

The role of emotion in moral psychology

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Recent work in the cognitive and neurobiological sciences indicates an important relationship between emotion and moral judgment. Based on this evidence, several researchers have argued that emotions are the source of our intuitive moral judgments. However, despite the richness of the correlational data between emotion and morality, we argue that the current neurological, behavioral, developmental and evolutionary evidence is insufficient to demonstrate that emotion is necessary for making moral judgments. We suggest instead, that the source of moral judgments lies in our causal-intentional psychology; emotion often follows from these judgments, serving a primary role in motivating morally relevant action.

Introduction

The role of emotion in our moral psychology has long been the focus of philosophical dispute [1,2]. Critically, it has often been asked: does emotion influence moral judgment or merely motivate morally relevant action? Recently neurological and behavioral data have been marshaled in favor of the claim that emotion is necessary for moral judgment [3–7], if not both necessary and sufficient [7,8]. We are not convinced that the evidence warrants such conclusions. Although there is ample support for the claim that emotion has some role in moral thought and moral motivation, current evidence is insufficient to explain when or how emotion has a role in our moral judgments. We argue that the existing data cannot establish ‘the synchronic claim’ that emotion partially or wholly constitutes our moral capacities, nor can it establish ‘the diachronic claim’ that emotion is necessary for the development of our moral capacities [9,10]. Our goal is to clarify the relationship between current empirical evidence and existing theories concerning the source of our moral judgments, concluding with some brief suggestions for future research.

Before we begin, we pause to note that ‘emotion’ and ‘moral’ are contentious terms. We do not intend to enter into disputes over the meaning of these terms, and this is not an oversight on our part. The targets of our criticism have not typically explicated these terms or felt that it was necessary to define them to make the claim that, for example, emotion mediates our moral judgments

[3,4,7,8,11–14]. In line with this research, we adopt the vernacular understanding of ‘emotion’ and merely appeal to the paradigm examples of emotional states that have been studied by such researchers: happiness, disgust, fear, contempt and guilt. The term ‘moral’ is more contentious. Yet, although there is debate over the scope of the term, there is a broad consensus that physically harming others and violating considerations of fairness are central to the moral domain [15–18], although there are clearly other aspects of morality as well [19].

Emotion has a role in our moral psychology

It has long been recognized that violating moral norms is emotionally taxing [20]. Moreover, although our emotions do not always prevent us from contemplating morally reprehensible actions, feelings of guilt and shame typically compel us to stop short of immoral action. Indeed, psychopaths, who lack the capacity for empathy and guilt, often fail to inhibit their violent tendencies [9,21,22]. Such observations provide the background against which the role of emotion in moral psychology must be understood. However, they are also consistent with a variety of conceptually and empirically distinct claims about the relationship between emotion and moral psychology (Box 1), with at least four specifically implicated thus far:

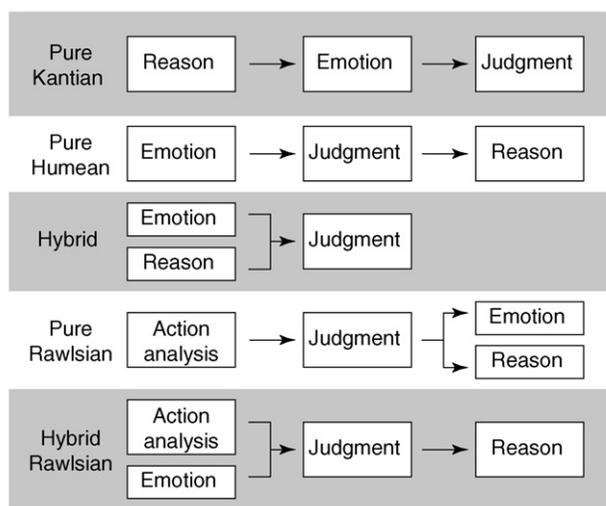
- (i) Perceived moral violations often evoke contempt, shame, anger or disgust [23,24].
- (ii) Emotion often leads to moralization [7,13,25], for example, when disgust is cultivated in the service of the politically insidious goal of removing people from the realm of moral concern.
- (iii) Neuroscientific studies [3,4,12,21] demonstrate that emotional structures are recruited in making moral judgments.
- (iv) Morally relevant action is often emotionally motivated, appearing early in ontogeny [12,26–30] and phylogeny [31].

