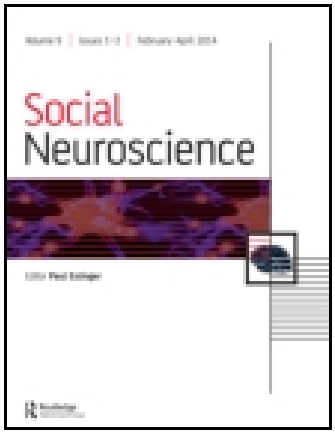

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Beyond "utilitarianism": Maximizing the clinical impact of moral judgment research

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Commentary

Beyond "utilitarianism": Maximizing the clinical impact of moral judgment research

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The use of hypothetical moral dilemmas—which pit utilitarian considerations of welfare maximization against emotionally aversive "personal" harms—has become a widespread approach for studying the neuropsychological correlates of moral judgment in healthy subjects, as well as in clinical populations with social, cognitive, and affective deficits. In this article, we propose that a refinement of the standard stimulus set could provide an opportunity to more precisely identify the psychological factors underlying performance on this task, and thereby enhance the utility of this paradigm for clinical research. To test this proposal, we performed a re-analysis of previously published moral judgment data from two clinical populations: neurological patients with prefrontal brain damage and psychopathic criminals. The results provide intriguing preliminary support for further development of this assessment paradigm.

Keywords: Moral judgment; Neuropsychology; Social cognition; Psychopathy; Prefrontal cortex.

Recent years have seen a surge in research investigating the neuropsychological mechanisms underlying human moral judgment. An influential theoretical framework in this field highlights "dual processes" contributing to moral judgment; one process consists of automatic and intuitive emotional responses, whereas the second process consists of more deliberate, controlled cognitive reasoning (Greene, 2007; Greene, Morelli, Lowenberg, Nystrom, & Cohen, 2008). Empirical tests of this model have typically employed a stimulus set that features a number of "personal" dilemmas, which putatively pit the two processes directly against one another—an emotionally aversive act of direct personal harm versus more "utilitarian" considerations of aggregate welfare (e.g., sacrificing one person's life to save a number of other lives) (Greene, Nystrom, Engell, Darley, & Cohen, 2004; Greene, Sommerville, Nystrom, Darley, & Cohen, 2001). Following a groundbreaking set of neuroimaging studies that demonstrate dissociable networks of brain activity for the dual processes (Greene et al., 2004, 2001), clinical studies have shown that performance on this moral judgment test is sensitive to a number of neurological and psychiatric conditions featuring social-affective disturbances, including focal prefrontal lesions (Ciaramelli, Muccioli, Ladavas, & Di Pellegrino, 2007; Koenigs et al., 2007), fronto-temporal dementia (Mendez, Anderson, & Shapira, 2005), psychopathy (Koenigs, Kruepke, Zeier, & Newman, 2012), substance use disorder (Carmona-Perera, Verdejo-García, Young, Molina-Fernández, & Pérez-García, 2012; Khemiri, Guterstam, Franck, Jayaram-Lindström, & García, 2012), and autism (Gleichgerrcht et al., 2013).

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Moreover, performance on this test is sensitive to more broadly distributed personality traits (e.g., empathy) in non-clinical populations (Bartels & Pizarro, 2011; Gleichgerrcht, Young, & Gray, 2013; Wiech et al., 2013), as well as to transient psychological manipulations such as social stress (Youssef et al., 2012), cognitive load (Greene et al., 2008), and positive mood induction (Valdesolo & Desteno, 2006). These findings suggest a potential application of this test in assessing social and affective function in clinical populations. However, in order for this paradigm to achieve its maximal potential utility (for both research and clinical purposes), we believe that further refinement of the stimulus set is necessary to improve the precision of the psychological processes being measured. In this article, we present preliminary results that cast doubt on the standard interpretation that performance on this test primarily reflects the degree of "utilitarian" judgment. We will first describe the conceptual basis for this proposal and then present a re-analysis of previously published data from key clinical populations to demonstrate empirical support for the proposal.

