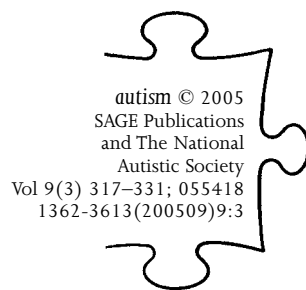# Moral understanding in children with autism

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ABSTRACT   Children with autism were compared with control groups on their ability to make moral judgements. Participants were presented with pairs of vignettes in which actions were either deliberate or accidental and caused injury to a person or damage to property. Participants were asked to judge which protagonist was the naughtier and to verbally justify this judgement. Results showed that the children with autism were as likely as controls to judge culpability on the basis of motive, and to judge injury to persons as more culpable than damage to property. Children with autism also offered some appropriate verbal justifications for their judgments although most justifications were of poor quality and reiterated the story. Results are discussed in terms of theory of mind and the possible role of deficits in complex reasoning and executive functions.

KEYWORDS
*autism;
mental state
understanding;
moral
understanding*

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Introduction

Understanding mental states is necessary for the normal development of social interaction and communication (Astington et al., 1988; Whiten, 1991). It is well established that people with autism have impaired understanding of mental states and succeed on false belief tasks later than typically developing children, if at all (see Baron-Cohen et al., 2000 for a review). However, the true extent of this difficulty remains uncertain. In particular, there is evidence that children with autism can represent some mental states such as simple desires and emotions (Tan and Harris, 1991; Yirmiya et al., 1992), true belief (Sparrevohn and Howie, 1995) and intention (Carpenter et al., 2001; Russell and Hill, 2001). This raises the possibility that children with autism may be able to apply their limited mental

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state understanding to interpret some social situations. It is the aim of this article to examine this possibility with respect to the ability of children with autism to make an adequate appraisal of moral transgression.

In order to interpret and judge moral transgression, some understanding of the transgressor's motive and/ or intention is required to properly categorize harm. In Piaget's (1965[1932]) early tests of moral development, typical tests involved telling children stories in which one protagonist has ill motives that result in a mildly negative outcome while another protagonist has good or neutral motives that result in a very negative outcome, and asking children which protagonist was the naughtier. Piaget showed that typically developing children up to the age of six use outcome rather than motive to judge culpability in such stories. However, if outcomes of the behaviour are held constant, five-year-olds can use motive to judge culpability (Constanzo et al., 1973). This suggests either that young children consider outcome more important than motive, or, more probably, that they are unable to inhibit responses to negative outcomes in favour of their more fragile understanding of motives and intentions.

Affect is also an important aspect of moral judgment (Blair, 1995; Nichols, 2002; Turiel, 1983). Turiel (1983) argued for a distinction between moral rules and social-conventional rules based partly on differences in the consequences of a protagonist's actions. Specifically, moral transgressions have intrinsic effects upon the rights or well being of others, and cause distress to persons; while transgressions of social-conventional standards have effects on social order and do not, in general, cause distress to persons. Consequently, moral transgressions are likely to produce negative affect in observers, whereas social-conventional transgressions are not likely to do so. Recent evidence from Blair (1995) also suggests that affect plays a crucial role in moral judgement and he has developed a detailed cognitive account of how this might work. Briefly, Blair postulates that a cognitive mechanism called the 'violence inhibition mechanism' (VIM) gives rise to a withdrawal from aggression in response to distress cues in others. The activation of VIM becomes aversive over time through a process of meaning analysis. Eventually, a sense of aversion is generated in response to distress cues (or associations to distress cues as in the case of moral transgressions). People with an intact VIM will therefore show high levels of physiological response to distress cues and will treat events that are experienced as aversive differently from events that don't result in aversion. Thus people who have a defective VIM will not experience aversion, a high physiological response to distress cues and will not distinguish between moral and conventional transgression. This has been reported to be the case in psychopaths (Blair, 1995). In young children, others' distress produces a considerable affective response (Zahn-Waxler

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et al., 1992), and it has been shown that children as young as three years old are able to judge moral transgressions as more serious than social-conventional ones (Smetana, 1985). Moreover, young children also judge actions that result in damage and distress to a person as more culpable than actions that cause damage to objects or property (Elkind and Dabek, 1977).

