In S. M. Laham (Ed.), *Handbook of ethics and social psychology* (pp. 118-129). Cheltenham, UK: Edward Elgar Publishing.

10. Moral-dilemma judgments

Bertram Gawronski, Nyx L. Ng, and Michael T. Dale

INTRODUCTION

Although moral dilemmas have been a prominent tool in psychological research since Kohlberg's (1971) work on moral development, modern research on moral-dilemma judgments has focused predominantly on a particular class of dilemmas in which choices maximizing the greater good (that is, utilitarianism or outcome-based morality) conflict with choices adhering to moral norms (that is, deontology or rule-based morality). Over the past two decades, a large body of research in various areas of psychology has investigated contextual conditions that influence preference for utilitarian versus deontological judgments, the psychological processes underlying utilitarian and deontological judgments, neural correlates of utilitarian and deontological judgments, and individual-difference factors that are associated with preference for utilitarian versus deontological judgments. This chapter provides an overview of significant methodological, empirical, and theoretical contributions in this line of work.

TRADITIONAL DILEMMA PARADIGM

Research on moral-dilemma judgments has been strongly shaped by the trolley problem, in which a runaway trolley is said to approach a group of five people who would be killed by the trolley if it continues on its path. In a variant called the switch dilemma, participants are told that pulling a lever would redirect the trolley to a different track where it would kill only one person instead of five (Foot, 1967). In a variant called the footbridge dilemma, participants are told that the trolley could be stopped by pushing a man from a bridge in front of the trolley, which would kill the man but save the five people on the track (Thomson, 1976). Judgments supporting these actions have been described as characteristically utilitarian in the sense that they maximize well-being for the larger number of people (that is, kill one to save five; see Conway et al., 2018). In contrast, judgments opposing these actions have been described as characteristically deontological in the sense that they conform to a relevant moral norm (that is, do not kill; see Conway et al., 2018). Although the trolley problem is by far the most frequently used scenario in this line of work, researchers have created a variety of structurally similar scenarios for empirical investigations of moral-dilemma judgments (e.g., Christensen et al., 2014).

The traditional dilemma paradigm has been used in many studies to investigate contextual influences, individual-difference correlates, and biological determinants of moral-dilemma judgments. Examples of contextual influences that have been investigated in moral-dilemma research include incidental mood states (e.g., Valdesolo and DeSteno, 2006), uncertainty about outcomes (e.g., Kortenkamp and Moore, 2014), and use of a foreign language (e.g., Geipel et al., 2015); examples of individual-difference variables that have been investigated in moral-dilemma research include the propensity to engage in cognitive reflection (e.g., Patil

et al., 2021), antisocial traits (e.g., Bartels and Pizarro, 2011), and political orientations (e.g., Hannikainen et al., 2017); examples of biological determinants that have been investigated in moral-dilemma research include hormone levels (e.g., Carney and Mason, 2010), brain activity (e.g., Koenigs et al., 2007), and genetic factors (e.g., Bernhard et al., 2016). Much past research has assessed correlates of and influences on moral judgments (that is, "Is it acceptable to do X?") and moral decisions (that is, "Would you do X?"), with extant work suggesting that different psychological processes may underlie these distinct forms of moral-dilemma responses (e.g., Pletti et al., 2017; Tassy et al., 2013). Some studies have used hypothetical judgments in the traditional dilemma paradigm to predict actual moral behavior, but available evidence in this line of work is rather mixed and inconclusive about associations between hypothetical moral-dilemma judgments and actual moral behavior (e.g., Bostyn et al., 2018; Capraro et al., 2018; Dickinson and Masclet, 2019).

DUAL-PROCESS MODEL

Among the theories that have been proposed to explain moral-dilemma judgments (e.g., Cohen and Ahn, 2016; Cushman, 2013; Greene, 2008, 2014; Holyoak and Powell, 2016), the most prominent account is Greene's (2008, 2014) dual-process model (DPM). According to the DPM, utilitarian and deontological judgments are rooted in distinct psychological processes. Whereas utilitarian judgments are assumed to be the product of controlled cognitive analyses of costs and benefits, deontological judgments are assumed to be rooted in automatic emotional reactions to the idea of causing harm. Consistent with these ideas, participants have been found to show a lower preference for utilitarian over deontological judgments in the footbridge dilemma than in the switch dilemma, presumably because direct physical contact with the target in the footbridge dilemma involves a stronger emotional reaction to the idea of causing harm (Greene, 2008). Moreover, some studies found that factors undermining cognitive reflection (for example, time pressure, cognitive load) interfere with utilitarian judgments, presumably because utilitarian judgments require greater cognitive resources than deontological judgments (e.g., Greene et al., 2008; Suter and Hertwig, 2011). Another frequently cited finding is that utilitarian and deontological judgments seem to have distinct neural underpinnings, in that utilitarian judgments are associated with activation in brain areas claimed to signify central aspects of cognitive processing, whereas deontological judgments are associated with activation in brain areas claimed to signify central components of emotional processing (e.g., Greene et al., 2001, 2004).

