4 CONSEQUENCES, NORMS, AND GENERAL ACTION TENDENCIES

Understanding Individual Differences in Moral Dilemma Judgments

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A few years before the COVID-19 pandemic killed more than 6 million people around the world, an outbreak of the Ebola virus disease in West Africa stirred a heated debate in the United States. The debate was ignited by the case of Dr. Kent Brantly, an American physician who contracted the Ebola virus in Liberia (Blinder & Grady, 2014). It soon became clear that Brantly would die if he did not receive advanced medical treatment in his home country, but returning him involved a risk of causing an Ebola outbreak in the United States. In the weeks before Brantly was returned and cured, some people claimed a moral duty to save Brantly's life by returning him to the United States for treatment; others argued that it would be better to let him die in Liberia to avoid the potential death of a larger number of people.

The two conflicting views in this debate illustrate two philosophical ideas about morality. From a deontological view, the moral status of a behavioral option depends on its consistency with moral norms. This view is reflected in the argument that returning Brantly to the United States is morally right because it conforms to a moral duty to save his life. In contrast, from a utilitarian view, the moral status of a behavioral option depends on its consequences

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for the greater good. This view is reflected in the argument that not returning Brantly to the United States is morally right because it prevents the potential death of a larger number of people. Inspired by the distinction between deontology and utilitarianism, a substantial amount of research has investigated people's responses to moral dilemmas that pit one philosophical idea against the other (for a review, see Bartels et al., 2015). In addition to identifying various contextual factors that influence people's preference for utilitarian versus deontological judgments (e.g., Suter & Hertwig, 2011; Valdesolo & DeSteno, 2006), this research revealed a wide range of individual-difference variables that are systematically related to moral dilemma judgments (e.g., Gleichgerrcht & Young, 2013; Moore et al., 2011; Patil, 2015; van den Bos et al., 2011). The latter findings suggest that conflicting views in societal debates about the right course of action in real-world dilemmas (e.g., the debate about Brantly's return for medical treatment) may reflect deeper psychological differences between people.

In this chapter, we illustrate the value of a mathematical modeling approach in understanding individual differences in moral dilemma judgments. Toward this end, we first explain the traditional approach to studying moral dilemma judgments and its limitations. We then describe the CNI model of moral decision making (Gawronski et al., 2017), which quantifies three determinants of moral dilemma judgments: sensitivity to consequences (C), sensitivity to moral norms (N), and general preference for inaction versus action (I). In the remainder of the chapter, we review research that has used the CNI model to investigate the nature of individual differences in moral dilemma judgments. Our central argument is that, by identifying individual differences along the three dimensions, research using the CNI model provides more nuanced insights into the roots of societal controversies about the right course of action in real-world dilemmas.

THE TRADITIONAL DILEMMA APPROACH

In the traditional approach to studying moral dilemma judgments, participants are presented with a brief scenario with two response options, one of which is morally right from a utilitarian view and morally wrong from a deontological view, the other of which is morally right from a deontological view and morally wrong from a utilitarian view. The most well-known example is the *trolley dilemma*, a scenario in which a runaway trolley is on course to kill a group of five workers unless a particular action is performed that would kill one person instead of five (see Chapter 3, this volume). In a variant known

as the *switch dilemma*, participants are asked if it would be acceptable to pull a switch to redirect the trolley to another track where it would kill only one person instead of five (Foot, 1967). In a variant known as the *footbridge dilemma*, participants are asked if it would be acceptable to push a person from a footbridge to their death in order to obstruct the path of the trolley (Thomson, 1976). If participants judge the described action as acceptable, they are said to have made a characteristically utilitarian judgment (i.e., a judgment that maximizes the greater good; see Conway et al., 2018). Conversely, if participants judge the described action as unacceptable, they are said to have made a characteristically deontological judgment (i.e., a judgment that is consistent with the moral norm that one should not kill innocent people; see Conway et al., 2018).

