

# The Role of Emotion Regulation in Moral Judgment

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**Abstract** Moral judgment has typically been characterized as a conflict between emotion and reason. In recent years, a central concern has been determining which process is the chief contributor to moral behavior. While classic moral theorists claimed that moral evaluations stem from consciously controlled cognitive processes, recent research indicates that affective processes may be driving moral behavior. Here, we propose a new way of thinking about emotion within the context of moral judgment, one in which affect is generated and transformed by both automatic and controlled processes, and moral evaluations are shifted accordingly. We begin with a review of how existing theories in psychology and neuroscience address the interaction between emotion and cognition, and how these theories may inform the study of moral judgment. We then describe how brain regions involved in both affective processing and moral judgment overlap and may make distinct contributions to the moral evaluation process. Finally, we discuss how this way of thinking about emotion can be reconciled with current theories in moral psychology before mapping out future directions in the study of moral behavior.

**Keywords** Moral judgment · Emotion regulation

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So far, about morals, I know only what is moral is what you feel good after and what it immoral is what you feel bad after.

—Ernest Hemingway, *Death in the Afternoon*

In “Death in the Afternoon”, Hemingway takes on bullfighting, a morally ambiguous issue that elicits strong opinions and emotions. For some, the act is seen as the cruel torture of an innocent animal, but for others—including Hemingway himself—bullfighting is seen as an art form, a dance between two strong opponents and a proud symbol of Spanish culture. This type of moral dichotomy extends far outside the bullfighting ring, and is perhaps even as close as one’s kitchen table—the same juicy steak may look like a delicious meal to one person or the brutal murder of an innocent animal to another. From issues like abortion to cigarette smoking, moral opinion can vary wildly, and is infused with both strong emotion and strong opinions at every turn. Certain acts and behaviors can become imbued with a moral meaning dependent on context, culture, the emotions that the act evokes, and how an individual is able to reason about its causes and consequences. The process is dependent upon the interaction of cognition and emotion, or how we *think* about something is coupled with how we *feel* about something. Thus, the study of moral decision-making may be particularly informed by adopting a perspective that emphasizes interaction over separation [1].

Traditional models in psychology approach this interaction of feeling and thinking, or cognition and emotion, much in the way that the matador approaches the bull: emotion is strong and willful, and must be tamed,

weakened, and sometimes silenced by the steadier, smarter, and more controlled reason [2]. Below, we will instead suggest that the relationship between emotion and cognition is not a fight inasmuch as it is a smooth dance between equal and inseparable partners—when one shifts the other moves accordingly, and though one may take the lead, it takes two to tango. While both social psychology and cognitive neuroscience have different models for how emotion and cognition interact, most agree that they can be thought of as complementary—indeed, the majority of current neuroscience models focus on how controlled “cognitive” processes can shape and guide affect, whereas many social psychological models tend to focus on how affective inputs shape and modify cognition [3–5]. Due to its composition of particularly strong top-down cognitions (e.g. goals, motivations, and ideals) coupled with powerful bottom-up emotional processes, we believe that the moral domain may be an ideal area in which to gain a better understanding of the cognition-emotion interaction.

The goal of this paper is to present a new framework in which to think about affective and cognitive processes in moral judgment, one that views the role of emotion in moral behavior as both automatic and controlled, and takes into account perspectives from extant research in social psychology and social cognitive and affective neuroscience. We will first review how existing theories in psychology and neuroscience address the interaction between emotion and cognition, and how these theories may inform the interpretation of prior research on moral judgment. In the second section, we suggest that, taken together, these ideas form a model of moral judgment in which the relationship between emotion and cognition is bidirectional—emotional processes motivate different types of cognitions and cognitions rein in different emotions. In the third section, we describe how different brain regions may contribute to different aspects of controlled and automatic emotion processes, and how these processes may inform moral behavior and moral judgment. Finally, we will map out how future research in moral judgment and moral behavior can begin to incorporate this way of thinking about the emotion-cognition interaction, and what new insights may be gained by doing so. We suggest that studying moral judgment from a multi-level perspective that has been used in the study of emotion regulation [5], that takes into account behavioral phenomena (i.e. assessments of wrongness, blame, and emotional responses), coupled

with a focus on the neural regions that contribute to moral judgment, we may be able to gain new insights into the nature of the cognitive and affective processes that underlie moral decision-making.

