suggestion of any specific box contents (pre-task) and then for a second time, after the completion of the box selection tasks (post-task) as in experiment 6. A similar number of children looked inside the boxes when they were left alone pre-task as had done so post-task in experiment 6. However, these behaviours appeared to be differently motivated - whereas after the suggestion of box contents (experiment 6) the children tended to look inside the positive box, prior to the suggestion of box contents (experiment 7) the children tended to look inside all three
boxes. Furthermore, the developmental differences and the association with the children’s response patterns on the box selection tasks found in experiment 6, were not replicated in experiment 7. These results were interpreted as demonstrating that the spontaneous behaviours observed in experiment 6 were related to the effects of increased cognitive availability but that those observed in experiment 7 were not. The finding that in experiment 6 but not experiment 7, there was a relationship between children’s spontaneous behaviours and their earlier behaviours on the box selection tasks was interpreted as validating the use of box selection tasks as a way of assessing children’s understanding of the pretend-reality distinction.

Taken together the results from the experiments conducted in this research provide compelling evidence that both the availability hypothesis (Harris et al 1991; Johnson & Harris, 1994) and the pretence continuation account (Golomb & Galasso, 1995) are required to explain children’s understanding of the pretend-reality distinction and their behaviour towards pretend entities. Both accounts are required since the evidence suggests that there are individual and developmental differences in this domain. That is, within each of the age groups studied some (credulous) children experience confusion about the pretend-reality distinction whilst other (sceptical) children simply continue the pretence and respond in terms of the affect it evokes. Furthermore there are differences according to the child’s age in the way in which these differences in the children’s beliefs are displayed behaviourally. These differences relate to variations in the children’s responses to the affect evoked by the pretence. Before giving a detailed account of these developmental and individual differences in children’s beliefs and behaviour, an account of the contribution that these findings have made to our understanding of the influence of empirical evidence of reality and to our understanding of the influence of affect on children’s behaviour will be given.

The influence of empirical evidence on children’s understanding of pretence

In the introduction it was argued that one of the main problems with the availability hypothesis (Harris et al, 1991; Johnson & Harris, 1994) is that it predicts considerably more instances of pretend-reality confusion than are actually observed. Although potentially any act of pretence can lead to an increase in cognitive availability that is sufficient to cause children to wonder about the reality status of what has been imagined, such confusions are actually very rare. It was therefore argued that there must be some mechanisms which constrain the effects of availability. Empirical
evidence of reality, or visual confirmation of the outcome of the pretence (Woolley, 1997a), is one possible limiting mechanism - being able to see that something is only pretend should minimise the possibility that any child could wonder about the reality status of that entity.

In the present research, the influence of empirical evidence of reality on children's understanding of the pretend-reality distinction was assessed in two ways. First, children's behaviour across hypothetical and actual opening tasks was compared (experiments 1, 2, 6 and 7). During the hypothetical task, children made their box selections without any empirical evidence of the reality status of the box contents. In contrast, when they actually opened the first box, children obtained visual confirmation that the box was empty. It was anticipated that children's behaviour across the hypothetical and actual opening tasks might differ if empirical evidence constrained the effects of increased cognitive availability. Second, children's behaviours under conditions of continual visual confirmation of box contents were assessed by asking children to pretend about the contents of transparent boxes (experiments 3, 4a and 4b).

The results from comparing children's performance across the hypothetical and actual opening tasks were inconclusive. In experiments 1 and 2 no clear differences between the tasks were observed. However, in experiments 6 and 7 there were differences between the tasks and furthermore, these differences seemed quite systematic. The change in children's behaviour tended to be that whereas on the hypothetical task children selected the positive box, the neutral box and then negative box, actually opening the positive box and finding it to be empty was followed by opening the negative box and then the neutral box. It seems that finding the positive box to be empty may have reassured children that the others would also be empty and this then led to a change in their strategy when choosing between the negative and neutral boxes. It is not clear why empirical evidence should have influenced children's behaviour in experiments 6 and 7, but not in experiments 1 and 2 - one possibility is that this relates to the different pretend entities used in each experiment. However, this inconsistency in the results makes the findings difficult to interpret.