PSYCHOLOGICAL FACTORS (BEYOND UTILITARIANISM) MAY INFLUENCE RESPONSES TO THE STANDARD BATTERY OF DILEMMAS

As described above, researchers have used the battery of moral dilemmas to investigate moral judgment in healthy subjects as well as in neurological and psychiatric clinical populations. Affirmative responses, especially to moral dilemmas of the personal type, have been widely interpreted to indicate an abnormally "utilitarian" pattern of judgment (Bartels & Pizarro, 2011; Carmona-Perera et al., 2012; Ciaramelli et al., 2007; Koenigs et al., 2012, 2007). One initial concern about this interpretation was that several of the original 24 personal moral scenarios, namely those labeled *Infanticide, Hired Rapist, Country Road, Grandson*, and *Architect*,[1] do not propose a utilitarian action, but rather a purely selfish one. In those stories nobody obtains a benefit except the person who harms the victim; they do not present the direct harming action as a means to save a greater number of other persons. To address this disparity within the personal scenarios, Koenigs et al. (2007) divided 21 personal scenarios into two subgroups, labeling "low conflict" those scenarios that healthy controls unanimously reject and "high conflict" those scenarios that elicit longer reaction times and non-unanimity among healthy subjects. Predictably, each of the purely selfish actions was included in the low-conflict subset. After Koenigs et al. (2007), multiple studies have focused their analyses on the 13 high-conflict (HC) personal moral scenarios in order to support conclusions regarding the degree of utilitarian judgment (e.g., Carmona-Perera et al., 2012; Greene et al., 2008). Moreover, a number of subsequent studies have highlighted the fact that even within this subset of HC personal scenarios, there is significant heterogeneity with respect to additional features of the scenarios that could influence the subject's response (Huebner, Hauser, & Pettit, 2011; Kahane & Shackel, 2008, 2010; Moore, Clark, & Kane, 2008). For example, in *Preventing the Spread, Lawrence of Arabia*, and *Bomb*, the persons to be saved in the story are threatened directly or indirectly by the person who is the target of harm in the proposed utilitarian action. About this action the scenarios ask: "Is it right to harm this person?" Harming the person leads to "welfare maximization", but it also involves punishing a guilty (or at least a harm-intending) person. We therefore label these scenarios "guilty victim" dilemmas. A second kind of feature has previously been described by Moore et al. (2008) and Huebner et al. (2011). In *Sophie's Choice, Submarine, Euthanasia*, and *Crying Baby*, the victim to be sacrificed would die anyway; that is, the victim is "fated". This feature of the scenario augments the rationale for an affirmative response—approval of harming the victim to save others—beyond a strictly utilitarian rationale of the type "welfare maximization trumps harm", because harm to the victim is unavoidable. We label these stories as "fated victim" dilemmas. A third kind has previously been described by Moore et al. (2008). In *Modified Lifeboat, Modified Safari, Sacrifice* (and in *Crying Baby* and *Submarine* as well), the action of harming that maximizes welfare also saves the agent who carries it out; in other words, a "selfish reason" is present in addition to the utilitarian consideration. In these cases an increased predisposition to selfishness could motivate affirmative responses to these dilemmas. We label these the "selfish reason" dilemmas. Rosas, Arciniegas, Caviedes, and Arciniegas (2014) have suggested that these three features could potentially impact affirmative responses to personal moral dilemmas and would thus call into question the standard interpretation of utilitarian bias reported in these studies. Here, through a re-analysis of the responses of subjects in two studies (Koenigs et al., 2012, 2007), we offer preliminary evidence in support of this proposal.

[1] Throughout this article we use the original scenario labels from Greene et al. (2001).

Only in *Footbridge, Vaccine*, and *Vitamins* (and also in *Transplant*, which is not counted among the 13 HC scenarios by Koenigs et al., 2007, because the subject sample in this study surprisingly uniformly rejected the utilitarian action), the reason to harm is purely utilitarian: the protagonist does not have an additional reason to deliver an affirmative response unrelated to welfare maximization. Therefore, 10 of the 13 HC scenarios confront subjects with some additional consideration that could plausibly affect their judgment, in a way that may be unrelated to the presumed interest in welfare maximization, per se.