Clinical opinion and research studies suggest that children with autism lack empathic behavioral responses (e.g., Frith, 1989; Kanner, 1943; Sigman et al., 1992). Other studies have shown that children with autism have social-emotional deficits and use cognitive strategies to decode emotion (for a review see Kasari et al., 2001). A recent study on loneliness and friendship, for example, reported that children with autism lack an understanding of the emotional aspects of friendship and loneliness, instead being more likely to understand loneliness in a cognitive way (Bauminger and Kasari, 2000). It might be predicted, therefore, that children with autism would be unable to make the distinction between moral and social rules, but Blair (1996) found that children with autism did make the distinction between moral and social rules. At first sight, this result seems surprising. However, Blair (1999) also showed that children with autism do not lack the physiological correlates of empathy. Thus, it may be that the physiological correlates of behavioural empathic responsivity are sufficient for making the distinction between moral and social-conventional rules and rule breaking (although not sufficient for empathic behavioural responsivity).

Moral understanding is multifaceted and further studies are required to examine which aspects of moral understanding are intact in children with autism. In particular, do children with autism judge transgressions in terms of outcomes or motives? Are children with autism similar to typically developing children in finding damage to persons more salient than damage to property and judging it as more culpable? In view of the persistent mentalizing impairments that are characteristic of children with autism it might be predicted that judgements of culpability will be made on the basis of the outcome of the behaviour. The opposite prediction could also be made, however, as there is some evidence that children with autism can represent desires and intention and may therefore be able to appreciate motive. It is also uncertain whether children with autism would judge damage to people as being more culpable as damage to property. In view of the clinical and research evidence that children with autism lack empathic behavioural responses, it might be predicted that they would not make this judgement, but again, Blair's evidence, cited above, might lead to the opposite prediction.

The present study examined judgements of moral culpability involving accidental harm against deliberate harm and damage to a person against

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damage to property. We were interested in whether children with autism recognize the importance of motive for judgements of culpability in general and whether they are able to weigh up both the motive and the outcome of behaviour. Participants were presented with pairs of stories, each of which illustrated the protagonist's motive, behaviour and outcome of the behaviour. In some story pairs, the motive of the protagonists' behaviour would differ, but the outcomes of the behaviour would be identical (Condition A) and vice versa (Condition B). For other story pairs, both the outcome and the motive of behaviour differed (Condition C). Participants were asked to judge which protagonist in each story pair was the naughtier and asked to justify or explain each of their culpability judgements. The aim here was to collect qualitative data concerning the children's moral reasoning. We were particularly interested to assess whether children's correct culpability judgements derived from appropriate, or adult-like reasoning, or whether correct judgements resulted from idiosyncratic reasoning.

Method

Participants

Three groups of children took part in the study: 19 children with autism spectrum disorders 17 of whom met the established criteria for autism, two others met the established criteria for Asperger syndrome (American Psychiatric Association, 1994). 17 children with moderate learning difficulties (MLD) all of whom attended special schools and typically developing children all of whom attended mainstream schools. The two clinical groups were matched on chronological age (CA) and verbal mental age (VMA) on the long form of the British Picture Vocabulary Scale (BPVS) (Dunn et al., 1982).[1] The typically developing group was matched on VMA only. Participant details are summarized in Table 1.

Table 1 **Participants' mean chronological age in months (CA); verbal mental age in months (VMA); & verbal IQ (standard deviations are shown in brackets)**

	CA	VMA	VIQ
Autism	146.14 (37.38)	102.50 (31.46)	74.18 (19.94)
MLD	153.76 (34.89)	94.35 (27.56)	66.65 (16.05)
Typically developing	100.85 (25.98)	99.22 (26.63)	99.45 (4.97)

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Materials

Six pairs of stories were adapted from Elkind and Dabek (1977). Two pairs of stories were used in each of three test conditions (see Appendix). In Condition A, within each story pair the outcome of the protagonists' behaviour was identical, while in one story the protagonist's motive was good but in the other story the protagonist's motive was bad. This was the 'Same outcome, different motives' condition. In Condition B, within each story pair the protagonists' motives were the same (e.g., good in both stories) but the outcome of the behaviour differed: one story would involve damage to a person and the other story damage to property. This was the 'Same motives, different outcomes' condition. In Condition C, within each story pair the protagonists' motives varied, as did the outcomes of their actions. This was the 'Different motives and outcomes' condition.

