

## 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 six 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 doctor who contracted the Ebola virus in Liberia (Blinder & Grady, 2014). It soon became clear that Dr. 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 Dr. Brantly was returned and cured, some people claimed a moral duty to save Dr. 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 Dr. 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 for the greater good. This view is reflected in the argument that not returning Dr. 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, Bauman, Cushman, Pizarro, & McGraw, 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; Patil, 2015; Moore, Stevens, & Conway, 2011; Van den Bos, Müller, & Damen, 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 Dr. Brantly's return for medical treatment) may reflect deeper psychological differences between people.

In the current 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, Armstrong, Conway, Friesdorf, & Hütter, 2017), which quantifies three determinants of moral dilemma judgments: (1) sensitivity to consequences, (2) sensitivity to moral norms, and (3) general preference for inaction versus action. 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, while the other 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 also Chapter 4, 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 bridge 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, Goldstein-Greenwood, Polacek & Greene, 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 employed in this research are rather implausible, which has been found to promote norm-congruent judgments (Körner, Joffe, & Deutsch, 2019). This aspect is especially problematic for studies comparing responses across dilemmas that differ in terms of their plausibility. For example, although both the switch and the footbridge dilemma seem rather implausible, many participants find the footbridge dilemma especially implausible (Körner & Deutsch, 2021). 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, Sommerville, Nystrom, Darley, & Cohen, 2001). Given that (1) participants find the footbridge dilemma less plausible than the switch dilemma (Körner & Deutsch, 2021) and (2) low plausibility promotes norm-congruent judgments (Körner et al., 2019), different responses to the 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 (1) willingness to entertain implausible assumptions buffers the tendency to make norm-congruent judgments in implausible scenarios and (2) 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 to the artificial scenarios commonly employed in moral dilemma research (see also Bauman, McGraw, Bartels, & Warren, 2014).

In addition to the ambiguities arising 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 Dr. Brantly's Ebola infection, where the action-inaction mapping is directly opposite to the one in the trolley problem. In the trolley dilemma and all of its variants, outcome maximization suggests action (e.g., pulling the lever, pushing the man) while norm adherence suggests inaction (e.g., not pulling the lever, not pushing the man). In contrast, in the case of Dr. Brantly's Ebola infection, outcome maximization suggests inaction (e.g., not returning him to the U.S. for treatment) while norm adherence suggests action (e.g., returning him to the U.S. for treatment). Because research using the traditional approach rarely controls for action-inaction mappings, it remains ambiguous whether differences in moral dilemma judgments reflect differences in outcome maximization, norm adherence, or general action tendencies.

### 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 (1) the consequences of the focal action for the greater good are either greater or smaller than the costs and (2) the focal action is either proscribed by a proscriptive norm or prescribed by a prescriptive norm (for an example, see Table 5.1). By exclusively relying on scenarios inspired by societal debates about real-world dilemmas (see Gawronski et al., 2017; Körner, Deutsch, & Gawronski, 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 dilemmas reflect (1) a response pattern that is sensitive to consequences (first row in Figure 5.1), (2) a response pattern that is sensitive to moral norms (second row in Figure 5.1), and (3) a response pattern of general inaction versus general action (third and fourth row in Figure 5.1). 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 are explained in detail by Gawronski et al. (2017), we only summarize the main steps in analyzing moral dilemma responses with the CNI model. Based on the processing tree depicted in Figure 5.1, 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, aiming to minimize 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, it can be inferred 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 criterion. Traditional dilemmas are scenarios where 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 on 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).

Based on 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,<sup>i</sup> preference for utilitarian over deontological judgments on traditional dilemmas has been found to be (1) positively associated with sensitivity to consequences on the *C* parameter, (2) negatively associated with sensitivity to moral norms on the *N* parameter, and (3) negatively associated with general preference for inaction versus action on the *I* parameter (Gawronski et al., 2020). Research by Luke and Gawronski (in press) further suggests that individual differences in sensitivity to consequences and moral norms are highly stable over a period of one 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 to the *C* and the *N* parameter (see Gawronski et al., 2020; Luke & Gawronski, in press).