THE ROLE OF DIFFERENT EMOTIONS IN INFLUENCING "UTILITARIAN" JUDGMENTS

We next argue that these additional psychological factors may indeed be capable of influencing patients' responses. The battery of personal scenarios was created on the basis of their ability to evoke emotional responses in healthy subjects (Greene et al., 2004, 2001; Koenigs et al., 2007). To more specifically examine the types of emotion that are engaged by each of the personal moral scenarios, Choe and Min (2011) presented 243 healthy experimental subjects with all 24 dilemmas of the original battery. In this study, subjects were asked to report their emotions as they responded to each dilemma. While the subject data from the Choe and Min study are somewhat limited (i.e., selection of the emotion that the subject felt most strongly while reading the scenario), to our knowledge this is the only attempt to assess the experience of specific emotions during the personal moral judgment test. Here, we use Choe and Min's data about the emotions reported in the 13 HC scenarios to consider whether clinical populations could differ from healthy subjects in displaying excessive or diminished levels of those emotions. Finally, we reanalyze data from two clinical populations previously purported to show abnormally "utilitarian" moral judgment—ventromedial prefrontal lesion patients (Koenigs et al., 2007) and psychopathic criminals (Koenigs et al., 2012)—to demonstrate intriguing differences in responses to cases where those emotions are present in comparison with cases where they are absent.

According to the Choe and Min results, among the HC personal scenarios, anger is often reported for "guilty victim" scenarios, which involve harm to a person intending to harm others (*Preventing the Spread, Bomb*). Guilt is reported more often for the "selfish reason" scenarios, where the agent is also among the threatened (*Modified Lifeboat, Modified Safari, Sacrifice, Crying Baby*, and *Submarine*) than when she is not (*Transplant, Footbridge*). Sadness is reported more often when the victim is fated to die (*Sophie's Choice, Crying Baby, Submarine, Euthanasia*) than when he is not (*Transplant, Footbridge*).

Hence, the emotions reported in the Choe and Min study correspond neatly with the "additional considerations" we have highlighted above for 10 of the 13 HC scenarios. This correspondence allows us to potentially draw more precise conclusions about the psychological factors that drive abnormally utilitarian moral judgments in clinical populations on this test. For example, an affirmative response (i.e., "yes, sacrifice the person") could be triggered by an excess of anger in "guilty victim" scenarios, a lack of guilt in selfishly wanting to save oneself in "selfish reason" scenarios, and/or a lack of sadness at the prospect of sacrificing innocent but hopeless individuals in "fated victim" scenarios. In the following section, we examine this proposal through a re-analysis of previously published data.

THE MECHANISMS BEHIND AFFIRMATIVE RESPONSES IN LESION PATIENTS AND PSYCHOPATHIC CRIMINALS

The perspective developed in this article affords a more precise exploration of the psychological mechanisms underlying the observed increase in utilitarian judgments among ventromedial prefrontal lesion patients and criminals with primary psychopathy. Instead of limiting the interpretation to an abnormally high degree of "utilitarian" judgment, we hypothesize that both subject groups respond according to their peculiar emotional constitution: they do not feel the sadness that would restrain them from sacrificing a fated victim; they respond selfishly and guiltlessly when they can save themselves through a "utilitarian" action; and they feel more anger and more predisposition to harm persons who themselves threaten harm to others. This would explain the increase in affirmative responses in a way that need not presuppose that they care for welfare maximization, per se.