Each story was illustrated in a comic-strip fashion, using three pictures per story, with the story printed underneath as captions. For example, Picture 1: This is John. John is playing tennis in the garden with a friend; Picture 2: John hits the ball to his friend, but the ball went too high, over his friend's head, and hit and broke a window; Picture 3: John felt sad about what happened.

Procedure

All participants were individually tested in a quiet room in their own school after a minimum of two visits, one for familiarization and one in which language ability was assessed. The test was administered over two sessions within a period of one month. The order of the presentation of the story pairs was randomized, and the order of the presentation within the story pairs was counterbalanced. Children either listened to the stories being read by the experimenter, or they read along with the experimenter. In either case, attention was drawn to the pictures illustrating key events in the story. After the children had listened to a given pair of stories, and with both stories still visible, memory and comprehension questions were asked. For example, following presentation of the story described in the materials section above, the child was asked: 'What happened when John hit the ball?'; 'Did this make John happy or sad?'; 'Was John trying to hit the window with the ball?'. All of the children completed the memory and comprehension questions satisfactorily, and no child was excluded from the analysis. Following the memory and comprehension questions, the child was asked: 'Which one of these two children is the naughtier?' After the child had responded, he or she was asked 'Why? Why do you think that X is the naughtier?' Participants' responses to the culpability questions were recorded on a standard score sheet, and their justifications of their judgements were audio-recorded and later transcribed.

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Results

Judgements of culpability

Answers to the culpability questions were scored categorically. For Conditions A and C, answers that judged ill motives as more culpable scored 1, and answers that judged good motives as more culpable scored 0. For Condition B, answers that judged personal injury as more culpable scored 1 and answers that judged property damage as more culpable scored 0. The data for conditions A and B were analyzed using one-way ANOVA's. The data for condition C were analysed using non-parametric tests (Kruskal-Wallis and Mann Whitney) as they violated the assumptions of ANOVA. Mean scores for the groups and conditions are summarized in Table 2.

There were no differences between groups on condition A ($F (2,54) = 0.90$, $p > 0.05$) and no significant covariates. All the groups based their judgements on the motive of the protagonist. There were also no differences between groups on condition B ($F (2,54) = 1.34$, $p > 0.05$) although VMA was a significant covariate ($F (2,54) = 4.57$, $p < 0.05$). All three groups judged damage to people to be more serious than damage to property. There was a difference between groups on condition C ($\chi^2 = 7.91$, df $= 2$, $p < 0.02$). Mann Whitney tests showed the difference to lie between the typically developing group and the autism group ($Z = -2.24$, $p < 0.025$, two tailed) and the typically developing group and the MLD group ($Z = -2.86$, $p < 0.004$, two tailed). The typically developing group scored at ceiling on condition C, always judging on the basis of the protagonist's motive. In comparison, the autism and MLD groups under-performed on this task compared to the typically developing group, but were not under-performing compared to their performance in conditions A and B.

Justifications for judgements of culpability

The children's justifications of their judgements of culpability were coded using the following categories: (i) appeals to the pain involved – the child mentions that to damage a person would hurt them, and this is more serious than to damage property; (ii) mention of the greater reversibility

Table 2 **Mean scores for culpability judgments by condition and group for experiment 1 (standard deviations are shown in brackets, maximum score = 2)**

Condition:	A: Intentions varied, outcomes constant	B: Intentions constant, outcomes varied	C: Intentions varied, outcomes varied
Autism	1.32 (0.72)	1.82 (0.39)	1.77 (0.43)
MLD	1.59 (0.51)	1.88 (0.49)	1.59 (0.62)
Typically developing	1.65 (0.67)	1.90 (0.45)	2.00 (0.00)

of damage to property – that objects can be replaced, but hurts to people can't be undone; (iii) statement of intention or accident – the child comments on whether an act was deliberate or not; (iv) not scorable, e.g., the child re-iterates the story; (v) other reasons – the child provides an appropriate justification which does not fit into categories (i) – (iii). Two raters (the first author and a colleague blind to diagnosis and hypotheses) independently coded all 336 justifications of children's correct culpability judgements, and agreed on 332 (98.8 percent; Cohen's kappa = 0.98). The four disagreements were resolved through discussion.