## A Brief History of Moral Psychology

For decades, psychologists viewed judgment and decision-making as solely the product of the cognition side of a see-saw equation, where rational thought ruled and there was a direct link between knowledge and behavior such that one knows both what one does and *why* one is doing it [6]. This strong emphasis on reason was present in moral research; with early theorists claiming that moral judgment is the product of consciously applying learned rules in order to resolve moral dilemmas [7, 8]. They believed that as children aged and their mental abilities developed, they were able to engage in role-taking and mentalizing, which enabled moral maturation [9].

In experiments, these cognition-focused models of moral judgment tended to rely on the use of dilemmas that present a conflict between two moral principles, such as the famous trolley dilemma, wherein individuals must make a decision about whether it is appropriate to kill one person by pushing them into the path of an oncoming trolley in order to save five others [10, 11]. These types of dilemmas present a conflict between two moral principles, are often presented from a first-person perspective, and ask participants to evaluate the dilemmas in terms of higher-level concepts that reflect rule application (evaluating moral permissibility requires contrasting an action with a moral rule). Reason's reign as the primary contributor to moral judgment came to an abrupt end following Haidt's influential [12] paper, which claimed that moral judgments, rather than being the result of a complicated calculus between moral rules and moral outcomes, are instead made quickly and effortlessly and are the products of affective intuitions. If moral reasoning did occur, it is usually as a *post-hoc* explanation used to persuade others. This line of argument was again consistent with see-saw models of cognition-emotion interactions (cf. [13]), but this time the balance of power was shifted away from cognition and back to emotion.

This shift toward emotional primacy has been accompanied by an explosion of moral psychological research within the field of social psychology, with

research exploring the philosophical [14], neural [10], and affective [15] bases of moral judgment. Many of these affect-focused models claim that being able to generate a narrative for one's decisions or preferences does not require direct access to or a complete understanding of their causes [12, 16]. Instead, moral judgments are made much like aesthetic judgments – quickly, effortlessly, and driven by affective intuitions [9]. This type of moral research tends to rely on scenarios that elicit moral reactions, or emotional responses to behavior of others [12, 15], where these behaviors are often novel or unusual, such as incest or bestiality (from [12]).

While others have claimed that differences between different moral judgments lay in the *engagement* of emotion [10] we are making a different argument, that emotion is being engaged in both cases, but what varies is the extent to which the emotion is controlled. When we view these two types of moral judgments (those seemingly based on cognition vs. those seemingly based on emotion) within a framework that views emotion as resulting from the operation of *both* automatic and controlled processes, a new picture begins to emerge. Consider, for example, that individuals often use emotion as an informational source when constructing preferences and making evaluations, particularly when the impact of feelings increases the perception of their relevance, and when other informational inputs are scarce [17, 18]. In situations where no one is morally harmed, but individuals are asked to make an evaluation of moral wrongness (e.g. the classic Haidt scenario wherein two siblings make love and claim that it brings them closer together), individuals may be more likely to use their affective response (i.e. disgust) as an informational input. These types of dilemmas may be triggering automatic emotional responses, which individuals then seamlessly use as a proxy for their moral evaluations. In contrast, when individuals are presented with dilemmas that elicit conflict between two competing goals (e.g. the trolley problem), they may engage in more controlled emotional processing, leading to a conclusion that looks more like the product of reason rather than emotion [19].