Expanding on the empirical work inspired by the DPM, Greene proposed the normative conclusion that utilitarian judgments are superior to deontological judgments (e.g., Greene, 2003, 2008, 2014). Greene based this claim on the argument that the emotional system supposedly underlying deontological judgments is less reliable than the cognitive system supposedly underlying utilitarian judgments, because judgments produced by the emotional system are affected by morally irrelevant factors (for example, whether a focal action does or does not involve direct physical contact). For example, in the switch and footbridge versions of the trolley problem, the number of lives lost and the number saved are identical across the two dilemmas (that is, one versus five). Yet, people are less inclined to endorse the utilitarian option in the footbridge dilemma than in the switch dilemma, presumably because direct physical contact with the target in the footbridge dilemma elicits a stronger emotional

reaction, which in turn interferes with what might be called the "rational" choice. According to Greene, the cognitive system underlying utilitarian judgments is immune to such morally irrelevant influences, which makes utilitarian judgments normatively superior to deontological judgments.

Although the DPM is still the most prominent account of moral-dilemma judgments, the theory has also been the target of criticism. One critique is that the available evidence is much less consistent than is suggested by selective citation patterns in the literature. For example, while some studies found that manipulations to disrupt cognitive reflection reduced utilitarian judgments (e.g., Suter and Hertwig, 2011), such manipulations did not influence moral-dilemma judgments in several other studies (e.g., Greene et al., 2008; Gürçay and Baron, 2017; Tinghög et al., 2016), and some studies even found the opposite effect (e.g., Hashimoto et al., 2022). The frequently cited evidence for distinct neural underpinnings seems similarly ambiguous. Aside from the issue that inferences of mental processes from neural activation involve the fallacy of reverse inference (Beer, 2015; Poldrack, 2006), the evidence itself is not as clean as commonly assumed, because utilitarian judgments in these studies were also associated with areas claimed to signify emotional processing, and deontological judgments were also associated with areas claimed to signify cognitive processing (see Dale, 2020). These issues pose a challenge not only for the DPM: they also raise questions about Greene's (2003, 2008, 2014) normative arguments about the superiority of utilitarian judgments, because these arguments presuppose that the theoretical claims of the DPM are valid.

METHODOLOGICAL PROBLEMS

In addition to critiques of the DPM, concerns have been raised about several methodological problems of the trolley problem and the traditional dilemma paradigm more broadly. One critique is that the trolley problem and many other traditional dilemmas are highly unrealistic, and that many of the scenarios cause amusement among participants rather than moral concern. The former issue seems problematic, because low plausibility has been found to influence moral-dilemma judgments in a manner that can produce empirical artifacts (Körner et al., 2019). The latter issue also seems problematic, because amusement is a rather unlikely response to moral situations, which raises questions about the suitability of such scenarios for understanding moral judgments (Bauman et al., 2014).

Although these concerns can be addressed by using realistic dilemmas based on real-world events (Körner and Deutsch, 2023), the traditional dilemma paradigm has also been criticized for including two confounds that render empirical findings theoretically ambiguous. One confound involves the non-independent measurement of utilitarian and deontological judgments, in that endorsement of the utilitarian option necessarily requires rejection of the deontological option, and vice versa (Conway and Gawronski, 2013). Thus, for any given finding, it remains unclear whether it is driven by differences in the tendency to make a utilitarian judgment, differences in the tendency to make a deontological judgment, or differences in both. An illustrative example is the finding that participants who score high on measures of psychopathy show a greater preference for utilitarian over deontological judgments than participants who score low on measures of psychopathy (for a meta-analysis, see Marshall et al., 2018). Arguably, it seems rather implausible that individuals high in psychopathy are concerned about maximizing well-being for the greater good (Bartels and Pizarro, 2011; Kahane et al., 2015). Instead,

it seems much more likely that individuals high in psychopathy do not object to causing harm (Conway et al., 2018). Yet, in the traditional dilemma paradigm, it is impossible to distinguish between the two alternatives.

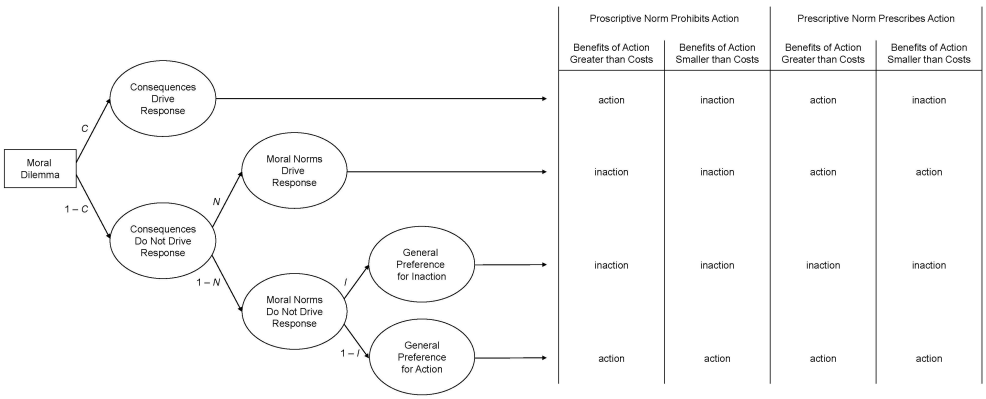
A second confound present in the traditional dilemma paradigm is that the utilitarian option typically involves action, whereas the deontological option typically involves inaction (Crone and Laham, 2017). Thus, for any given finding, it remains unclear whether it reflects differences in moral preferences, differences in general action preferences, or differences in both. This issue becomes especially important when considering research on the omission bias, which reflects the tendency to perceive harm caused via action as more severe than the same harm caused via inaction (for example, killing a person is perceived as more severe than letting the person die; see Cushman et al., 2006; Spranca et al., 1991; for a meta-analysis, see Yeung et al., 2022). Such asymmetric perceptions of harm can lead to a general preference for inaction over action, in that someone may support inaction regardless of whether a proscriptive norm suggests inaction or a prescriptive norm suggests action (Janoff-Bulman et al., 2009), and regardless of whether overall well-being would be maximized by action or inaction.