Figure 1 shows the types of justification given for correct judgements by group. The majority of the justifications given by the children with autism were reiterations of the story rather than explanations of their judgements. Although some justifications from this group also involved the motive/intention of the protagonist these were few in number compared to the amount of 'not scorable' justifications given by the group and the amount of motive/intention explanations given by the MLD and typically developing groups. Very few of the justifications given by all groups concerned pain or reversibility of damage. Finally, all of the groups offered some justifications, which while appropriate, did not fit into the other categories.

Table 3 shows the number of participants in each group who made correct judgements of culpability across the six story pairs, and the number who combined correct judgements with appropriate justifications. Participants in all three groups made more correct judgements than justifications. Eight participants in the autism group made correct judgements on all 6 story-pairs, but only three of these were able to provide appropriate justifications for each judgement. The discrepancy between making correct judgements and providing appropriate justifications was even bigger in the typically developing group: out of the 14 who made correct judgements on all six story-pairs, only three were able to provide appropriate
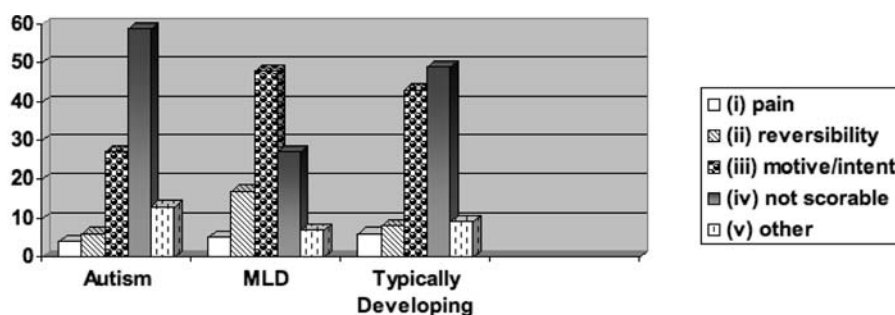

Figure 1   **Types of justifications given by group**

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Table 3 **Number of participants who made correct judgements of culpability and combined correct judgements with appropriate justifications**

Overall performance on story pairs	Autism (N = 19)		MLD (N = 17)		Typically developing (N = 20)	
	No of people making correct judgement	No of people making correct judgement & justification	No of people making correct judgement	No of people making correct judgement & justification	No of people making correct judgement	No of people making correct judgement & justification
0/6 correct[1]	0	5	0	3	0	4
1/6 correct	0	4	0	0	0	1
2/6 correct	0	2	0	1	0	1
3/6 correct	2	2	2	1	0	4
4/6 correct	4	1	2	3	3	2
5/6 correct	5	2	6	4	3	5
6/6 correct	8	3	7	5	14	3

[1] None of the children with autism, MLD or typically developing children made zero correct judgements, in contrast 5 children with autism, 3 children with MLD and 4 typically developing children were unable to provide any appropriate justifications.

justifications for each judgement. The difference between performance on judgement and justification was less for the MLD group: of the seven who made correct judgements on all story pairs, 5 were also able to provide correct justifications for each judgement.

Correlations with chronological age, verbal mental age and verbal IQ

To determine whether there were relations between children's performance on judgement and justification and their chronological age, verbal mental age and verbal IQ, correlations between these measures were tested. For children with autism, the ability to make correct judgements of culpability was not correlated with chronological age, verbal mental age, or verbal IQ. In contrast, the ability to provide appropriate justifications was correlated with both verbal mental age ($r = .66$, $p < 0.01$) and verbal IQ ($r = .50$, $p < 0.05$). For the MLD group, the ability to provide correct culpability judgements was correlated with verbal mental age ($r = .58$, $p < 0.05$) and verbal IQ ($r = .76$, $p < 0.01$), while the ability to provide appropriate justifications correlated with verbal mental age only ($r = .51$, $p < 0.05$). The ability to provide correct culpability judgements was not correlated with chronological age, verbal mental age, or verbal IQ in the typically developing group. However, appropriate justifications correlated with chronological age ($r = .57$, $p < 0.01$) and verbal mental age ($r = .58$, $p < 0.01$).

Discussion

The aim of the study was to assess moral understanding in children with autism. The central finding is that the children with autism showed some overall unexpected abilities on the moral judgement tasks. Children with autism were as likely as the MLD and typically developing groups to use motive for the basis of culpability judgements and did so even when the outcome of behaviour was negative. Children with autism were also as likely as children in the other two groups to judge damage to people as more culpable as damage to property. Finally, children with autism were able to provide some appropriate justifications for their judgements, but most justifications were of poor quality.