In line with this criticism, more recent models of moral behavior have claimed that the current dual-process accounts of morality are unable to account for the true nature of what is occurring when individuals make moral decisions [20–22]. Some of these newer approaches rely heavily on models of reinforcement learning, and focus on the distinction between a

model-based learning process, wherein individuals represent the outcomes associated with different courses of action – and select the ones that maximize the best outcome across multiple decisions – and a model-free learning process – which represents the value associated with the immediate decision and guides decisions that maximize values associated with it [23]. For example, Crockett [20] posited that deontological judgments are the result of a model-free learning system, wherein individuals make decisions based on what has been reinforced in the past. In contrast, utilitarian judgments are the product of a model-based learning system, which maximizes outcomes via a computationally dense decision tree (“If I do Y, then X will occur, if X occurs, then Z will happen...”). In addition to the model-based and model-free systems, this model includes a Pavlovian system, which “prunes” the model-based decision tree when an aversive outcome is found (e.g. pushing a man to his death). Though these new models represent a promising step forward in laying out the cognitive mechanics that underlie moral decision-making, and in particular the *union* between emotion and cognition rather than making false distinctions between the two, we think that they are still limited when it comes to characterizing the degree to which emotion arises from and can be altered by both reflexive *and* controlled cognitive processes. Further, they fail to adequately characterize the role of emotion within moral judgment (though, for an argument that attempting to even define the role of emotion within moral judgment is likely a fruitless task, see: [24]).

### Automatic and Controlled Emotions

Emotions arise from the identification of a goal-relevant stimulus or situation and the activation of associated behavioral and physiological changes that prepare an individual for action, both of which are dependent on the contextual, individual, and cultural factors [25, 26]. Though a great deal of research historically has operated from the perspective that emotions are only reflexive or automatic, and that cognitive control is involved in emotion only insofar as it is used for stopping or blocking emotions from happening, current research in suggests that emotions result as much from controlled processes as they result from automatic ones, and that control processes play roles in all kinds of affective processes [4, 13].

On the automatic side, emotional processes can be rapid and reflexive, and surely underlie a great deal of human behavior. Automatic emotional processes play an important role in a number of social and cognitive behaviors, including threat and reward detection, person-perception, the formation and expression of attitudes and evaluations, and moral judgment [12, 27–29]. Affective responses can be quickly and non-consciously tied to representations of individuals and their actions and can act as cues to pay attention to certain features of an evaluative target [30, 31].

On the controlled side, higher cognitive processes can also play key roles in emotion. In general, cognitive control refers to processes involved in the effortful, goal-driven guidance of all manner of behaviors, ranging from attention or memory retrieval, to language, perception and actions of all sorts [32, 33]. In the context of emotion, controlled processes influence attention to and elaboration of the meaning of a stimulus [34], as well as the monitoring and reporting of emotion [35], all of which can change how the emotional value of a stimulus is construed, how we categorize and perceive our affective states, and how they will inform our future behavior [36].

Together, controlled and automatic processes both create and change affect, and the meaning derived from a situation and subsequent emotional responses are the product of both of these processes working in tandem. These automatic and controlled processes are bidirectional, and can interact in a number of ways to produce distinct affective experiences and evaluations. For example, while we often think of emotional stimuli as the sole producer of affective states (e.g. facing a charging bull), cognitive processes can also give rise to equally powerful affective experiences in the absence of environmental emotional stimuli (e.g. *imagining* facing a charging bull) [37]. Taken together, this suggests that emotions can be both immediately felt and consciously constructed, and are the result of automatic and controlled processes that both play a role in generating and transforming an individual's affective state [38].

