doi:10.1093/scan/nsp051 SCAN (2010) 5, 59–67

Psychopaths know right from wrong but don't care

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Adult psychopaths have deficits in emotional processing and inhibitory control, engage in morally inappropriate behavior, and generally fail to distinguish moral from conventional violations. These observations, together with a dominant tradition in the discipline which sees emotional processes as causally necessary for moral judgment, have led to the conclusion that psychopaths lack an understanding of moral rights and wrongs. We test an alternative explanation: psychopaths have normal *understanding* of right and wrong, but abnormal regulation of morally appropriate *behavior*. We presented psychopaths with moral dilemmas, contrasting their judgments with age- and sex-matched (i) healthy subjects and (ii) non-psychopathic, delinquents. Subjects in each group judged cases of personal harms (i.e. requiring physical contact) as less permissible than impersonal harms, even though both types of harms led to utilitarian gains. Importantly, however, psychopaths' pattern of judgments on different dilemmas was the same as those of the other subjects. These results force a rejection of the strong hypothesis that emotional processes are causally necessary for judgments of moral dilemmas, suggesting instead that psychopaths *understand* the distinction between right and wrong, but do not care about such knowledge, or the consequences that ensue from their morally inappropriate behavior.

Keywords: psychopaths; moral intuitions; emotions; permissible harms; immoral behavior

INTRODUCTION

The behavior of psychopaths is, without doubt, morally inappropriate, including murder, sexual molestation, fraud, and arson. Further, clinical analyses show that they present abnormal emotional profiles, as well as problems with inhibitory control, often leading to both reactive and instrumental aggression (Blair, 1995, 1997, 2008; Blair and Cipolotti, 2000; Blair *et al.*, 1995; Glenn and Raine, 2008; Kiehl, 2006; Kiehl *et al.*, 2001; Raine and Yang, 2006). What is unclear is the extent to which psychopaths suffer from damage to morally-specific knowledge that, in healthy individuals, guides intuitive judgments of right and wrong independently of their moral actions. On the one hand, studies indicate that psychopaths, both adults and juveniles, show a diminished capacity to distinguish between conventional and moral transgressions (Blair, 1995, 1997, 2008; Smetana, 2005; Turiel, 1998, 2005). For example, unlike healthy adults, adult psychopaths will typically judge as equally forbidden transgressions in which a person wears pyjamas to a restaurant (conventional) and a person who gratuitously hits a waiter in the restaurant (moral). Psychopaths also show diminished inhibitory control, a deficit that may contribute to their impulsive behavior, especially in the context of violence (Blair, 2008; Blair and Cipolotti, 2000; Kiehl, 2006). This research has led to the view that because of their emotional deficits, psychopaths have corresponding deficits in moral knowledge which, coupled with poor inhibitory control, leads to morally inappropriate behavior (Blair, Mitchell, and Blair, 2005; Nichols, 2002; Prinz, 2008).

Further support for the idea that the deficit in moral psychology seen among psychopaths is due to the deficit in emotional processing, comes from the wealth of research showing a significant relationship between emotional experience and moral judgment. For example, dozens of studies now show that you can prime people's emotional state, and as a result, change their judgment of particular moral scenarios. For instance, putting people in a happy state is associated with a greater tendency to allow someone to be used as a means to some greater good (Valdesolo and DeSteno, 2006); associating a neutral word with disgust under hypnosis is associated with more severe moral condemnation (Wheatley and Haidt, 2006); inducing disgust is associated with more severe moral judgments (Schnall *et al.*, 2008).

In addition to these behavioral studies, neuroscientific experiments also support the critical role of emotion in moral judgment. In particular, several imaging experiments reveal clear patterns of activation in emotionally-relevant areas when subjects read about moral dilemmas (Greene, 2003; Greene *et al.*, 2003, 2004; Moll *et al.*, 2002,

Received 31 July 2009; Accepted 19 October 2009
Advance Access publication 6 January 2010

This study was supported by a grant to MC from the Netherlands Organization for Scientific Research (NWO) grant number: 451-05-020, and to MH from the National Science Foundation-Human Social Dynamics. We would like to thank the patients of the Rooyse Wissel for participating in this study. For comments on the data and earlier drafts of the manuscript, we thank James Blair, Joshua Greene, Kent Kiehl, Walter Sinnott-Armstrong, Liane Young, and two authors of SCAN. The authors declare they have no competing interests.