The children with autism in the present study were able to judge culpability according to motive when the outcome of the protagonists' behaviour was the same across story pairs (Condition A). Thus, they would appear to have some understanding of motive and to be able to use motive in judgements of culpability when outcome is not a consideration. Perhaps more surprisingly however, children with autism were as able as the MLD

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group to judge culpability according to motive when outcomes as well as motives were varied (Condition C). Thus, they were comparable to learning disabled children in their ability to consider motive and to view this as more important than consequence. However, neither group performed as well as might be expected given their verbal mental age, or compared to the VMA matched typically developing group who performed at ceiling level. In order to ascertain if moral understanding in children with autism is commensurate with their developmental level, further studies are required using more challenging moral scenarios and/or children of lower verbal mental age.

Children with autism did not differ from either of the other groups on judging damage to a person as being more culpable than damage to property. The finding is consistent with Blair's (1996) report that children with autism could make the affect-related distinction between moral rules and social-conventional rules. Blair (1999) explained his finding in terms of the normal physiological responsivity to the emotions of others in children with autism, and the same explanation might apply to our finding. However, a simpler explanation may be that the children with autism whom we tested have been explicitly taught that damage to people is more culpable than damage to objects or property. This explanation gains some support from the finding that the justifications were mediated by verbal ability. Further investigation including a replication of the psychophysiological tests carried out by Blair would be required to discriminate between these two – and possibly other – explanations of this finding. However, this type of extended follow up investigation was beyond the scope of the present study.

Children were asked to justify or explain their correct culpability judgments ('Why do you think X was naughtier?'). The aim here was to assess whether correct culpability judgements derived from appropriate, adult-like reasoning, or whether correct judgements resulted from idiosyncratic reasoning, which might not have involved an appreciation of motive. The majority of responses provided by the children with autism were unscorable responses that reiterated the story, rather than serving to explain or justify the judgements of culpability made. Fewer than a third of their responses involved the motive of the protagonist. This was in contrast to the MLD group who justified the majority of their judgements with reference to the underlying motive or intention of the protagonist. Moreover, the MLD group gave fewer 'unscorable' responses than either of the other two groups. The majority of the responses given by the typically developing group were also 'unscorable' although they provided almost equal amounts of justifications that involved the protagonist's motive. These differences occurred despite the fact that there was no difference

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between the number of correct culpability judgements made by the three groups.

There are at least two possible explanations why justification might be problematic. First, justification, but not judgements were related to verbal ability in children with autism. In contrast, verbal mental age was related to correct judgement and justification in the MLD group, while in the typically developing group judgement was independent of verbal mental age but justification was correlated. It is possible that matching participants for VMA using a vocabulary comprehension test put the children with autism at a disadvantage when asked to produce responses consisting of sentences, although, Jarrold et al. (1997) reported a uniform profile of language attainment across groups of individuals with autism. Moreover, the children with autism (and the typically developing children) did in fact formulate appropriate sentences in their responses. What they failed to do was to provide appropriate content within their responses, tending to repeat elements of the story.

A second possible explanation of the difficulties with justification lies within the broad area of complex information processing (Minshew and Goldstein, 1998) and executive functions (Ozonoff, 1997; Russell, 1997). It might be argued, for example, that identifying and retrieving relevant information and ignoring distracting information so as to formulate an appropriate justification requires more complex information processing and executive control than decoding the story and making a judgement of culpability. A narrower explanation, which nevertheless falls under the general rubric of executive function/complex information processing, is to suggest that young children and people with autism have problems in voluntarily and flexibly accessing available information in order to produce novel (generative) responses. There is an increasing body of evidence in support of the notion of such a 'generativity impairment' in autism (Boucher, 1988; Lewis and Boucher, 1995; Jarrold et al., 1996; Turner, 1997), although the precise nature and origins of this impairment are unknown.

In summary, the findings of this study indicated that moral judgement was not impaired in children with autism, relative to learning disabled controls. However, both groups under-performed compared to typically developing children matched for verbal mental age. The children with autism showed some understanding of motive and were able to apply this understanding to social issues in an experimental setting. The children with autism were also able to make the persons/property distinction despite the fact that affect has been shown to be impaired on a variety of experimental tasks, as well as in daily life. It may be, as Blair (1996, 1999) suggests, that physiological responsivity to the distress of others is unimpaired in

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autism, and this is sufficient for the children to make these particular distinctions, but not sufficient for them to make empathic behavioral responses. The complex neural circuitry involved in emotion perception and emotion responsivity makes this explanation entirely plausible (Emery and Perrett, 2000). Alternatively, it may be that the distinctions are explicitly taught, or simply learned by experience. Again, further research is needed to discriminate between these and other possible explanations.

