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Chapter 6

Psychological Origins of Utilitarianism

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Abstract

Utilitarian ethics prioritizes maximizing individual welfare, whereas deontological ethics emphasizes adherence to universal moral principles. The Dual Process Model (DPM) of moral cognition posits that utilitarian choices stem from controlled, reflective reasoning, while deontological decisions are primarily driven by emotional and intuitive responses. Although this model has received substantial empirical support, the sacrificial dilemmas used to validate it have faced significant scrutiny over the past decade, leading to the development of new methods and approaches. This chapter first examines the cognitive foundations of utilitarianism through the lens of the DPM, followed by a review of sacrificial dilemmas and the cross-cultural validity of the model. We then explore key critiques, particularly regarding the ecological validity of sacrificial dilemmas. In response to these concerns, alternative models have emerged. One such approach is the Process Dissociation method, which independently quantifies predispositions toward utilitarian and deontological decision-making. Similarly, the CNI model refines traditional distinctions by addressing conceptual ambiguities in sacrificial dilemmas by quantifying the sensitivity to consequences (C), sensitivity to moral norms (N), and general preference for inaction versus action (I). Additionally, the Two-Dimensional Model of Utilitarianism differentiates between impartial beneficence (maximizing well-being for all) and instrumental harm (permitting harm for the greater good), further clarifying utilitarian inclinations. In conclusion, we examine the extent to which moral dilemmas, typically assessed as hypothetical intentions in sacrificial scenarios, correlate with real-life expressions of utilitarianism. This includes evaluating whether experimental findings reliably predict everyday moral behavior, thereby bridging the gap between theoretical moral reasoning and real-world moral behavior.

Keywords moral cognition · utilitarianism · sacrificial dilemmas · Dual Process Model · real-world behavior

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Moral philosophy encompasses a variety of frameworks for assessing the ethical dimensions of behavior, among which normative ethics, particularly utilitarianism and deontology, provoke significant debate. Utilitarianism, which seeks to maximize happiness and welfare, posits that sacrificing a few for the benefit of many can be ethically permissible (Mill, 1861/1998). For example, it might be acceptable to sacrifice one innocent person to save five others, highlighting a utilitarian moral perspective. Conversely, deontological ethics, rooted in the philosophy of Kant (1785/1964), holds that actions are moral if they adhere to universal rules and duties, regardless of their consequences. This approach would argue that lying or causing harm to an innocent person is inherently wrong, irrespective of any beneficial outcomes. Psychologists examine these ethical considerations from an empirical standpoint, striving to understand the cognitive and emotional processes that influence whether individuals make decisions based on utilitarian or deontological principles. This chapter will explore the psychological underpinnings of utilitarian decision-making as discussed in social and cognitive psychology, focusing on the prevalent models and the ongoing debates surrounding them.

We begin with the Dual Process Model (DPM) of moral cognition (Greene, 2008), which has been extensively tested but also critiqued for its conceptual and methodological shortcomings (Saribay & Yilmaz, 2024). The model posits that utilitarian decision-making is often driven by rational, controlled cognitive processes, while deontological judgments are influenced by automatic, emotional responses. Subsequently, we discuss the cognitive origins of utilitarianism and evaluate the universality and applicability of the DPM's assumptions. The discussion will then pivot the conceptual limitations of this model and explore alternative approaches designed to overcome these shortcomings.

One such approach is the Process Dissociation (PD) method, which addresses the issue that traditional moral dilemmas may not independently measure deontological and utilitarian tendencies (Conway & Gawronski, 2013). Another alternative model is the CNI Model, which seeks to differentiate responses to moral dilemmas by measuring sensitivity to consequences ("C"), sensitivity to moral norms ("N"), and a general preference for inaction ("I") (Gawronski et al., 2017). Additionally, we examine the Two-Dimensional Model of Utilitarianism, which challenges the simplicity of traditional utilitarian assessments by suggesting that utilitarianism encompasses multiple dimensions to overcome the conventional sacrificial dilemmas may conflate utilitarian decision-making with traits associated with psychopathy (Kahane et al., 2015, 2018).

Lastly, we address the limitations of using hypothetical sacrificial dilemmas to predict real-life utilitarian behavior. This discussion aims to highlight the gap between theoretical moral reasoning and practical ethical conduct, questioning the validity of these experimental approaches in capturing the complexities of real-world moral decision-making.

Sacrificial Dilemmas and the Dual Process Model

Hypothetical sacrificial dilemmas, such as the classic trolley problem in moral philosophy, are widely used to enhance our understanding of moral decision-making. In the trolley dilemma, a runaway trolley is heading towards five people on the tracks. The only way to save them is by pressing a button to switch the trolley to a different track, where it would kill one person instead. Would you press the button, diverting the trolley to save five at the expense of one (Foot, 1967)? Most people choose to act, driven by utilitarian moral reasoning to save more lives (Greene et al., 2001).