ALTERNATIVE APPROACHES

To resolve the non-independent measurement of utilitarian and deontological tendencies, Conway and Gawronski (2013) adopted a process-dissociation (PD) approach (see Jacoby, 1991) to independently quantify the strength of utilitarian and deontological tendencies in responses to moral dilemmas. To this end, Conway and Gawronski's (2013) PD model compares responses across two moral-dilemma versions. In one version, utilitarian and deontological judgments are pitted against each other, such that utilitarianism supports action and deontology supports inaction (that is, incongruent dilemmas). In the other version, the scenarios are designed such that utilitarianism and deontology both support inaction (that is, congruent dilemmas). By applying PD analyses to judgments on congruent and incongruent dilemmas, one can independently quantify the strength of utilitarian and deontological tendencies in responses to moral dilemmas. Although some studies using this approach obtained results that are consistent with predictions of the DPM, others produced findings that are difficult to reconcile with the DPM. For example, consistent with predictions of the DPM, Conway and Gawronski (2013) found that: (1) cognitive load reduced utilitarian tendencies without affecting deontological tendencies; and (2) enhanced salience of harm increased deontological tendencies without affecting utilitarian tendencies. However, inconsistent with predictions of the DPM, other studies found that both utilitarian and deontological tendencies are positively associated with cognitive reflection (e.g., Byrd and Conway, 2019); yet other studies found that, among religious participants, time pressure reduced deontological tendencies without affecting utilitarian tendencies (McPhetres et al., 2018). The latter set of findings is difficult to reconcile with the DPM hypotheses that utilitarian judgments are the product of controlled cognitive analyses of costs and benefits, whereas deontological judgments are rooted in automatic emotional reactions to the idea of causing harm.

Expanding on Conway and Gawronski's (2013) PD model, Gawronski et al. (2017) proposed an extended multinomial processing tree (MPT) model (see Hütter and Klauer, 2016) that additionally resolves the action–inaction confound in the traditional dilemma paradigm. To this end, the model compares responses across four types of moral dilemmas that differ

in terms of whether: (1) the focal action is proscribed by a proscriptive norm or prescribed by a prescriptive norm; and (2) the benefits of the focal action for the greater good are either greater or smaller than the costs (see Gawronski and Beer, 2017). A model parameter labeled *C* captures sensitivity to consequences in responses to the four types of dilemmas, involving support for action when the benefits of action are greater than the costs and support for inaction when the benefits of action are smaller than the costs (see first row in Figure 10.1). A model parameter labeled *N* captures sensitivity to moral norms in responses to the four types of dilemmas, involving support for inaction when a proscriptive norm prohibits action, and support for action when a prescriptive norm prescribes action (see second row in Figure 10.1). Finally, a model parameter labeled *I* captures general preference for inaction versus action in responses to the four types of dilemmas, involving support for inaction (versus action) regardless of cost–benefit ratios and moral norms (see third and fourth rows in Figure 10.1). Based on the labels of the three parameters, the model is called the CNI model of moral-dilemma judgment.



Source: Gawronski et al. (2017). Reprinted with permission from the American Psychological Association.

Figure 10.1 *CNI model of moral decision-making predicting action versus inaction responses in moral dilemmas with proscriptive and prescriptive norms, and consequences wherein the benefits of action are either greater or smaller than the costs of action*

The value of the CNI model in providing deeper insights into the determinants of moral-dilemma judgments can be illustrated with the abovementioned finding that participants who score high on measures of psychopathy show a greater preference for utilitarian over deontological judgments in the traditional dilemma paradigm as compared to those who score low on measures of psychopathy (for a meta-analysis, see Marshall et al., 2018). Research using the CNI model found that the relation between psychopathy and moral-dilemma judgments is much more complex, in that individuals high (versus low) in psychopathy show: (1) weaker sensitivity to consequences; (2) weaker sensitivity to moral norms; and (3) weaker general preference for inaction versus action (e.g., Gawronski et al., 2017; Körner et al., 2020; Luke and Gawronski,

2021a). Arguably, the most interesting aspect of these findings is the negative association between psychopathy and sensitivity to consequences, which suggests that individuals high in psychopathy are less utilitarian than individuals low in psychopathy. This finding stands in contrast to the conclusion suggested by research using the traditional dilemma paradigm that individuals high in psychopathy are more utilitarian than individuals low in psychopathy (see Bartels and Pizarro, 2011; Kahane et al., 2015; Marshall et al., 2018). Because it is not possible to disentangle the three determinants of moral-dilemma judgments in the traditional dilemma paradigm, it can lead to inaccurate conclusions, such as the one about psychopathy being positively related to utilitarianism.