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2005, 2007). And further, recent studies of patients with severe deficits in emotional processing [i.e. fronto-temporal dementia (FTD) and individuals with bilateral damage to the ventral medial prefrontal cortex (VMPC)], show a highly selective, but significant deficit in moral judgment (Ciaramelli *et al.*, 2007; Koenigs *et al.*, 2007). For example, whereas VMPC patients, like controls, judged actions involving impersonal harms (e.g., flipping the switch on the trolley to kill one person, but save five) as more permissible than actions involving personal harms (e.g., pushing the fat man off the footbridge to stop the trolley, killing the man, but saving the 5), VMPC patients were more likely to endorse these personal cases, including situations where aversive acts lead to significant benefits to others. Thus, for a broad range of moral dilemmas, emotions appear to play little to no role in guiding judgment; for dilemmas that pit highly aversive actions against significant utilitarian gains, these patients favour the outcome, providing evidence for the causal role of emotion for a specific class of moral problems.

The neuropsychological data are of particular interest because they provide a more causal account of the relationship between emotional processes and moral judgment. Further, and of special interest to the present paper, several authors have alluded to the similarity in profile between VMPC patients and psychopaths, especially their flat socio-emotional responses and their lack of inhibitory control (Anderson *et al.*, 1999; Barrash *et al.*, 2000). On this view, psychopaths and VMPC patients should show the same pattern of moral judgments.

Summarizing, a dominant perspective in the current literature sees intact emotional processes as essential to our moral psychology. Here, we consider an alternative framework, one that motivates the present studies of psychopaths. In particular, though we do not deny that emotions play some role in our moral psychology, it is possible that our emotional experiences *follow from* our moral judgments as opposed to *preceding and guiding* them (Huebner *et al.*, 2008). If this view is correct, then psychopaths may well show normal patterns of moral judgments relative to control populations. Where psychopaths deviate is in both not caring about their judgments (i.e. what they know about morally forbidden and permissible cases) and in not engaging with the kinds of motivational systems that inspire morally appropriate behavior and inhibit morally inappropriate behavior.

The following study targets three issues at the core of current work in moral psychology: (i) To what extent is normal emotional regulation necessary for making normal moral judgments, especially in the context of moral dilemmas where there are no clear, societally-mandated or typical responses? (ii) To what extent are the systems that guide moral judgments dissociable from those that guide moral behavior? More specifically, do psychopaths show deficits in both moral knowledge and behavior, in knowledge, or in the link between knowledge and behavior? (iii) Given the parallels between psychopaths and VMPC patients with respect to their deficits in socio-emotional processing and self-control, do they show parallel patterns of moral judgments?

METHODS

Subjects

Participants (all male adults) provided informed consent in accord with the policies of the Ethical Commission of the Faculty of Psychology and Neuroscience, Maastricht University, The Netherlands. Healthy controls ($n = 35$; mean age = 30.29 years, SD = 9.99) were recruited from the south of the Netherlands. The psychopath ($n = 14$; mean age = 36.66 years; SD = 6.55) and non-psychopath ($n = 23$; mean age = 40.95 years; SD = 9.77) offenders were sampled from the Forensic Psychiatric Centre de Rooyse Wissel (FPCdRW) in Venray, the Netherlands. Of the 37 delinquents, IQ scores were available for a subgroup of 20 (7 psychopaths and 13 non-psychopathic offenders) participants. Though mean IQ scores for the psychopaths ($M = 81.6$, SD = 8.66) was slightly lower than for the non-psychopathic offenders ($M = 92.5$; SD = 19.37), there was no group difference [$t(18) = 1.41$; $P = 0.18$; $d = 0.66$].

Clinical diagnosis

Psychopathy was assessed by a clinician presenting the Psychopathic Checklist-Revised [PCL-R (Hare, 1991)] test. The PCL-R is a reliable and valid instrument, designed to measure psychopathic traits such as antisocial behaviour, shallowness, impulsivity, callousness, criminal history, and lack of moral emotions, based on evidence obtained from medical and juridical records and documents, as well as extensive interviews with the forensic patients. Based on a study of Grann *et al.* (1998), a PCL-R cutoff score of 26 was used to divide the current sample into psychopaths (PCL-R ≥ 26) and non-psychopaths (PCL-R < 26). Total PCL-R scores were available for all 37 offenders. However, of the 14 psychopaths, 2 were described in the crime record as having high PCL-R scores, without mentioning the exact scores. Therefore, the relationship within the psychopathic group between PCL-R scores and type of crime (Figures 3 and 4) were only available for 12 psychopaths. Finally, regarding PCL-R factor scores, Factor 1 and Factor 2 scores were only available for 15 subjects.

The PCL-R has two main factors. The first factor comprises interpersonal and affective characteristics of psychopathy, including shallow affect, lack of remorse or guilt and glibness/superficial charm (Cooke and Michie, 2001; Hare, 2003). The second impulsive, antisocial and unstable lifestyle factor comprises the social deviance characteristics, and includes impulsivity, early behavioural problems, and parasitic lifestyle (Cooke and Michie, 2001; Hare, 2003).