In contrast, the results from continually confronting children with empirical evidence of reality were much clearer - subject to individual and developmental differences, there were children whose behaviour was influenced by the use of transparent boxes. These findings were subsequently interpreted as demonstrating that some children are sensitive to the effects of increased cognitive availability and therefore become
uncertain about the pretend-reality distinction unless they are provided with visual confirmation of the outcome of the pretence.

Some corroborating evidence for the importance of empirical evidence in children's understanding of the pretend-reality distinction was obtained in experiment 5 when children were asked to explain how they knew that the pretence had or had not led to an imagined object becoming real. The children's replies often referred to empirical evidence of what had and had not happened. For example, several children reported the fact that they had previously seen that the boxes were empty, or the fact that they had not seen the imagined entity enter the box. These children appear to be giving verbal reports of how they use empirical evidence of reality to guide their judgements about the pretend-reality distinction.

Taken together, the results obtained in this research suggest that empirical evidence of reality does influence some children's understanding of the pretend-reality distinction. The nature of this influence is that the effects of increased cognitive availability are constrained amongst those children who might otherwise become uncertain about the pretend-reality distinction. What has this added to our understanding of the nature of pretend-reality confusions?

This knowledge of the influence of empirical evidence of reality allows a clear explanation of the relative rarity of pretend-reality confusions and enables some quite specific predictions to be made about the circumstances in which such confusions are more or less likely to occur. Furthermore, the paradoxical literature relating to children's competence at distinguishing fantasy from reality and their experience of pretend-reality confusions can also be explained in terms of the effects of empirical evidence of reality on availability. Basically, whenever visual confirmation of the outcome of the pretence is readily available, pretend-reality confusions should be, and indeed are, rare. For example, pretend-reality confusions should be highly unlikely during object substitution pretence. This is because children can see that the banana they are using as a telephone, is really only a banana, or that the block they are pretending is a car is only a block. This argument is consistent with the considerable amount of research evidence which demonstrates that children can clearly differentiate the pretend and real identities of objects used in object substitution pretence (for example, Flavell, Flavell & Green, 1987; Harris, Kavanaugh & Meredith, 1994; Lillard & Flavell, 1992; Woolley, 1993b; Woolley & Wellman, 1990). Similarly, the fact that children do not become uncertain about the existence of their imaginary friends
(Taylor, Cartwright & Carlson, 1993) is consistent with the fact that they are reassured of the status of the friend by their inability to see him or her. Likewise, in imaginary object pretence the child can see, for example, that the tea that has been poured does not really exist and is therefore only imaginary tea. Thus it seems that children’s competence in maintaining a distinction between pretence and reality is interpretable in terms of the influence of empirical evidence of reality on children’s beliefs.

Evidence relating to when pretend-reality confusions do occur can also be discussed in terms of the operation of empirical evidence as a constraint on the effects of increased cognitive availability. The studies by Harris et al (1991), Johnson and Harris (1994) and Woolley and Phelps (1994) all required children to make judgements about the reality status of imagined objects when they were unable to see whether the objects were real or not. That is, asking children to pretend about the contents of opaque boxes denies them the opportunity to see the outcome of the pretence. Thus the effects of increased cognitive availability are not constrained and as a consequence, some children experience pretend-reality confusion.

The evidence relating to magical thinking obtained by Subbotskii (1985; Subbotsky, 1994, 1996, 1997a, 1997b) can also be interpreted in terms of availability and the constraining influence of empirical evidence of reality. For example, in Subbotskii (1985) the fairy story may have increased the cognitive availability for the possibility of the magical outcomes. The adult’s comments about trying out the magical apparatus may have contributed to this. There was no evidence available to suggest that the magic was not possible. Similarly, in Subbotsky’s (1994) later studies where children were shown a magical transformation, all the empirical evidence confronting the child suggested the possibility of magical transformations. There was no counter-evidence to constrain the resultant increase in cognitive availability.