Research using the CNI model has provided nuanced insights for a wide range of questions in moral-dilemma research, including the effects of incidental emotional states (Gawronski et al., 2018), foreign-language use (Białek et al., 2019), uncertainty about outcomes (Ng et al., 2023), antisocial traits (Luke et al., 2022), political orientation (Luke and Gawronski, 2021b), and hormone levels (Brannon et al., 2019). There is also evidence suggesting that the parameters of the CNI model can be used to predict moral behavior (Ng et al., 2022). At the theoretical level, several findings obtained with the CNI model pose a challenge to the DPM and, by extension, Greene's (2008, 2014) normative arguments about the superiority of utilitarianism to deontology (Dale and Gawronski, 2023). For example, counter to the DPM hypothesis that utilitarian judgments are the product of controlled cognitive analyses of costs and benefits, two studies by Gawronski et al. (2017) found that cognitive load increased general preference for inaction versus action without affecting sensitivity to consequences and sensitivity to moral norms. A potential interpretation of this finding is that people prefer inaction when they feel that they do not have the cognitive capacity to make a well-informed decision, because harm caused via inaction is perceived as less severe than harm caused via action (see Yeung et al., 2022). Although this interpretation accounts for the findings obtained with the CNI model, it is rather different from the hypothesis that cognitive analyses of costs and benefits require cognitive resources. If the latter hypothesis were correct, cognitive load should reduce sensitivity to consequences, which does not seem to be the case.

Another example pertains to the effect of personal involvement which, according to the DPM, should increase deontological judgments via enhanced automatic emotional reactions to the idea of causing harm. Yet, research using the CNI model suggests a more complex pattern of effects, in that personal involvement reduced sensitivity to moral norms on the model's *N* parameter and, at the same time, increased general preference for inaction versus action on the model's *I* parameter (Gawronski et al., 2017; Körner et al., 2020). Although the latter finding can be reconciled with the DPM by assuming that general preference for inaction can reflect general aversion to causing harm (Baron and Goodwin, 2020), the DPM is unable to explain why personal involvement should reduce sensitivity to moral norms, which arguably reflects a pattern of deontological responding. Together, these findings pose a challenge to the DPM and, by extension, the normative arguments that have been made based on the DPM. If the validity of the DPM as a theory of moral-dilemma judgments is in doubt, so are the normative conclusions derived from the DPM (Dale and Gawronski, 2023).

SOCIAL IMPRESSIONS

Based on research indicating that morality is a central dimension of social impressions (Brambilla et al., 2021), a recent line of work has investigated how moral impressions of others are shaped by their responses in moral dilemmas. A well-replicated finding in this work is that people who make deontological judgments in the traditional dilemma paradigm are perceived as having stronger moral character than people who make utilitarian judgments (e.g., Everett et al., 2016; Rom et al., 2017). Drawing on the distinction between warmth and competence in social impressions (see Abele et al., 2021; Koch et al., 2021), some studies further suggest that people who make deontological judgments in the traditional dilemma paradigm are perceived as warmer than people who make utilitarian judgments, while people who make utilitarian judgments are perceived as more competent than people who make deontological judgments (Rom et al., 2017).

Expanding on work relying on the traditional dilemma paradigm to study social impressions, research using the CNI model suggests that the link between deontological judgments and perceived morality is driven by sensitivity to moral norms, in that perceived morality is associated with greater presumed adherence to moral norms in the resolution of moral dilemmas (Gawronski, 2022). Associations with sensitivity to consequences and general action tendencies seem to be less reliable and driven by factors that tend to be confounded with perceived morality (for example, perceived social influence). Together, the findings on social impressions suggest that people's naïve intuitions about morality do not align with Greene's (2003, 2008, 2014) normative arguments about the superiority of utilitarianism. Instead, people seem to regard those whose responses conform to deontological ideas when resolving moral dilemmas as morally superior, potentially because those who adhere to moral norms are perceived as more predictable (Turpin et al., 2021) and trustworthy (Sacco et al., 2017). Another interesting implication of the findings on moral perception is that people might use mental simulations of the presumed choices by moral paragons to guide their own decisions; a potential mechanism underlying moral-dilemma judgments that has hitherto been ignored (see Gawronski, 2022).

OUTLOOK

Findings obtained with advanced approaches such as the CNI model (Gawronski et al., 2017) pose a challenge to the DPM (Greene, 2007) as the most influential account of moral-dilemma judgments. However, because these advanced approaches only quantify patterns of responses without specifying their underlying mental processes (Dale and Gawronski, 2023), a dismissal of the DPM raises the question of what mechanisms underlie moral-dilemma judgments. At this point, there is no straightforward answer to this question. Although some of the less influential theories might be able to fill this explanatory gap (e.g., Holyoak and Powell, 2016), there has been no attempt to systematically link these theories to the evidence obtained with advanced approaches (to gauge their explanatory power) and to derive novel predictions that could be tested with these approaches (to gauge their predictive power). We deem these endeavors as the most important tasks for the next phase of research on moral-dilemma judgments.