All psychopathic offenders had a personality diagnosis (Table 1). Most of them (57.1%) had a diagnosis of

Table 1 Biographical descriptions in percentages and mean (s.d.'s) of the background information of the psychopaths ($n = 14$), non-psychopathic delinquents ($n = 23$), and healthy controls ($n = 35$)

	Healthy controls	Non-psychopathic offenders	Psychopathic offenders
Diagnosis	None	Substance abuse:39 Paedophilia: 35 Personality disorder: 91.3	Substance abuse:64 Paedophilia: 0 Personality disorder: 100
Offence	None	Murder: 35 Sexual offence: 48 Bodily harm: 9 Theft: 8	Murder: 29 Sexual offence: 36 Bodily harm: 14 Theft: 21
Ethnicity	White: 91 Multiracial: 3 Other: 6	Asian: 4 White: 88 Black: 4 Multiracial:4	Hispanic: 7 White: 64 Black: 7 Multiracial:14 Other: 7
Religion	Buddhist: 3 Catholic: 17 None: 80	Buddhist: 4 Catholic: 35 Protestant: 22 None: 35 Other: 4	Buddhist: 14 Catholic: 21 Protestant: 21 Muslim:14 None: 29
Married	14	4	4
PCL-R scores[a]	0.00 (0.00)	13.91 (6.63)	27.08 (8.61)
Age[b]	30.29 (9.99)	40.95 (9.77)	36.66 (6.56)
IQ ($n = 20$)[c]	–	($n = 13$); 92.54 (19.37)	(n = 7); 81.57 (8.66)
Education[d]	1.82 (0.76)	1.35 (0.49)	1.07 (0.27)

[a]Significant differences between the three groups [$F(2,56) = 95.45$; $P < 0.000$].
[b]Significant differences between non-psychopathic delinquents and healthy controls [$t(56) = 4.01$, $P < 0.000$].
[c]no significant differences between the groups [$t(18) = 1.41$, $P > 0.05$].
[d]The higher the mean, the higher the education: significant differences between psychopaths and healthy controls [$t(46) = 3.60$, $P < 0.001$]; no significant difference between psychopaths and non-psychopathic delinquents [$t(35) = 1.95$, $P > 0.05$].

cluster B (narcissistic personality disorder or antisocial personality disorder), while the minority had a personality disorder not otherwise specified. Of the non-psychopathic offenders, the majority suffered a personality disorder not otherwise specified, 21.7% had a cluster B personality disorder, and 4.3% had a cluster C personality disorder.

To strengthen the link to emotion all subjects in our test groups also participated in a well-established, physiological test of stress reactivity involving measures of cortisol [i.e., Trier Social Stress Test; (Kirschbaum *et al.*, 1993; Kirschbaum *et al.*, 1995)]. Results showed that psychopathic offenders, unlike the two comparison groups, showed no significant increase in cortisol in response to the stressor. Within both the non-psychopathic group and healthy controls, cortisol levels significantly increased at T1 (before administering the stressor) to T3 (after administering the stressor) as demonstrated by pairwise comparison (all t's > 2.81; all P's < 0.01 and all t's > 3.07; all P's < 0.01, respectively). In contrast, within the psychopathic group there was no significant increase of cortisol levels between T1 and T3 (all t's < 1.00; all P's > 0.34); see Cima, Popma, and Nicolson (in preparation) for a more detailed overview of these data. Thus, based on both their PCL-R scores and stress reactivity profiles, this psychopathic population showed relatively flat emotional responses, consistent with many other studies.

Participants had no history of psychosis or depression, and no current alcohol or drug dependence. In the delinquent sample these criteria were considered by the psychologist, psychiatrist and file records. In the healthy control sample, these criteria were inquired. We tested all offenders on the moral dilemmas after they had been interviewed with the PCL-R.

Summarizing, both psychopaths and non-psychopathic delinquents differed from healthy controls in that they had been convicted of crimes; and as in numerous other studies (Herpertz *et al.*, 2001; Kirschbaum *et al.*, 1995; Williamson *et al.*, 1991), psychopaths differed fundamentally from non-psychopath delinquents in that they showed diminished emotional reactivity based on both the standard clinical diagnostic test [i.e. the PCL-R (Hare, 1991)] and physiological measures (Cima *et al.*, in preparation).