Although the trolley dilemma and similar sacrificial dilemmas have been used in hundreds of studies, this research has been criticized for multiple reasons. One criticism is that the scenarios used in this research are rather implausible, which has been found to promote norm-congruent judgments (Körner et al., 2019). This is especially problematic for studies that compare responses across dilemmas that differ in terms of their plausibility. For example, although both the switch and the footbridge variants of the trolley dilemma seem rather implausible, many participants find the footbridge dilemma especially implausible (Körner & Deutsch, 2022). This difference poses a challenge to the widespread assumption that stronger preferences for deontological judgments in the footbridge dilemma are the result of direct physical contact with the target of one's harmful action (i.e., killing a person by pushing the person from a bridge vs. killing a person by pulling a switch), which has been claimed to enhance negative emotional reactions to the idea of causing harm (Greene et al., 2001). Given that (a) participants find the footbridge dilemma less plausible than the switch dilemma (Körner & Deutsch, 2022) and (b) low plausibility promotes norm-congruent judgments (Körner et al., 2019), different responses to these two dilemmas could also be due to differences in their perceived plausibility.

The low plausibility of the trolley dilemma and its variants also has important implications for research on individual differences in moral dilemma judgments. If (a) willingness to entertain implausible assumptions buffers the tendency to make norm-congruent judgments in implausible scenarios and (b) people systematically differ in their willingness to entertain implausible assumptions, people may show systematic differences in their responses to implausible dilemmas in the absence of genuine differences in moral preferences. These considerations call for scenarios with greater plausibility and real-world relevance compared with the artificial scenarios commonly used in moral dilemma research (see also Bauman et al., 2014).

In addition to the ambiguities that arise from low dilemma plausibility, the traditional approach includes two structural confounds that further undermine interpretations of findings obtained with this approach. First, the traditional approach confounds the measurement of outcome maximization and norm adherence in that accepting one option implies rejecting the other (Conway & Gawronski, 2013). Thus, it is impossible to determine whether differences in moral dilemma judgments are driven by differences in the tendency to maximize outcomes, differences in the tendency to adhere to moral norms, or differences in both. Second, the traditional approach typically conflates outcome maximization with action and norm adherence with inaction, leading to a confound with general action tendencies (Crone & Laham, 2017). This confound can be illustrated with the introductory example of Brantly's Ebola infection, where the action–inaction mapping is directly opposite to the one in the trolley dilemma. In the trolley dilemma and all of its variants, outcome maximization suggests action (e.g., pulling the lever, pushing the person), whereas norm adherence suggests inaction (e.g., not pulling the lever, not pushing the person). In contrast, in the case of Brantly's Ebola infection, outcome maximization suggests inaction (e.g., not returning him to the United States for treatment), whereas norm adherence suggests action (e.g., returning him to the United States for treatment). Because research using the traditional approach rarely controls for action–inaction mappings, whether differences in moral dilemma judgments reflect differences in outcome maximization, norm adherence, or general action tendencies remains ambiguous.

THE CNI MODEL

The CNI model of moral decision making is a formal model that resolves the two structural confounds in the traditional approach (Gawronski et al., 2017). Toward this end, the CNI model identifies patterns of responses across four types of dilemmas that vary in terms of whether (a) the consequences of the focal action for the greater good are either greater or smaller than the costs and (b) the focal action is either proscribed by a proscriptive norm or prescribed by a prescriptive norm (for an example, see Table 4.1). By exclusively relying on scenarios inspired by societal debates about real-world dilemmas (see Gawronski et al., 2017; Körner et al., 2020), research using the CNI model also addresses concerns about potential artifacts resulting from low dilemma plausibility.