Another interesting direction for future research involves applications of PD and MPT modeling to other moral trade-offs. According to moral foundations theory (Graham et al., 2013),

moral-dilemma research is primarily concerned with trade-offs involving care and harm, providing little information about trade-offs in other domains of morality such as fairness, loyalty, authority, and purity. Although some researchers have rejected the idea of "harmless wrongs," arguing that harm is an essential aspect of morality (Schein and Gray, 2018), it would be possible to create trade-off scenarios involving other moral foundations and to utilize advanced approaches such as PD and MPT modeling to quantify different factors underlying moral judgments in these scenarios. Yet, when pursuing ideas along these lines, researchers should be aware that consensus about moral norms tends to be much smaller in domains that do not involve care and harm (Graham et al., 2009), which makes it inherently difficult to develop construct-valid manipulations of moral norms for applications of PD and MPT modeling. Thus, while it would be interesting to extend the use of PD and MPT modeling to trade-offs involving moral foundations other than care and harm, such applications need to be thoroughly validated before interpreting findings involving contextual influences, individual-difference correlates, and biological determinants of moral judgments.

REFERENCES

Abele, A.E., Ellemers, N., Fiske, S.T., Koch, A., and Yzerbyt, V. (2021). Navigating the social world: Toward an integrated framework for evaluating self, individuals, and groups. Psychological Review, 128, 290–314. https://psycnet.apa.org/doi/10.1037/rev0000262.

Baron, J., and Goodwin, G.P. (2020). Consequences, norms, and inaction: A critical analysis. *Judgment and Decision Making*, *15*, 421–442. https://doi.org/10.1017/S193029750000721X.

Bartels, D.M., and Pizarro, D.A. (2011). The mismeasure of morals: Antisocial personality traits predict utilitarian responses to moral dilemmas. *Cognition*, *121*, 154–161. https://doi.org/10.1016/j.cognition.2011.05.010.

Bauman, C.W., McGraw, A.P., Bartels, D.M., and Warren, C. (2014). Revisiting external validity: Concerns about trolley problems and other sacrificial dilemmas in moral psychology. *Social and Personality Psychology Compass*, *8*, 536–554. https://doi.org/10.1111/spc3.12131.

Beer, J.S. (2015). Cognitive neuroscience of social behavior. In B. Gawronski and G.V. Bodenhausen (eds), *Theory and explanation in social psychology* (pp. 183–204). Guilford Press.

Bernhard, R.M., Chaponis, J., Siburian, R., Gallagher, P., Ransohoff, K., Wikler, D., ... and Greene, J.D. (2016). Variation in the oxytocin receptor gene (OXTR) is associated with differences in moral judgment. *Social Cognitive and Affective Neuroscience*, *11*, 1872–1881. https://doi.org/10.1093/scan/nsw103.

Białek, M., Paruzel-Czachura, M., and Gawronski, B. (2019). Foreign language effects on moral dilemma judgments: An analysis using the CNI model. *Journal of Experimental Social Psychology*, *85*, Article 103855. https://doi.org/10.1016/j.jesp.2019.103855.

Bostyn, D.H., Sevenhant, S., and Roets, A. (2018). Of mice, men, and trolleys: Hypothetical judgment versus real-life behavior in trolley-style moral dilemmas. *Psychological Science*, *29*, 1084–1093. https://doi.org/10.1177/0956797617752640.

Brambilla, M., Sacchi, S., Rusconi, P., and Goodwin, G.P. (2021). The primacy of morality in impression development: Theory, research, and future directions. *Advances in Experimental Social Psychology*, *64*, 187–262. https://doi.org/10.1016/bs.aesp.2021.03.001.

Brannon, S.M., Carr, S., Jin, E.S., Josephs, R.A., and Gawronski, B. (2019). Exogenous testosterone increases sensitivity to moral norms in moral dilemma judgments. *Nature Human Behavior*, *3*, 856–866. https://doi.org/10.1038/s41562-019-0641-3.

Byrd, N., and Conway, P. (2019). Not all who ponder count costs: Arithmetic reflection predicts utilitarian tendencies, but logical reflection predicts both deontological and utilitarian tendencies. *Cognition*, *192*, Article 103995. https://doi.org/10.1016/j.cognition.2019.06.007.

Capraro, V., Sippel, J., Zhao, B., Hornischer, L., Savary, M., Terzopoulou, Z., … and Griffioen, S.F. (2018). People making deontological judgments in the Trapdoor dilemma are perceived to be more

prosocial in economic games than they actually are. *PlosONE*, *13*, Article e0205066. https://doi.org/10.1371/journal.pone.0205066.

Carney, D.R., and Mason, M.F. (2010). Decision making and testosterone: When the ends justify the means. *Journal of Experimental Social Psychology*, *46*, 668–671. https://doi.org/10.1016/j.jesp.2010.02.003.