Overall, pretend-reality confusions and magical thinking amongst children seem most likely when there is a lack of empirical evidence of reality to constrain the influence of increased cognitive availability for the idea of the magical possibility being genuine or for the idea of the imagined entity being real. The same may also be true for adults - for example, in the studies by Rozin, Millman and Nemeroff (1986) and Rozin, Markwith and Ross (1990) the cognitive availability for the idea that the sugar solution was cyanide was not constrained since there was no empirical evidence to confirm that it was only a sugar solution but a clear piece of evidence (the label) that it was cyanide.
Childhood fears of imaginary creatures are also consistent with the operation of availability - these are at their most severe, and most prevalent at night - in the dark the child can not see that the imagined creatures are not real. Indeed, the operation of empirical evidence as a constraint on availability might explain why so many children are reassured by sleeping with the light on - they can instantly see that the monsters or ghosts they are worrying about have not materialised. Similarly, when parents say to their children that monsters are not real, and when they check underneath the bed or in the cupboard for such a creature, parents are providing their children with direct empirical evidence of reality.

In summary, the present research has made a clear contribution to our understanding of the impact of empirical evidence of reality on children’s ability to differentiate pretence from reality. As a result, the paradox between children’s understanding of the distinction between pretence and reality on the one hand, and their pretend-reality confusions on the other, seems much less paradoxical. These results can be attributed to the differential levels of empirical evidence of reality provided in these studies.

The influence of affect on children’s behaviour during pretence

The Golomb and Galasso (1995) pretence continuation account assumes that during pretence children will be motivated to behave in ways which increase their experience of positive affect and which decrease their experience of negative affect. However, as was noted in the initial discussion of this explanation, there are behaviours which have been observed experimentally which simply do not fit this model. For example, in Harris et al (1991 - experiment 4) some children approached rather than avoided a scary monster. An additional problem with the pretence continuation account is that it makes no clear statement about how children might prioritise their affect when they are prevented from responding differentially to both forms at the same time. The issue of the influence of affect on children’s pretence has also not been squarely addressed in previous accounts of the availability hypothesis (Harris et al, 1991; Johnson & Harris, 1994). Although the effects of increased cognitive availability are said to operate for harmless as well as frightening creatures, no claims have been made about how these effects might vary according to the type of affect evoked by the pretence. Thus, these two existing explanations of children’s understanding of the pretend-reality distinction do not offer completely convincing predictions about the influence of affect on children’s behaviour during pretence.
In the present research, the influence of affect on children’s behaviour was explored in three ways. First, children were given box selection tasks using positive, negative and neutral pretend entities on a within subjects basis (experiments 1, 2, 3, 6 and 7). Second, the hierarchical organisation of affect was assessed by placing positive and negative affect in conflict in a forced choice task (experiments 4a and 4b). Third, children’s spontaneous behaviours towards positive, negative and neutral pretend entities were assessed (experiments 6 and 7).

Putting aside the issue of whether the children’s behaviours reflect pretence continuation or pretend-reality confusion, the results from the present experiments suggest that the influence of affect on children’s behaviour during pretence is less straightforward than the Golomb and Galasso (1995) account would suggest. Moreover, the evidence indicates that affect and the effects of increased cognitive availability interact in a predictable manner.

As Golomb and Galasso (1995) would anticipate, the most frequent patterns of response on the serial box selection tasks were those in which children consistently approached the positive pretend entity and avoided the negative one. In other words, the children were presumably increasing their experience of positive affect and decreasing their experience of negative affect. However, a sizeable group of children consistently emerged who, rather than avoiding the negative pretend entity, elected to approach that box sooner than was absolutely necessary (opening it second rather than last). These children simply do not behave in a way which reduces their negative affect on the opening tasks, although they do so on the discarding tasks (the negative box was discarded first by these children). It seems that the negative affect evoked by fictional mental states is not always aversive. One possibility is that those children who behaved such as to increase their negative affect in this research, go on to be those children and adults who report enjoying the fear that is aroused by horror films (see for example, Allerton, 1995; Johnston, 1995; Murry & Dacin, 1996; Sparks, 1986; Tamborini, Stiff & Heidel, 1990). That is, perhaps one aspect of the individual differences between people is in their ability to view some forms of negative affect as pleasurable and that this trait develops at an early age through the child’s emotional involvement in their pretend play.