First, although emotion ‘accompanies’ some of our moral judgments, this does not mean that emotional responses ‘constitute’ such moral judgments. Second, although emotion sometimes leads to moralization, this is consistent with the hypothesis that emotion merely draws our attention to the morally salient features of our environment,

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Box 1. Five models of our moral psychology

It is commonly agreed that moral psychology relies on a variety of computational mechanisms. However, there is little agreement concerning the causal structure or temporal organization of these mechanisms. We suggest that the following five models delimit the most promising avenues for empirical enquiry (NB these are merely initial models; a complete story of our moral cognition is likely to be far more complicated) (Figure 1). The 'Pure Kantian' [61] model indicates that moral judgment is a rational, deliberative endeavor. According to the Pure Kantian, emotion generates reactive attitudes [62] on the basis of rational appraisals, but moral judgment is primarily a conscious process of deliberate reflection. The 'Pure Humean' [7,8], by contrast, maintains that reason is the 'slave of the passions', that moral psychology is essentially emotive and that deliberative mechanisms are recruited only to provide post-hoc rationalizations of moral judgments. 'Hybrid' [3,4,10] models have also been developed on the basis of recent neurophysiological data, indicating that both emotional and deliberative mechanisms are recruited in making moral judgments. Some advocates of this view [10] maintain that moral judgment always requires both emotion and reason; others [3,4,12] maintain that emotion has a important role only in evaluating personal-moral dilemmas that require physical intervention. 'Pure Rawlsian' [15,16,63] indicate the existence of a distinctively moral faculty, operating independently of deliberative and emotional mechanisms. For the Pure Rawlsian, emotional mechanisms are recruited antecedent to moral judgment to translate moral judgments into morally relevant actions. Finally, the 'Hybrid Rawlsian' could indicate that emotion is recruited in evaluating high-conflict personal dilemmas and in resolving ambiguous outputs from the moral faculty. However, the plausibility of this model has yet to be defended or subjected to empirical scrutiny.



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Figure 1. Five models of the moral mind.

capturing attention and triggering distinctively moral cognition [32–34]. Third, existent neurological data are insufficiently precise to demonstrate the causal or temporal role of emotion in moral psychology. Finally, we take no issue with the fourth claim. In fact, we not only applaud attempts to understand the role of emotion in motivating moral action but also suggest that this is probably its most important role [15]. It is, however, more frequently hypothesized that emotion is both necessary and sufficient for the possession of moral concepts [8], that making a moral judgment is nothing more, nor less, than being in a particular emotional state and that emotional structures are recruited in making some [3,4,6,7,12,13] or even all [10]

moral judgments. Furthermore, building on a long philosophical tradition [1,2], some cognitive scientists have recently suggested that sympathetic concern is both ontogenetically and phylogenetically necessary for the development of kin-altruism, reciprocal altruism and even genuine altruism [9,21,31,35–39]. Unfortunately, we do not believe the existent experimental paradigms are sufficient to test these hypotheses.

To clarify what is theoretically at stake in this debate, consider a parallel set of concerns about 'embodied cognition'. The strong embodied cognition thesis holds that explicit motor representations partially constitute many concepts [40–42]. The concept HAMMER is thought to consist of (i) features that typify hammers (e.g. a grasping shaft, a hard end) and (ii) the motor routines involved in goal-directed grasping and swinging. Supporters of this hypothesis often appeal to neuroimaging data demonstrating that the word 'hammer' activates circuits classically associated with object categorization and circuits in the primary motor cortex [43]. However, activation in the motor cortex does not license the conclusion that the concept HAMMER includes motor routines. Given the poor temporal resolution of neuroimaging, it is just as likely that the concept HAMMER activates circuits dedicated to object categorization, which, in turn, activate circuits in the motor cortex. Distinguishing these hypotheses enables cognitive scientists to target motor routines to see whether they are 'part of our concepts' or instead 'stand in important causal relationships to them'. Analogously, we argue that cognitive scientists must target emotional mechanisms to see whether they 'constitute' moral concepts or merely 'stand in an important causal relationship' to them.