Christensen, J.F., Flexas, A., Calabrese, M., Gut, N.K., and Gomila, A. (2014). Moral judgment reloaded: A moral dilemma validation study. *Frontiers in Psychology*, *5*, Article 607. https://doi.org/10.3389/fpsyg.2014.00607.

Cohen, D., and Ahn, M. (2016). A subjective utilitarian theory of moral judgment. *Journal of Experimental Psychology: General*, *145*, 1359–1381. https://psycnet.apa.org/doi/10.1037/xge0000210.

Conway, P., and Gawronski, B. (2013). Deontological and utilitarian inclinations in moral decision-making: A process dissociation approach. *Journal of Personality and Social Psychology*, *104*, 216–235. https://psycnet.apa.org/doi/10.1037/a0031021.

Conway, P., Goldstein-Greenwood, J., Polacek, D., and Greene, J. (2018). Sacrificial utilitarian judgments do reflect concern for the greater good: Clarification via process dissociation and the judgments of philosophers. *Cognition*, *179*, 241–265. https://doi.org/10.1016/j.cognition.2018.04.018.

Crone, D.L., and Laham, S.M. (2017). Utilitarian preferences or action preferences? De-confounding action and moral code in sacrificial dilemmas. *Personality and Individual Differences*, *104*, 476–481. https://doi.org/10.1016/j.paid.2016.09.022.

Cushman, F. (2013). Action, outcome, and value: A dual-system framework for morality. *Personality and Social Psychology Review*, *17*, 273–292. https://doi.org/10.1177/1088868313495594.

Cushman, F., Young, L., and Hauser, M. (2006). The role of conscious reasoning and intuition in moral judgment: Testing three principles of harm. *Psychological Science*, *17*, 1082–1089. https://doi.org/10.1111/j.1467-9280.2006.01834.x.

Dale, M. (2020). Neurons and normativity: A critique of Greene's notion of unfamiliarity. *Philosophical Psychology*, *33*, 1072–1095. https://doi.org/10.1080/09515089.2020.1787972.

Dale, M.T., and Gawronski, B. (2023). Brains, trains, and ethical claims: Reassessing the normative implications of moral dilemma research. *Philosophical Psychology*, *36*, 109–133. https://doi.org/10.1080/09515089.2022.2038783.

Dickinson, D.L., and Masclet, D. (2019). Using ethical dilemmas to predict antisocial choices with real payoff consequences: An experimental study. *Journal of Economic Behavior and Organization*, *166*, 195–215. https://doi.org/10.1016/j.jebo.2019.08.023.

Everett, J.A.C., Pizarro, D.A., and Crockett, M.J. (2016). Inference of trustworthiness from intuitive moral judgments. Journal of Experimental Psychology: General, 145, 772–787. https://psycnet.apa.org/doi/10.1037/xge0000165.

Foot, P. (1967). The problem of abortion and the doctrine of double effect. *Oxford Review*, *5*, 5–15.

Gawronski, B. (2022). Moral impressions and presumed moral choices: Perceptions of how moral exemplars resolve moral dilemmas. *Journal of Experimental Social Psychology*, *99*, Article 104265. https://doi.org/10.1016/j.jesp.2021.104265.

Gawronski, B., Armstrong, J., Conway, P., Friesdorf, R., and Hütter, M. (2017). Consequences, norms, and generalized inaction in moral dilemmas: The CNI model of moral decision-making. Journal of Personality and Social Psychology, 113, 343–376. https://psycnet.apa.org/doi/10.1037/pspa0000086.

Gawronski, B., and Beer, J.S. (2017). What makes moral dilemma judgments "utilitarian" or "deontological"? *Social Neuroscience*, *12*, 626–632. https://doi.org/10.1080/17470919.2016.1248787.

Gawronski, B., Conway, P., Armstrong, J., Friesdorf, R., and Hütter, M. (2018). Effects of incidental emotions on moral dilemma judgments: An analysis using the CNI model. *Emotion*, *18*, 989–1008. https://psycnet.apa.org/doi/10.1037/emo0000399.

Geipel, J., Hadjichristidis, C., and Surian, L. (2015). The foreign language effect on moral judgment: The role of emotions and norms. *PLoS ONE*, *10*, Article e0131529. https://doi.org/10.1371/journal.pone.0131529.

Graham, J., Haidt, J., Koleva, S., Motyl, M., Iyer, R., Wojcik, S.P., and Ditto, P.H. (2013). Moral foundations theory: The pragmatic validity of moral pluralism. *Advances in Experimental Social Psychology*, *47*, 55–130. https://doi.org/10.1016/B978-0-12-407236-7.00002-4.

Graham, J., Haidt, J., and Nosek, B.A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology*, *96*, 1029–1046. https://psycnet.apa.org/doi/10.1037/a0015141.

Greene, J. (2003). From neural "is" to moral "ought": what are the moral implications of neuroscientific moral psychology? *Nature Reviews Neuroscience*, *4*, 846–849. https://doi.org/10.1038/nrn1224.

Greene, J. (2008). The secret joke of Kant's soul. In W. Sinnott-Armstrong (ed.), *Moral psychology: The neuroscience of morality* (pp. 35–79). MIT Press.

Greene, J. (2014). Beyond point-and-shoot morality: Why cognitive (neuro)science matters for ethics. *Ethics*, *124*, 695–726. https://doi.org/10.1086/675875.