Stimuli

We used the moral dilemmas of Greene *et al.* (2001, 2004), previously tested with the VMPC patients (Koenigs *et al.*, 2007). Each dilemma was first translated into Dutch by FT, back-translated into English by a second bilingual Dutch-English speaker, and then checked by MH for accuracy. We presented seven impersonal and 14 personal moral dilemmas (see Supplementary Information). Subjects

then answered "yes" or "no" to the question "Would you X?". A population of native Dutch speakers (adults, 324 females, 348 males) judged these cases on a Dutch version of the Moral Sense Test (http://www.serve.com/~harvardpcnl/MST/Dutch/), whereas the three test groups responded to these dilemmas with paper and pencil. Though we recognize that studies of moral judgment and responses to artificial dilemmas in particular, represent only one of several valid approaches to understanding our moral psychology, we used this approach to provide the most direct comparison with VMPC patients, as well as other recent studies of intuitive moral judgments.

To control the possibility that psychopaths simply lie about their responses to our moral dilemmas, we also administered a questionnaire [Socio-Moral Reflection; SRM-SF (Gibbs *et al.*, 1992)], asking straightforward and explicitly whether certain familiar transgressions would be morally permissible. For instance, "How important is it to keep a promise to your friend?"; "How important is it not to steal?". Answers could be given on a 5-point scale, ranging from very unimportant to very important. Scores on the SRM-SF questionnaire result in a total score and a score of moral standing, indicating the level of moral development.

RESULTS

The Dutch sample responding on the web-based version of this task replicated the overall pattern obtained in prior research: subjects provided fewer endorsements of personal dilemmas ($M = 0.37$, $SD = 0.28$) than of impersonal dilemmas ($M = 0.75$; $SD = 0.26$; $U = 22$; $z = 2.01$; $P = 0.04$; $r = 0.08$).

As in our larger Dutch sample, all three test groups judged impersonal cases as more permissible than personal cases (Figure 1): healthy controls ($U = 13.0$; $z = 2.69$; $P = 0.007$; $r = 0.46$); non-psychopathic delinquents ($U = 18.0$; $z = 2.32$; $P = 0.02$; $r = 0.48$); psychopaths ($U = 23.5$; $z = 1.92$; $P = 0.05$; $r = 0.52$). Thus, for all four test populations, individuals are more likely to perceive up close and personal harms as less permissible than harms that come about by impersonal means, such as flipping a switch in the classic trolley problem.

To examine whether the groups differed on the percentage of cases in which they endorsed the action – supporting the utilitarian outcome – and more generally, test the hypothesis that psychopaths (like VMPC patients) are more utilitarian on personal scenarios, we performed a 3 (test populations) × 2 (impersonal *vs* personal dilemmas) ANOVA (see also, Supplementary Information for Bayesian analyses of the same data set, designed to test the null hypothesis of no group differences). There was, as noted above, a highly significant dilemma type effect [$F(1,69) = 20.02$; $P = 0.0001$; $d = 2.03$], but no significant group effect [$F(2, 69) = 0.21$; $P = 0.81$], and a non-significant interaction [$F(2,69) = 0.22$; $P = 0.80$; Figure 1]. Bonferroni corrected post-hoc tests revealed no statistically significant group effect for either impersonal (P's > 0.18) or personal moral dilemma (P's > 0.41).

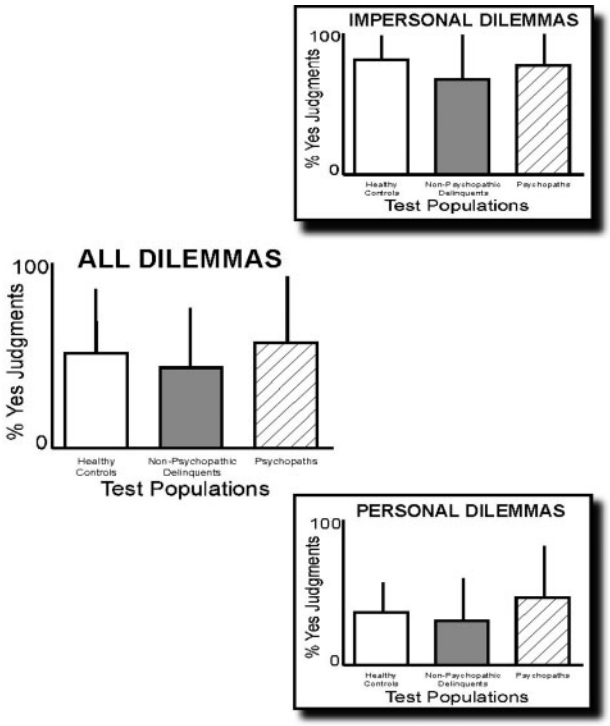

Fig. 1 The left column presents the results for subjects' judgments of all 21 dilemmas. There were no differences between healthy controls (white bar, $n = 35$), non-psychopathic delinquents (gray bar, $n = 23$), and psychopaths (hashed bar, $n = 14$) for the mean proportion (+s.d.) of Yes judgments. The right column presents the results for subjects' judgments on impersonal (top) and personal dilemmas. Again, there were no differences between groups. However, all three groups judged impersonal dilemmas as more permissible (i.e. a higher proportion of Yes judgments) than personal dilemmas.