Behavioral data

The central behavioral data in favor of the claim that emotion is the source of moral judgment is the apparent modulation of moral judgment by disgust [7,44]. Participants responding to moral dilemmas at a dirty desk or when smelling a noxious odor, make more severe moral judgments than controls [6]. Highly susceptible participants, hypnotically induced to experience 'a brief pang of disgust' when confronted with a neutral word, see moral transgressions as more morally wrong in vignettes containing the hypnotically targeted word [44]. And, participants who watch a humorous clip from 'Saturday Night Live', as opposed to a neutral control clip, report feeling more positive mood and offer more utilitarian responses to the footbridge dilemma but not to the bystander dilemma [45]. Yet, although these are fascinating effects, they are insufficient to demonstrate that emotion is necessary for moral judgment. As we see it, there are four difficulties with appealing to such behavioral data in establishing that emotions partially constitute moral judgments.

First, these data fail to isolate the precise point at which emotion has a role in our moral psychology (see Box 2). Studies [6,45] in which emotional stimuli are presented before the scenario is read, could modulate the inputs to the emotional system, enabling emotion to influence the interpretation of the scenario or the question. Or, emotion could act as a gain on what has already been conceived as a moral infraction (thereby, increasing the severity of the

Box 2. Where is the effect of emotion?

Although various experiments demonstrate that strong emotional stimuli affect the response to moral scenarios, the exact point at which the effect occurs has not been critically examined. On the basis of currently available data, the effect of emotion could occur (i) in the interpretation of the scenario, (ii) in the interpretation of the question, (iii) in the production of the moral judgment or (iv) in reporting the judgment as a measurable response. The precise point at which emotion has a role is the most important issue for establishing the truth or falsity of the emotional constituency hypothesis (Figure 1).

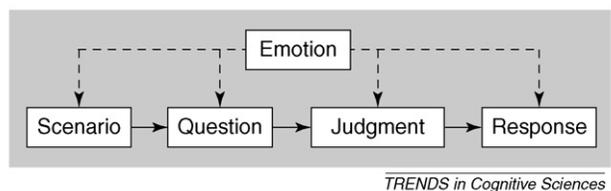


Figure 1. Possible roles of emotion in moral cognition.

perceived wrong) antecedent to the operation of distinctively moral circuits. Moreover, appeals to hypnotically induced disgust [44] cannot alleviate this worry. Because, here too, emotion could modify the inputs into distinctively moral circuits rather than modulating the operation of these moral circuits themselves. Thus, although asking subjects to evaluate a moral question triggers the process of moral evaluation, the negative emotional state yields a more severe moral judgment because of an increased focus on the ‘antecedently’ morally salient features of the scenario.

Second, and on a related note, these data fail to demonstrate that emotion transforms conventional judgments into moral judgments. To demonstrate that judgments can be shifted from the non-moral into the moral realm by inducing or amplifying an emotional response (a thesis suggested by Nichols [46]) experiments analyzing the perceived moral relevance of a transgression would have to be used. Thus, all existent data fail to distinguish between three plausible hypotheses: (i) emotion acts as a gain antecedent to moral judgment, (ii) negative emotion alerts us to the moral salience of a situation and (iii) emotion triggers a genuine conceptual shift from merely conventional to moral.

Third, there is little consistency in the scales used to measure the role of emotion in moral psychology. Some use a 7-point scale ranging from ‘perfectly OK’ to ‘extremely immoral’ [6], others use a scale asking ‘how morally wrong’ an action is [44]. Yet others pose a dichotomous question about ‘acceptability’ or ‘permissibility’ and some use a combination of these and other scales within the same study. This makes comparison across, and even within, studies [6] impossible.