In fact, there is independent evidence that both ventromedial prefrontal cortex (vmPFC) lesion patients and primary psychopaths may experience elevated levels of interpersonal anger. Both groups are significantly more likely to reject unfair offers in

Ultimatum games (Koenigs, Kruepke, & Newman, 2010; Koenigs & Tranel, 2007)—a behavioral response that has been associated with feelings of anger and spite (Pillutla & Murnighan, 1996). According to the data from Choe and Min (2011), anger is often reported in HC personal moral scenarios where the sacrificed victim is guilty of intending to harm others (*Preventing the Spread*, *Bomb*). On these two dilemmas, vmPFC patients approve harming the guilty person at 92%, as compared to 75% in brain-damaged comparison (BDC) subjects and 71% in healthy normal comparison (NC) subjects. Primary psychopathic adult male inmates endorsed these harms at 96%, as compared to 88% in secondary psychopathic adult male inmates and 90% in non-psychopathic adult male inmates. Despite these slightly greater rates of endorsement by vmPFC patients and primary psychopaths relative to their respective comparison groups, the between-groups differences did not achieve statistical significance (all P values > 0.19). This is likely due to a "ceiling effect" for the "guilty victim" scenarios; all subject groups across both studies endorsed over 70% of these scenarios—the highest rate of endorsement for any subset of scenarios. In fact, even among normal healthy adults, the rate of endorsement for the "guilty victim" scenarios was significantly greater than for all other scenarios (t = 4.05, P = 0.006). It is possible that anger at the victim underlies the relative increase in affirmative responses in these scenarios, in which case the "utilitarian" judgment would be a side effect.

In Choe and Min's study, healthy subjects report guilt as a predominant emotion in "selfish reason" dilemmas. If clinical subjects were less disposed to feel guilt, they would likely give more affirmative answers in scenarios where they can save themselves through the harming action. Both vmPFC lesion patients and primary psychopaths are known to exhibit egocentrism and a conspicuous lack of guilt (Barrash, Tranel, & Anderson, 2000; Hare, 2003). Among the "selfish reason" HC dilemmas (i.e., *Modified Lifeboat, Modified Safari, Submarine, Sacrifice*, and *Crying Baby*) vmPFC lesion patients had 74% approval, as compared to 21% and 25% in brain-damaged comparison patients and healthy controls, respectively. These between-group differences are statistically significant (vmPFC vs. NC: t = 3.18, P = 0.006; vmPFC vs. BDC: t = 3.77, P = 0.002). Among the prison inmates, primary psychopaths (PP) had 78% approval, as compared to 64% in secondary psychopaths (SP) and 61% in non-psychopaths (NP) (PP vs. NP: t = 2.20, P = 0.03; PP vs. SP: t = 1.38, P = 0.18). Overall, these data are consistent with the proposal that a propensity to selfish action and a diminished sense of guilt could drive affirmative responses on this subset of dilemmas.[2]

In dilemmas with a "fated victim" (i.e., *Sophie's Choice, Crying Baby, Submarine, Euthanasia*), to which healthy subjects report sadness in Choe and Min's study, a lack of feeling and concern for the well-being of others (i.e., empathy) could explain an abnormally high rate of affirmative responses. Again, both vmPFC lesion patients and primary psychopaths are characterized by low empathy (Barrash et al., 2000; Hare, 2003). Accordingly, vmPFC patients endorsed the harm in 76% of these scenarios, as compared to 21% and 31% in brain-damaged comparison patients and healthy controls, respectively. These between-group differences are statistically significant (vmPFC vs. NC: t = 3.15, P = 0.006; vmPFC vs. BDC: t = 4.14, P = 0.001). Among the prison inmates, primary psychopaths had 71% approval, as compared to 54% in both secondary psychopaths and non-psychopaths (PP vs. NP: t = 1,81, P = 0.08; PP vs. SP: t = 1.41, P = 0.17).

Finally, we consider the "pure" utilitarian HC scenarios (i.e., *Footbridge, Transplant, Vitamins*, and *Vaccine*) where the stories involve no additional factors to elevate the intensity levels of sentiments like anger, sadness, or guilt. For these scenarios, vmPFC patients endorsed the harm at a rate of only 40%, as compared to 18% and 21% in brain-damaged comparison patients and healthy controls, respectively. These between-group differences are *not* statistically significant (vmPFC vs. NC: t = 1.32, P = 0.21; vmPFC vs. BDC: t = 1.54, P = 0.14). Among the prison inmates, primary psychopaths showed virtually no difference from comparison subjects: 29% approval, as compared to 29% in secondary psychopaths and 25% in non-psychopaths (PP vs. NP: t = 0.33, P = 0.74; PP vs. SP: t = 0.00, P = 0.99). In addition, it is noteworthy that the "pure" utilitarian scenarios elicited the lowest rate of endorsement for any subset of scenarios for all subject groups. Among the key clinical groups, the rate of endorsement for the "pure" utilitarian