Evaluation of educational level demonstrated a significant difference between the groups, with offenders having lower levels of education than non-offenders, but no difference between the two groups of offenders ($\chi^2[2] = 12.90$; $P < 0.05$). More importantly, an ANCOVA demonstrated that there was no significant effect of education on judgments of either personal or impersonal dilemmas (all P's > 0.05).

Healthy controls were generally younger than both delinquent groups. Since there was a significant age difference [$F(2,69) = 9.29$; $P < 0.000$], due to healthy controls being younger than non-psychopathic delinquents, we conducted a correlation analysis to examine whether age was related to moral responses. For both personal as well as impersonal dilemmas, there was no effect of age ($r = 0.04$ and -0.21 respectively with all $P's > 0.05$).

Given that prior work on VMPC and FTD patients revealed a highly selective deficit within the personal dilemmas, with greater endorsements of the utilitarian outcome for other-serving (i.e. harming one for the benefit of others) than self-serving (harming one for self-benefit) personal

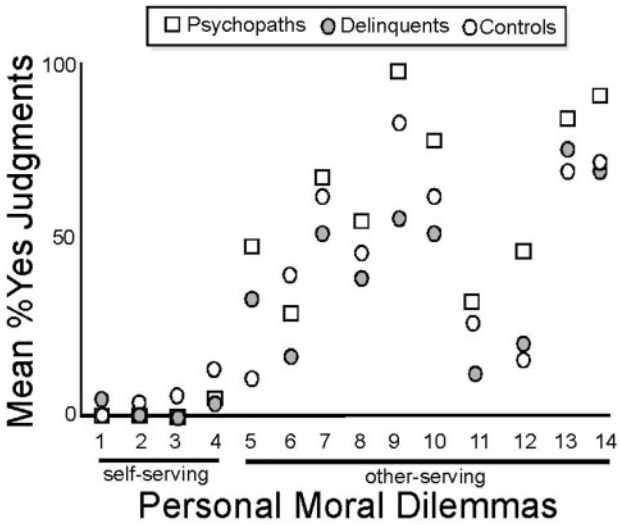

Fig. 2 Scatterplot of subjects' judgments (mean proportion of Yes responses) for all personal moral dilemmas, divided into self-serving (far left, first three cases) and other-serving (right, 11 cases) vignettes. Healthy controls are indicated by white circles, non-psychopathic delinquents by gray circles, and psychopaths by hashed squares.

dilemmas, we explored in greater detail the variance in responses to personal dilemmas by both delinquent groups and our controls (Figure 2). An overall 2 (Self *vs* Other-serving) × 3 (Psychopaths, Delinquents, Controls) ANOVA revealed a statistically significant main effect for dilemma type, with subjects judging other serving cases as more permissible than self-serving [$F\ (1, 36) = 48.52$; $P < 0.0001$]. There was, however, no main effect for the three test populations [$F\ (2, 36) = 0.81$; $P = 0.45$] and nor was there a statistically significant interaction between dilemma type and test population [$F\ (2, 36) = 1.01$; $P = 0.37$]. Thus, psychopaths were not more likely to endorse the utilitarian outcome for other-serving, personal dilemmas.

On a scenario level, there were several dilemmas that elicited virtually complete support of the utilitarian outcome by subjects in all groups (80–100% Yes judgments) or virtually complete prohibition of this outcome (0–20% Yes judgments; Figure 2). For example, each of our test populations agreed that the actions to be taken in dilemmas 2, 3, 4 and 6 were largely impermissible, whereas those in dilemmas 13 and 14 were largely permissible; furthermore, although subjects in all three test populations were less clear about the permissibility of the action for several cases (e.g. 7, 8, and 11 in Figure 2), all clustered around the same proportion of Yes responses. Lastly, although the mean permissibility ratings for psychopaths were higher than the control populations for 8 out of 11 other-serving dilemmas, the variance in all three groups was sufficiently high to make this apparent difference non-significant. More specifically, for 3 of the 11 other-serving dilemmas, the delinquents provided a greater proportion of Yes judgments; for four of these dilemmas, the psychopaths differed from the other groups by less than 15%, leaving only four cases where the psychopaths judged the case more permissible by 20–40%. Thus, even on a case by case basis, there is no consistent pattern of judgments that is mediated by the characteristics of our study populations.