Acknowledgements

Appendix: Condition A. Same outcome, different motives

Story pair 1

i). (Neutral motive; outcome is personal injury)　This is Tina. Tina is baking cookies with her little sister. Tina notices that the cookies are ready and decides to take them out of the oven. The cookies are too hot to eat yet so she puts them to one side to cool. Tina tells her sister how nice the cookies look but does not see her little sister reach for a cookie. Tina's sister burns her hand and she cries. Tina felt sad about what happened.

ii). (Ill motive; outcome is personal injury)　This is Michael. Michael is baking cookies with his little brother. Michael notices that the cookies are ready and decides to take them out of the oven. The cookies are too hot to eat yet but he decides to play a trick on his brother. Michael tells his brother that the cookies taste nice and he should have one. Michael's brother reaches for a cookie and burns his hand, which makes him cry. Michael is pleased about what happened.

Story pair 2

i). (Ill motive; outcome is property damage)　This is Pete. Pete is helping his brother to clean his room. Pete decides to help by putting the records back in their covers. Pete finds a record which he dislikes and which his brother always plays. Instead of putting the record away Pete smashes the record and puts it in the bin. Pete is pleased that the record can no longer be listened to.

ii). (Good motive; outcome is property damage)　This is Carol. Carol is helping her sister to clean her room. Carol decides to help by putting the records back in their covers. When returning one of the records to the shelf, Carol trips over and the record falls to the ground and breaks. Carol feels sad about what happened.

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Condition B. Same motive, different outcomes

Story pair 3

i). (Ill motive; outcome is personal injury)   This is Steven. Mother has told Steven not to kick the football near baby brother as he could get hurt. Steven decides to kick the ball at his brother. The ball hits his brother in the face and makes him cry. Steven laughs about what happened.

ii). (Ill motive; outcome is property damage)   This is Jimmy. Mother has told Jimmy not to play ball in the house as something could get broken. Jimmy decides to play ball in his brother's room and throws the ball at some toys. The ball hits his brother's favourite toy and breaks it. Jimmy's brother cries. Jimmy laughs about what happened.

Story pair 4

i). (Neutral motive; outcome is property damage)   This is Larry. Larry is playing in the park with a friend. Larry has a ball that he decides to throw in the air to see where it will land. Larry threw the ball in the air as high as he could. When the ball came down, it hit and broke his friend's glasses, which were lying on a bench. Larry felt sad about what happened.

ii). (Neutral motive; outcome is personal injury)   This is Tommy. Tommy is playing in the park with a friend. Tommy has a ball which he decides to play catch with. He throws the ball in the air and runs to catch it. While running to catch the ball, Tommy bumps into his friend and breaks his friend's arm. Tommy felt sad about what happened.

Condition C. Different motives and outcomes

Story pair 5

i). (Ill motive; outcome is personal injury)   This is Tony. Mother has told Tony not to kick the football near baby brother as he could get hurt. Tony decides to kick the ball at his brother. The ball hits his brother in the face and makes him cry. Tony laughs about what happened

ii). (Neutral motive; outcome is property damage)   This is John. John is playing tennis in the garden with a friend. John hits the ball to his friend, but the ball went too high, over his friend's head, and hit and broke a window. John felt sad about what happened.

Story pair 6

i). (Neutral motive; outcome is personal injury)   This is Sally. Sally is playing hide and seek with a friend. Sally was hiding up in the tree. Sally's friend heard a noise from the tree and tried to climb up to see if Sally was hiding there. But she couldn't get up there, she slipped and fell, hurting her arm. Sally felt sad about what happened.

ii). (Ill motive; outcome is property damage)   This is Samantha. Samantha is playing hide and seek with a friend. Samantha decided to hide in the greenhouse but

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found that the door was locked. She decided to smash a piece of glass on the door so that she could unlock it and get in. Samantha was pleased that she had got into the greenhouse.

Note

1 At the time of the study the latest version of the BPVS was not available within our department.

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