

Punishment and Sympathy Judgments: Is the Quality of Mercy Strained in Asperger's Syndrome?

Shelley Channon · Sian Fitzpatrick ·
Helena Drury · Isabelle Taylor · David Lagnado

Published online: 2 March 2010
© Springer Science+Business Media, LLC 2010

Abstract This study examined reasoning about wrongdoing in people with Asperger's syndrome (AS) and matched healthy controls in relation to car accident scenarios. The two groups made similar judgments with respect to degree of driver negligence for both fines imposed and sympathy ratings. They also made similar judgments of fines in relation to the type of justification given for the drivers' actions. However, the AS group differentiated more in sympathy judgments relating to good and poor justifications. The AS group thus appeared to show preserved judgment with respect to compensation and sympathy for the victim and fines for the driver, but expressed less sympathy towards drivers with poor justifications for their actions.

Keywords Moral judgment · Mentalising · Theory of mind · Empathy · Sympathy · Asperger's syndrome

Introduction

One of the basic principles of societal living is the setting and monitoring of common standards for behaviour, with the expectation that individuals will adopt these. Punishing wrongdoing is a central mechanism used to enforce compliance with societal standards, and legal systems oversee this by empowering individuals to make judgments about

others' behaviour. In reasoning about responsibility for events, we make inferential judgments based on the nature of the human actions that led to them and the contributions of the individuals involved (see e.g. Alicke 2000; Heider 1958; Kelley 1967; Shaver 1985). Difficulties with interpersonal reasoning about mental states have been well documented in Asperger's syndrome (AS), but less is known about the nature or extent of any impairment in judgment in the wider domain of moral judgment. At the level of simple differentiations between protagonists with good and bad motives, children with AS have been shown to be accurate in making judgments, although they had some difficulties justifying their decisions (Grant et al. 2005). Even autistic children with severe mentalising impairments are able to distinguish good actions deserving reward and bad actions meriting punishment (Leslie et al. 2006), and to make distinctions between moral transgressions leading to others' distress and conventional transgressions (breaking social rules that do not involve a victim) (Blair 1996). The experiment described below was designed to examine factors influencing everyday judgments in making decisions about the consequences of wrongdoing, and how this is affected in those with AS.

Whilst legal guidelines guide the punishment judgments made by the courts, everyday interpretations of moral responsibility and blame may not conform to legal guidelines. The 'just deserts' model (see e.g. Carlsmith et al. 2002) contends that punishment is meted out primarily in proportion to the moral wrongdoing of the perpetrator, and hence the extent to which they are deserving of punishment. Lay judgments of punishment have been shown to be motivated predominantly by the desire to punish in proportion to the perceived degree of moral wrongdoing by the perpetrator, rather than by the desire to prevent further crimes by deterring them or locking them away from

S. Channon (✉) · S. Fitzpatrick · H. Drury · I. Taylor ·
D. Lagnado
Department of Cognitive, Perceptual and Brain Sciences,
University College London, Bedford Way Building, Gower
Street, London WC1E 6BT, UK
e-mail: s.channon@ucl.ac.uk

society (Darley et al. 2000; Carlsmith et al. 2002). The degree of moral wrongdoing by the offender has also been found to be the primary influence on the severity of penalty imposed when compared against the amount of harm suffered by victims (Alter et al. 2007).

What factors influence notions of the moral wrongdoing of the perpetrator? In addition to the harmful consequences of the negative event for any victims, factors relating to the mental state of the protagonist such as the extent to which they had control over their actions and their motivations for acting are also likely to inform judgment. Work adopting a legal perspective has investigated various factors which shape people's judgments of negligence and responsibility. Thus, Garvey (1998) reported that jurors were swayed by factors that were beyond the control of the defendant, but were not lenient in the face of factors within their control such as alcohol or drug intoxication. A study by Greene et al. (1999) compared driving scenarios where the driver's conduct was either reasonable or careless. Participants were asked to give both individual and group ratings as to negligence and liability. In all cases defendants who acted carelessly were deemed more negligent and more likely to have caused the injury than those who acted reasonably. The findings in relation to negligence seem inherently intuitive from both a legal perspective and a normative one. We would expect an individual to be thought of as more negligent and be held more legally or morally accountable if they had indeed behaved without due care.