### 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 above, the theoretical meaning of these findings is ambiguous, because the observed associations may be driven by individual differences in (1) sensitivity to consequences, (2) sensitivity to moral norms, or (3) 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 using traditional approach and then review the more nuanced results obtained in research using the CNI model. Because the dilemmas in the latter work have been designed to be more plausible compared to the artificial scenarios in prior work with the traditional approach, we also discuss whether the findings of previous research using the traditional approach replicate with the more plausible scenarios in research using 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 problem.

### **Empathic Concern**

Prior research with 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 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 to 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, in press), which can reduce statistical power for the detection of actually existing associations. Nevertheless, the reliable association between empathic concern and the *N* parameter suggests that previous findings 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 found to be somewhat unreliable across studies (e.g., Patil et al., 2021). It also did not replicate in studies using 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 using 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 (1) low plausibility promotes norm-congruent judgments and (2) 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 using 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 deliberation invariably increases concerns about outcomes (e.g., Byrd & Conway, 2019; Körner & Volk, 2014).

### **Moral Identity Internalization**

Some studies using 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, Koleva, Iyer, Graham, & Ditto, 2010). This finding replicated in several studies using the more plausible dilemmas for research with the CNI model (Körner et al., 2020). Interestingly, further analyses using the CNI model 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 consistently showed a stronger association with moral identity internalization compared to 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: (1) *impartial beneficence* (IB), which refers to an impartial concern for the greater good and

(2) *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 IB and IH are both positively associated with preference for utilitarian over deontological judgments. Both of these associations 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 IB and IH 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* parameter. That is, higher scores on each dimension were associated with (1) a weaker sensitivity to moral norms and (2) 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 with 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 while 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 using 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 did not consistently replicate in studies using 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, Opre, & Miu, 2015). This finding did not replicate in studies using 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. Interestingly, 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, Miller, & Cushman, 2017). This finding replicated in several studies using 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 to 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 was 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, Willer, & Keltner, 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., status quo bias; see Samuelson & Zeckhauser, 1988).

#### **Basic Personality Traits**

We are not aware of any published research that 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, openness; see Soto & John, 2017), Luke and Gawronski (in press) found that (1) sensitivity to consequences was negatively associated with extraversion and positively associated with openness, (2) sensitivity to moral norms was positively associated with agreeableness and openness, and (3) general preference for inaction versus action was positively associated with openness. Investigating associations between moral dilemma judgments and a selected subset of the HEXACO personality traits (i.e., honesty-humility, emotionality, conscientiousness; see Ashton

& Lee, 2007), Kroneisen and Heck (2020) 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.<sup>ii</sup>

### Testosterone

Prior research with 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 using the more plausible dilemmas for research with the CNI model (Brannon, Carr, Jin, Josephs, & Gawronski, 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. Paradoxically, an experimental manipulation of exogenous testosterone showed the opposite pattern, in that intranasal administration of testosterone increased (rather than decreased) sensitivity to moral norms compared to 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 using the traditional approach has found a positive association between psychopathy and preference for utilitarian over deontological judgments (for a meta-analysis, see Marshall, Watts, & Lilienfeld, 2018). This finding replicated in several studies using the more plausible dilemmas for research with the CNI model (e.g., Gawronski et al., 2017; Körner et al., 2020; Luke & Gawronski, 2021b). Yet, 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, Neumann, & Gawronski, in press). Specifically, individuals high (vs. low) in psychopathy showed (1) a weaker sensitivity to consequences, (2) a weaker sensitivity to moral norms, and (3) 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,

Everett, Earp, Farias, & Savulescu, 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, Jones, Clark, & Smith, 1995). For other associations, the results suggest that individuals high in psychopathy are aware of societal standards about right and wrong, but do not care about using these standards in their personal judgments (see Aharoni, Sinnott-Armstrong, & Kiehl, 2012, 2014; Cima, Tonnar, & Hauser, 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 (1) differences in the understanding of societal conventions involving moral norms and (2) 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.

