

Transgressors, victims, and cry babies: Is basic moral judgment spared in autism?

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Human social intelligence comprises a wide range of complex cognitive and affective processes that appear to be selectively impaired in autistic spectrum disorders. The study of these neuro-developmental disorders and the study of canonical social intelligence have advanced rapidly over the last twenty years by investigating the two together. Specifically, studies of autism have provided important insights into the nature of “theory of mind” abilities, their normal development and underlying neural systems. At the same time, the idea of impaired development of the neurocognitive mechanisms underlying “theory of mind” has shed new light on the nature of autistic disorders. This general approach is not restricted to the study of impairments but extends to mapping areas of social intelligence that are spared in autism. Here we investigate basic moral judgment and find that it appears to be substantially intact in children with autism who are severely impaired in “theory of mind”. At the same time, we extend studies of moral reasoning in normal development by way of a new control task, the “cry baby” task. Cry baby scenarios, in which the distress of the victim is “unreasonable” or “unjustified,” do not elicit moral condemnation from normally developing preschoolers or from children with autism. Judgments of moral transgressions in which the victim displays distress are therefore not likely the result of a simple automatic reaction to distress and more likely involve moral reasoning. Mapping the cognitive comorbidity patterns of disordered development must encompass both impairments and sparings because both are needed to make sense of the neural and genetic levels.

INTRODUCTION

The autistic syndrome is a complex genetic disorder with diverse cognitive behavioral signs. To make sense of the relevant genetic and

neurological facts and to relate these to behavior, it will be critical to understand the disorder at the cognitive level (Frith, Morton, & Leslie, 1991). We can simplify the cognitive-level problem posed by autism if we focus on the

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pathognomonic behavioral signs. These are Wing and Gould's (1979) triad of social, communicative, and imaginative impairments relative to IQ level, with a developmental onset prior to age three. What kind of neurocognitive-developmental disorder might produce the triad? To answer this question researchers have been trying to map the social impairment in children with autism. Research has focused on a number of areas such as "theory of mind" (Baron-Cohen, Leslie, & Frith, 1985; for recent reviews see Baron-Cohen, 2000; Tager-Flusberg, 2001), affect recognition (e.g., Hobson, 1993) or imitation (e.g., Meltzoff & Gopnik, 1993; Rogers & Pennington, 1991). However, in order to understand comorbidity patterns, it is equally important to map aspects of social intelligence that are relatively *spared* in autism. The cognitive map of autism needs to show *both* impaired *and* spared areas, if we are to make sense of the neural and genetic levels.

One important aspect of social functioning, almost completely ignored in the study of autism, is moral judgment. Moral sense and reasoning are important for both immediate practical and wider societal reasons. For example, are individuals with autism able to morally evaluate their own actions and the actions of others or do their impairments leave them quite unable to assess this? Moreover, both moral reasoning and autism are of increasing theoretical interest to developmental, cognitive, and neuroscience researchers. The paucity of studies of autistic moral judgment is thus doubly surprising. As far as we know, there is but a single study, published ten years ago (Blair, 1996), that is an exception to this.

Blair tested two groups of high-functioning children with autism on tasks measuring the moral versus conventional distinction. One group was composed of false belief task passers and the other of false belief task failers. Both groups appeared to draw the moral versus conventional distinction successfully, regardless of their status on "theory of mind" ability.

The moral/conventional distinction is believed to be a key marker of moral development (Nucci, 1985; Smetana, 1995; Smetana & Braeges, 1990; Turiel, 1983; Turiel & Wainryb, 1994; for a recent review see Killen, Lee-Kim, McGlothlin, & Tangor, 2002). Normally developing children as young as three years distinguish between acts that violate moral versus conventional rules along a number of dimensions, including *seriousness* (conventional transgressions considered less "bad") and *authority contingency* (conventional rules

judged more contingent on the decisions of authority than moral rules). Although the cognitive mechanisms underlying these judgments have not been closely specified, they appear to be universal and present early (Turiel, 1983). In some accounts, taking the perspective of what "it is like" to be the victim of a moral transgression or empathizing with the victim plays a key role in moral judgment (Kohlberg, 1984). A characteristic feature of conventional transgressions is that there is no victim as such who suffers distress as the result of the transgression.

If either perspective taking or affective empathy is the basis for the moral versus conventional distinction, then it is surprising that children with autism would draw the distinction. Perspective taking, at least in the sense of "theory of mind", is severely impaired in children with autism; autistic children are also less emotionally responsive to others (Kanner, 1943) and show little sign of affective empathy when others—even the child's own mother—are in distress (Sigman & Capps, 1997; Sigman, Kasari, Kwon, & Yirmiya, 1992).

Blair (1996) suggested that individuals with autism do retain a normal reaction to distress cues. This reaction produces increased arousal and—contrary to Sigman et al. (1992)—the inhibition of on-going behaviors (including aggression). According to Blair (1995), such arousal is aversive and may provide a basis for acquiring reactions that are specific to moral transgression. In both normal and autistic development this response becomes generalized to situations that may lack victim-distress cues and provides a basis for the emergence of moral notions. Notably, this provides a developmental route that is independent of perspective taking.