[2] This interpretation is further supported by a recent study of moral judgment patients with vmPFC damage acquired early in life (Taber-Thomas et al., 2014). Early-onset vmPFC damage results in more severely disrupted social and affective function (including more "psychopathic"-like behavior) than adult-onset damage (Anderson, Bechara, Damasio, Tranel, & Damasio, 1999). Accordingly, Taber-Thomas et al. found that early-onset vmPFC lesion patients, like psychopathic criminals, make more affirmative responses to the purely selfish scenarios (including the "low-conflict" scenarios).

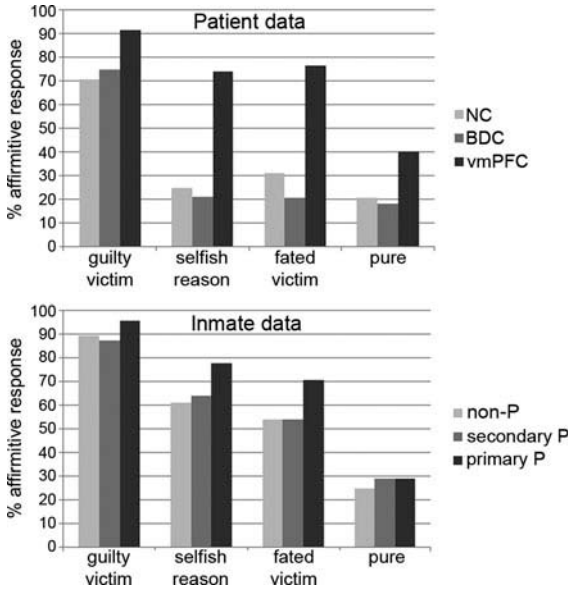

Figure 1. Re-analysis of moral judgment data based on subclassification of high-conflict personal scenarios in two different clinical populations. Top panel (data from Koenigs et al., 2007): NC, normal comparison subjects; BDC, brain-damaged comparison subjects; vmPFC, ventromedial prefrontal cortex lesion patients. Bottom panel (data from Koenigs et al., 2012): non-P, non-psychopathic inmates; secondary P, secondary psychopathic inmates; primary P, primary psychopathic inmates.

scenarios was significantly lower than for all other scenarios (vmPFC: t = 3.08, $P = 0.005$; PP: t = 5.09, $P < 0.001$).

In looking across the data from both study populations (Figure 1), several trends are apparent. First, the prison inmates as a whole endorsed greater overall proportions of personal harms and exhibited smaller group differences, for each scenario subtype, as compared to the NC and BDC participants from the neurological patient study. This could be due to demographic factors (the inmates were all young adult men, as opposed to middle-aged and elderly men and women); personality factors (the inmates all have higher-than-normal levels of aggression, impulsivity, and antisocial personality); and/or testing factors (the battery of scenarios was slightly different between studies). Second, in both studies, the "guilty victim" scenarios elicited the highest level of harm endorsement for every subject group. This finding is consistent with previous data showing that anger induction increases endorsement of personal harms in this task (Ugazio, Lamm, & Singer, 2012) and supports the notion that anger or contempt for the victim could facilitate the endorsement of utilitarian harm on these particular scenarios. Third, the influence of "selfish reasons" and "fated victims" on utilitarian judgment appeared to differ among subject groups. For NC and BDC subjects, the rates of utilitarian harm endorsement were nearly the same for these scenarios and the "pure" scenarios. By contrast, the vmPFC group and all inmate groups (especially the primary psychopathy group) exhibited markedly greater levels of endorsement for the "selfish reason" and "fated victim" scenarios, relative to the "pure" scenarios, suggesting that sensitivity to these factors may be characteristic of antisocial personality and dependent on vmPFC function. Finally, in both clinical populations, the between-group difference in the rate of "utilitarian" judgment appears smallest for the "pure" scenarios, where additional emotions (anger, guilt, sadness) are less prevalent.