Judgments of people's actions are influenced not only by the extent to which they showed negligence or were affected by factors beyond their control, but also by the reasons underlying the behaviour. Carlsmith et al. (2002) reported that the extent of punishment awarded was influenced by any circumstances that mitigated or exacerbated the degree of moral wrongdoing. Several theorists have proposed certain conditions in which an individual might be released from moral or legal responsibility. Shaver's (1985) theory included the possibility of arguing that someone's actions were justified and not wrong in the circumstances. By claiming this, a driver might accept a degree of responsibility by admitting to a causal connection between their actions and the outcome, but maintain that they should not be held morally accountable. Attributions of blame and culpability/punishment should therefore be influenced by such mitigating factors.

Taking into account factors such as negligence and mitigating factors in making judgments about reparations and fines can be readily accommodated in models which assume that mentalistic factors play a significant part over and above considerations of simple physical causality in influencing our reasoning. Cushman (2008) concluded that judgments of blame and punishment depend upon both the causal responsibility of the protagonists in bringing about

harm, and also on their mental states. One central question is the extent to which people with AS are able to make comparable judgments to healthy normal participants when making decisions in a social context. Examining judgments in groups with deficits in cognitive or affective processes associated with social functioning is important in establishing how widespread the effects of these are in everyday performance. Blair (2008) has argued that impaired cognitive mentalising is a core deficit in autism spectrum disorders, whereas affective deficits may not be key in AS (see also Frith and Happé 2005). This is supported by a range of evidence indicating mentalising difficulties in AS (e.g. Boraston et al. 2007; Castelli et al. 2002; Happé 1994; Jolliffe and Baron-Cohen 1999; Kaland et al. 2002). Evidence with respect to ability to empathise emotionally with others is less clearcut (e.g. Lombardo et al. 2007; Minio-Paluello et al. 2009; Ponnet et al. 2004; but see also Dziobek et al. 2008). Blair (2008) has argued that apparent emotional deficits such as difficulties in processing facial expressions may be mediated by impairments in processing facial stimuli in general, whether neutral or emotional.

The presence of any deficits in cognitive mentalising or in emotional empathic processes does not necessarily mean that people with AS will be unable to apply normative principles of social justice in making judgments about punishment, as demonstrated by the work showing intact moral discriminations by children with AS and autism (Blair 1996; Grant et al. 2005; Leslie et al. 2006). The nature and extent of any impairment in social judgment may depend upon the task in question, and the extent of its reliance on social and emotional processes. People with AS may therefore compensate for any deficits in these areas by the use of deliberate reasoning strategies and learned social rules to make moral judgments.

The present study was designed to examine punishment judgments in car accident scenarios in adult participants with AS and healthy matched controls. These scenarios did not ask participants to draw inferences about the mental states of either the drivers or victims involved in the accidents, since this is already known to be potentially problematic for people with AS. Rather, the scenarios explored the extent to which judgments were influenced by the degree of driver negligence demonstrated by the actions which led to loss of control over the car, and by the justifications given by the drivers for their actions. Harmfulness to the victims was kept constant, since all suffered the same fate, and the extent to which the drivers were able to control their actions was varied. Severity of punishment merited was assessed by asking people to determine the size of any fine that should be imposed on the driver in each scenario, and also the amount of victim compensation. It was predicted that fines for the driver, but not compensation for the victim, would be influenced by driver

negligence and the type of justifications for driver actions. The present study also incorporated ratings of sympathy for the driver and victim. Of particular interest was the extent to which participants sympathised not only with the victim, but also with the driver. Sympathy for the driver might be expected to be greater for accidents which do not involve negligence, or where good justifications exist for the actions. The central question was whether the AS group showed the same sensitivity as the control group to driver negligence and type of justification, and whether they expressed similar or reduced levels of sympathy.

Method

Participants

Twenty participants with AS (15m, 5f) who met DSM-IV^{TR} criteria (American Psychiatric Association 2000) for AS took part in the study. Participants who had previously been given a diagnosis of AS were recruited by advertisement, and diagnosis was confirmed by a clinician-administered interview. Exclusion criteria were comorbid major psychiatric disorder according to DSM-IV^{TR}, including ADHD, OCD or any other disorder; a history of learning disability, physical illness or injury that might have affected brain function. Inclusion criteria were fluency in English, age between 18 and 65, and a Full Scale IQ score of 85 or above on the Wechsler Test of Adult Reading (WTAR; Wechsler 2001). This test of irregular word reading was developed and co-normed with the Wechsler Adult Intelligence Scale—Third Edition (WAIS-III; Wechsler 1997). It was designed to estimate intellectual performance, and has been found to be significantly positively correlated with WAIS-III Full Scale IQ for both the US ($r = .73$) and UK ($r = .67$) standardisation samples (Wechsler 2001); it was also validated with a range of clinical groups.