However, if the moral judgment—in the moral versus conventional distinction—is based merely upon a reaction to the victim's (overt or implied) distress, the response that has been labeled "moral" may not in fact constitute a *moral* judgment as such. It is possible that children's differential reactions to scenarios are *simply* a reaction to the degree of distress caused by an action. Children with both normal and autistic developmental patterns may react automatically with more "bad" judgments—higher on the "seriousness" dimension—for (moral) stories that depict or imply distress on the part of the person whose hair gets pulled, for example, than for (conventional) stories where, for example, a person wears pajamas to school with little or no

distress on the part of the teacher. This reaction may not involve any moral reasoning, properly called. Let us call the automatic reaction to distress absent moral reasoning, the “*knee jerk*” hypothesis.

The knee jerk hypothesis can also account for differential involvement of authority in moral versus conventional stories. Children’s judgments change relatively little when, for example, Teacher proclaims it is “now okay” for one child to pull another’s hair and make them cry (moral story). But if Teacher proclaims that it is “now okay” for children to wear pajamas to school (conventional story), children revise their judgments of pajama wearing substantially, judging that the proclamation does now indeed make it okay. From the point of view of the knee jerk hypothesis this pattern too is expected because Teacher’s proclamations will not make hair pulling any less painful. However, a proclamation should remove any doubt over whether Teacher might be distressed about pajama wearing. This ambiguity in interpreting the results on the moral versus conventional distinction affects, not only Blair’s findings on children with autism, but also the existing literature on normal development because the required control conditions have never been run. It would still be interesting that children with autism show a “knee jerk” response to another person’s distress. However, this is a much more limited claim than that moral judgment is intact.

To avoid misunderstanding, we should explain that by contrasting “knee jerk” with moral reasoning, we are not assuming that moral reasoning must be carried out consciously. There is a position in the moral judgment literature that does make this assumption in line with traditions in social psychology (Haidt, 2001). For present purposes, we count as reasoning any inference process whether conscious or unconscious, deliberative or intuitive; we do so in line with the standard cognitive science usage.

Our main aim in this research was to obtain exploratory data to indicate whether or not children with autism make basic moral judgments. We aimed to go about this in two ways. In Experiment 1, we tested the very basic distinction between “good” and “bad.” Moral judgments are not simply about what is bad but also about what is good (Killen, 1991). We tested children with autism on both antisocial and prosocial acts to determine if they could make both sorts of judgments appropriately by comparing them

with groups of normally developing preschoolers between three and five years of age. We also tested all subjects on appropriate judgments regarding reciprocation and retaliation and on whether the various acts were deserving of reward or punishment. In Experiment 2, our aim was to replicate Blair’s findings on the moral versus conventional distinction in autism but with a new control task that could test between “knee jerk” reactions and moral judgments. This task also contributed basic data regarding normal preschool development relevant to determining whether the well-known moral versus conventional distinction is, in fact, moral after all.

EXPERIMENT 1

We used stories to test simple moral judgments of harmful and prosocial initial acts and of retaliatory and reciprocal acts as responses of the recipients of the first acts. Children were asked a series of questions that evaluated how bad or good the acts were and how deserving of reward or punishment the acts were. The primary aim was to obtain evidence on whether children with autism could make basic judgments appropriately and to compare their performance with normally developing preschoolers between three and five years of age. Because the aim was to test only basic moral judgment, we avoided testing the role of the understanding of intention in moral judgment. We assumed that such judgment would depend upon “theory of mind” skills and we assumed that our children with autism would be impaired in those skills. We therefore tested only moral judgments that were basic—that is, judgments that might be relatively independent of “theory of mind”. Because it was possible that children with autism might be impaired on only one type of moral valence, we tested on stories with both positive and negative valences.

Method

Subjects

Forty-eight normally developing children were seen. Three children failed to demonstrate understanding of the use of the scales and were not tested further. The remaining subjects were assigned to three age groups: 13 three-year-olds (7 girls) aged between 39 and 47 months (mean age = 43.5, $SD = 2.9$), 16 four-year-olds (8 girls)

aged between 48 and 59 months (mean age = 54.1, $SD = 3.3$), and 16 five-year-olds (8 girls) aged between 60 and 70 months (mean age = 63.9, $SD = 3.7$).

Nineteen children with autistic spectrum disorders (3 girls) were also tested. These subjects were aged between 7 years 7 months and 16 years 8 months (mean age = 12 years 5 months, $SD = 2.6$ years). All subjects with autism attended special schools for children with autism. Subjects were screened by examining case notes and ascertaining that each child had received a diagnosis of autism or PDD (NOS) by a qualified pediatric neurologist or psychiatrist. Additionally, a checklist derived from DSM IV (American Psychiatric Association, 1994) was used to ensure that case histories documented appropriate evidence that the child met standard diagnostic criteria for autism or PDD (NOS). This checklist was also used with teachers and parents of the child to confirm current status. Although autistic subjects' diagnostic status was not assessed formally, they met the same criteria as have been used in the majority of previously published studies of "theory of mind" performance in autism (e.g., Baron-Cohen et al., 1985; Happé, 1995; Sodian & Frith, 1992; Surian & Leslie, 1999). Their verbal mental ages (vMA) were assessed by the Peabody Picture Vocabulary Test; vMA ranged between 3 years 3 months and 11 years 1 month (mean vMA = 5 years 11 months, $SD = 2$ years 4 months). Autistic subjects were also tested on two standard false belief tasks, the "Sally and Anne" task (Baron-Cohen et al., 1985) and the "Smarties" task (Perner, Frith, Leslie, & Leekam, 1989). Only one child in our autistic group (5.3%) passed both tasks. Our autistic subjects were similar to previously studied samples and specifically to Blair's (1996) "No-ToM" group, though with a somewhat lower vMA.