### Conclusions

The reviewed findings suggest that conflicting views in societal debates about real-world moral dilemmas may reflect deeper psychological differences between people. However, it would be ill-founded 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 (1) sensitivity to consequences, (2) sensitivity to moral norms, or (3) general preference for inaction versus action (or any combination of the three). Compared to 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., positive association between sensitivity to consequences and moral identity internalization; 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. While some researchers claimed that individual differences in moral dilemma judgments primarily reflect differences in anti-social motivations (e.g., Kahane et al. 2018), others suggested that individual differences in moral dilemma judgments can arise from differences in either pro-social or anti-social motivations (e.g., Conway et al., 2018). Yet others claimed that differences in moral dilemma judgments could even stem from differences in self-focused motivations (e.g., Miller, Hannikainen, & Cushman, 2014; Sarlo, Lotto, Ruminati, & Palomba, 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 provide deeper insights into the understudied role of motivational processes in moral dilemma judgments.

### References

- Aharoni, E., Sinnott-Armstrong, W., & Kiehl, K. A. (2012). Can psychopathic offenders discern moral wrongs? A new look at the moral/conventional distinction. *Journal of Abnormal Psychology, 121*, 484-497.
- Aharoni, E., Sinnott-Armstrong, W., & Kiehl, K. A. (2014). What's wrong? Moral understanding in psychopathic offenders. *Journal of Research in Personality, 53*, 175-181.
- Ashton, M. C., & Lee, K. (2007). Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. *Personality and Social Psychology Review, 11*, 150-166.
- Bartels, D. M., Bauman, C. W., Cushman, F. A., Pizarro, D. A., & McGraw, A. P. (2015). Moral judgment and decision making. In G. Keren & G. Wu (Eds.) *The Wiley Blackwell handbook of judgment and decision making* (pp. 478-515). Chichester, UK: Wiley.
- Bartels, D. M., & Pizarro, D. A. (2011). The mismeasure of morals: Antisocial personality traits predict utilitarian responses to moral dilemmas. *Cognition, 121*, 154-161.
- Bauman, C. W., McGraw, A. P., Bartels, D. M., & 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.
- Blair, R. J. R. (1995). A cognitive developmental approach to morality: Investigating the psychopath. *Cognition, 57*, 1-29.
- Blair, R. J. R., Jones, L., Clark, F., & Smith, M. (1995). Is the psychopath 'morally insane'? *Personality and Individual Differences, 19*, 741-752.
- Blinder, A., & Grady, D. (2014, August 2). American doctor with Ebola arrives in U.S. for treatment. *New York Times*. Retrieved from <https://www.nytimes.com/2014/08/03/us/kent-brantley-nancy-writebol-ebola-treatment-atlanta.html> (October 19, 2020).
- Brannon, S. M., Carr, S., Jin, E. S., Josephs, R. A., & Gawronski, B. (2019). Exogenous testosterone increases sensitivity to moral norms in moral dilemma judgments. *Nature Human Behaviour, 3*, 856-866.
- Byrd, N., & 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*:103995.
- Carney, D. R., & Mason, M. F. (2010). Moral decisions and testosterone: When the ends justify the means. *Journal of Experimental Social Psychology, 46*, 668-671.
- Cima, M., Tonnaer, F., & Hauser, M. D. (2010). Psychopaths know right from wrong but don't care. *Social Cognitive and Affective Neuroscience, 5*, 59-67.
- Conway, P., & Gawronski, B. (2013). Deontological and utilitarian inclinations in moral decision-making: A process dissociation approach. *Journal of Personality and Social Psychology, 104*, 216-235.
- Conway, P., Goldstein-Greenwood, J., Polacek, D., & Greene, J. D. (2018). Sacrificial utilitarian