Twenty healthy control participants (15m, 5f) who met the inclusion criteria and who matched the AS group on age, years of education and WTAR IQ also took part in the study. The two groups did not differ significantly in age, years of education or WTAR Full Scale IQ (all $p > .1$). Mean scores and standard deviations are shown in Table 1.

Table 1 Mean scores and standard deviations for demographic data

	Asperger group Mean (SD)	Control group Mean (SD)
Demographic		
Age	40.65 (15.25)	44.90 (15.41)
Years of education	14.35 (1.93)	15.05 (1.54)
WTAR Full Scale IQ	106.45 (7.61)	109.30 (4.75)

Materials

Each scenario involved loss of control by the driver as a result of actions varying in degree of negligence (driving whilst drunk, on the phone, eating or having a heart attack). Drivers gave either a poor or a good justification for their actions. Order of presentation of the eight scenarios was randomised for each participant. The types of scenario used are shown in Table 2. An example of a negligent act with poor justification was:

“D.W. was in a car accident. As a result of the accident, D.W. was seriously injured and was in a wheelchair for 5 years. In the accident, the driver of the other car lost control because he was drunk. The driver of the other car said that he had been drinking at a party. He could not find a taxi and did not want to walk home.”

Judgments

Participants were asked to judge how much the driver should be fined (£0–£100,000 scale, calibrated in units of £1,000) and how much compensation should be given to the victim (£0–£100,000 scale). They also judged how much sympathy they felt for the driver (0–10 scale) and for the victim (0–10 scale).

Piloting

The materials were developed and piloted using healthy normal participants, to establish that they were appropriately sensitive to the expected effects of negligence and type of driver justification.

Procedure

Ethical approval for the study was granted by the Joint UCL/UCLH Committee on the Ethics of Human Research, and all participants gave written informed consent in accordance with this. Participants were asked to read a series of short stories in order to award compensation and fines to people who had been involved in automobile accidents. Participants were told that they would not be required to remember the details of each case as the information would remain on the screen.

Results

The judgments of financial consequences and sympathy were analysed using both parametric and non-parametric tests, since some of the variables were skewed. Since these showed the same pattern of findings, ANOVA and any appropriate post-hoc *t*-tests were reported.

Table 2 Types of scenarios used

	Types of negligence			
	Heart Attack	Eating	On phone	Drunk
Good justification	In good health, recent check-up with doctor	Diabetic, needed to eat something	Received urgent call about work crisis	Drinking at home, pregnant wife went into labour
Poor justification	Chest pains before left home	Very hungry, wanted to eat hot roll	Called friend to chat because bored	Drinking at party, didn't want to walk home

Judgments of Financial Consequences

Mean scores and standard deviations for the AS and control groups are shown in Table 3.

ANOVA was performed with one between-groups factor (group: AS vs. control) and two within-groups factors, driver negligence (4 levels) and type of justification given (good vs. poor), to examine the fines imposed by the AS and control groups. ANOVA showed significant main effects of degree of negligence, $F(3,36) = 21.31$, $p = .0001$, and of type of justification, $F(1,38) = 29.26$, $p = .0001$, and no significant interaction between them. Mean scores showed that higher fines were awarded for actions involving greater negligence or poor justifications. The two groups awarded fines in a similar way, since there

was no significant main effect of group or interactions with group and negligence or type of justification, $p > .05$.

ANOVA was also performed to see whether the AS and healthy normal participants also weighted compensation for the victim according to factors relating to the driver including degree of negligence and type of justification given, despite the fact that the severity of injury for the victim was kept constant across scenarios. ANOVA comparing the two groups in the amount of compensation awarded to the victim showed no effect of driver factors on compensation, since there was no significant main effect of degree of negligence or type of justification, nor interaction between them, $p > .05$. There was also no significant main effect of group or interactions with group and negligence or type of justification, $p > .05$.