Subjects were assigned randomly to the Good and Bad conditions with equal numbers in each condition (except 7 three-year-olds and 10 children with autism in the Bad condition).

Design and procedure

Children were tested in schools in a quiet room or quiet part of the classroom, and were videotaped for later scoring. Each child was told a story, which came in two parts. After each part a series of questions was asked. Pilot testing had indicated

that the stories were understood by the normally developing children at all age levels.

Prior to testing, children were introduced to the response scales and trained on their use. The Green scale showed three stars at one end of a black line, and three Xs at the other extreme. Children were told that the stars end meant "very good" and the Xs end meant "very bad". At the midpoint was a blank circle. Children were told this meant "just OK." At points in between the midpoint and extremes were a single star and a single X and children were told these meant "a little good" and "a little bad", respectively. The children were asked if they liked ice cream, told they could show how much they liked ("good") or hated it ("bad") by pointing to a place on the scale, and were encouraged to do so. This procedure was repeated for broccoli (or other item the child indicated was disliked) and for an item that they indicated was "just okay," typically water. Children were then shown the Pink scale, which was very similar but showed three stickers at one extreme ("lot of stickers"), three chairs at the other ("lot of time-out"), a blank circle midway ("nothing") and, between the midpoint and extremes, one sticker and one chair, respectively. Only children who understood and readily used the scales were tested further.

Subjects were assigned to one of two conditions. In the Bad condition, children were introduced to the story characters who were illustrated with toy props and asked to name them. Then they were told the Initial Harm story:

Today Miss Megan's class gets a treat. Everyone in Miss Megan's class gets to pick a special toy. Sarah gets to pick a toy first. Sarah picks the stuffed bear. This makes Patty mad. Patty wanted the stuffed bear. Patty hits Sarah in the arm. This makes Sarah sad, and Sarah starts to cry (boo-hoo).

Children were then asked four questions:

Good/bad question. Was it good, bad, or just okay that Patty hit Sarah? [good, OK, bad: +1, 0, -1]

Green scale. Show me how good or bad it was on the Green Scale. [child indicates point on scale: +2, +1, 0, -1, -2]

Punish/reward question. Teacher Miss Megan saw what Patty did. What should Teacher do?

Should Teacher give stickers, nothing, or time-out? [stickers, nothing, time out: +1, 0, -1]

Pink scale. Show me how much of [child's previous answer] on the Pink Scale. [child indicates point on scale: +2, +1, 0, -1, -2]

Responses were scored with negative points for bad or punishment answers and with positive points for good or reward answers. Responses of OK or scale midpoints were scored with zero points.

Following this, children were told the second part of the story, the Retaliation story. First, the original story was repeated and then continued:

Look what happened next! Now Sarah stops crying and Sarah hits Patty back. Now Patty is very sad and Patty starts to cry (boo-hoo).

Children were then asked the same set of four questions as before but with the character names changed as appropriate. These responses were scored in the same way.

In the Good condition, children were also introduced to the story characters who were illustrated with toy props and asked to name them. Then they were told the Initial Kindness story:

Today Miss Megan's class is eating. Sarah has no candy. This makes Sarah sad, and Sarah starts to cry (boo-hoo). This is Patty. Patty has two pieces of candy. Patty shares her candy with Sarah. This makes Sarah very happy and Sarah starts to laugh (laughter).

Children in this condition were then asked the same set of questions as above with the necessary changes to wording. Responses were scored the same way. Following the first set of questions, the second part of the story was told, the Reciprocity story. First the original story was repeated and then continued:

Look what happened next! Sarah is so happy that Sarah gives Patty a toy bear to play with. Now Patty is very happy and Patty starts to laugh (laughing).

Children were then asked the same set of four questions as before but with the character names changed as appropriate. These responses were scored in the same way.

Results

Preliminary analyses of the Initial Act stories showed that answers to the good/bad and Green Scale questions were highly consistent across subjects (Pearson's $r = .84$, $p < .01$, two-tailed). Data was therefore reduced to an average Act Valence score. Responses to the reward/punish and Pink Scale questions were also highly consistent (Pearson's $r = .86$, $p < .01$, two-tailed) and reduced to a single Reward/Punish score. All groups made judgments with an appropriate valence for the stories that they heard.

A repeated measures ANOVA with Judgment (2: Act vs. Reward/Punish) \times Valence (2: Good vs. Bad) \times Group (4: 3-, 4-, 5-year-olds, autistic) showed significant main effects of Judgment, $F(1, 56) = 5.8$, $p = .019$, $\eta^2 = .09$, and of Valence, $F(1, 56) = 300.7$, $p < .001$, $\eta^2 = .84$. Group was not significant as a main effect, $F(1, 56) = 1.12$, $p = .35$, $\eta^2 = .056$, but there was a significant Group \times Valence interaction, $F(3, 56) = 2.79$, $p = .048$, $\eta^2 = .13$. Inspection of the means suggests that the main effect of Judgment reflected a tendency to be overall more negative on punishment/reward ($M = -0.27$) compared to more balanced good/bad judgments on the initial acts ($M = -0.02$). The large effect of Valence reflected subjects' tendency to judge Bad stories as bad and deserving of punishment and Good stories as good and deserving of reward. The overall data collapsed across the two types of judgment are visualized for each group in Figure 1A.