#### Controlled Cognitive Processes Shape and Change Affect

It seems likely that one of the contributing factors to forming and acting upon moral judgments is the ability to up- and down- regulate emotion depending on the context of the moral situation and the cognitive and

motivational resources that are available to the individual at the time of evaluation [39, 40]. To revisit the trolley paradigm used by Greene et al. [10]), asking participants to imagine themselves killing another person by pushing them onto the trolley tracks may lead to cognitive and behavioral processes consistent with the cognitive up-regulation of emotion (e.g. picturing oneself in the situation, imagining the person one is hurting). This up-regulation may lead an individual to claim that the act of pushing the person is wrong. In contrast, if the same person were given the trolley dilemma, but instead asked to imagine pushing a button in a distant control booth in order to alter the trolley's path such that it will hit a person, this may engender processes consistent with the cognitive down-regulation of emotion. This down-regulation may cause individuals to endorse a utilitarian viewpoint, and view killing one person to save five as less morally blameworthy. Thus, by considering emotions as evolving out of both automatic and controlled processes, it opens the possibility for new reinterpretations of old moral judgments. If we grant that emotion generation can be the product of controlled processes, a utilitarian decision could be seen as indicative of the *presence* of emotion rather than its absence. After all, saving five by sacrificing one involves making an affective prediction that saving five will, in fact, feel better than not doing so. Or to reconsider the classic Heinz dilemma, choosing to steal in order to save one's wife (the utilitarian decision) is a choice inarguably informed by emotion.

*Aligning Emotion with Moral Beliefs* To extend this further, it seems possible to reframe moral behavior as the controlled regulation of emotion so that one acts or makes evaluations that are in line with one's pre-existing ideals and goals. For example, in one study, participants were split into high-utilitarian and low-utilitarian groups based on frequency of utilitarian responses [41]. While both groups showed an effect of load, among high-utilitarian participants, the utilitarian judgments were faster than non-utilitarian judgments in the *absence* of load. While this is consistent with a dual-process view of moral judgment, it could also be consistent with different regulation and appraisal styles, such that some individuals may be more sensitive to different features of the same situation. In support of this assertion, recent research suggests that when presented with trolley-type dilemmas, individuals are sensitive to variations in probability (how likely people are to be saved) and

magnitude (how many people will be saved) when calculating an expected value of a moral judgment [42]. While on the surface this looks like a wholly “reasoned” process, it is also consistent with a regulatory account. Different meanings of probability and magnitude, and individual differences within these factors (e.g., a 30 % chance of saving 5 may be construed very differently based on individual levels of risk-sensitivity) may be linked to the intensity of a response. Making a utilitarian judgment may reflect using higher cognitive processes in order to accumulate meanings that layer on top of, and shape the meaning of, responses cued up by more automatic processes that generate an initial affective response. This may take more time—but may not necessarily reflect a qualitatively different combination of processes—compared to those that lead to deontological judgments [43]. Thus, the likelihood of making a utilitarian or deontological judgment may be rooted in the regulation (and not the overriding) of affect.

Individuals may up- or down- regulate their automatic emotional responses to moral stimuli in a way that encourages goal-consistent behavior. For example, individuals may down-regulate their disgust when evaluating dilemmas in which disgusting acts occurred but no one was harmed, or they may up-regulate anger when engaging in punishment or assigning blame. To observe this effect in the wild, one need go no further than the modern political arena. Someone who is politically liberal may be as disgusted by the thought of two men kissing as someone who is politically conservative, but may choose to down-regulate their response so that it is more in line with their political views [44]. They can do this in multiple ways, including reframing the situation as one about equality and fairness, construing the act as one of love and affection, or manipulating personal relevance by thinking about homosexual individuals whom the person knows. This affective transformation would rely on controlled emotional processes that shape the initial automatically elicited emotion (disgust) into a very different emotion (tolerance or acceptance). This process requires motivation, recognition (conscious or non-conscious) that one is experiencing an emotion that is in conflict with one's goals and ideals, and a reconstruction of the situation and one's emotions in order to come to a moral resolution. Comparatively, political conservatives may be less motivated to do so, and may instead up-regulate their disgust response so that their moral judgment is in line with their overarching goals. In contrast, the opposite regulatory pattern may occur

(such that liberals up-regulate emotion and conservatives down-regulate emotion) when considering issues like the death penalty or gun control.