Table 3 Mean scores and standard deviations for judgments of financial consequences

	Asperger group Mean (SD)	Control group Mean (SD)
Penalty		
Heart attack good justification	13.50 (23.96)	10.80 (22.40)
Heart attack poor justification	30.95 (28.05)	20.00 (24.22)
Eating good justification	34.45 (33.12)	28.30 (31.12)
Eating poor justification	51.30 (37.34)	39.50 (37.12)
Talking on phone good justification	36.05 (31.16)	37.70 (33.97)
Talking on phone poor justification	58.35 (35.78)	49.25 (35.08)
Drink-driving good justification	38.55 (30.82)	45.65 (35.47)
Drink-driving poor justification	60.15 (36.73)	58.20 (36.51)
Main effect of justification**	Main effect of negligence**	Main effect of group NS
Compensation		
Heart attack good justification	68.55 (31.50)	69.15 (30.72)
Heart attack poor justification	66.75 (32.23)	72.45 (27.20)
Eating good justification	68.75 (32.17)	72.55 (26.05)
Eating poor justification	71.50 (33.13)	74.80 (25.64)
Talking on phone good justification	68.50 (31.84)	73.50 (29.74)
Talking on phone poor justification	68.90 (32.82)	78.65 (25.03)
Drink-driving good justification	67.90 (33.75)	76.05 (26.33)
Drink-driving poor justification	68.50 (33.07)	76.30 (26.57)
Main effect of justification NS	Main effect of negligence NS	Main effect of group NS

** Significance $p = .01$; NS non-significant

Sympathy Ratings

Mean scores and standard deviations for the AS and control groups are shown in Table 4.

Of particular interest was the question of whether the AS group expressed similar levels of sympathy for the driver as the control group. ANOVA examining sympathy for the driver showed similarities between the two groups in that there were significant main effects of degree of negligence, $F(3,36) = 45.83, p = .0001$, and of type of justification, $F(1,38) = 112.63, p = .0001$, and no significant interaction between them. There was no significant main effect of group or interactions with group involving negligence, $p > .05$.

However, there was a significant group by type of justification interaction, $F(1,38) = 8.02, p = .007$. Mean scores averaged across degrees of negligence showed that both groups were more sympathetic to drivers with good (AS $M = 4.63$; C $M = 4.60$) rather than poor justifications (AS $M = 1.69$; C $M = 2.90$). Comparison of good and poor justifications showed that the AS group did not differ significantly from the control group for good justifications, $p > .05$. However, they were significantly less sympathetic to those with poor justifications, $t(38) = 2.40, p = .022$.

Sympathy for the victim was also assessed, to see whether this was influenced by driver variables even

though the consequences of the accident for the victim were the same. ANOVA examining sympathy for the victim showed a marginally significant main effect of degree of negligence, $F(3,36) = 2.85, p = .051$, such that sympathy ratings tended to be higher for more negligent actions; the main effect of type of justification was not significant, nor the interaction between them, $p > .05$. There was also no significant main effect of group or interactions with group and negligence or type of justification, $p > .05$.

Correlations with WTAR FSIQ were examined for judgments of both financial consequences and sympathy. Spearman rank correlations were not significant for either group for judgments of fines imposed on drivers or compensation awarded to victims. However, sympathy for the victim was found to be positively correlated with IQ for both groups for both good justifications (control group: $r = .54, p = .015$; AS group: $r = .65, p = .002$) and poor justifications (control group: $r = .46, p = .041$; AS group: $r = .59, p = .007$). Sympathy for the driver was found to be negatively correlated with IQ only for the AS group for both good justifications ($r = -.63, p = .003$) and poor justifications ($r = -.47, p = .035$); the equivalent correlations for the control group were negative but not significant (good justifications: $r = -.24, p = .218$; poor justifications: $r = -.29, p = .220$).