Preliminary analyses of responses to the second repercussive part of each story also showed that answers were highly consistent (Pearson's $r_s = .83$ and $.72$, respectively, $p_s < .01$) and the data was again reduced as above. All groups again made judgments with an appropriate valence for the stories that they heard. Results from the repercussion judgments were overall similar to those regarding the initial acts but with some subtle differences. There was no main effect of Judgment ($F < 1$) but there were significant interactions for Judgment \times Valence, $F(1, 56) = 4.5$, $p = .038$, $\eta^2 = .075$, and Judgment \times Group \times Valence, $F(3, 56) = 3.586$, $p = .019$, $\eta^2 = .16$. Valence was again highly significant as a main effect, $F(1, 56) = 148.8$, $p < .001$, $\eta^2 = .73$. Group was again not significant as a main effect ($F < 1$, $\eta^2 = .024$) and no other interactions approached significance.

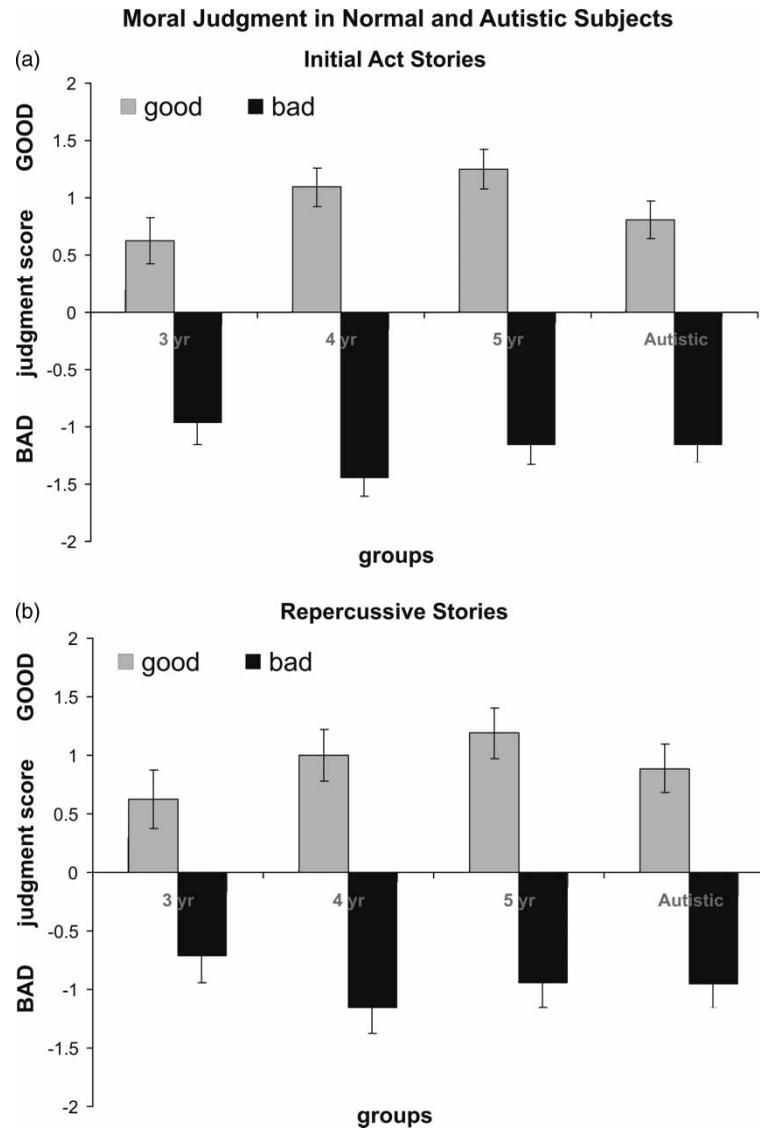


Figure 1. Averaged Good/Bad and Reward/Punish judgments for Initial Act stories (panel A) and for Repercussion (retaliation/reciprocation) stories (panel B) in normally developing 3-, 4- and 5-year-olds and older children with autism.

Inspection of the means suggests the Judgment \times Valence interaction reflects a tendency to award both less punishment relative to the badness of the retaliatory act and less reward relative to the goodness of the reciprocation. Inspection of the means suggests that the three-way interaction of Judgment \times Valence \times Group reflects subtle differences between the groups in how their awarding of punishment and reward related to their valence judgments for the retaliatory acts involved. Difference scores were calculated between the two judgments; a score of zero reflects that both judgments were of the same magnitude and sign. For Bad stories a negative difference score reflects leniency in

punishment of an act relative to judgment of its badness; a positive score reflects severity of punishment relative to judged act valence. For Good stories, a positive difference score reflects economy of reward for an act relative to judgment of its goodness; a negative score reflects generosity of reward relative to judged act valence. For Bad stories, 3-year-olds awarded the least relative punishment (-0.57); the autistic and 4-year-olds were similar and awarded less relative punishment (-0.2 and -0.19 , respectively) than the 5-year-olds ($+0.125$). For Good stories, the 3-year-olds and 4-year-olds were similar ($+0.9$ and $+1.0$, respectively) awarding less relative reward than the autistic and

5-year-old subjects who were similar to each other (-0.22 and -0.25 , respectively). In either case, the children with autism were more similar in their pattern of relative judgments either to the 4- or to the 5-year-olds than to the 3-year-olds. The overall repercussive data collapsed across judgment type are visualized in Figure 1B.