It is important to note that this re-analysis is based on a relatively small number of data points. Because the original clinical research studies did not take into account the finer-grained scenario distinctions discussed in this paper, there were only several of each scenario type available for this re-analysis. This leads to the possibility of false-positive results, perhaps due to additional idiosyncratic characteristics of particular scenarios, as well as the possibility of false-negative results, due to low statistical power. Nonetheless, together these data offer preliminary support for our proposal that further refinement of the stimulus set could improve the precision of the psychological processes being measured and thus enhance the utility of the paradigm for clinical (as well as non-clinical) research.

One contentious issue in the field of moral judgment research is the degree to which the original Greene stimuli reveal a dissociable "dual process" neuropsychological basis for utilitarian vs. deontological moral judgment. Whereas Greene and colleagues have marshaled data in support of this model (Greene, 2007; Greene et al., 2008), others have offered alternative models and interpretations (Kahane et al., 2012; Moll & De Oliveira-Souza, 2007; Tassy et al., 2012). The data from our re-analysis suggest that claims of "utilitarian" bias among the clinical populations with conspicuous deficits in affective processing (vmPFC lesion patients and psychopathic criminals) may be misstated. The endorsement of personal harms in these clinical groups appears to be based more on sensitivity (or insensitivity) to particular social-affective factors that vary across scenarios within this set of stimuli, rather than on a strictly utilitarian mindset.

A second question in the field of moral judgment research is the degree to which psychopathy is associated with abnormal performance on this test. Two experimental approaches have been employed to address this question. One approach uses large

samples of healthy community participants to correlate self-reported psychopathic personality traits with rates of endorsement on this test (Bartels & Pizarro, 2011; Tassy, Deruelle, Mancini, Leistedt, & Wicker, 2013). The second approach uses incarcerated samples of criminal offenders, divided into low and high levels of psychopathy, for between-group comparisons (Cima, Tonnaer, & Hauser, 2010; Koenigs et al., 2012). While inconsistencies in the results between studies could be due to differences in psychopathy assessment and classification techniques (see Koenigs, Baskin-Sommers, Zeier, & Newman, 2011 for a discussion of this point), our findings raise the possibility that differences in the specific scenarios used in each study could also substantially affect the study results. We believe that the evaluation of moral judgment competency in psychopathy is one area of research that could benefit from the framework proposed here.

CONCLUSION: A FRAMEWORK FOR REFINING THE STIMULUS SET FOR CLINICAL RESEARCH

The possibility that unique emotional factors (e.g., excessive anger, lack of guilt, or empathy) could drive responses on specific moral dilemmas warrants further consideration as framework to refine and expand the stimulus set. For example, in the standard battery, it appears that guilt and empathy decrease utilitarian judgment, whereas anger increases it—but this is likely a function of where (to whom) the anger and empathy are directed. If the victim to be sacrificed provokes anger because she is guilty of intending to harm others, then anger will move subjects to approve harming this person (and thereby increasing utilitarian judgment as a side effect). On the other hand, if anger were provoked by the persons to be saved, rather than by the person to be sacrificed, this would, presumably, decrease utilitarian judgment. The sensitivity of the patients' performance to this manipulation could therefore be interpreted as an objective measure of the patients' disposition to spite and anger (rather than welfare maximization). Similarly, manipulations of the self-interest of the action or vulnerability of the victims could be used to index aspects of guilt (or conversely, egocentrism) and empathy (or conversely, callousness), respectively. In sum, we believe a relatively straightforward adaptation of the standard moral dilemma stimulus set would offer significant promise as a means of assessing more specific domains of social-affective processing through a performance-based neuropsychological test. In this article, we have outlined theoretical and empirical support for this proposal. In our view, refinement of this groundbreaking paradigm is an essential step in achieving a more conceptually sophisticated and clinically relevant field of moral judgment research.

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