Table 4 Mean scores and standard deviations for ratings of sympathy

	Asperger group Mean (SD)	Control group Mean (SD)
Sympathy towards driver		
Heart attack good justification	8.10 (1.77)	7.75 (2.51)
Heart attack poor justification	4.35 (3.33)	6.85 (2.25)
Eating good justification	3.75 (3.32)	4.45 (2.68)
Eating poor justification	1.30 (2.20)	1.85 (2.52)
Talking on phone good justification	3.60 (3.07)	2.50 (2.12)
Talking on phone poor justification	.70 (1.03)	1.25 (2.20)
Drink-driving good justification	3.05 (2.58)	3.70 (2.45)
Drink-driving poor justification	.40 (.68)	1.65 (2.52)
Main effect of justification**	Main effect of negligence**	
Group × justification**	Group: good justifications NS	Group: poor justifications*
Sympathy towards victim		
Heart attack good justification	9.05 (2.28)	9.05 (1.36)
Heart attack poor justification	8.65 (2.43)	9.10 (1.45)
Eating good justification	8.80 (2.21)	9.30 (.92)
Eating poor justification	8.90 (2.40)	8.75 (2.29)
Talking on phone good justification	8.90 (2.00)	8.80 (2.19)
Talking on phone poor justification	9.10 (2.25)	9.40 (.88)
Drink-driving good justification	9.35 (1.39)	9.35 (.88)
Drink-driving poor justification	9.10 (2.25)	9.55 (.83)
Main effect of justification NS	Main effect of negligence*	

** Significance $p = .01$; * significance $p = .05$; NS non-significant

Discussion

The findings with respect to financial consequences showed that the AS participants were sensitive to the degree of driver negligence in the same way as the control group, since both groups moderated their judgments in a similar fashion in accordance with this. Greater negligence was associated with higher fines imposed on the driver. Both the AS and control groups were also influenced by the type of justification given for the driver's actions, imposing higher fines for poor versus good justifications for driver actions. By contrast, neither group was influenced by driver variables in awarding compensation to the victims.

Previous work has suggested that compensation for the victim should primarily be determined by the impact on the victim (e.g. Bornstein 1998; Greene et al. 1999). Similar injuries should warrant similar compensation, regardless of how injury occurred. In the present scenarios, the negative outcomes for the victims were deliberately kept the same. In line with expectations, both the AS and control groups appear to have made logical decisions about compensation for the victim, disregarding the nature of driver actions.

When sympathy was considered, both groups gave reduced sympathy ratings for the driver under conditions of greater driver negligence, and sympathy for the victim was higher. Both groups expressed less sympathy for drivers with poor versus good justifications. However, the AS group made greater distinctions between good and bad motives than did the control group, primarily reflecting lower sympathy ratings for drivers with poor justifications. Both groups did show a small effect of driver negligence on sympathy for the victim, perhaps reflecting the view that negligent acts are more preventable; people's low opinions of the driver and their lack of care may increase their sympathy for the victims.

The pattern of judgments across groups about the punishment of wrongdoing in the present study may be interpreted with reference to a wider literature examining social and moral judgment. Earlier models emphasised the role of deliberate reasoning strategies in moral judgment (e.g. Kohlberg and Kramer 1969). More recent work has also highlighted the role of more rapid emotional processes (see e.g. Haidt 2001), implying that cognitive and emotional factors may play separate roles, and functional imaging literature suggests that cognitive and emotional processes contributing to moral judgment are mediated by separable networks of brain regions (see e.g. Greene et al. 2004, 2008; Moll et al. 2001). For instance, an imaging study by Buckholz et al. (2008) found that the amount of punishment awarded was linked to activations in networks involved in emotional processing, whereas regions associated with cognitive control were activated by varying degrees of criminal responsibility. From an emotional

perspective, moral 'outrage' or negative emotions triggered by the perpetrator's behaviour are purported to play a part in punishment based on the just deserts motive (e.g. Carlsmith et al. 2002; Fiske and Tetlock 1997; Lerner et al. 1998; Rozin et al. 1999; but see also Huebner et al. 2008). Conversely, positive emotions such as sympathy may also moderate punishment; sympathy for the protagonist may play a part, particularly in situations where protagonists have lacked situational control or had good justifications for their actions.

What factors could account for the similarities and differences in social judgement between the AS and control groups in the current study? Turning firstly to judgments of financial consequences, the results indicate that the AS group performed in a similar way to the healthy normal participants. This evidence of preserved social judgment in AS compared with healthy control participants is an important finding, given the prevalence of studies suggesting deficits. Both groups adjusted their ratings in relation to the driver but not the victim, based on the circumstances of the accident. The finding of preserved judgment of financial consequences in AS dovetails with recent work in children with AS (Grant et al. 2005) and autism (Blair 1996; Leslie et al. 2006) showing preserved ability to make simple moral judgments, albeit with limited ability to justify their decisions (Grant et al. 2005). People with AS have repeatedly been found to have difficulties on social and emotional tasks involving understanding others' perspectives (e.g. Happé 1994; Jolliffe and Baron-Cohen 1999). It is less clear whether emotional empathic processes are affected in AS (see Blair 2008 for a review).