Using a multinomial modeling approach (Hütter & Klauer, 2016), the CNI model quantifies the extent to which participants' judgments in a set of moral

TABLE 4.1. Example of a Moral Dilemma Involving Either a Proscriptive or a Prescriptive Norm Where the Benefits of Action Are Either Greater or Smaller Than the Costs of Action

	Benefits of action greater than costs	Benefits of action smaller than costs
Proscriptive norm prohibits action	You are the director of a hospital in a developing country. A foreign student who is volunteering in the country got infected with a rare virus. The virus is highly contagious and deadly to seniors and children. The only medication that can effectively stop the virus from spreading has severe side effects. Although the virus will not kill her, the student suffers from a chronic immune deficiency that will make her die from these side effects.	You are the director of a hospital in a developing country. A foreign student who is volunteering in the country got infected with a rare virus. The virus is highly contagious and can cause severe stomach cramps. The only medication that can effectively stop the virus from spreading has severe side effects. Although the virus will not kill her, the student suffers from a chronic immune deficiency that will make her die from these side effects.
	Would you give the student the medication in this case?	Would you give the student the medication in this case?
Prescriptive norm prescribes action	You are the director of a hospital in a developing country. A foreign student who is volunteering in the country got infected with a rare virus. The virus is highly contagious and can cause severe stomach cramps. The student suffers from a chronic immune deficiency that will make her die from the virus if she is not returned to her home country for special treatment. However, taking her out of quarantine involves a considerable risk that the virus will spread.	You are the director of a hospital in a developing country. A foreign student who is volunteering in the country got infected with a rare virus. The virus is highly contagious and deadly to seniors and children. The student suffers from a chronic immune deficiency that will make her die from the virus if she is not returned to her home country for special treatment. However, taking her out of quarantine involves a considerable risk that the virus will spread.
	Would you take the student out of quarantine to return her to her home country for treatment in this case?	Would you take the student out of quarantine to return her to her home country for treatment in this case?

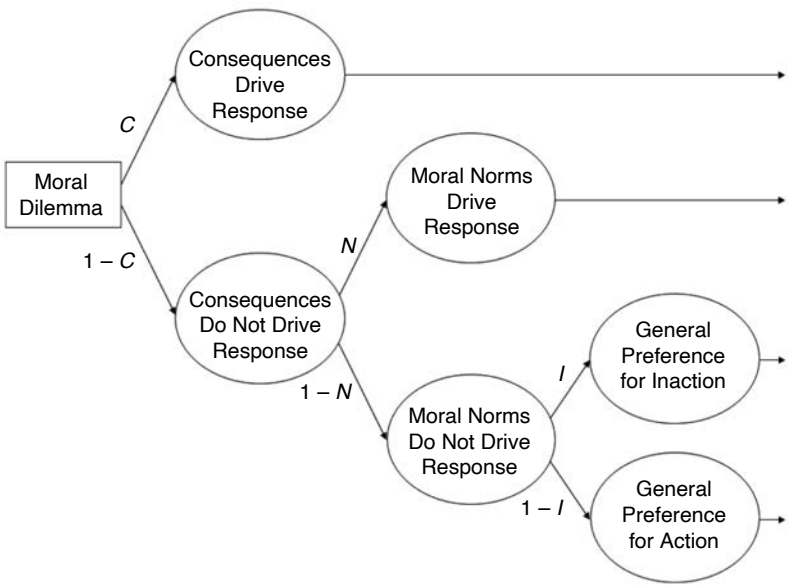
Note. From "Consequences, Norms, and Generalized Inaction in Moral Dilemmas: The CNI Model of Moral Decision-Making," by B. Gawronski, J. Armstrong, P. Conway, R. Friesdorf, and M. Hütter, 2017, *Journal of Personality and Social Psychology*, *113*(3), p. 371 (https://doi.org/10.1037/pspa0000086).

dilemmas reflect (a) a response pattern that is sensitive to consequences (first row in Figure 4.1), (b) a response pattern that is sensitive to moral norms (second row in Figure 4.1), or (c) a response pattern of general inaction versus general action (third and fourth rows in Figure 4.1). Each response pattern is captured by a model parameter that can range from a value of 0 to 1. Sensitivity to consequences is captured by the model's *C* parameter, with higher scores reflecting a greater impact of consequences on responses; sensitivity to moral norms is captured by the model's *N* parameter, with higher scores reflecting a greater impact of moral norms on responses; and general preference for inaction versus action is captured by the model's *I* parameter, with scores above .50 reflecting a greater general preference for inaction responses and scores below .50 reflecting a greater general preference for action responses.