In terms of the hierarchical organisation of affect during pretence, the results showed that whilst some children prioritise avoidance of the negative pretend entity, the
majority prioritise their approach towards the positive pretend entity. This behaviour occurs despite the fact that by opening both boxes the children approach the negative pretend entity as well as the positive one. The children’s spontaneous behaviours also suggested that positive affect was prioritised. Under conditions of equivalent availability for positive, negative and neutral pretend entities, half of the children who opened one or more of the boxes opened just the positive box. Although the children’s failure to open the negative and neutral boxes in these circumstances attracts multiple interpretations, the fact that so many children only open the positive box strongly suggests some form of interaction between affect and availability. It is possible that availability for desirable entities is exaggerated and that pretend-reality confusions become more likely for positive entities than for affectively negative or neutral ones. This may of course relate to wishful thinking - the fact that children would like this outcome to occur (Woolley, 1997a).

Overall, it would seem that affect is a very powerful force in determining children’s behaviours towards pretend entities. However, the influence of affect seems to be strongly related to whether the child is continuing the pretence or has become uncertain about the pretend-reality distinction and this is subject to developmental differences. In the section which follows these individual and developmental differences in children’s understanding of the pretend-reality distinction and in the influence of affect on children’s behaviour will be considered in some detail.

Individual and developmental differences in children’s understanding of pretence

The findings from this research are best interpreted in terms of individual and developmental differences between children in relation to whether they experience pretend-reality confusion or simply continue the pretence and in relation to how these differing belief states are reflected in the children’s behaviour. The purpose of the discussion which follows is to give an account of the findings obtained for the three main age groups studied in this research. In so doing, a statement will be given about whether any of the children in the specified age range appear to be sensitive to empirical evidence as a constraint on the effects of increased cognitive availability, of the types of behaviours displayed by such children and of the types of behaviours displayed by children who are best thought of as continuing their pretence in relation
to the affect it has evoked. The content of this discussion is summarised in Figure 9.1 (see page 232).

The beliefs and behaviours of four to five year old children
There are four findings from the present research which suggest that at least some four to five year old children (younger age group) are influenced by empirical evidence of reality. First, providing continual visual confirmation of the box contents was associated with a decrease in the number of children who opened the positive box first, neutral box second and negative box last on the serial box selection task. Second, the same experimental manipulation was also associated with an increase in the number of children who opened the positive box first and then the negative box, leaving the neutral box until last. Third, four to five year old children were more likely to throw away both a positive and a negative box when they were denied empirical evidence of the box contents, than when they were provided with visual confirmation that the boxes were empty. Finally, a number of children in this age group described physical possibilities and impossibilities and what they had or had not seen happening when explaining their pretend-reality judgements. Taken together, these findings suggest that for at least some children in this age group, empirical evidence of reality constrains the effects of increased cognitive availability and reduces the likelihood that they will experience pretend-reality confusion.

This being the case, how do four to five year old children behave when they have become uncertain about the reality status of the pretend entities? In other words, what behaviours characterise the responses of credulous children within this age group? First, they tend to open the positive box first, neutral box second and negative box last on the serial box selection task. Second, they discard both boxes when given the choice of either opening or discarding a positive and a negative box. Third, they explain their behaviour either in terms unrelated to the pretence or in terms of the presence of objects inside the boxes. Finally, they spontaneously open one or more boxes in the experimenter's absence. However, this latter behaviour only accounts for a quarter of the children in this age group - it is possible that there are more children in this age group who experience pretend-reality confusion but who do not approach the boxes, perhaps due to their wariness and continued avoidance of the negative entity.

The behaviours described above do not account for all children - some children seem to be unaffected by the effects of availability and instead simply respond by continuing with the pretence theme. In other words, some children in this age group are sceptical.
Some of these children open the positive box first, neutral box second and negative box last on the serial box selection task and are therefore impossible to distinguish from those children who are uncertain of the pretend-reality distinction on the basis of this task alone. In other words, this behaviour is generated by two separable, differently motivated groups of children. However, some children who continue the pretence do so by opening the positive box first, negative box second and neutral box last. The fact that such children also tend to open both boxes when positive and negative affect are placed in direct conflict suggests that these children are behaving in ways which increase rather than decrease their negative affect. Finally, these children tend to explain their behaviours in terms that are not related to the pretence.