In the present study, is it possible to make judgments about punishment based on inferential reasoning skills rather than mentalising or empathic processes? It seems probable that mentalising ability to understand others' viewpoints in detail is not a necessary skill in order to form judgments of financial consequences of driver negligence, since the drivers' actions alone made the degree of wrongdoing salient. Despite any mentalising deficits, people with AS may therefore use deliberate reasoning strategies in a similar way to control participants in order to award fines and compensation. Sensitivity to driver negligence could thus be achieved by drawing reasoned inferences from the descriptions of the drivers to conclude that having a heart attack immediately before crashing the car merited a lesser penalty than other causes such as drink-driving. In relation to this, whilst none of these driver behaviours involved deliberately crashing the car, it can be argued that the development of a heart attack is unforeseen, whereas loss of control of the car when driving after drinking is readily foreseen. Using a deliberate reasoning strategy, drivers' actions could therefore be ranked in terms of the degree of risk of precipitating an accident, which

may in turn have mediated perception of responsibility for the negative outcome. This is consistent with recent work on normal participants showing that they tend to assign higher causal and blame ratings to actions that are highly foreseeable, even when the same negative outcome results from their actions (Lagnado and Channon 2008).

The hypothesis that preserved judgment of financial consequences in AS may be mediated by deliberate reasoning strategies also fits with previous work such as the findings of Mendez et al. (2005), who reported that people with frontal variant fronto-temporal dementia showed preserved ability to make impersonal moral judgments, but were impaired in making personal moral judgments that are likely to involve self-reflection. In a comprehensive review, Lieberman (2007) concluded that social tasks that do not require the processing of mentalistic representations are mediated by different brain networks than tasks that do draw upon such processes. The findings of normative punishment and compensation judgments in the AS group in the current study could be interpreted within this framework.

Turning to judgments of sympathy, there were again similarities in performance across groups, but also interesting differences with respect to sympathy for drivers but not victims. For both groups, sympathy ratings for the victim were unrelated to driver justifications, whereas sympathy ratings for the driver showed sensitivity to good and bad justifications. However, the AS participants gave lower sympathy ratings than the control participants for drivers with poor justifications. Can the performance of the AS group on sympathy ratings be accounted for by reliance on inferential reasoning skills rather than mentalising or empathic processes? Eisenberg (2000) described sympathy as concern for another's emotional state, without necessarily experiencing this vicariously in an empathic sense; she classed it as a moral emotion which engenders other-oriented prosocial behaviour. People with AS have been found in some studies to have deficits in empathizing emotionally with others (e.g. Lombardo et al. 2007; Ponnet et al. 2004). Feeling sympathy for drivers who have caused accidents as a result of negligence or actions without extenuating circumstances appears to involve a more subtle form of compassion than sympathy for victims, perhaps requiring people to imagine themselves in such situations, or to show a degree of tolerance for human weakness even in the face of self-knowledge that they would not put themselves in such situations.

Potential support for the reliance on reasoning is provided by the finding that correlations between driver sympathy ratings and IQ reached significance for the AS group, but not for the control group. Their judgments were rational in differentiating between good and bad justifications for driver actions, perhaps more so than those of the control group, making them apparently accurate judges

(albeit unsympathetic to perpetrators without mitigating circumstances). The findings are therefore consistent with an interpretation of sympathy judgments based predominantly on deliberate reasoning processes in AS, whereas sympathy judgments in the control group may have been moderated by emotional processes. Alternatively, the more black-and-white distinctions made by the AS group between good and bad driver justifications may not reflect reasoned operations, but rather the application of rule-based learning. This thinking style is commonly described clinically in AS (see e.g. Frith 2003; Howlin 1997). It is of course possible that the AS and control groups differed in their personal experience of driving (a variable not assessed by this study), and that this in turn influenced the ease with which they were able to empathise with acts leading to accidents.