Fourth, although emotion yields ‘practical’ judgments, it is unclear that this warrants treating emotion as constitutive of ‘moral’ judgments. Perhaps moral cognition can be interfered with by introducing distracting emotional stimuli [6]. However, because disgust functions practically to help us avoid toxic, infectious or contaminating substances, it could generate interruptive judgments that could compete with moral cognition for attentional

resources. Existent data fail to address the plausible hypothesis that the apparent modulation of moral judgments by emotion is an artifact of the redeployment of attentional resources. With this in mind, we also note that although high socio-economic status (SES) participants treat harmless wrongdoings (e.g. cleaning a toilet with one’s national flag) as disgusting, whereas low-SES participants treat such actions as universally wrong and deserving of punishment [13], such data merely show that the class of universally wrong actions that are deserving of punishment has a permeable boundary. This is unsurprising. After all, differences in socialization, mediated by strong emotional cues, can ground conventional judgments about taboos that exhibit precisely these features.

In summary, current behavioral data fail to license the claim that emotional processes are the source of moral computation leading to judgment.

Neuroimaging data

Neurobiological data have also been offered in support of the claim that emotional circuits are integral to evaluating morally salient stimuli. For example, judgments about morally salient claims (e.g. ‘The elderly are useless’) show increased activity in the frontal polar cortex (FPC) and medial frontal gyrus, when compared to judgments about non-moral claims (e.g. ‘Telephones never ring’) [47]. Moreover, morally salient stimuli evoke increased functional connectivity between the left FPC, orbital frontal (OFC), anterior temporal, and anterior cingulate cortices (ACC) and limbic structures such as the thalamus, midbrain and basal forebrain [48]. Finally, personal-moral dilemmas (e.g. footbridge dilemma) selectively recruit emotional circuits when compared to impersonal-moral dilemmas (e.g. bystander dilemma).

On the basis of these and similar imaging results [3,4,12], Greene [11] has proposed that moral judgment requires a prepotent emotional response (subserved by circuits in the medial frontal gyrus, the posterior cingulate gyrus and the angular gyrus) that drives moral disapproval and reflective utilitarian reasoning (implemented in the dorsolateral prefrontal cortex [DLPFC]). Although these systems typically produce convergent outputs, outputs diverge in personal-moral dilemmas, generating conflict (evidenced by increased activity in the ACC) that must be resolved by higher-cognitive control circuits in the anterior DLPFC. Converging data from neuroeconomics indicate that unfair offers in an ‘ultimatum game’ elicit increased cortical activity in the anterior insula in addition to the DLPFC [49,50]. More broadly, emotional circuits in the insular cortex are differentially activated in the perception of inequity [50], and it is hypothesized that activity in the insular cortex is indicative of the sensitivity to norm-violations implicated in deontological judgment.

As interesting as these neurobiological data are, they only show ‘that some perceived deontological violations are associated with strong emotional responses’, a perspective that ‘few would doubt or deny’ [51]. More generally, the activity of emotional circuits provides only correlational data, showing that emotions are associated with moral judgments. Such data (on their own) can never be used to infer causality, and because of the poor temporal resolution

of neuroimaging, cannot be used to assess when emotions have a role or whether they are constitutive of moral concepts. In summary, the mere activity of neural circuits classically associated with emotion in processing moral scenarios fails to distinguish between the claim that (i) emotions are integral to moral computation and (ii) emotions result from these computations. We, therefore, conclude that imaging data on their own are insufficient to determine whether emotions are activated before moral computations, during moral computations or antecedent to moral computations. Future research combining functional magnetic resonance imaging (fMRI) with event related potentials (ERPs) could help resolve this timing issue.

Neuropsychological data

A much stronger test of the hypothesis that emotion is the source of moral judgment is indicated by studies of patients with adult-onset, bilateral damage to ventromedial prefrontal cortex (VMPC). VMPC patients exhibit: (i) a flattening of their social emotions, indicated by behavioral and physiological measures; (ii) an inability to redeploy emotional representations previously associated with punishment and reward; (iii) an inability to anticipate future outcomes, punishments and rewards and (iv) a lack of inhibitory control [10,52–54]. Damasio [10] argues that emotion is usually integral to cognition, and on this basis, hypothesizes that moral judgment is likely to rely on the emotional processes implemented in VMPC.