In sum, amongst four to five year old children there are four clear sub-groups:

i) credulous children who become uncertain of the pretend-reality distinction due to the effects of increased cognitive availability
ii) sceptical children who continue the pretence by increasing positive affect and decreasing negative affect
iii) sceptical children who continue the pretence by increasing both positive and negative affect, and
iv) other children who respond randomly or in terms of perseverative response patterns.

The beliefs and behaviours of five to six year old children

Three findings from this research suggest that the behaviour of some five to six year old children (middle age group) was influenced by empirical evidence of reality. First, providing children with continual visual confirmation of the box contents was associated with an increase in the number of children who opened the positive box first, neutral box second and the negative box last, and a corresponding decrease in the number of children who opened the positive box first, negative box second and neutral box last on the serial box selection task. Second, this experimental manipulation was also associated with a decrease in the number of children who prioritised the reduction of negative affect by discarding both boxes on the forced choice task. Finally, some children described what physically could or could not happen, or what they had or had not seen happen, when they were justifying their beliefs about the pretence. Thus it would seem that some five to six year old children are sensitive to the constraining influence of empirical evidence of reality on the effects of increased cognitive availability. This being the case, some children must therefore become uncertain of the pretend-reality distinction during pretence tasks. How do these credulous children
behave? First, on the serial box selection tasks they open the positive box first, negative box second and the neutral box last. Second, they discard both boxes when positive and negative affect are placed in direct conflict. Third, they spontaneously open one or more of the boxes when left alone with them. Interestingly, of these children about half open the positive, neutral and then the negative box on the serial task. This suggests that some of the children producing this response pattern were also uncertain of the pretend-reality status of the box contents.

However, some five to six year old children respond in ways that suggest they are simply continuing the pretence. Some of these sceptical children open the positive box first, neutral box second and negative box last on the serial box selection task and are thus impossible to distinguish from children of this age who are uncertain about the pretend-reality distinction. These children continue the pretence by opening both boxes on the forced choice task and discuss their behaviour in terms of the presence of objects inside the boxes. However, given that amongst the children who open both boxes, some discuss their uncertainty about the box contents, it is possible that some of these children are confused about the pretend-reality distinction.

In sum, the behaviour of five to six year old children suggests that there are four clear sub-groups within this age group:

i) credulous children who become uncertain about the pretend-reality distinction due to the effects of availability who open the positive, negative and then the neutral box, but who prioritise negative affect by discarding both boxes

ii) credulous children who become uncertain about the pretend-reality distinction due to the effects of availability who open the positive, neutral and then the negative boxes and who prioritise positive affect by opening both boxes

iii) sceptical children who continue the pretence in affectively appropriate ways, and

iv) other children who respond randomly or in terms of perseverative response patterns.

Broadly speaking, there are continuities between the beliefs and behaviours of four to five year old children and five to six year old children. Within both of these age groups there are children who experience pretend-reality confusion due to the effects of increased cognitive availability and there are others who instead respond in terms of a continuation of the pretence theme. However, the way that these differing beliefs are represented behaviourally differs between the two age groups. Amongst four to five year old children, pretend-reality confusion is characterised by seeking the positive
entity, avoiding the negative one and prioritising a response to negative affect. In contrast, amongst five to six year old children pretend-reality confusion generates two differing sets of behaviours. First, seeking positive entities, avoiding negative entities and prioritising positive affect. Second, premature approach to the negative entity and prioritising negative affect. Similarly, the behaviour of children who are continuing the pretence theme differs in these two age groups. Amongst four to five year old children pretence continuation involves prioritising positive affect and either seeking the positive pretend entity and avoiding the negative one, or approaching the negative entity prematurely. In contrast, amongst five to six year old children, pretence continuation consistently involves seeking the positive entity, avoiding the negative one and prioritising positive affect.