Finally, we examined whether moral judgments of the autistic subjects were correlated with their performance on standard false belief tasks. Each subject was assigned a ToM score between zero and 3: 1 point for each correct answer on Sally and Anne prediction, Smarties Say-for-Self, and Smarties Say-for-Other questions. The mean score for the group was 1.11 ($SD = 0.99$), out of a possible 3. Next the Act judgment scores and the Punish/Reward score across the two parts of the study were averaged and the absolute values taken. These scores were entered into a partial correlation controlling for vMA (Peabody Picture Vocabulary Test). Autistic subjects' ToM scores were not significantly correlated with their Act judgment either as zero order ($df = 17$, Pearson's $r = .062$, $p > .4$, one-tailed) or with vMA controlled ($df = 16$, Pearson's $r = -.098$, $p = .35$, one-tailed). Likewise, autistic ToM scores were not significantly correlated with their Punish/Reward scores either as zero order ($df = 17$, Pearson's $r = .146$, $p > .27$, one-tailed) or with vMA controlled ($df = 16$, Pearson's $r = .121$, $p > .3$, one-tailed). By contrast, ToM scores and vMA were significantly correlated ($df = 17$, Pearson's $r = .501$, $p = .014$, one-tailed) in line with a number of previous studies.

Discussion

All groups showed broadly similar patterns of judgment that were evaluatively appropriate to story type, so that bad acts were judged bad and deserving of punishment and good acts as good and deserving of reward. The only difference between groups was in nuances that showed up as a three-way interaction. It appeared that the 3-year-olds were more lenient than the other groups regarding punishment and together with the 4-year-olds less generous with reward for retaliatory and reciprocal acts, respectively. The calibration of reward and punishment to appropriate acts may represent an area that is highly dependent on experience.

The major result concerns basic moral judgment and suggests that children with autism may

reach a 4- or 5-year-old level, despite "theory of mind" performance that is at, or worse than, a 3-year-old level. Furthermore, there was little evidence of correlation between moral judgment and false belief performance in the autistic group, the largest observed correlation, if real, indicating about 2% shared variance. Our results then provide background data consistent with Blair (1996). Our stories contained explicit mention of the affective states of the characters with victims crying and laughing. It remains possible, then, that subjects' judgments were "knee jerk" reactions to affective states rather than moral judgments as such. We noted earlier that this possibility applies to Blair (1996) too and also to previous work on the moral-conventional distinction in normally developing preschoolers. The next experiment examined whether Blair's result with autistic children could be replicated with a new control for "knee jerk" responding.

EXPERIMENT 2

A number of studies have linked the moral-conventional distinction and other moral judgments to developments in empathy and sympathy (Arsenio & Lover, 1995; Lamb, 1991; Selman, 1971). But if children's responses in the moral-conventional task are automatic sympathy reactions to the distress of victims then it tends to undermine the importance of that task, at least for what its originators had in mind, namely as a litmus test for specifically moral judgment. A sympathetic reaction is not the same thing as a moral judgment, even though victims of moral transgressions should evoke our sympathy. We also feel sympathy for those who suffer illness, for example, without that entailing that someone must be to blame. At the same time, it would be surprising if children with autism, who are known to be relatively unresponsive to the suffering of others (Sigman & Capps, 1997; Sigman et al., 1992), nevertheless drew the moral distinction, if that distinction rests entirely upon sympathy. To probe these questions, we included, in addition to stories portraying both a moral and a conventional transgression, a new story that we call the "cry baby" story. In this scenario, two children each have cookies, but one of the children wants to eat both his own and the other child's cookie. The other child, however, proceeds to eat her own cookie, whereupon the "cry baby" is distressed and bursts into tears. Our subjects were asked to

judge whether the action that led to the “cry baby’s” distress (eating one’s own cookie) was “bad” or not. From an adult perspective, the child who proceeds to eat her own cookie is well within her rights to do so and commits no transgression whatsoever, neither moral nor conventional. She simply asserts her property rights and any resulting distress of the “victim” is not justified. However, if normally developing preschoolers and older children with autism simply react to the distress of another person whenever the distress has been caused by the actions of a third party, then they will judge the “cry baby” story to be of the same type as the moral transgression story. That is, they will judge that the “eater of her own cookie” did something that was *not* okay, even if Teacher said it was okay, and that it was a *bad* thing to do.

Method

Subjects

Fifteen normally developing children between 48 and 71 months of age were tested ($M = 57.5$, $SD = 6.2$). In addition, 17 of the children with autism from Experiment 1 participated in this experiment (one child was not available for further testing and the child who had passed both false belief tasks was dropped to make the group correspond to Blair’s “theory of mind” failers group). The remaining group had vMAs between 39 and 121 months ($M = 63.9$ months, $SD = 20.4$).

Design and procedure

Children were tested in schools in a quiet room or quiet part of the classroom, and were videotaped for later scoring. Each child was told three stories with order counterbalanced across children. Stories were illustrated with pictures.

In the Conventional condition, children were told a story in which Johnny goes to school one day wearing his pajamas. Children were then asked the *OK?* Question: Was it okay for Johnny to wear pajamas to school?, followed by the *Bad?* Question: Was it bad for Johnny to wear his pajamas to school? The story then continued, what if Teacher said that anybody can wear pajamas to school if they want to? Children were then asked the *OK Now?* Question: Would it be OK for Johnny to wear pajamas to school if Teacher says Johnny can?