Consider a variation: the only way to stop the trolley with five people ahead is to push an overweight, innocent person onto the tracks from an overpass, halting the trolley. Would you push this innocent person to their death (Thomson, 1976)? Known as the footbridge dilemma, this scenario typically yields a different response; the direct act of harming an individual is widely viewed as unacceptable (Greene et al., 2001, 2004). Although both the trolley and footbridge dilemmas aim to save five lives, reflecting

utilitarian ethics, people's responses are inconsistent, with utilitarian judgments prevalent in the trolley scenario and deontological judgments in the footbridge scenario. The DPM (Greene, 2007; Greene et al., 2001; 2004) proposes that these conflicting judgments stem from two distinct psychological mechanisms. Utilitarian judgments are linked to processes that demand significant cognitive effort, while deontological judgments emerge from more emotional and intuitive processes. The physical and emotional proximity involved in physically pushing a person in the footbridge dilemma likely triggers a stronger emotional response than merely pressing a button, hence the variation in moral decisions (Greene et al., 2001; Greene, 2007). According to Greene, the footbridge dilemma requires more cognitive effort and emotional suppression to arrive at a utilitarian decision. In contrast, less emotional arousal in the trolley dilemma facilitates faster cognitive processing and a cost-benefit analysis favoring the utilitarian outcome. The footbridge scenario has inspired further exploration into personal dilemmas, where the physical and emotional closeness to potential harm plays a critical role in moral decision-making. For example,

> "Enemy soldiers have taken over your village. They have orders to kill all remaining civilians. You and some of your townspeople have sought refuge in the cellar of a large house. Outside you hear the voices of soldiers who have come to search the house for valuables. Your baby begins to cry loudly. You cover his mouth to block the sound. If you remove your hand from his mouth his crying will summon the attention of the soldiers who will kill you, your child, and the others hiding out in the cellar. To save yourself and the others you must smother your child to death. Is it appropriate for you to smother your child in order to save yourself and the other townspeople?"

Similarly, in such moral dilemmas, one must choose between causing the death of an innocent baby and saving multiple lives. However, impersonal dilemmas, which include scenarios like the classic trolley dilemma, tend to elicit less emotional intensity when individuals are faced with conflicting options (Greene et al., 2001). Consequently, researchers often prefer personal scenarios because they more profoundly manifest the conflict between utilitarian and deontological principles compared to impersonal scenarios.

These assumptions have been substantiated through neuroimaging and physiological measurements. Activation in the medial prefrontal cortex and amygdala—regions associated with emotional processing—was observed in subjects faced with personal dilemmas. In contrast, no such activation was noted in impersonal or non-moral dilemma situations (Greene et al., 2001). Further, activation in the anterior dorsolateral prefrontal cortex, which is involved in working memory and cognitive control, has been linked to utilitarian decision-making in personal dilemmas (Greene et al., 2004). Studies involving patients with damage to the ventromedial prefrontal cortex (VMPC), where the emotional value of stimuli is encoded, have shown that these individuals tend to make more utilitarian choices in emotionally charged personal scenarios compared to those with intact prefrontal cortices (Koenigs et al., 2007). Thus, it has been demonstrated that personal dilemmas involving direct physical harm and the potential to save lives evoke an automatic and emotional response, and utilitarian decisions can only be achieved through significant cognitive control (Cushman et al., 2012).

Building on the premise that moral judgments integrate the nervous system with internal organs, Gewnhi et al. (2016) explored heart rate variations in response to sacrificial dilemmas. Their findings suggest that utilitarian judgments, which involve fewer emotional processes, are positively correlated with lower heart rates, supporting the DPM. On the other hand, research by Hutcherson et al. (2015) indicates that while personal sacrificial dilemmas activate emotional brain regions, utilitarian judgments

and emotional appraisals are not antagonistic. Instead, these processes occur in distinct brain areas and converge in the ventromedial prefrontal cortex (vmPFC) to form a comprehensive moral judgment.