The beliefs and behaviours of six to seven year old children

The evidence relating to six to seven year old children (older age group) suggests that they are not systematically influenced by empirical evidence of reality during pretence - their behaviour does not change when they are provided with visual confirmation of box contents compared to when they are not. However, this cannot be taken as conclusive evidence that these children do not experience pretend-reality confusions. It could be the case that the same behaviours are differently motivated such that with no empirical evidence of reality the children experience pretend-reality confusion but respond similarly even when continuing the pretence when they can see that the boxes are empty. One indication that some six to seven year old children do experience pretend-reality confusion is the finding that some of these children justify their decision to prioritise positive affect in terms of their uncertainty about the box contents. However, overall it seems that the children in this age group are most likely to be responding in terms of a continuation of the pretence - they open the positive box first, neutral box second and negative box last, some of them prioritise positive affect whereas others prioritise negative affect, and they tend to discuss their behaviours in terms of the objects being inside the boxes. This age group can thus be divided into the following four sub-groups:

i) a possible group of credulous children who become uncertain about the pretend-reality distinction due to the effects of availability
ii) sceptical children who continue the pretence by approaching positive pretend entities, avoiding negative pretend entities and prioritising positive affect
iii) sceptical children who continue the pretence by approaching positive pretend entities, avoiding negative pretend entities and by prioritising negative affect, and
iv) other children who respond randomly or in terms of perseverative response patterns.

The beliefs and behaviours of six to seven year old children are rather different to those of five to six year old children since there is no behaviourally distinct group of six to seven year old children who are susceptible to pretend-reality confusions. However, these two age groups continue the pretence in broadly similar ways. Both groups of children approach positive entities and avoid negative ones, prioritise positive affect and discuss their behaviour in terms of the objects being inside the boxes. However, unlike five to six year old children, some six to seven year old children prioritise negative affect as part of a continuation of the pretence. The behaviour of six to seven year old children compares similarly with that of four to five year old children as with five to six year old children. Unlike four to five year old children, amongst six to seven year old children there is no behaviourally distinct group of children who become uncertain about the pretend-reality distinction. Amongst both age groups, some children continue the pretence by approaching the positive entity, avoiding the negative entity and prioritising positive affect, however amongst six to seven year old but not four to five year old children, some continue the pretence by prioritising negative affect.

In summary, there are clear continuities and discontinuities between the age groups studied in this research. These findings are summarised in Figure 9.1 which clearly shows that, excluding miscellaneous children who behave randomly or perseveratively, in each age group there are three groups of children who differ in terms of their susceptibility to the effects of increased cognitive availability. Children’s behaviour on the pretence tasks seems to be dependent on an interaction between individual differences, the child’s age, affect and whether or not they have visual confirmation of the outcome of their pretence. Clearly what is needed now is some longitudinal research to investigate how each of these groups of children map onto each other developmentally.
Figure 9.1: Summary of individual and developmental differences in children's susceptibility to the effects of increased cognitive availability (+ = positive entity; - = negative entity)
Theoretical explanations of children's understanding of pretence

The overall findings from this research have demonstrated that both the availability hypothesis (Harris et al., 1991; Johnson & Harris, 1994) and the pretence continuation account (Golomb & Galasso, 1995) are required to explain children's understanding of the pretend-reality distinction. This is because these explanations, rather than being competing explanations for the behaviour of all children, are instead complementary explanations for the behaviour of separable sub-groups of children. However, this research has also expanded upon our understanding of these pre-existing theoretical accounts.

The availability hypothesis
The present research has furthered our understanding of the availability hypothesis by demonstrating that the effects of increased cognitive availability can be constrained by empirical evidence of reality. Thus, for those children who are susceptible to pretend-reality confusions, visual confirmation of the outcome of the pretence is reassuring and reduces their uncertainty. This research has also added to our understanding of the effects of availability by generating results which suggest an interaction between the effects of availability and affect. Under conditions of equivalent availability for positive, negative and neutral entities, children tend to spontaneously open only the positive box during the experimenter's absence. It is possible that this occurs because the effects of increased cognitive availability are exaggerated for entities that children find desirable. The final novel finding relating to the availability hypothesis is that pretence is not the only cue that can lead to an increase in cognitive availability and uncertainty about the reality status of certain entities - the labelling of boxes with pictures can have a similar effect.