In the Moral condition, children were told a story in which Sally is in the playground playing with a doll, when Catherine comes up to her and pulls her hair. Sally begins to cry. Children were then asked the *OK?* Question: Was it okay for Catherine to pull Sally’s hair? followed by the *Bad?* Question: Was it bad for Catherine to pull Sally’s hair? The story continued, what if Teacher said that anybody can pull someone’s hair if they want to? Children were then asked the *OK Now?* Question: Would it be OK for Catherine to pull Sally’s hair if Teacher says Catherine can?

In the Cry Baby condition, children were told a story in which James and Tammy each had a cookie. James did not want just to eat his own cookie, he wanted to eat Tammy’s cookie too. Teacher says that anybody can eat their own cookie if they want to. Tammy eats up her own cookie, but this makes James very unhappy and he begins to cry. Children were asked the *OK?* Question: Was it OK for Tammy to eat her own cookie?, followed by the *Bad?* Question: Was it bad for Tammy to eat her own cookie? Given that in this story Teacher had already said that it was okay for a child to eat his or her own cookie, we did not ask an *OK Now?* Question.

Children were scored -1 if they answered, “No, not okay,” to the *OK?* and *OK Now?* Questions or, “Yes, bad,” to the *Bad?* Question. A negative score thus represents a negative valence judgment. A score of $+1$ was awarded when a child answered, “Yes, okay,” to the *OK?* and *OK Now?* Questions or, “No, not bad,” to the *Bad?* Question. A positive score thus represents a positive valence.

There was also a second set of stories modeled on the above but featuring a child who turned his back on Teacher when Teacher was speaking (conventional), a girl who hit another girl making her cry (moral), and a girl who takes her turn on a swing but cries when a boy takes his own turn on the swing because she wants his turn too (cry baby). This second set of stories was given in a later session also with order counterbalanced across subjects. All of the normal children were retested with these stories but only 7 of the autistic group were available for retest.

Results

Scores were averaged across the two sets of stories. Scores on the *OK?* and *Bad?* Questions were then combined by averaging. Figure 2 shows

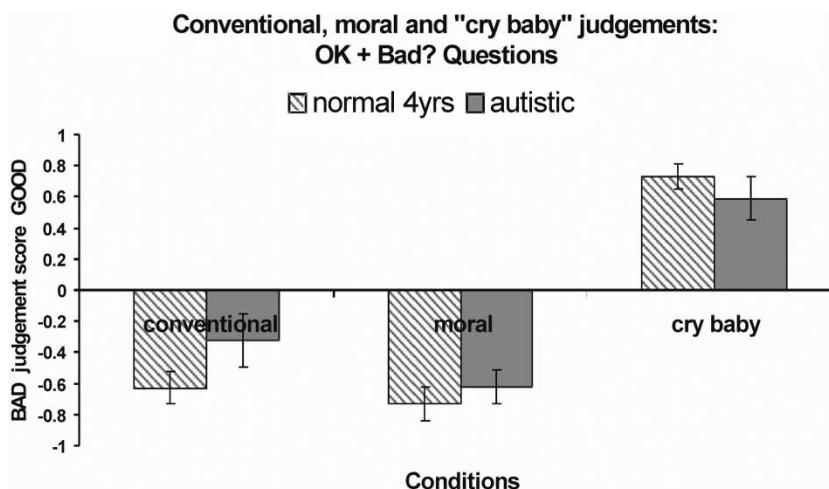


Figure 2. Valence judgments for conventional, moral, and cry baby transgression stories in normally developing 4-year-olds and older children with autism.

the mean scores for the *OK? + Bad?* Questions for each group by condition. These scores were entered into a repeated-measures ANOVA with factors Conditions (3: conventional, moral, cry baby) \times Groups (2: 4-year-olds, autistic). There was no main effect of Groups ($F < 1$, $\eta^2 = .022$) and no significant Group \times Conditions interaction, $F(2, 60) = 1.81$, $p = .17$, $\eta^2 = .057$. Conditions was significant as a main effect, $F(2, 60) = 71.48$, $p < .001$, $\eta^2 = .704$. Cry baby stories were judged more positively.

The moral vs. conventional distinction was examined by entering scores on the *OK?* and *OK Now?* Questions into a repeated-measures ANOVA with Conditions (2: conventional, moral) \times Question (2: *OK?*, *OK Now?*) \times Groups (2: 4-year-olds, autistic). There was a significant main effect of Conditions, $F(1, 30) = 9.76$, $p = .004$, $\eta^2 = .245$, and a significant main effect of Question, $F(1, 30) = 17.7$, $p < .001$, $\eta^2 = .37$. The Conditions \times Questions interaction was not significant, $F(1, 30) = 1.697$, $p = .2$, $\eta^2 = .054$, nor was Question \times Groups, $F(1, 30) = 1.23$, $p = .28$, $\eta^2 = .039$. There was no main effect of Groups ($F < 1$, $\eta^2 = .03$). In both groups the valence judgment moved toward more positive in both the conventional and moral stories with the *OK Now?* Question. Nevertheless, judgments for the conventional stories were neutral for both groups ($M_s = 0.0$), whereas the moral stories were judged to be still negative in valence following *OK Now?* with means of -0.41 and -0.41 for the normal and autistic groups, respectively. This difference was significant, $F(1, 30) = 6.68$, $p = .015$, $\eta^2 = .182$,

and was confirmed non-parametrically (Wilcoxon Signed Ranks test, $z = 2.31$, $p = .021$, two-tailed).