#### Affect Changes and Shapes Controlled Processes

Whether it is the dilemma posed by a rapidly approaching trolley or considering the moral wrongness of consensual sibling incest, it is clear that the types of moral scenarios presented to participants tend to be novel, atypical, and complex—three factors that have been shown to increase the use of emotion as a source of information [17, 18, 45]. Individuals may both differ in the initial intensity of their emotional response, and in the extent to which they think that their emotions are a valuable input to the formation their moral judgments. For example, for some individuals who are particularly disgusted by homosexuality, the strength of the initial affective response may bias downstream reasoning processes and impact their ability to reappraise the situation, resulting in a stronger affective bias—they may end up justifying their reaction without attempting to or being able to down-regulate it. In contrast, an individual who makes moral evaluations based solely on considerations of harm may decide that even though they may be initially disgusted, the act is not morally wrong. And finally, a third individual may initially think that it was disgusting and wrong, but may later change his or her mind after further consideration. Thus, three different individuals might experience disgust about the same situation, but the degree to which this emotion will impact their judgments might vary substantially. This type of moral evaluation process is in line with our proposed model, and helps to explain how two different individuals may come to dramatically different conclusions even if they began with the same automatic affective state.

*Aligning Moral Beliefs with Emotion* Inter-individual differences in moral sensitivity may also be rooted in emotional experiences. Individual differences in disgust sensitivity have been linked to increased moral severity [15, 46, 47], political conservatism [48], and negative attitudes towards homosexuality [49]. In addition, individual differences at the controlled level of emotion processing have also been linked to affective influences on moral judgment. In one study, Van Dillen et al. [50] demonstrated that disgust's influence on moral judgment was modulated by individual differences in

attentional control, or how able individuals are to disengage their attention from specific stimuli in their environments. Taken together, this suggests that the interaction between affective and cognitive processes varies across time, across individuals, and is strongly influenced by preexisting conditions.

This parallels research findings within the stress and coping literature—the same traumatic experience can engender different cognitive and affective consequences across different individuals in both the short- and long-term [51]. Part of this may be due to differences in situation selection and the types of coping strategies used to help an individual reframe an emotionally evocative event [52]. That said, the majority of studies that have focused on emotion within moral behavior have done so looking at emotion as an environmental constant or as a trait-like factor, rather than as a variable that changes throughout the formation of a moral evaluation. Viewing emotion this way may give new insight into the moral decision-making *process*. For example, an individual who responds with anger when hearing about two men having sex or getting married may act very differently than an individual who feels disgust when presented with the same situation. These qualitatively different emotions may promote two distinct appraisals (“that’s wrong!” vs. “that’s gross!”) and divergent action tendencies (approach vs. avoid).

#### Neural Systems Involved in Shaping and Changing Affect and in Moral Judgment

We know a great deal about the factors that influence whether individuals make seemingly cognition- or emotion- driven moral judgments [9]. However, determining whether these judgments are reflective of an integrative process whereby both top-down control regions and bottom-up automatic processes combine to generate and control emotion requires examining moral judgment as it occurs on different levels (i.e. behavioral and brain). Prior neuroscience research has demonstrated that making moral judgments within separate moral domains (i.e. harm, dishonesty, disgust) largely relies on different, non-overlapping brain regions [53], echoing assertions that moral judgment is complex, and involves many underlying processes [54]. By taking a multi-level approach, we may be able to gain a better understanding of the processes that underlie both generating and regulating the emotions involved in moral judgment, and consequently, develop a more nuanced—and perhaps

more accurate—view of emotion’s role in human morality. Below, we demonstrate that there is a striking overlap between the regions involved in both automatic and controlled emotional processes and those implicated in moral judgment (Table 1).