In summary, this study has demonstrated that adults with AS make judgments about punishment and compensation that are comparable to those of healthy controls, showing preserved sensitivity to driver variables including both the extent to which their actions leading up to loss of control of the car were negligent, and the type of motivations underlying the actions in question. Sympathy for the victim was also comparable for the two groups. These findings indicate that despite any mentalising deficits, people with AS can make reasonable social judgments when information relating to the motivations for drivers' actions is made salient. However, the AS participants sympathised less with drivers who lacked mitigating reasons for their actions. Emotionally-driven rather than cognitively-driven processes may have influenced the higher sympathy ratings for the perpetrator in the healthy normal group. People with AS may therefore draw upon deliberate reasoning strategies and/or learned social rules mediated by effortful controlled rather than emotional processes to infer whether behaviour is right or wrong on the basis of legal or societal expectations about driving. On the other hand, it could be argued that sympathizing with the wrongdoer may require more effortful cognitive resources to imagine their perspective than are needed to sympathise with the victim.

Acknowledgments We are grateful to the ESRC for supporting this research (grant reference RES-000-23-0959).

References

- Alicke, M. D. (2000). Culpable control and the psychology of blame. *Psychological Bulletin*, *126*, 556–574.
- Alter, A. L., Kernochan, J., & Darley, J. (2007). Transgression wrongfulness outweighs its harmfulness as a determinant of sentence severity. *Law and Human Behavior*, *31*, 319–335.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th Ed., text revision). Washington, DC: American Psychiatric Association.