Because the statistical underpinnings of the CNI model were explained in detail by Gawronski et al. (2017), here we only summarize the main steps in analyzing moral dilemma responses with the CNI model. On the basis of the processing tree depicted in Figure 4.1, the CNI model provides four mathematical equations that include the three model parameters as unknowns and the observed probabilities of action (vs. inaction) responses on the four kinds of dilemmas as known values (see Gawronski et al., 2017, Appendix B). Numerical scores for the three parameters are estimated via maximum likelihood statistics with the aim of minimizing the discrepancy between the empirically observed probabilities of action (vs. inaction) responses on the four types of dilemmas and the probabilities of action (vs. inaction) responses predicted by the model equations using the identified parameter estimates. The adequacy of the model in describing the data can be evaluated by means of goodness-of-fit statistics, such that poor model fit would be reflected in a significant deviation between the empirically observed probabilities and the probabilities predicted by the model. Differences in parameter estimates across groups can be tested by enforcing equal estimates for a given parameter across groups. If setting a given parameter equal across groups leads to a significant reduction in model fit, one can infer that the parameter estimates for the two groups are significantly different. To the extent that the number of dilemmas completed by each participant is sufficiently large, associations between the three parameters and individual-difference measures can be investigated by fitting the CNI model to the responses from each participant (see Körner et al., 2020).

The value of the CNI model in resolving the ambiguities of findings with the traditional approach can be illustrated with the results of multiple regression analyses using the three parameters as predictors and responses on traditional dilemmas as the criterion. Traditional dilemmas are scenarios where

FIGURE 4.1. The CNI Model of Moral Decision Making Predicting Action Versus Inaction Responses in Moral Dilemmas With Proscriptive and Prescriptive Norms and Consequences Involving Benefits of Action That Are Either Greater or Smaller Than the Costs of Action



Proscriptive Norm Prohibits Action		Prescriptive Norm Prescribes Action	
Benefits of Action Greater Than Costs	Benefits of Action Smaller Than Costs	Benefits of Action Greater Than Costs	Benefits of Action Smaller Than Costs
action	inaction	action	inaction
inaction	inaction	action	action
inaction	inaction	inaction	inaction
action	action	action	action

Note. From "Consequences, Norms, and Generalized Inaction in Moral Dilemmas: The CNI Model of Moral Decision-Making," by B. Gawronski, J. Armstrong, P. Conway, R. Friesdorf, and M. Hütter, 2017, *Journal of Personality and Social Psychology*, *113*(3), p. 347 (https://doi.org/10.1037/pspa0000086). Copyright 2017 by the American Psychological Association.

an action is prohibited by a moral norm but produces benefits for overall well-being that are greater than the costs (in line with the structure of the trolley dilemma). In the traditional approach, action responses to this type of dilemma maximize overall outcomes and have therefore been interpreted as characteristically utilitarian judgments (see Conway et al., 2018). Conversely, inaction responses conform to moral norms and have therefore been interpreted as characteristically deontological judgments (see Conway et al., 2018). On the basis of this conceptualization, the relative preference for action over inaction on this type of dilemma can be described as the relative preference for utilitarian over deontological judgments. Consistent with the concern that this preference score conflates multiple distinct factors, multiple regression analyses revealed systematic relations with all three parameters of the CNI model. Controlling for mere mathematical dependence,[1] preference for utilitarian over deontological judgments on traditional dilemmas has been found to be (a) positively associated with sensitivity to consequences on the *C* parameter, (b) negatively associated with sensitivity to moral norms on the *N* parameter, and (c) negatively associated with general preference for inaction versus action on the *I* parameter (Gawronski et al., 2020). Research by Luke and Gawronski (2022) further suggests that individual differences in sensitivity to consequences and moral norms are highly stable over a period of 1 month, showing test–retest correlations that are comparable to those of the Big Five personality traits (*r*s = .81 and .84, respectively). The temporal stability of general action tendencies was found to be significantly lower ($r = .41$). The latter finding seems partly due to the lower internal consistency of scores on the *I* parameter compared with the *C* and the *N* parameters (see Gawronski et al., 2020; Luke & Gawronski, 2022).