A key idea is that the regions enumerated below work together as individuals gain explicit awareness of their emotional states—the amygdala and anterior insula respond to the intensity of the affective stimulus and direct attention to the elicitors of the emotion and the body states they elicit, respectively; the dmPFC supports making attributions about the nature of those feelings; the vlPFC helps select appropriate labels for describing the emotional response verbally [35, 85]. This suggests that a constellation of brain regions contributes to the generation of emotions that can be both automatic and controlled, shaped by specific situations, and that differ across individuals based on preexisting evaluations, goals and beliefs, and sensitivity to specific stimuli.

Within research on moral judgment, the concerted action of, and communication between, these regions has been shown to influence moral decision-making and moral behavior. One example comes from a study by Decety et al. [86]), who examined the development of moral sensitivity, and found that the interaction and connectivity of many of the regions enumerated above change across development, reflecting both neural and socioemotional maturation. In this study, participants across a wide age range (7–40) viewed a series of video clips that portrayed intentional and accidental physical harm. The researchers found that observing unintentional harm was associated with increased activation in the ACC and anterior insula, along with other regions involved in experiencing pain. In contrast, observing intentional harm was associated with increased activation in the mPFC, the posterior superior temporal sulcus (STS) and the OFC. The researchers claimed that these differences in activation patterns are due to the integration of mental states (intention) when interpreting affective information. Perhaps most intriguingly, the researchers found two significant age-related changes: 1) a posterior-to-anterior progression of activation in the insula across age, accompanied by greater signal change in prefrontal control regions, and 2) a medial-to-lateral activation shift in the OFC when observing intentional harms, possibly reflecting a shift from relatively automatic somatosensory responses to observing pain in childhood to more controlled emotional responses in adolescence and adulthood. These results suggest that

**Table 1** Neural Systems Involved in Shaping and Changing Affect

Region	Role in Shaping and Changing Affect	Role in Moral Judgment
Amygdala	Detecting and responding to affective stimuli [55, 56] Processing goal relevance [58] Affective learning [60]	Correlated with implicit moral attitude strength [57] Implicated in evaluation of one's moral transgressions [59] Involved in deciding punishment for immoral behavior [61]
Insula	Integration of body states ([62]; [63]) Identifying emotional expressions that convey information about body states (e.g. disgust) [65] Empathic responding [67] Evaluating risk and avoiding harm [68] Disgust experience and recognition [69]	Involved in evaluations of fairness and cooperative behavior [64] Expression and experience of disgust [66]
Anterior Cingulate Cortex	Self monitoring [70] Emotion regulation [5]	Consequentialist decision-making [71]
Dorsomedial prefrontal cortex	Drawing inferences about the mental states and traits of individuals [72] Reflecting on and describing feelings related to and intentions behind actions ([73]; [74])	Involved in making moral judgments across multiple domains (e.g. disgusting, harmful, and dishonest actions) [53]
Ventromedial prefrontal cortex	Integrate multiple streams of information from amygdala, ventral striatum, and dorsal and lateral prefrontal regions [75] Provides an index of a stimulus's present value [26]	Anticipating and regulating emotional responses when making personally relevant moral judgment ([76]; [10, 71]) Linking intentions with moral behavior [77]
Dorsolateral prefrontal cortex	Controlling the focus of selective attention [78] Retrieving semantic and episodic information from memory [79] Selecting context appropriate and inhibiting context inappropriate responses [80]	Endorsement of utilitarian judgments [42] Judgments involving harm [53]
Ventrolateral prefrontal cortex	Resolving cognitive dissonance [81] Regulating amygdala activity [5]	Acceptance of unfair offers [82]
Orbitofrontal cortex	Integration of affective and motivational information [83] Implicit self-monitoring of behavior [84]	Endorsement of utilitarian tradeoffs [42]

while affective inputs make a large contribution to both understanding and observing moral situations, affect is both reinterpreted and regulated based on high-level inferences and developmental maturation.