We also explored the difference in judgments within the class of other-serving cases in which sometimes, harming one to benefit many others makes the one worse off (e.g., the footbridge trolley case where pushing the man off the bridge kills him but saves five) whereas in others, harm to the one is inevitable, does not make the individual worse off, and yet benefits many others (e.g., every person in a war bunker will be killed by enemy soldiers if anyone makes noise, so if a baby starts crying, killing the crying baby doesn't make her worse off, but saves the others); these latter cases are often described as Pareto dilemmas, and in previous work, are typically judged more permissible than non-Pareto cases where the one is made worse off (Huebner, Pettit, and Hauser, in review; Moore *et al.*, 2008). Group contrasts for the Pareto cases failed to reveal a significant difference (P's > 0.22).

Of the 37 delinquents, PCL-R factor scores were available for 15 subjects. There was no statistically significant correlation between subjects' moral judgments on personal dilemmas and their factor 1 ($r = -0.02$, $P = 0.95$) or 2 scores ($r = -0.02$; $P = 0.93$; Figure 3A and B).

Though there is a generally agreed upon cut-off on the PCL-R diagnostic for classifying individuals as psychopaths (i.e., scores of 26 or higher), there was, as in all previous work, variation among our subjects in such scores, as well as in the nature of their criminal conviction. To assess whether such variation was related to their moral judgments, we plotted (Figure 4A) each psychopath's PCL-R score against the proportion of personal dilemmas that they endorsed, and further grouped the subjects by their type of crime. Though the sample size is too small to evaluate statistically, neither the scatter in the data shows relationship between PCL-R score and proportion of personal dilemmas endorsed, nor a clear pattern for type of crime. Similarly, there was no effect of PCL-R score or type of conviction on the proportion of utilitarian outcomes endorsed for the other-serving cases (Figure 4B).

Results on the SRM-SF showed that overall there was no statistically significant difference among the groups, with psychopaths showing slightly lower SRM-SF scores ($M = 276.14$; SD $= 33.43$) than healthy controls ($M = 286.03$; SD $= 45.15$), whereas non-psychopathic offenders had slightly higher SRM-SF scores ($M = 290.01$; SD $= 46.59$) than healthy controls [$F(2,69) = 0.45$; $P = 0.64$]. None of the post-hoc tests were statistically significant (all t's < 0.98; $P > 0.34$).

DISCUSSION

Philosophers, legal scholars, and scientists agree that our moral judgments are influenced by processes of reasoning, intuition and emotion (Damasio, 1994; Dwyer, 2004;

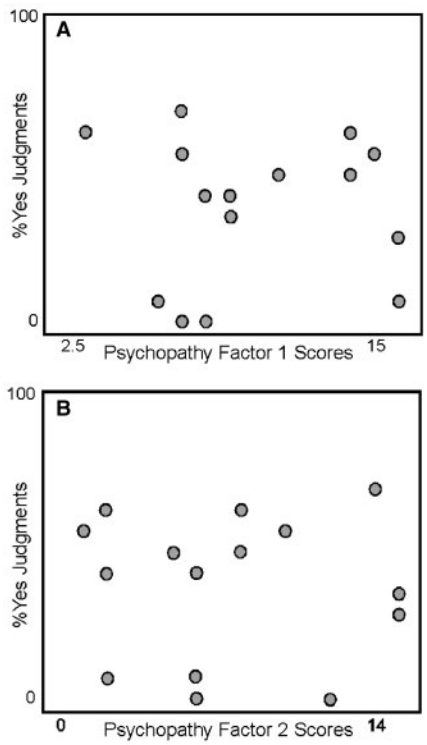

Fig. 3 (**A**) Scatterplot of psychopathy factor 1 scores for offenders [psychopaths and non-psychopathic delinquents[[$N = 15$*] grouped by the proportion of yes judgments for all personal moral dilemmas. (**B**) Scatterplot of psychopathy factor 2 scores for offenders [$N = 15$*] grouped by the proportion of yes judgments for the personal moral dilemmas. *: For 20 individuals, crime files documented the administration of a PCL-R interview. However, these juridical file records only described PCL-R total score without mentioning both factor scores.