INDIVIDUAL DIFFERENCES IN MORAL DILEMMA JUDGMENTS

Research using the traditional approach has identified a wide range of individual-difference variables that are associated with moral dilemma judgments. However, as we explained earlier, the theoretical meaning of

[1]Because responses to traditional dilemmas are used in the CNI model equations to estimate numerical values for the three parameters, Gawronski et al. (2020) ensured mathematical independence of predictors and outcomes by using CNI model parameters for dilemmas with odd item numbers to predict traditional scores for dilemmas with even item numbers. Conversely, CNI model parameters for dilemmas with even item numbers were used to predict traditional dilemma scores for dilemmas with odd item numbers.

these findings is ambiguous because the observed associations may be driven by individual differences in (a) sensitivity to consequences, (b) sensitivity to moral norms, or (c) general preference for inaction versus action (or any combination of the three). In the following sections, we review research that has used the CNI model to gain deeper insights into the nature of individual differences in moral dilemma judgments. Toward this end, we first describe evidence regarding the relation of a given variable with moral dilemma judgments in research that has used the traditional approach, and then we review the more nuanced results obtained in research that has used the CNI model. Because the dilemmas in the latter work have been designed to be more plausible compared with the artificial scenarios in prior work that has taken the traditional approach, we also discuss whether the findings of previous research that has used the traditional approach can be replicated with the more plausible scenarios in research that has used the CNI model. Although different findings in the two lines of work may be due to multiple factors, one potential reason is that the low plausibility of the dilemmas in prior research produces artificial associations that may not reflect genuine differences in moral preferences (see Körner et al., 2019). Such artifacts may emerge when a given individual-difference variable is associated with systematic differences in the willingness to entertain implausible assumptions, such as the implausible assumptions in the trolley dilemma.

Empathic Concern

Prior research that has adopted the traditional approach has found a negative association between individual differences in empathic concern and preference for utilitarian over deontological judgments (e.g., Gleichgerrcht & Young, 2013). This finding was replicated in several studies using the more plausible dilemmas for research with the CNI model (Körner et al., 2020). Further analyses suggest that this relation is driven by a positive association between empathic concern and sensitivity to moral norms. Some studies also found a positive association between empathic concern and general preference for inaction versus action (Körner et al., 2020); however, this association seems less reliable compared with the association with sensitivity to moral norms. A potential reason for the mixed findings with the *I* parameter is that scores on this parameter tend to show lower estimates of internal consistency (Gawronski et al., 2020; Luke & Gawronski, 2022), which can reduce statistical power for the detection of associations that actually exist. Nevertheless, the reliable association between empathic concern and the *N* parameter suggests that previous findings obtained with the traditional approach are

driven by a stronger sensitivity to moral norms among individuals high in empathic concern (instead of a weaker sensitivity to consequences).

Need for Cognition

Some studies have found a positive association between individual differences in need for cognition and preference for utilitarian over deontological judgments (e.g., Wiech et al., 2013), but this association has been somewhat unreliable across studies (e.g., Patil et al., 2021). It also did not replicate in studies that have used the more plausible dilemmas for research with the CNI model (Körner et al., 2020). If anything, these studies suggest a negative association between need for cognition and preference for utilitarian over deontological judgments. Further analyses using the CNI model suggest that this negative relation is driven by a positive association between need for cognition and sensitivity to moral norms. A conceptually similar link has been found in studies that have used reaction times as an indicator of cognitive elaboration, showing that longer reaction times are associated with greater sensitivity to moral norms (Kroneisen & Steghaus, 2021). A potential explanation for the conflicting findings is that low plausibility of the dilemmas in prior research produces artificial associations that do not reflect genuine differences in moral preferences (see Körner et al., 2019). To the extent that (a) low plausibility promotes norm-congruent judgments and (b) individuals high in need for cognition are more willing to entertain the implausible assumptions of artificial dilemmas, need for cognition may show an artificial positive association with preference for utilitarian over deontological judgments, but this association may not be reflective of genuine differences in moral preferences. Thus, if such artifacts are controlled by means of plausible dilemmas with high real-world relevance, associations between need for cognition and moral dilemma judgments may look very different, as shown in studies that have used the more plausible dilemmas for research with the CNI model (Körner et al., 2020). This conclusion is consistent with other findings suggesting that the impact of cognitive deliberation on moral dilemma judgments is much more complex than suggested by the widespread assumption that high levels of deliberation invariably increase concerns about outcomes (e.g., Byrd & Conway, 2019; Körner & Volk, 2014).