The *OK?* Question for the cry baby stories followed an authorization of the affecting act and thus it should be compared with the *OK Now?* Question in the moral story to allow a conservative evaluation of the two cases. Scores on these two questions were entered into a repeated-measures ANOVA with Conditions (2: moral, cry baby) \times Groups (2: 4-year-olds, autistic). There was a significant main effect of Conditions, $F(1, 30) = 36.45$, $p < .001$, $\eta^2 = .549$. No other effects were significant ($F_s < 1$). This result was confirmed non-parametrically (Wilcoxon Signed Ranks test, $z = 3.91$, $p < .001$, two-tailed).

Finally, we again found no significant correlations between autistic ToM scores and their judgments on any of the three story types with or without vMA controlled (all $p_s > .16$, one-tailed). In particular, ToM scores and moral transgression scores were not correlated significantly (vMA controlled; $df = 14$, Pearson's $r = -.214$, $p = .21$, one-tailed).

Discussion

Experiment 2 supported the findings of Blair (1996) that children with autism who fail standard false belief tasks nevertheless may draw a distinction between moral and conventional transgressions. The strongest evidence in favor of this claim would have been to find an interaction between moral vs. conventional stories on the *OK?* versus *OK Now?* Questions. We did not find this effect

perhaps due to the limited number of stories (two) that we used in each condition plus the fact that half our autistic subjects were not available for the second testing session and thus contributed data on only one story per condition. However, we did find that conventional violations were no longer judged negatively on balance following authorization whereas moral transgressions were. Thus, an important component of the effect was evident. Furthermore the groups did not differ in this regard.

Although we found no significant group differences, Figure 2 suggests that the autistic subjects may have differed most from the 4-year-olds on their judgments of conventional transgressions. This might be the result of the greater chronological age of the autistic group, who averaged twelve and a half years of age, and reflect the growth of "cynicism." Future studies, however, should look more closely at the possibility, hinted at here, that autistic children are less sensitive to the non-moral transgressions of social convention.

The most striking result of Experiment 2, however, was the sharp difference between moral transgressions, on the one hand, and the cry baby stories, on the other. Both normally developing and autistic children responded more positively to cry baby stories indicating that their judgments distinguish between the distress of a "cry baby" and the distress of a victim. Although both the moral and the cry baby stories featured a character who starts to cry following the actions of another person, only in the moral stories can that action remotely be deemed culpable rather than a mere cause. This in turn suggests that the reaction to distress cues in moral transgressions is not simply of the "knee jerk" type but involves moral reasoning.

It may be that moral transgression judgments involve a tacit judgment of whether the action that is the cause of another person's distress was "justified" or "fair," or alternatively whether the distress itself is "justified" or "reasonable" in the circumstances. These findings have implications not only for children with autism but also for normally developing preschoolers. In the latter case, they answer a long-standing question over whether preschoolers' moral judgments are truly moral or merely "knee jerk" sympathetic reactions to the distress of others. If moral judgment does depend upon sympathy then it seems that preschoolers withhold their sympathy from "cry

babies". So too, apparently, do children with autism.

GENERAL DISCUSSION

Taken together the results of Experiments 1 and 2 suggest that children with autistic spectrum disorders who fail standard false belief tasks may yet retain a basic moral sense. Experiment 1 suggested that the autistic group studied here made simple bi-valued moral judgments that were comparable to those made by 4- and 5-year-old normally developing children. Three-year-olds make essentially the same kinds of judgment but the pattern is weaker as other studies with this age group have found (e.g., Smetana, 1981). This may represent an emergence of the moral faculty at this age or more general limitations.

Three-year-old normally developing children, like older children with autism, are also limited in their ability to pass standard false belief tasks (e.g., Happé, 1995). A large number of studies have shown that the pass rate for 3-year-olds on standard false belief tasks is around 30% (Wellman, Cross, & Watson, 2001). On a stringent criterion of passing all three of our false belief questions, only a single subject in the autistic group passed (5%). Using a less stringent measure, the FB score, which simply counts passing answers without requiring consistency, our autistic group scored around 30%. This level of performance is in line with previous findings with autistic samples with similar vMA (Frith et al., 1991; Happé, 1995). There is abundant evidence from a wider range of belief and related tasks that children with autism and normally developing 3-year-olds show quite different patterns of performance (Baron-Cohen, 1987, 1988, 1989a,b; Baron-Cohen & Goodhart, 1994; Charman & Baron-Cohen, 1992, 1995; Leslie, 1987; Leslie & Frith, 1988, 1990; Leslie & Thaiss, 1992) and that the two groups fail standard false belief tasks for different reasons (Roth & Leslie, 1991, 1998; Surian & Leslie, 1999). By contrast with "theory of mind", we found that our autistic group had a 4- or 5-year-old level on simple moral judgment tasks. We also found no evidence that performance on the two sets of tasks was correlated in this group. This suggests that basic moral judgment may function and develop to an interesting degree independently of "theory of mind".