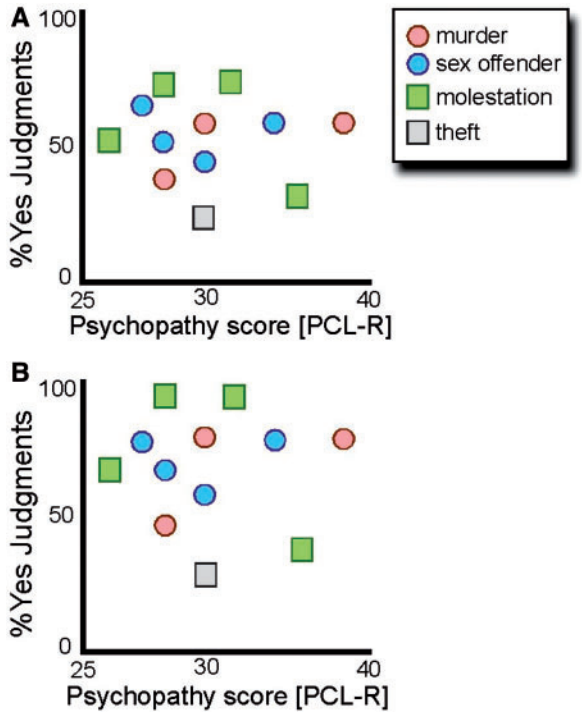

Fig. 4 (**A**) Scatterplot of psychopathy scores (PCL-R; $N = 12$*) grouped by type of crime, against the proportion of yes judgments for all personal moral dilemmas. (**B**) Scatterplot of psychopathy scores (PCL-R; $N = 12$*) grouped by type of crime, against the proportion of yes judgments for the high conflict, other-serving personal moral dilemmas. *: For two individuals, crime files documented the administration of a PCL-R interview. However, these juridical file records only described these subjects as being a psychopath without mentioning the exact PCL-R score.

Greene, 2003; Haidt, 2001; Hauser, 2006; Mikhail, 2007, 2009; Posner, 1999), where controversy emerges in deciding which of these processes alone or in combination provide the source of our moral judgments. For example, though we often reflect upon moral problems, weighing the pros and cons of particular actions and outcomes, using our knowledge of similar cases to deliberate, several recent studies indicate that such rational and reasoned contemplation often arises after an intuitive system has fired off a judgment of moral permissibility. Commonly, this intuitive process has been aligned with the emotions, and more specifically, the source of our moral judgments lie in our feelings about particular actions and outcomes (Blair *et al.*, 2005; Haidt, 2001; Moll *et al.* 2007; Nichols, 2004; Prinz, 2008). Support for this position comes from three lines of evidence: (i) subjects are dumb-founded by their judgments, unable to provide a coherent explanation for why a particular action is morally forbidden (Haidt, 1993, 2001); (ii) emotional priming influences moral judgment (Schnall *et al.*, 2008; Valdesolo and DeSteno, 2006; Wheatley and Haidt, 2006); (iii) when healthy subjects process moral scenarios, classic emotional areas activate (Greene *et al.*, 2001, 2004; Moll *et al.*, 2002a, b, 2005); in contrast, patients with diminished emotional processing (i.e., FTD, VMPC, and psychopaths) show different patterns of moral judgments than healthy subjects, at least for a particular set of moral problems (Anderson *et al.*, 1999; Blair, 1995, 1997; Koenigs *et al.*, 2007; Mendez *et al.*, 2005).

The present work was aimed at both the general thesis that proper emotional processing is necessary for moral understanding, and the more specific thesis that the compromised emotional processes of psychopaths accounts for their abnormal moral psychology, including most specifically, their heinous violence and disregard for others. Our results license two conclusions. First, like healthy subjects and non-psychopath delinquents, psychopaths judged impersonal moral actions as more permissible than personal moral actions. As previously noted (Greene *et al.*, 2001, 2004), this distinction is anchored on an emotional gradient, with impersonal cases considered less emotionally intense than personal cases. Thus, even though psychopaths show diminished emotional processing, either a sufficient level or type of emotion is preserved or non-emotional processes can carry out the relevant computation required to evaluate these particular moral scenarios. Second, though psychopaths showed diminished emotional processing relative to both control groups, and even though both delinquent groups differed from healthy subjects in their morally inappropriate behaviors (e.g., paedophilia, murder), there were no group

differences in moral judgments for either impersonal or personal scenarios. Furthermore, though there was variation among our psychopathic participants in terms of their PCL-R scores, as well as the nature of their criminal convictions, there was no relationship between these factors and their moral judgments.