Moral Identity Internalization

Some studies that have used the traditional approach have found a negative association between individual differences in self-importance of moral identity

internalization (for the sake of brevity, hereafter called *moral identity internalization*) and preference for utilitarian over deontological judgments (e.g., Glenn et al., 2010). This finding was replicated in several studies that used the more plausible dilemmas for research with the CNI model (Körner et al., 2020). It is interesting to note that further analyses using the CNI model have revealed that moral identity internalization is positively associated with sensitivity to consequences as well as sensitivity to moral norms. Although the two associations should have compensatory effects on the relation between moral identity internalization and preference for utilitarian over deontological judgments, the *N* parameter has consistently shown a stronger association with moral identity internalization compared with the *C* parameter, leading to a negative "net" relation between moral identity internalization and preference for utilitarian over deontological judgments. These findings indicate that the confounds in the traditional approach can conceal complex associations that remain hidden in standard data analytic methods, and these associations can be uncovered with the CNI model.

Utilitarian Beliefs

Kahane et al. (2018) proposed a two-dimensional model that distinguishes between two kinds of utilitarian beliefs: (a) *impartial beneficence* (IB), which refers to an impartial concern for the greater good; and (b) *instrumental harm* (IH), which refers to a permissive attitude toward instrumental harm. Using a newly developed scale measuring individual differences along the two dimensions, Kahane et al. found that impartial beneficence and instrumental harm are both positively associated with preference for utilitarian over deontological judgments. Both of these associations were replicated in several studies using the more plausible dilemmas for research with the CNI model (Körner et al., 2020). However, counter to the idea that impartial beneficence and instrumental harm are linked to individual differences in utilitarian responding, further analyses using the CNI model did not find any evidence for positive associations between the *C* parameter and the two dimensions; instead, both IB and IH showed significant negative associations with the *N* and the *I* parameters; that is, higher scores on each dimension were associated with (a) a weaker sensitivity to moral norms and (b) a weaker general preference for inaction versus action. Although further research is needed to understand the psychological underpinnings of these findings, they suggest that the two dimensions of utilitarian beliefs may serve to rationalize a preference for norm-violating actions regardless of the specific situation (see Haidt, 2001) instead of promoting a maximization of outcomes in a utilitarian sense.

Behavioral Activation and Inhibition

Prior research that has taken the traditional approach suggests that preference for utilitarian over deontological judgments is positively associated with individual differences in behavioral activation (BAS; e.g., Moore et al., 2011) and negatively associated with individual differences in behavioral inhibition (BIS; e.g., van den Bos et al., 2011). Conceptually, these findings may point to the role of general action tendencies in moral dilemma judgments in that BAS may be associated with a general preference for action, whereas BIS may be associated with a general preference for inaction. With the traditional measure of preference for utilitarian over deontological judgments, these associations should produce a negative association with BIS and a positive association with BAS; however, the available evidence for these predictions has been somewhat mixed across studies that have used the traditional approach (see Moore et al., 2011; van den Bos et al., 2011). In line with the mixed evidence, the obtained associations with BAS and BIS were not consistently replicated in studies that have used the more plausible dilemmas for research with the CNI model (Körner et al., 2020). The latter work also did not obtain any reliable associations with the three CNI parameters.