Consistent with this hypothesis, frontotemporal dementia (FTD), resulting from the deterioration of prefrontal and anterior temporal cortex, generates blunted emotion, disregard for others and a willingness to engage in moral transgressions. Moreover, FTD patients show a pronounced tendency to adopt the utilitarian alternative in personal moral dilemmas such as the footbridge case [55]. With these results in mind, Koenigs, Young and colleagues [53] examined the judgments of the previously mentioned VMPC patients for moral and non-moral dilemmas. Each dilemma was classified as involving a personal or an impersonal violation [4]; personal violations were further subdivided into low-conflict (characterized by short reaction times and low variance in subject judgments) and high-conflict cases. VMPC patients were indistinguishable from controls, except in high-conflict dilemmas in which they were more likely to endorse the utilitarian outcome.

Overall, these data show that even though VMPC patients experience a flattened socio-emotional profile, they nonetheless judge most moral dilemmas (i.e. impersonal moral dilemmas, low-conflict personal dilemmas and personal dilemmas in which ‘harm to another’ is pitted against a ‘benefit to self’) as do healthy controls. Moreover, given the limited range of cases on which VMPC patients deviate, it is plausible that they fail to treat the morally salient features of high-conflict dilemmas as morally salient. If our interpretation is correct, then moral cognition would yield deviant outputs as a result of deviant inputs, rather than as a result of a deficit in moral processing *per se*; this parallels the interpretation we offered earlier for the hypnotism study [44]. In this case, the process of moral evaluation would remain intact. However,

the flattening of negative emotion would yield more permissible moral judgments because of a failure to focus on the ‘antecedently’ morally salient features of the scenarios.

The diachronic necessity of emotion?

Correlational data from the mind sciences could be further reinforced by data demonstrating that emotion is necessary for the acquisition of moral concepts and the development of moral judgment. Hoffman [56], for example, appeals to the affectively laden tools used by parents to convey social rules and correct behavior in arguing that emotions are developmentally necessary for moral judgment. We disagree. Children are not given sufficient moral correction to account for the intricate structure of their moral psychology [57], and although there is virtually no work on the morally relevant input the child receives, our sense is that most rule-based correction is directed towards conventional transgressions (‘Take your finger out of your nose!’) as opposed to moral ones (‘Don’t kill your brother.’). As in studies of child language acquisition, it is clear that we need serious studies of the actual input the child receives in the moral domain.

An alternative ontogenetic hypothesis relies on the moral deficiencies of psychopaths. Psychopaths engage in immoral acts, show a callous lack of concern for others and lack the capacities for guilt, remorse and empathy [9,21,32,58]. Blair has claimed that in normally developing children, emotional circuits facilitate negative reinforcement for actions that generate distress cues. Psychopaths lack these emotional circuits, and Blair [9,21] argues from this fact to the claim that emotion is the developmental source of our moral concepts and that psychopathy is a developmental consequence of an early emotional deficit.

Although psychopaths fail to distinguish moral from conventional transgressions, treating conventional violations as less permissible, more serious and as authority-independent (i.e. as moral transgressions) [21], such data do not speak to either the source or the content of a psychopath’s moral cognition. This pattern of response is equally well accounted for by a cold, calculated rationality, designed to get ‘off the hook’ and to say what others want to hear. Moreover, as Blair [9] himself has shown by using age-matched psychopathic and non-psychopathic juvenile delinquents, even psychopathic juveniles draw the moral-conventional distinction (although it is less pronounced in psychopathic than non-psychopathic juveniles), and make just as many references to welfare considerations as do non-psychopathic controls (although psychopathic juveniles were less likely to ascribe moral emotions to others). These data indicate a developmental trajectory for psychopathy, but contrary to what one would predict if emotion is developmentally necessary for acquiring moral concepts. Psychopathic juveniles apparently lose the capacity to distinguish moral from conventional violations over the course of development. Therefore, perhaps the deficiencies in the moral psychology of the psychopath are a developmental consequence of antisocial behavior, instead of the other way around. As Raine [58] argues, a life filled with antisocial behaviors could modify the moral psychology of an individual, allowing for the justification of immoral behaviors and reducing cognitive dissonance. However, if

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this is true, the moral cognition of psychopaths is deviant as a result of deviant inputs rather than as a result of a deficiency in moral processing.