In addition, previous research has linked activation in the OFC and amygdala to the formation and expression of implicit moral attitudes [57]. Some have even suggested that the callous and unemotional tendencies seen in psychopathy may be due to dysfunction in the vmPFC and amygdala, resulting in a reinforcement-learning problem [87]. In this population, harmful and immoral acts might be not associated with aversive reinforcement (i.e. the distress of the victim) and thus are not tagged as a negative behavior. Instead, immoral

and harmful behavior may be seen as instrumental in achieving goals. This may result in a failure to exhibit normal reinforcement learning—psychopaths may have affective reactions, but are not updating their moral representations. Moral reasoning and learning moral rules thus appears to require the coordination of multiple cognitive processes and brain areas, including those involved in both automatic and controlled emotional processing.

#### Future Directions

In the sections above, we suggest that affective and controlled cognitive processes involved in moral

judgment are complementary and can be informed by social cognitive neuroscience, which has models of the way controlled cognitive processes interact with affective processes in a number of ways. The use of neuroimaging methods can give moral researchers a better understanding of the overlapping processes involved in moral judgment and emotion regulation. In particular, we believe that neuroscience is particularly well suited to determine the role of emotion generation and regulation in moral behavior. The majority of moral research within cognitive neuroscience has either focused on passive emotional experiences [88], artificial moral dilemmas [71], or on the distinction between moral and nonmoral evaluations [59]. While these have been useful in terms of laying a foundation which to build, there remains a paucity of naturalistic studies that take into account how factors such as motivated reasoning, emotion generation, controlled cognitive appraisals, and regulatory strategies may influence complex moral decision-making [89].

### Regulating Moral Emotion

Future research should examine how dorsolateral and posterior prefrontal regions are involved in directing attention to specific features of a moral situation, and the role that these regions may play in modulating amygdala and insula activation to affectively charged moral stimuli. The dmPFC, which is involved in attributing mental states, has been shown to guide decisions about intentionality and attributions within moral contexts [90]. As this region is also involved in the amplification of emotional responses [5], it therefore may play an important role in increasing affective responses to moral events.

When regulating emotion via cognitive reappraisal, there are different tactics that one might use. Two of the most common are reinterpretation (or reevaluating the affective stimulus in a way that makes it more or less unsettling) and psychological distancing (or altering one's distance from, both psychologically or physically, from the affective stimulus) [26]. Both tactics are effective, but involve different brain regions—reinterpretation relies more on ventral lateral prefrontal regions, whereas distancing is linked to increased activation in parietal regions linked to spatial representation [5]. While the majority of studies focusing on emotion regulation have primarily focused on reinterpretation rather than distancing, research on moral judgment has done

the opposite, focusing largely on psychological distancing rather than reinterpretation [10, 71, 91, 92]. Looking at the use of these two regulatory tactics within the context of moral judgment may yield surprising results. For example, psychological distancing may cause the dampening down of an emotional experience (as seen in variants of the trolley dilemma), whereas reinterpretation may lead to different appraisals and qualitatively different emotional experiences. If individuals are motivated to reinterpret situations so as to make them more in line with their goals, we may expect to see more activation in the vlPFC, a region involved in the selection of goal-appropriate responses and the retrieval of semantic memory information that may generate a new reappraisal and/or alter the first one [5].

### Focusing on Everyday Moral Decision-Making

Individuals make moral decisions all of the time—recent research has shown that acting morally and immorally are frequent parts of everyday life [93]. However these types of everyday, first-person moral judgments, remain relatively understudied. Prior research has shown that moral behaviors happen on at least three social dimensions: 1) First-person, such as making personal moral decisions, evaluating one's own moral judgments, and experiencing emotions as a consequence of one's own behaviors (e.g. guilt, regret, sadness, pain), 2) Third-person, such as evaluating the "rightness" and "wrongness" of others' moral actions [12] and experiencing emotions as a consequence of others' behaviors (e.g. condemnation/contempt, anger, pain, disgust) [94], and 3) at the group-level, such as adhering to social norms, and exhibiting disgust/contempt for out-group members and pride/loyalty for in-group members [95–97].