The pretence continuation account
The findings from this research have also added to our understanding of the pretence continuation account by demonstrating that whilst many children do respond in ways which increase their positive affect and decrease their negative affect, others instead respond in ways which also increase their negative affect. Furthermore, when forced to prioritise either positive or negative affect, although most children prioritise positive affect, some instead prioritise negative affect. Thus children's response to affect during pretence is less straightforward than the original pretence continuation account implied.
The transmigration hypothesis
This explanation of children's understanding of the pretend-reality distinction was offered by Harris et al (1991) and later by Johnson and Harris (1994) who rejected it on the grounds that the children's verbal justifications for their behaviour very rarely suggested any uncertainty about the generative powers of the imagination. That is, very few children made any comments that could have been interpreted as suggesting that they were unsure of the rules governing when imagined objects can and cannot become real. Although the present research did not directly assess this hypothesis, the findings from children's verbal explanations support the Johnson and Harris grounds for dismissing this explanation. When asked how they had known that the boxes were empty or how they thought the objects had got inside the boxes, less than 10% of the children gave explanations referring to the generative powers of the imagination. Such explanations were also given by less than a quarter of the children when they were asked whether pretending could ever lead to an imagined object becoming real. Importantly, all of these children denied the possibility that their mental states could generate real entities. Thus children do not appear to be uncertain of the generative powers of their imagination in the way that the transmigration hypothesis would suggest. Therefore the transmigration hypothesis is rejected as an explanation of breakdowns in children's understanding of the pretend-reality distinction.

Directions for future research
The present research has successfully contributed to our understanding of children's experience of pretend-reality confusions and their behaviour in response to the affect that is evoked by their pretence. In doing so this research has raised further issues in need of empirical investigation. The purpose of the discussion which follows is to outline the nature of these issues and suggest directions for future research activities. These further issues can be sub-divided into three broad areas:
- issues arising from the experimental paradigms used in this research
- further issues arising from those already addressed in this research, and
- new issues arising from the findings obtained in this research.

Several further issues arise from the current experimental paradigms. First, the results from the forced choice task (experiment 4) were interpreted as reflecting the hierarchical organisation of affect during pretence - it was assumed that children's decisions to open or to discard the boxes were motivated by their desire to prioritise a
response to one form of affect over the other. However, as was noted previously, there are several competing explanations for children’s behaviours in this task. One empirically testable possibility is that children elect to open the boxes as a result of a stronger behavioural association between boxes and opening, than between boxes and discarding. To be able to make any clear statements about the extent to which the opening bias observed in this research was a product of the pretence or of box function, it is necessary to obtain a baseline measure of rates of box opening and discarding that is independent of any pretence.

Second, the final two experiments in this research turned to the analysis of children’s spontaneous behaviours in the experimenter’s absence as a way of assessing children’s understanding of the pretend-reality distinction. The contrasts between the two experiments raise a number of issues - further experimental work is required to establish why so many children looked inside the boxes in the pre-task period (experiment 7), why so few children looked inside the boxes in the post-task period of experiment 7 compared to the same period in experiment 6, and finally, why the children’s behaviours on the box selection tasks differed in experiment 7 relative to experiment 6. There are several possibilities which could be explored. For example, the possibility that children’s approaches to the boxes during the pre-task period were simply an effect of the children trying to work out what the boxes were to be used for, could be tested by simply telling the child before the experimenter leaves, what they are going to do with the boxes when the experimenter returns. This disambiguation of the role of the boxes should reduce levels of box opening if children look inside the boxes during the pre-task period to find their function. An alternative possibility is that children believe that they were shown that the boxes were empty immediately prior to the experimenter’s departure because that fact is relevant to what is about to happen. This perhaps raises the children’s suspicions about the experimenter’s intentions. To test this possibility an experiment should be designed in which the child’s discovery that the boxes are empty prior to the experimenter’s pre-task departure is accidental or incidental to the experimental proceedings.