A final piece of evidence for the developmental necessity of emotion is indicated by the moral psychology of early-onset VMPC patients. Early-onset lesions to VMPC [54,59] lead to a phenotype that is unresponsive to punishment, lacks inhibitory control, generates behavioral deficiencies in moral and prudential domains and shows emotional deficits in guilt, remorse and empathy. Such patients also fail to acquire moral concepts, justifying their behavior by appeal to the egocentric desire to avoid punishment [54,59]. However, such data only tell us that the acquisition of moral concepts is downstream from some social-emotional mechanisms. To establish that emotional processes are constitutive of moral cognition, we would need a much clearer picture of the precise deficits present in early-onset VMPC patients, testing them on the same battery of dilemmas used in the adult study. Given the rarity of this disorder, it is unclear whether the absence of moral cognition is a deficit in the acquisition of social rules produced by a lack of positive feedback, or even a result of deviant behavior that inhibits the maturation of moral cognition.

Box 3. Directions for future research

- Future experiments should adopt a single scale for analyzing the effect of emotion on moral judgment, or at least use different scales with one set of dilemmas to assess whether they generate different patterns of judgment. For example, to explore the potential 'gain' function of emotion in shifting the severity of the moral judgment, we propose a 7-point scale ranging from obligatory (1) – permissible (4) – forbidden (7) [64]. To explore the potential driving force of emotion in labeling a situation as moral, we propose using a moralness scale that runs from conventional (1) to moral (7), each end point anchored by a concrete example. Experimental paradigms should be established to time-lock fMRI data with ERP data, and experimental paradigms should be developed to distinguish the effect of emotion on moral judgment from the effect of attentional redeployment and cognitive load on moral judgment.
- Further experiments on patient populations (especially adult- and early-onset VMPC patients) should be carried out to examine the precise deficits that they exhibit on moral tasks, including the interaction between social emotions. Similarly, we should pursue experiments targeting the performance of psychopaths on moral dilemmas, instead of moral-conventional cases, to eliminate the use of previously rehearsed answers and a rational desire to cohere.
- A more complete account of the component processes that underlie moral judgment must be established, distinguishing domain-specific from domain-general processes, and documenting how non-morally specific components interface to create new and potentially morality-specific representational resources [15,16]. With this descriptive account in place, it will then be possible to map out the ontogenetic and phylogenetic patterns of change, and use neurobiological techniques such as transcranial magnetic stimulation to disrupt these components.
- Finally, we propose that emerging work on the performance of participants in virtual reality environments provides an important and intriguing test ground for examining the role of emotion in moral motivation as opposed to moral judgment [65,66]. Such studies are only in their early days, however, they do indicate a promising and untapped research environment, especially one aimed at distinguishing judgment from action.

Conclusion

We conclude that current evidence is insufficient to support the hypothesis that emotional processes mediate our intuitive moral judgments, or that our moral concepts are emotionally constituted. We suggest instead (for more complete development, see Refs [15,16,51,60]) that our moral judgments are mediated by a fast, unconscious process that operates over causal-intentional representations. The most important role that emotions might have is in motivating action. We offer these criticisms to sharpen future discussion and empirical enquiry. In addition, we hope that future studies will be careful to disambiguate the various ways in which emotional mechanisms might have a role in our moral cognition (Box 3). Do the social emotions push us into the moral domain, alerting us to the presence of morally salient properties? Do they modify the severity of our moral judgments? Do emotional structures inhibit our tendency to entertain thoughts that are contrary to moral reasoning? Do they merely inhibit practically irrational action? We are optimistic that more careful research in the cognitive sciences will lead to more satisfying answers to these empirical and conceptual questions, and that the tools of cognitive neuroscience and neuropsychology will be at the forefront of future discussion.

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