Greene, J.D., Morelli, S.A., Lowenberg, K., Nystrom, L.E., and Cohen, J.D. (2008). Cognitive load selectively interferes with utilitarian moral judgment. *Cognition*, *107*, 1144–1154. https://doi.org/10.1016/j.cognition.2007.11.004.

Greene, J., Nystrom, L., Engell, A., Darley, J., and Cohen, J. (2004). The neural bases of cognitive conflict and control in moral judgment. *Neuron*, *44*, 389–400. https://doi.org/10.1016/j.neuron.2004.09.027.

Greene, J., Sommerville, R., Nystrom, L., Darley, J., and Cohen, J. (2001). An fMRI investigation of emotional engagement in moral judgment. *Science*, *293*, 2105–2108. https://doi.org/10.1126/science.1062872.

Gürçay, B., and Baron, J. (2017). Challenges for the sequential two-system model of moral judgement. *Thinking and Reasoning*, *23*, 49–80. https://doi.org/10.1080/13546783.2016.1216011.

Hannikainen, I.R., Miller, R.M., and Cushman, F.A. (2017). Act versus impact: Conservatives and liberals exhibit different structural emphases in moral judgment. *Ratio*, *30*, 462–493. https://doi.org/10.1111/rati.12162.

Hashimoto, H., Maeda, K., and Matsumura, K. (2022). Fickle judgments in moral dilemmas: Time pressure and utilitarian judgments in an interdependent culture. *Frontiers in Psychology*, *13*, Article 795732. https://doi.org/10.3389/fpsyg.2022.795732.

Holyoak, K.J., and Powell, D. (2016). Deontological coherence: A framework for commonsense moral reasoning. *Psychological Bulletin*, *142*, 1179–1203. https://psycnet.apa.org/doi/10.1037/bul0000075.

Hütter, M., and Klauer, K.C. (2016). Applying processing trees in social psychology. *European Review of Social Psychology*, *27*, 116–159. https://doi.org/10.1080/10463283.2016.1212966.

Jacoby, L.L. (1991). A process dissociation framework: Separating automatic from intentional uses of memory. *Journal of Memory and Language*, *30*, 513–541. https://doi.org/10.1016/0749-596X(91)90025-F.

Janoff-Bulman, R., Sheikh, S., and Hepp, S. (2009). Proscriptive versus prescriptive morality: Two faces of moral regulation. *Journal of Personality and Social Psychology*, *96*, 521–537. https://psycnet.apa.org/doi/10.1037/a0013779.

Kahane, G., Everett, J.A.C., Earp, B.D. Farias, M., and Savulescu, J. (2015). "Utilitarian" judgments in sacrificial moral dilemmas do not reflect impartial concern for the greater good. *Cognition*, *134*, 193–209. https://doi.org/10.1016/j.cognition.2014.10.005.

Koch, A., Yzerbyt, V., Abele, A., Ellemers, N., and Fiske, S.T. (2021). Social evaluation: Comparing models across interpersonal, intragroup, intergroup, several-group, and many-group contexts. *Advances in Experimental Social Psychology*, *63*, 1–68. https://doi.org/10.1016/bs.aesp.2020.11.001.

Koenigs, M., Young, L., Adolphs, R., Tranel, D., Cushman, F., Hauser, M., and Damasio, A. (2007). Damage to the prefrontal cortex increases utilitarian moral judgements. *Nature*, *446*, 908–911. https://doi.org/10.1038/nature05631.

Kohlberg, L. (1971). Stages of moral development. *Moral Education*, *1*, 23–92.

Körner, A., and Deutsch, R. (2023). Deontology and utilitarianism in real life: A set of moral dilemmas based on historic events. *Personality and Social Psychology Bulletin*, *49*, 1511–1528. https://doi.org/10.1177/01461672221103058.

Körner, A., Deutsch, R., and Gawronski, B. (2020). Using the CNI model to investigate individual differences in moral-dilemma judgments. *Personality and Social Psychology Bulletin*, *46*, 1392–1407. https://doi.org/10.1177/0146167220907203.

Körner, A., Joffe, S., and Deutsch, R. (2019). When skeptical, stick with the norm: Low dilemma plausibility increases deontological moral judgments. *Journal of Experimental Social Psychology*, *84*, Article 103834. https://doi.org/10.1016/j.jesp.2019.103834.

Kortenkamp, K.V., and Moore, C.F. (2014). Ethics under uncertainty: The morality and appropriateness of utilitarianism when outcomes are uncertain. *American Journal of Psychology*, *127*, 367–382. https://doi.org/10.5406/amerjpsyc.127.3.0367.

Luke, D.M., and Gawronski, B. (2021a). Psychopathy and moral dilemma judgments: A CNI model analysis of personal and perceived societal standards. *Social Cognition*, *39*, 41–58. https://doi.org/10.1521/soco.2021.39.1.41.

Luke, D.M., and Gawronski, B. (2021b). Political ideology and moral dilemma judgments: An analysis using the CNI model. *Personality and Social Psychology Bulletin*, *47*, 1520–1531. https://doi.org/10.1177/0146167220987990.