While social psychologists have done an excellent job of looking at the latter two dimensions of moral behavior (third-person and group-level), we believe that neuroimaging is uniquely suited to addressing first-person moral decision-making. Though individuals may come to the same moral conclusions when evaluating their own and others' moral behaviors (e.g. stealing is wrong regardless of who does it), the process by which they get there may be markedly different—for example, one might expect to see more neural and behavioral indications of conflict when considering one's own moral transgressions than when considering



those of others. The differences in the early and late onset vmPFC patients mentioned above [77] suggest that this may be the case, and that this region may play an important role in the weighting of self-interest in moral decision-making. Future work should further examine these types of moral questions.

#### How Do Moral Intentions Become Moral Behavior?

Specifically, looking at more naturalistic first-person moral dilemmas will allow researchers to focus on how preexisting goals and motivations influence moral behavior. These factors may play an important role in clarifying and understanding the interplay between affective and cognitive processes in moral judgment. The majority of previously studied first-person dilemmas involve variations on the trolley dilemma, or other hypothetical moral scenarios that do not adequately reflect the types of moral decisions that individuals make frequently (such as cheating on tests, taxes, or romantic partners). Gaining better insight into affective and cognitive processes that underlie real-world moral decision-making would be useful in terms of understanding how individuals make moral predictions for their own behavior and when those predictions fail, for example, most individuals do not intend to cheat on their taxes, but many end up doing so.

The hot-cold empathy gap [98] suggests that human beings are unable to accurately imagine motivational and emotional states that they are not currently experiencing, and that they often fail to take into account visceral influences (e.g. hunger, arousal) on future decisions. Failure to take into account the strong pull of visceral states also leads individuals in “cold” states to stigmatize impulsive behavior [99]. This may partially account for discrepancies between individuals’ moral intentions and their immoral behaviors. By examining the affective processes underlying everyday moral decision-making, we may be able to gain a better understanding of this gap, and possibly how to close it.

#### Examining Moral Behavior across the Lifespan

While a great deal of moral research has focused on how children learn moral rules and make moral decisions, comparatively little has looked at how moral behavior changes throughout the lifespan. Viewing the same behavior from the lens of a parent versus that of a teenager

could shift moral meaning of the same situation (violating curfew). Indeed, changes in social roles like parenthood have been shown to impact how people construe what is moral and immoral. In one study, Eibach, Libby, and Ehrlinger [100] found that parents who were primed with their parental role prior to making moral judgments found harmless offensive acts (e.g. someone surgically adding horns to their head) to be more immoral than those who were not parents and parents who were unprimed. They make the argument that one’s social role and concerns can shape moral decision-making. The roles that an individual assumes throughout his or her life will change a great deal, and may change how she or he views certain moral actions. These developmental differences may also happen at the automatic level of emotion processing, as emotionality may change as a function of age [101]. As brain regions develop and change over time, their contributions to moral behavior may shift accordingly [102].

#### Conclusions

The field of moral psychology has done an excellent job of bringing emotion into the study of moral behavior, now it’s just a matter of figuring out the specific parameters of the role that it plays. The use of neuroscience methods, coupled with a perspective that views emotion’s role in moral judgment as both automatic and controlled, may help us gain a new view of moral behavior, one that can better address how emotions inform moral behavior throughout the evaluation process. Opinions and emotions about moral issues can be strong, but they can also be flexible, and can be shaped and altered by an individual’s goals and motivations. In many ways, Hemingway was right, when thinking about moral behavior; we tend to make distinctions based on what we feel good and bad after. However, studying the “after” only gets us halfway there. Only by understanding what is felt both “before” and “during” will we truly be able to gain a full picture of moral judgment.

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