Experiment 2 provided support for this contention by finding that children with autism may

indeed draw a distinction between moral and conventional transgressions, as first claimed by Blair (1996). Although our autistic group, following authorization, changed their judgments concerning permissibility toward the positive at the same rate for both moral and conventional transgressions, so did the normally developing group. In both cases, authorized conventional transgressions were more positively evaluated than authorized moral transgressions, providing some support for the distinction in both groups.

The main novel finding of Experiment 2 was that moral judgments are not automatic upon recognizing distress cues. When distress is not justified or reasonable in the circumstances, the causing act is not condemned. This finding supports the idea that moral judgments are not simply the reflexive result of recognizing an affective state but involve either conscious or intuitive moral reasoning. The reasoning behind the moral versus conventional distinction may well be moral after all.

Limitations

There are several limitations of the present studies that should be recognized. First, our autistic spectrum group was not assessed by formal instruments and so we cannot be sure how severely affected they were by their disorder. We have no reason to believe that this group differed in any important way from previous groups with autistic spectrum disorders that have been studied by us or by our colleagues but it would be an advance to perform further research on these questions with groups that have been characterized by formal instruments (e.g., Lord et al., 2000). Second, we used a limited number of stories of each type and group sizes were moderate; future studies should include a greater range and variety of scenarios and test larger samples. Nevertheless, given the small effect sizes observed for group differences and the large effects observed for moral judgment across groups, together with similar findings in Blair (1996), our results strongly suggest that children with autism develop a real moral sensibility despite severely impaired “theory of mind.”

The third limitation that we wish to acknowledge is theoretical. Although our findings and those of Blair (1996) suggest that “theory of mind” and basic moral judgment develop somewhat independently, the two nevertheless can

interact. For example, certain transgressions such as *lying* are of such a nature that they require a certain level of “theory of mind” performance to appreciate what constitutes the act of lying. This is a special case of a more general phenomenon in which judgments of intention in action impact moral judgment. The best known of these is the accidental/intentional distinction. Three-year-olds assign more blame for intentional actions than for accidental behaviors (Nuñez & Harris, 1998) and even make a three-way distinction for assigning blame, differentiating whether a falsehood is uttered intentionally, because of an innocent mistake, or because of negligence (Siegal & Peterson, 1998). Such cases imply a direction of processing that runs from “theory of mind” to moral judgment.

Recently, a case has been found that runs in the opposite direction—from moral judgment to “theory of mind.” Leslie, Knobe, and Cohen (2006) report that under some circumstances 4- and 5-year-olds’ judgments of whether or not an individual performed an action on purpose depend upon the moral valence of the action. The particular circumstances under which this is found involve the foreseen but disavowed side effects of a main action. When the disavowed side effect is harmful, children judge that the side effect was brought about on purpose, but when the disavowed side effect is beneficial they judge that it was not brought about on purpose. Leslie et al. (2006) call this the “side-effect effect.” Side-effect effect judgments run from moral judgment back to purpose. The side-effect effect emerges in preschoolers as soon as a child is able to process a critical feature of the scenarios involved, namely, that the actor does *not care* that the side effect will be produced. Our main point here is that there are many complex interactions between “theory of mind” and moral judgment. It will be interesting to study how children with autistic spectrum disorders process these complex interactions.

Questions for the future

Many more questions are raised than are answered by our findings. For example, what is the role, if any, of sympathetic/empathetic reactions in normal and autistic moral development? What is the role of distress recognition in normal and autistic moral development? Do autistic individuals retain a sense of fairness/justification? Is

affective intuition and personal engagement (Greene & Haidt, 2002; Haidt, 2001) the basis of autistic moral judgment? Is there an innate moral faculty (Harman, 1999; Hauser, 2006) that develops independently of “theory of mind”? What will brain-imaging studies reveal about the neural basis of moral judgment in autistic subjects?

A recent review of imaging normal adult brains making moral judgments highlights a number of areas that appear to be shared between “theory of mind” and moral judgment including medial frontal, superior temporal sulcus, and temporal poles (Greene & Haidt, 2002). These same areas show little or no activation by “theory of mind” tasks in autistic subjects (Castelli, Frith, Happé, & Frith, 2002). Saxe has argued that the right temporo-parietal junction is most selectively involved in “theory of mind” tasks while activation in other commonly activated areas may be related to necessary background information, about persons, actions, etc. (Saxe & Kanwisher, 2003; Saxe & Wexler, 2005). Autistic subjects with severely impaired “theory of mind” and relatively spared moral judgment provide a particularly important population for resolving issues concerning the neural systems substrates for both “theory of mind” and moral judgment. As regards regions shared between “theory of mind” and moral reasoning in normal adult brains, will these areas, which are inactive in “theory of mind” tasks in autistic subjects, nevertheless activate when autistic subjects process moral scenarios? It is too early to speculate on this intriguing question.

In conclusion, basic moral judgment may be one aspect of social intelligence that is relatively spared in autism. The study of autistic development has long ignored moral judgment and moral reasoning. This is regrettable from the practical point of view of educating and socially integrating individuals with autistic disorders because we neglect a socially important capacity that they may retain and which could therefore be reinforced. It is also an overlooked theoretical opportunity for mapping and characterizing the structure of autistic social cognitive abilities. This is particularly pressing given the importance of understanding comorbidity patterns in disordered development. Investigations should not proceed in a purely negative fashion, focusing only on impairments (Sigman & Capps, 1997). More attention to the positives of autistic social intelligence will be a valuable corrective and yield

further clues to understanding canonical social abilities.

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