Luke, D.M., Neumann, C.S., and Gawronski, B. (2022). Psychopathy and moral dilemma judgment: An analysis using the four-factor model of psychopathy and the CNI model of moral decision-making. *Clinical Psychological Science*, *10*, 553–569. https://doi.org/10.1177/21677026211043862.

Marshall, J., Watts, A.L., and Lilienfeld, S.O. (2018). Do psychopathic individuals possess a misaligned moral compass? A meta-analytic examination of psychopathy's relations with moral judgment. *Personality Disorders*: *Theory*, *Research*, *and Treatment*, *9*, 40–50. https://psycnet.apa.org/doi/10.1037/per0000226.

McPhetres, J., Conway, P., Hughes, J.S., and Zuckerman, M. (2018). Reflecting on God's will: Reflective processing contributes to religious people's deontological dilemma responses. *Journal of Experimental Social Psychology*, *79*, 301–314. https://doi.org/10.1016/j.jesp.2018.08.013.

Ng, N.L., Luke, D.M., and Gawronski, B. (2022). Prediction of dishonest behavior using the CNI model of moral dilemma judgment: A registered report. *Comprehensive Results in Social Psychology*, *6*, 85–112. https://doi.org/10.1080/23743603.2022.2102473.

Ng, N.L., Luke, D.M., and Gawronski, B. (2023). Moral judgment under uncertainty: A CNI model analysis. *European Journal of Social Psychology*, *53*, 1055–1077. https://doi.org/10.1002/ejsp.2952.

Patil, I., Zucchelli, M.M., Kool, W., Campbell, S., Fornasier, F., Calò, M., … and Cushman, F. (2021). Reasoning supports utilitarian resolutions to moral dilemmas across diverse measures. Journal of Personality and Social Psychology, 120, 443–460. https://psycnet.apa.org/doi/10.1037/pspp0000281.

Pletti, C., Lotto, L., Buodo, G., and Sarlo, M. (2017). It's immoral, but I'd do it! Psychopathy traits affect decision-making in sacrificial dilemmas and in everyday moral situations. *British Journal of Psychology*, *108*, 351–368. https://doi.org/10.1111/bjop.12205.

Poldrack, R. (2006). Can cognitive processes be inferred from neuroimaging data? *Trends in Cognitive Science*, *10*, 59–63. https://doi.org/10.1016/j.tics.2005.12.004.

Rom, S.C., Weiss, A., and Conway, P. (2017). Judging those who judge: Perceivers infer the roles of affect and cognition underpinning others' moral dilemma responses. *Journal of Experimental Social Psychology*, *69*, 44–58. https://doi.org/10.1016/j.jesp.2016.09.007.

Sacco, D.F., Brown, M., Lustgraaf, C.J., and Hugenberg, K. (2017). The adaptive utility of deontology: Deontological moral decision-making fosters perceptions of trust and likeability. *Evolutionary Psychological Science*, *3*, 125–132. https://doi.org/10.1007/s40806-016-0080-6.

Schein, C., and Gray, K. (2018). The theory of dyadic morality: Reinventing moral judgment by redefining harm. *Personality and Social Psychology Review*, *22*, 32–70. https://doi.org/10.1177/1088868317698288.

Spranca, M., Minsk, E., and Baron, J. (1991). Omission and commission in judgment and choice. *Journal of Experimental Social Psychology*, *27*, 76–105. https://doi.org/10.1016/0022-1031(91)90011-T.

Suter, R.S., and Hertwig, R. (2011). Time and moral judgment. *Cognition*, *119*, 454–458. https://doi.org/10.1016/j.cognition.2011.01.018.

Tassy, S., Oullier, O., Mancini, J., and Wicker, B. (2013). Discrepancies between judgment and choice of action in moral dilemmas. *Frontiers in Psychology*, *4*, Article 250. https://doi.org/10.3389/fpsyg.2013.00250.

Thomson, J.J. (1976). Killing, letting die, and the trolley problem. *The Monist*, *59*, 204–217.

Tinghög, G., Andersson, D., Bonn, C., Johannesson, M., Kirchler, M., Koppel, L., and Västfjäll, D. (2016). Intuition and moral decision-making: The effect of time pressure and cognitive load on moral judgment and altruistic behavior. *PLoS ONE*, *11*, Article e0164012. https://doi.org/10.1371/journal.pone.0164012.

Turpin, M.H., Walker, A.C., Fugelsang, J.A., Sorokowski, P., Grossmann, I., and Białek, M. (2021). The search for predictable moral partners: Predictability and moral (character) preferences. *Journal of Experimental Social Psychology*, *97*, Article 104196. https://doi.org/10.1016/j.jesp.2021.104196.

Valdesolo, P., and DeSteno, D. (2006). Manipulations of emotional context shape moral judgment. Psychological Science, 17, 476–477. https://doi.org/10.1111/j.1467-9280.2006.01731.x.

Yeung, S.K., Yay, T., and Feldman, G. (2022). Action and inaction in moral judgments and decisions: Meta-analysis of omission bias omission-commission asymmetries. *Personality and Social Psychology Bulletin*, *48*, 1499–1515. https://doi.org/10.1177/01461672211042315.