The three key issues investigated in this research have generated some further issues which need to be empirically investigated. First, in this research the influence of affect on children’s behaviour has been examined and throughout the text, claims have been made that children were prioritising one form of affect over another, or that they were responding differentially to positive and negative affect. However, at present there is no independent or objective means of knowing whether any of the children studied
ever experienced any affect whatsoever. The children's verbal comments, which often referred to their wariness or the negative entity and desire for the positive entity, suggest that at least some children experienced affect. However, if the role of affect in pretence is to be examined further it will be important to find some independent evidence that children do experience affect in relation to the pretence. For example, future studies might include physiological measures and explore the relationship between differences between children on these measures and on the box selection tasks.

Second, this research demonstrated that pretence is not the only cue which can increase the cognitive availability for the idea of objects being inside the boxes. However, the influence of such non-pretence cues needs to be more fully examined. For example, the differences between the pretence and non-pretence conditions were attributed to differences in levels of availability in each condition. However, it could simply be that children respond differently to the effects of availability when these are caused by pretence compared to when these are caused by other methods. This is an empirically testable possibility.

Finally, the individual and developmental differences between children that have been suggested by these research findings need to be more thoroughly explored. For example, further research is needed to examine children's beliefs and behaviours on a longitudinal basis in order that the pathways from pretend-reality confusion to pretence continuation can be determined and the continuities and discontinuities in individual children's behaviour can be assessed.

The finding that there are groups of children who experience pretend-reality confusions due to the effects of increased cognitive availability raises a number of issues. First, what is it about these children that makes them susceptible to pretend-reality confusions? It could be that these children are susceptible to availability effects in various domains. Alternatively, it could be that these children are not effective at deploying their understanding of pretence and reality to control their emotional states and that this contributes to, or interacts with, the increase in cognitive availability caused by the pretence. Furthermore, there could be temperamental differences between these children and those who do not experience pretend-reality confusions. Second, the relationship between everyday pretend-reality confusions, such as fears of imaginary creatures, and those observed experimentally should be assessed to establish whether these are the same children or whether one group is a
sub-section of the other. Finally, a further issue relates to parental strategies for dealing with children’s fears of imagined entities. Do the parents of children who approach the negative pretend entity earlier than is absolutely necessary use different techniques compared to the parents of children who avoid negative entities? In other words, how do parental behaviours map on to the individual differences observed in this research? The answers to these questions may be obtained through longitudinal research involving both parents and children.

Conclusion

This program of research consisted of a series of seven related experiments designed to investigate the availability hypothesis (Harris et al., 1991; Johnson & Harris, 1994) and the pretence continuation account (Golomb & Galasso, 1995) of children’s understanding of the pretend-reality distinction. The findings have demonstrated that these are not competing explanations for the behaviour of all children, but are instead complementary explanations which each account for the behaviour of separable sub-groups of children. That is, when placed in a situation whereby there are no real life consequences for engaging in magical thinking and in which there is only limited empirical evidence of the outcome of the pretence, some children will become uncertain of the reality status of what they have imagined, whilst others will remain confident of the pretend-reality distinction and respond in terms of their emotional involvement in the pretence. Overall, this thesis offers an account of children’s behaviour in pretence which highlights the importance of the child’s age, individual differences, affect and empirical evidence as related factors influencing children’s understanding of the pretend-reality distinction.
References


Harris, P.L. (1992) From simulation to folk psychology: The case for development. *Mind and Language, 7*, 120 - 144


Harris, P.L. (1996) Personal communication


Marjanovic-Shane, A. (1989) "You are a pig": For real or just pretend? Different orientations in play and metaphor. Play and Culture, 2, 225 - 234

Milburn, M.A. (1978) Sources of bias in the prediction of future events. Organizational Behavior and Human Performance, 21, 17 - 26


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Samuels, A. & Taylor, M. (1994) Children's ability to distinguish fantasy events from real-life events. *British Journal of Developmental Psychology, 12, 417 - 427*


Vygotsky, L.S. (1967) Play and its role in the mental development of the child. Soviet Psychology, 5, 6 - 18


Woolley, J.D. (1997b) Initiating a dialogue. Child Development, 68, 1027 - 1030


Appendix 1
Line drawings used in the animal selections and non-pretence task
in experiment 6 and experiment 7
Appendix 2

Picture given to the participants of experiment 6 and experiment 7