- judgments do reflect concern for the greater good: Clarification via process dissociation and the judgments of philosophers. *Cognition*, *179*, 241–265.
- Crone, D. L., & 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.
- Fleeson, W., & Jayawickreme, E. (2021). Whole traits: Revealing the social-cognitive mechanisms constituting personality's central variable. *Advances in Experimental Social Psychology*, *63*, 69-128
- Foot, P. (1967). The problem of abortion and the doctrine of double effect. *Oxford Review*, *5*, 5–15.
- Gawronski, B., Armstrong, J., Conway, P., Friesdorf, R., & 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.
- Gawronski, B., Conway, P., Hütter, M., Luke, D. M., Armstrong, J., & Friesdorf, R. (2020). On the validity of the CNI model of moral decision-making: Reply to Baron and Goodwin (2020). *Judgment and Decision Making*, *15*, 1054-1072.
- Gleichgerricht, E., & Young, L. (2013). Low levels of empathic concern predict utilitarian moral judgment. *PLoS ONE*, *8*:e60418.
- Glenn, A. L., Koleva, S., Iyer, R., Graham, J., & Ditto, P. H. (2010). Moral identity in psychopathy. *Judgment and Decision Making*, *5*, 497–505.
- Greene, J. D., Sommerville, R. B., Nystrom, L. E., Darley, J. M., & Cohen, J. D. (2001). An fMRI investigation of emotional engagement in moral judgment. *Science*, *293*, 2105–2108.
- Haidt, J. (2001). The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychological Review*, *108*, 814-834.
- Hannikainen, I. R., Miller, R. M., & Cushman, F. A. (2017). Act versus impact: Conservatives and liberals exhibit different structural emphases in moral judgment. *Ratio*, *30*, 462-493.
- Hütter, M., & Klauer, K. C. (2016). Applying processing trees in social psychology. *European Review of Social Psychology*, *27*, 116-159.
- Kahane, G., Everett, J. A. C., Earp, B. D., Caviola, L., Faber, N. S., Crockett, M. J., & Savulescu, J. (2018). Beyond sacrificial harm: A two-dimensional model of utilitarian psychology. *Psychological Review*, *125*, 131–164.
- Kahane, G., Everett, J. A. C., Earp, B. D., Farias, M., & Savulescu, J. (2015). 'Utilitarian' judgments in sacrificial moral dilemmas do not reflect impartial concern for the greater good. *Cognition*, *134*, 193-209.
- Körner, A., & Deutsch R. (2021). Deontology and utilitarianism in real life: A set of moral dilemmas based on historic events. *Unpublished Manuscript*.
- Körner, A., Deutsch, R., & Gawronski, B. (2020). Using the CNI model to investigate individual differences in moral dilemma judgments. *Personality and Social Psychology Bulletin*, *46*, 1392-1407.
- Körner, A., Joffe, S., & Deutsch, R. (2019). When skeptical, stick with the norm: Low dilemma plausibility increases deontological moral judgments. *Journal of Experimental Social Psychology*, *84*:103834.
- Körner, A., & Volk, S. (2014). Concrete and abstract ways to deontology: Cognitive capacity moderates construal level effects on moral judgments. *Journal of Experimental Social Psychology*, *55*, 139–145.
- Kroneisen, M., & Heck, D. W. (2020). Interindividual differences in the sensitivity to consequences, moral norms, and preferences for inaction: Relating basic personality traits to the CNI model. *Personality and Social Psychology Bulletin*, *46*, 1013-1026.
- Kroneisen, M., & Steghaus, S. (2021). The influence of decision time on sensitivity for consequences, moral norms, and preferences for inaction: Time, moral judgments, and the CNI model. *Journal of Behavioral Decision Making*, *34*, 140-153.
- Luke, D. M., & Gawronski, B. (in press). Temporal stability of moral dilemma judgments: An analysis using the CNI model. *Personality and Social Psychology Bulletin*.
- Luke, D. M., & Gawronski, B. (2021a). Political ideology and moral dilemma judgments: An analysis using the CNI model. *Personality and Social Psychology Bulletin*, *47*, 1520-1531.
- Luke, D. M., & Gawronski, B. (2021b). Psychopathy and moral dilemma judgments: A CNI model analysis of personal and perceived societal standards. *Social Cognition*, *39*, 41-58.
- Luke, D. M., Neumann, C. S., & Gawronski, B. (in press). 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*.
- Marshall, J., Watts, A. L., & 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.
- Miller, R. M., Hannikainen, I. A., & Cushman, F. A. (2014). Bad actions or bad outcomes? Differentiating affective contributions to the moral condemnation of harm. *Emotion*, *14*, 573–587.