Religiosity

Prior research with the traditional approach has found a negative association between religiosity and preference for utilitarian over deontological judgments (e.g., Szekely et al., 2015). This finding was not replicated in studies that used the more plausible dilemmas for research with the CNI model (Körner et al., 2020); however, further analyses using the CNI model obtained a pattern consistent with prior findings in that religiosity showed a reliable negative association with sensitivity to consequences. Of interest is that there was no evidence for a positive association between religiosity and sensitivity to moral norms, which speaks against the hypothesis that the negative association between religiosity and preference for utilitarian over deontological judgments in previous studies might be driven by a greater concern about moral norms among religious individuals.

Political Orientation

Prior research with the traditional approach suggests that conservatives show a weaker preference for utilitarian over deontological judgments than liberals (e.g., Hannikainen et al., 2017). This finding was replicated in several

studies that used the more plausible dilemmas for research with the CNI model (Luke & Gawronski, 2021a). Further analyses using the CNI model revealed that the obtained association is driven by a weaker sensitivity to consequences among conservatives compared with liberals. This difference is consistent with accounts suggesting that conservatives are less willing to accept consequentialist arguments about the greater good than liberals (see Piazza & Sousa, 2014). There is no evidence for an association between political ideology and sensitivity to moral norms, disconfirming the hypothesis that conservatives are more concerned about norm violations than liberals (see Young et al., 2013). Moreover, there was no evidence for an association between political ideology and general preference for inaction over action, disconfirming the hypothesis that conservatives are more concerned about actions that interfere with current states of affairs than liberals (i.e., the status quo bias; see Samuelson & Zeckhauser, 1988).

Basic Personality Traits

We are not aware of any published research that has investigated associations between basic personality traits (e.g., Big Five, HEXACO) and moral dilemma judgments using the traditional approach. Using the CNI model to investigate associations between moral dilemma judgments and the Big Five personality traits (i.e., Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness; see Soto & John, 2017), Luke and Gawronski (2022) found that (a) sensitivity to consequences was negatively associated with Extraversion and positively associated with Openness, (b) sensitivity to moral norms was positively associated with Agreeableness and Openness, and (c) general preference for inaction versus action was positively associated with Openness. Kroneisen and Heck (2020) investigated the associations between moral dilemma judgments and a selected subset of the HEXACO personality traits (i.e., Honesty–Humility, Emotionality, Conscientiousness; see Ashton & Lee, 2007) and found a positive association between sensitivity to consequences and Emotionality, a positive association between sensitivity to moral norms and Honesty–Humility, and a positive association between general preference for inaction versus action and Emotionality.[2]

[2]Kroneisen and Heck (2020) focused on only six of the 18 possible relations between the three CNI parameters and the six HEXACO traits. Thus, there may be more significant associations in the data set than reported in their article.

Testosterone

Prior research that has taken the traditional approach has found a positive association between individual differences in endogenous testosterone levels and preference for utilitarian over deontological judgments, and this association remained robust when controlling for gender (Carney & Mason, 2010). This finding did not replicate in a study that used the more plausible dilemmas for research with the CNI model (Brannon et al., 2019); however, further analyses using the CNI model revealed a pattern consistent with the association obtained in prior research in that endogenous testosterone levels showed a significant negative association with sensitivity to moral norms. An experimental manipulation of exogenous testosterone paradoxically showed the opposite pattern in that intranasal administration of testosterone increased (rather than decreased) sensitivity to moral norms compared with a placebo condition. The latter finding raises questions about whether the obtained associations between endogenous testosterone and moral dilemma judgments reflect a genuine causal effect of testosterone. A potential alternative is that these associations are driven by other variables that tend to be associated with both endogenous testosterone levels and moral dilemma judgments (e.g., psychopathy).

Psychopathy

Prior research that has used the traditional approach has found a positive association between psychopathy and preference for utilitarian over deontological judgments (for a meta-analysis, see Marshall et al., 2018). This finding was replicated in several studies that used the more plausible dilemmas for research with the CNI model (e.g., Gawronski et al., 2017; Körner et al., 2020; Luke & Gawronski, 2021b). However, further analyses using the CNI model revealed a much more complex pattern in that psychopathy showed negative associations with all three parameters (but see Luke et al., 2022). To be specific, individuals high (vs. low) in psychopathy showed (a) a weaker sensitivity to consequences, (b) a weaker sensitivity to moral norms, and (c) a weaker general preference for inaction versus action. A particularly noteworthy finding is the negative association between psychopathy and sensitivity to consequences. Counter to the association obtained with the traditional approach, this finding suggests that individuals high in psychopathy are less (not more) utilitarian than individuals low in psychopathy (cf. Bartels & Pizarro, 2011; Kahane et al., 2015).