- Blair, R. J. R. (1996). Morality in the autistic child. *Journal of Autism and Developmental Disorders*, 26, 571–579.
- Blair, R. J. R. (2008). Fine cuts of empathy and the amygdale: Dissociable deficits in psychopathy and autism. *Quarterly Journal of Experimental Psychology*, 61, 157–170.
- Boraston, Z., Blakemore, S. J., Chilvers, R., & Skuse, D. (2007). Impaired sadness recognition is linked to social interaction deficit in autism. *Neuropsychologia*, 45, 1501–1510.
- Bornstein, B. H. (1998). From compassion to compensation: The effect of injury severity on mock jurors' liability judgments. *Journal of Applied Social Psychology*, 28, 1477–1502.
- Buckholtz, J. W., Asplund, C. L., Dux, P. E., Zald, D. H., Gore, J. C., Jones, O. D., et al. (2008). The neural correlates of third-party punishment. *Neuron*, 60, 930–940.
- Carlsmith, K. M., Darley, J. M., & Robinson, P. H. (2002). Why do we punish? Deterrence and just deserts as motives for punishment. *Journal of Personality and Social Psychology*, 83, 284–299.
- Castelli, F., Frith, C. D., Happé, F., & Frith, U. (2002). Autism, Asperger syndrome and brain mechanisms for the attribution of mental states to animated shapes. *Brain*, 125, 1839–1849.
- Cushman, F. (2008). Crime and punishment. *Cognition*, 108, 353–380.
- Darley, J. M., Carlsmith, K. M., & Robinson, P. H. (2000). Incapacitation and just deserts as motives for punishment. *Law and Human Behavior*, 24, 659–683.
- Dziobek, I., Rogers, K., Fleck, S., Bahnemann, M., Heereken, H. R., Wolf, O. T., et al. (2008). Dissociation of cognitive and emotional empathy in adults with Asperger syndrome using the Multifaceted Empathy Test (MET). *Journal of Autism and Developmental Disorders*, 38, 464–473.
- Eisenberg, N. (2000). Emotion, regulation, and moral development. *Annual Review Psychology*, 51, 665–697.
- Fiske, A. P., & Tetlock, P. E. (1997). Taboo trade-offs. Reactions to transactions that transgress the spheres of justice. *Political Psychology*, 18, 255–297.
- Frith, U. (2003). *Autism: Explaining the enigma*. Oxford, UK: Blackwell.
- Frith, U., & Happé, F. (2005). Autism spectrum disorder. *Current Biology*, 15, R786–R790.
- Garvey, S. P. (1998). Aggravation and mitigation in capital cases: What do jurors think? *Columbia Law Review*, 1538, 1575–1576.
- Grant, C. G., Boucher, J., Riggs, K. J., & Grayson, A. (2005). Moral understanding in children with autism. *Autism*, 9, 317–331.
- Greene, E., Johns, M., & Bowman, J. (1999). The effect of injury severity on jury negligence decisions. *Law and Human Behavior*, 23, 675–693.
- Greene, J. D., Morelli, S. A., Lowenberg, K., Nystrom, L. E., & Cohen, J. D. (2008). Cognitive load selectively interferes with utilitarian moral judgment. *Cognition*, 107, 1144–1154.
- Greene, J. D., Nystrom, L. E., Engell, A. D., Darley, J. M., & Cohen, J. D. (2004). The neural bases of cognitive conflict and control in moral judgment. *Neuron*, 44, 389–400.
- Haidt, J. (2001). The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychological Review*, 108, 814–834.
- Happé, F. (1994). An advanced test of theory of mind: Understanding of story characters' thoughts and feelings by able autistic, mentally handicapped and normal children and adults. *Journal of Autism and Developmental Disorders*, 24, 129–154.
- Heider, F. (1958). *The psychology of interpersonal relations*. New York: Wiley.
- Howlin, P. (1997). *Autism and Asperger syndrome: Preparing for adulthood*. London, UK: Routledge.
- Huebner, B., Dwyer, S., & Hauser, M. (2008). The role of emotion in moral psychology. *Trends in Cognitive Sciences*, 13, 1–6.
- Jolliffe, T., & Baron-Cohen, S. (1999). The strange stories test: A replication with high-functioning adults with autism or Asperger syndrome. *Journal of Autism and Developmental Disorders*, 29, 395–406.
- Kaland, N., Møller-Nielsen, A., Callesen, K., Mortensen, E. L., Gottlieb, D., & Smith, L. (2002). A new advanced test of theory of mind: Evidence from children and adolescents with Asperger's syndrome. *Journal of Child Psychology and Psychiatry*, 43, 517–538.
- Kelley, H. H. (1967). Attribution theory in social psychology. In D. Levine (Ed.), *Nebraska symposium on motivation*. Lincoln: University of Nebraska Press.
- Kohlberg, L., & Kramer, R. (1969). Continuities and discontinuities in childhood and adult moral development. *Human Development*, 12, 93–120.
- Lagnado, D. A., & Channon, S. (2008). Judgments of cause and blame: The effects of intentionality and foreseeability. *Cognition*, 108, 754–770.
- Lerner, J. S., Goldberg, J. H., & Tetlock, P. E. (1998). Sober second thought: The effects of accountability, anger, and authoritarianism on attributions of responsibility. *Personality and Social Psychology Bulletin*, 24, 563–574.
- Leslie, A. M., Mallon, R., & DiCorcia, J. A. (2006). Transgressors, victims, and cry babies: Is basic moral judgment spared in autism? *Social Neuroscience*, 1, 270–283.
- Lieberman, M. D. (2007). Social cognitive neuroscience: A review of core processes. *Annual Review of Psychology*, 58, 201–225.
- Lombardo, M. V., Barnes, J. L., Wheelwright, S. J., & Baron-Cohen, S. (2007). Self-referential cognition and empathy in autism. *PLoS ONE*, 9, 1–11.
- Mendez, M. F., Anderson, E., & Shapira, J. S. (2005). An investigation of moral judgement in frontotemporal dementia. *Cognitive and Behavioral Neurology*, 18, 193–197.
- Minio-Paluello, I., Baron-Cohen, S., Avenanti, A., Walsh, V., & Aglioti, S. M. (2009). Absence of embodied empathy during pain observation in Asperger syndrome. *Biological Psychiatry*, 65, 55–62.
- Moll, J., Eslinger, P. J., & de Oliveira-Souza, R. (2001). Frontopolar and anterior temporal cortex activation in a moral judgment task: Preliminary functional MRI results in normal subjects. *Arquivos de Neuro-Psiquiatria*, 59, 657–664.
- Ponnet, K. S., Roeyers, H., Buysse, A., De Clercq, A., & Van der Heyden, E. (2004). Advanced mind-reading in adults with Asperger syndrome. *Autism*, 8, 249–266.
- Rozin, P., Lowery, L., Imada, S., & Haidt, J. (1999). The CAD triad hypothesis: A mapping between three moral emotions (contempt, anger and disgust) and three moral codes (community, autonomy, divinity). *Journal of Personality and Social Psychology*, 76, 574–586.
- Shaver, K. (1985). *The attribution of blame: Causality, responsibility & blameworthiness*. New York: Springer.
- Wechsler, D. (1997). *Wechsler memory scale*. San Antonio, TX: The Psychological Corporation.
- Wechsler, D. (2001). *Wechsler test of adult reading*. San Antonio, TX: Harcourt Assessment.