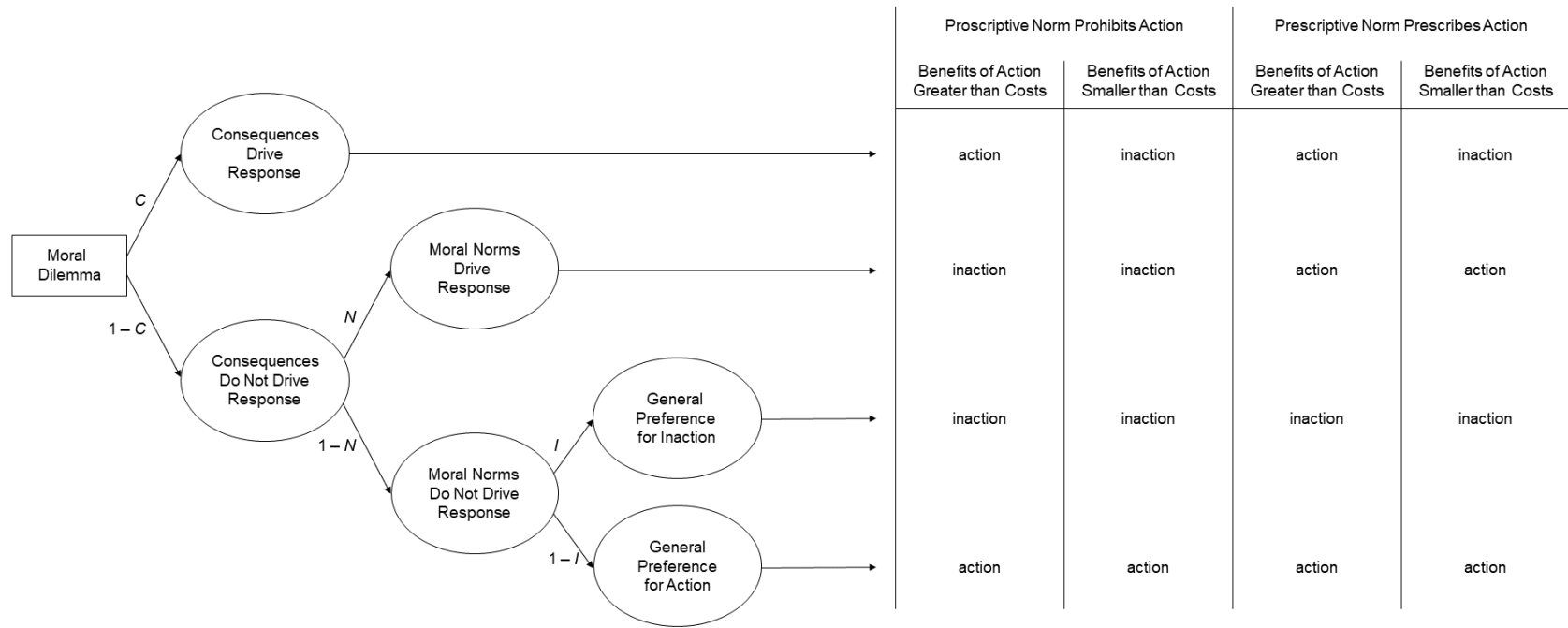


- Moore, A. B., Stevens, J., & Conway, A. R. (2011). Individual differences in sensitivity to reward and punishment predict moral judgment. *Personality and Individual Differences, 50*, 621–625.
- Patil, I. (2015). Trait psychopathy and utilitarian moral judgement: The mediating role of action aversion. *Journal of Cognitive Psychology, 27*, 349–366.
- Patil, I., Zucchelli, M. M., Kool, W., Campbell, S., Fornasier, F., Calò, M., ... & Cushman, F. (2021). Reasoning supports utilitarian resolutions to moral dilemmas across diverse measures. *Journal of Personality and Social Psychology, 120*, 443–460.
- Piazza, J., & Sousa, P. (2014). Religiosity, political orientation, and consequentialist moral thinking. *Social Psychological and Personality Science, 5*, 334–342.
- Samuelson, W., & Zeckhauser, R. (1988). Status quo bias in decision making. *Journal of Risk and Uncertainty, 1*, 7–59.
- Sarlo, M., Lotto, L., Rumiati, R., & Palomba, D. (2014). If it makes you feel bad, don't do it! Egoistic rather than altruistic empathy modulates neural and behavioral responses in moral dilemmas. *Physiology & Behavior, 130*, 127–134.
- Soto, C. J., & John, O. P. (2017). Short and extra-short forms of the big five inventory-2: The BFI-2-S and BFI-2-XS. *Journal of Research in Personality, 68*, 69–81.
- Suter, R. S., & Hertwig, R. (2011). Time and moral judgment. *Cognition, 119*, 454–458.
- Szekely, R. D., Opre, A., & Miu, A. C. (2015). Religiosity enhances emotion and deontological choice in moral dilemmas. *Personality and Individual Differences, 79*, 104–109.
- Thomson, J. J. (1976). Killing, letting die, and the trolley problem. *The Monist, 59*, 204–217.
- Valdesolo, P., & DeSteno, D. (2006). Manipulations of emotional context shape moral judgment. *Psychological Science, 17*, 476–477.
- Van den Bos, K., Müller, P. A., & Damen, T. (2011). A behavioral disinhibition hypothesis of interventions in moral dilemmas. *Emotion Review, 3*, 281–283.