At one level, these results could be perceived as conflicting with both previous studies of psychopaths as well as those with VMPC patients. In particular, adult psychopaths generally make less distinction between conventional and moral transgressions, whereas VMPC patients tend to provide a higher proportion of utilitarian judgments for a subclass of personal moral dilemmas. These data have been used to argue among the critical and causal role of emotion in generating normal moral judgments. However, it is difficult to provide firm evidence for a causal link between emotion and moral judgments, since both the theoretical arguments and empirical evidence to date are unclear about how specific types of emotion, impact upon moral judgment with moral concerns. Consider, for example, the Koenigs *et al.* (2007) paper, though it is generally agreed that patients with damage to VMPC have emotional deficits, and in particular, show difficulty with social emotions such as empathy, embarrassment, and guilt, it is not clear how the absence of these emotions, or the reduction in their manifestation would cause subjects to provide more utilitarian judgments for the narrow range of other-serving dilemmas. That is, why would the aversiveness of harming one person be diminished because one feels less embarrassment, empathy, or guilt? And even if one could provide a coherent account, including the possibility in the absence of guilt, one is simply less affected by harming one person, then why would not the same argument go through for other cases of harm that were present but that showed no group differences? Furthermore, even if there is a coherent account for this aspect of process, it doesn't necessarily show that emotions dictate how we decide whether an action is morally right or wrong. For example, it could be some other set of processes that makes this decision, but emotions titrate the severity of judgment. Thus, for example, when the social emotions are diminished with respect to their impact on decision making, we see harming one as less bad when there is a greater good, i.e. both VMPC patients and normals see harming one for some greater good as bad, but VMPC patients simply see the harm as less bad. On this view, emotions are like a gain function, moving our judgments up and down a scale from very bad or forbidden to obligatory or required (see Huebner *et al*, 2008, for further development of this argument).

There are at least two reasons why the psychopathy data on the moral-conventional distinction leave many questions unanswered, especially in terms of the specific role of emotions: 1) since both adults and juveniles received scenarios that were designed for children, it is unclear how adult psychopaths would fare on adult versions; 2) the adult and juvenile psychopaths appear to have opposite judgment biases, with adults judging most cases to be forbidden whereas juveniles consider most to be permissible; why differences in emotion would lead to this developmental flip-flop is unclear.

Though VMPC patients show some of the same kinds of emotional deficits as do psychopaths, no one has yet established how specific kinds of emotion are causally linked to specific kinds of moral problems. For example, though VMPC patients generate normal judgments for most moral dilemmas tested so far, it is not clear why diminished capacity to experience empathy, embarrassment and loyalty should lead to a selective deficit for other-serving moral dilemmas in which a highly aversive action is pitted against a significant utilitarian outcome. Given these uncertainties, it is perhaps less surprising, and at odds with the existing data, psychopaths show normal patterns of moral judgments for moral dilemmas. More specifically, though psychopaths show some of the same emotional deficits as patients with damage to VMPC, other aspects of their emotions may be relatively preserved, and these may be the most important with respect to moral understanding. At present, however, this literature is unclear, with some studies reporting normal recognition and judgments by psychopaths of basic emotions such as anger, fear, sadness and disgust, whereas other studies show differences, including evidence of abnormalities in brain activation during imaging studies of emotional processing (Blair *et al.*, 2002; Fullam and Dolan, 2006; Muller *et al.*, 2003; Pham *et al.*, 2000). Furthermore, though psychopaths may show deficits in distinguishing conventional from moral cases, whatever cognitive function is necessary for this distinction is apparently unnecessary with respect to judging moral dilemmas, and especially, for perceiving the difference between personal and impersonal cases. This conclusion is reinforced by a recent imaging study of psychopaths in which individuals evaluated the same set of dilemmas presented here, showed reduced activation in the amygdala relative to controls (Glenn *et al.*, 2009), but no difference in judgments (Glenn, Raine, Schrug, Young, and Hauser, in press). Moreover, Glenn *et al.* (in press) show that non-prison convicted psychopaths (classified based on the PCL-R) evidence significantly lower amygdala activation relative to controls, and significantly higher DLPC activation. Amygdala is associated with processing predominant negative emotions, and especially fear. In contrast, the DLPC plays a critical role in conscious reasoning and decision making. Despite these neural differences, population of non-prison convicted psychopaths showed no differences in moral judgment from a control group.

Lastly, it is possible that the emotional deficits of psychopaths only show up, or show up most intensely, under pressure to respond quickly, or feel compelled to do so, thereby triggering their more impulsive character (Kiehl, 2007). Here, there was no such pressure, perhaps resulting in normal patterns of judgment.

We conclude that psychopaths make the same kind of moral distinctions as healthy individuals when it comes to evaluating the permissibility of an action embedded in a moral dilemma. Consequently, these results support the hypothesis that normal social emotional processing does not appear necessary for making these kinds of moral judgments. Normal emotional processing is likely to be most important in generating an appreciation of these distinctions and in guiding actions (Huebner *et al.*, 2008). Psychopaths know what is right or wrong, but simply don't care. Given that legal distinctions often turn on whether crimes are committed knowingly (e.g., Model Penal Code), these results could have bearing on court decisions concerning the nature of moral knowledge – i.e. instead of strictly focusing on criminal actions carried out *knowingly*, we should also focus on whether such knowingly immoral and illegal actions are carried out *caringly*. Equally important, these results may shed light on treatment, pushing clinicians to distinguish between the sources of deficit regarding morally relevant decisions and actions.

SUPPLEMENTARY DATA

Supplementary data are available at *SCAN* online.

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