Research by Luke and Gawronski (2021b) further suggests that some of the obtained associations are driven by a poor understanding of societal

standards about right and wrong among individuals high in psychopathy (see Blair, 1995; Blair et al., 1995). For other associations, the results suggest that individuals high in psychopathy are aware of societal standards about right and wrong, but they do not care about using these standards in their personal judgments (see Aharoni et al., 2012, 2014; Cima et al., 2010). First, the negative association between psychopathy and the *C* parameter seems to be driven by differences in the understanding of societal conventions about the significance of morally relevant consequences. Second, the negative association between psychopathy and the *I* parameter seems to be driven by differences in the personal level of general action aversion, with individuals high and low in psychopathy showing a similar understanding of societal conventions regarding the moral status of actions versus inactions (e.g., difference between killing someone vs. letting someone die). Third, the negative association between psychopathy and the *N* parameter seems to be driven by both (a) differences in the understanding of societal conventions involving moral norms and (b) differences in personal standards about the acceptability of norm-incongruent actions (Luke & Gawronski, 2021b). These results have important implications for understanding the underpinnings of unethical behavior among psychopaths and demonstrate the value of the CNI model in providing nuanced insights that cannot be gained with the traditional approach.

CONCLUSION

The findings we have reviewed in this chapter suggest that conflicting views in societal debates about real-world moral dilemmas may reflect deeper psychological differences between people. However, it would be ill advised to reduce these psychological differences to a simple bipolar dimension with *outcome maximization* on one end and *norm adherence* on the other. After all, conflicting views may be driven by individual differences in (a) sensitivity to consequences, (b) sensitivity to moral norms, or (c) general preference for inaction versus action (or any combination of the three). Compared with the traditional dilemma approach, a major advantage of the CNI model is that it allows researchers to quantify the three determinants of moral dilemma judgments. Although research using the traditional dilemma approach has identified a wide range of individual-difference variables that are systematically associated with moral dilemma judgments, research using the CNI model suggests that the obtained associations differ in terms of their psychological underpinnings. Some associations are driven by differences in the sensitivity to

consequences, some are driven by differences in the sensitivity to moral norms, and some are driven by differences in general action tendencies. Indeed, some individual-difference variables show complex patterns of associations with more than one factor, with some of the identified associations remaining undetected in the traditional dilemma approach (e.g., a positive association between sensitivity to consequences and moral identity internalization, a negative association between sensitivity to consequences and psychopathy). Thus, by identifying individual differences along the three dimensions, research using the CNI model offers nuanced insights into the roots of societal debates about the right course of action in real-world dilemmas, providing a more informed foundation for their potential resolution.

An important question for future research concerns the mental processes underlying associations between the three dimensions of moral dilemma judgments and established individual-difference constructs (see Fleeson & Jayawickreme, 2021). What are the cognitive, affective, and motivational mechanisms that account for the obtained associations? A central aspect related to the topic of this book is the role of motivational factors, which thus far have received relatively little attention in research on moral dilemma judgment. Although some researchers claim that individual differences in moral dilemma judgments primarily reflect differences in antisocial motivations (e.g., Kahane et al., 2018), others suggest that individual differences in moral dilemma judgments can arise from differences in either prosocial or antisocial motivations (e.g., Conway et al., 2018). Still others claim that differences in moral dilemma judgments could even stem from differences in self-focused motivations (e.g., Miller et al., 2014; Sarlo et al., 2014). Empirical evidence regarding these claims is still scarce. By disentangling sensitivity to consequences, sensitivity to moral norms, and general action tendencies, the CNI model may be a helpful tool to gain deeper insights into the understudied role of motivational processes in moral dilemma judgments.

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