- Wiech, K., Kahane, G., Shackel, N., Farias, M., Savulescu, J., & Tracey, I. (2013). Cold or calculating? Reduced activity in the subgenual cingulate cortex reflects decreased emotional aversion to harming in counterintuitive utilitarian judgment. *Cognition, 126*, 364–372.
- Young, O. A., Willer, R., & Keltner, D. (2013). “Thou shalt not kill”: Religious fundamentalism, conservatism, and rule-based moral processing. *Psychology of Religion and Spirituality, 5*, 110–115.

**Table 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. Dilemmas adapted from Gawronski, Armstrong, Conway, Friesdorf, and Hütter (2017). Reprinted with permission.

|  | <b>Benefits of Action Greater than Costs</b>   | <b>Benefits of Action Smaller than Costs</b>  |
|--|--|---|
| <b>Proscriptive Norm Prohibits Action</b>  | <p>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.</p> <p>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.</p> <p>Would you give the student the medication in this case?</p>  | <p>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.</p> <p>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.</p> <p>Would you give the student the medication in this case?</p>  |
| <b>Prescriptive Norm Prescribes Action</b> | <p>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.</p> <p>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.</p> <p>Would you take the student out of quarantine to return her to her home country for treatment in this case?</p> | <p>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.</p> <p>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.</p> <p>Would you take the student out of quarantine to return her to her home country for treatment in this case?</p> |

**Figure 1.** 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. Reproduced from Gawronski, Armstrong, Conway, Friesdorf, and Hütter (2017). Reprinted with permission from the American Psychological Association.



**Footnotes**

<sup>i</sup> Because responses on 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 dilemma 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.

<sup>ii</sup> 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.