Cognitive Origins of Utilitarianism

Numerous studies manipulated various cognitive factors and assessed their impact on moral judgments to examine the role of cognitive processes in utilitarian versus deontological decision-making (Cummins & Cummins, 2012; Patil et al., 2021; Paxton et al., 2012; Rosas and Aguilar-Pardo, 2019; Spears et al., 2021). However, consensus remains elusive in the literature regarding the effects of these cognitive processes on utilitarian decision-making. For instance, experiments imposing cognitive control constraints like time pressure have shown a decrease in utilitarian decisions in personal dilemmas (Suter & Hertwig, 2011). Yet, this hypothesis faces challenges from emerging evidence suggesting that under certain conditions, such as when the stakes of saving lives are extremely high, utilitarian decisions can indeed be made intuitively and rapidly (Rosas & Aguilar-Pardo, 2019). Moreover, Gürçay and Baron (2017) found no consistent correlation between decision-making response time or the type of moral dilemma and the propensity for utilitarian or deontological judgments.

The Cognitive Reflection Test (CRT), a tool designed to assess analytical thinking, consists of questions that measure an individual's ability to override intuitive but incorrect answers (Frederick, 2005). For example, the question, "If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?" is designed to trigger a reflective response of "100," though the correct, reflective answer is "5." To activate analytical thinking, Paxton et al. (2012) presented participants with CRT questions before exposing them to high-conflict moral dilemmas. Their findings indicated that participants who scored higher on the CRT prior to the dilemmas made more utilitarian decisions than those who encountered the dilemmas first. However, since the CRT inherently measures individual differences in cognitive style, its sole use as a trigger for analytical thinking in this context has been met with skepticism.

Spears et al. (2021) differentiated whether utilitarian decisions were influenced by reflection (CRT), which counters intuitive responses, or by deliberative processing, incorporating an arithmetic test. The arithmetic test was chosen because it does not rely on intuitive responses and demands considerable cognitive engagement to determine the correct answer. For instance, participants were asked, "In a forest, 20% of the mushrooms are red, 50% brown, and 30% white. A red mushroom is poisonous with a 20% probability. A mushroom that is not red is poisonous with a probability of 5%. What is the probability that a poisonous mushroom in the forest is red?" The correct answer, 50%, requires analytical processing and is not intuitively obvious. The study found that both CRT and arithmetic test scores independently influenced responses to sacrificial dilemmas. Additionally, providing feedback on incorrect answers during the tests led to higher scores; however, increased utilitarian decision-making was only observed following feedback in the arithmetic test. This suggests that utilitarianism may derive more from deliberation than from merely resisting intuition. Additionally, to discern whether changes in test scores resulted from an innate disposition towards analytical thinking or from the experimental activation of analytical thinking, feedback was provided for incorrect responses. This feedback increased scores on both tests, but a significant increase in utilitarian decisions was noted only following the arithmetic test, suggesting that utilitarian judgments may arise more from deliberative thinking than from mere resistance to intuition.

In terms of cognitive styles, research showed that individuals with a more analytical thinking style are more likely to make utilitarian judgments, whereas those with an intuitive style are less so (Bartels, 2008). Moreover, a positive relationship has been documented between CRT performance and moral minimalism, which posits that harming an innocent person can be permissible but not obligatory in

moral dilemmas (Royzman et al., 2015). While this correlation was partially supported by Aktas et al. (2017), no direct link was found between CRT scores and overall utilitarian tendencies. Baron et al. (2015) suggested that inconsistencies between CRT performance and utilitarian thinking might be due to open-minded thinking, which correlates with CRT scores. To further explore these conflicting results, various measurement methods—such as self-reports, behavioral tests, and neuroanatomical studies—were employed to assess reasoning ability and cognitive style, revealing a positive association with utilitarian responses in moral dilemmas (Patil et al., 2021). Recent meta-analytic studies have also found inconsistent results. According to a meta-analysis of 68 experiments from 44 studies using sacrificial dilemmas, cognitive manipulations in the literature do not have a significant effect on utilitarian decisions even when publication bias is considered (Rehren, 2024). However, Capraro (2024) found that the induction of intuition has a negative effect on utilitarian responses (d = −0.23) in a meta-analysis of 111 experiments from 52 studies focusing solely on personal dilemmas.

Cross-cultural Validity of the Sacrificial Dilemmas and the Dual Process Model

The samples of studies conducted in the behavioral sciences are predominantly undergraduate students from Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies. This neglect of variation in the human population has been a major point of criticism in psychology studies (Henrich et al., 2010). Almost all the studies mentioned in this chapter have been conducted in so-called WEIRD societies. Thus, questions about whether responses to trolley dilemmas are influenced by culture, or in which cultures utilitarian morality is prominent, remain unanswered, raising concerns about the validity of the findings and discussions mentioned earlier. Although cross-cultural studies have examined utilitarian judgments of participants outside WEIRD societies, these studies have reported contradictory findings. For example, Moore et al. (2011) compared Chinese and American participants and found no cultural differences, showing that personal dilemmas (footbridge) elicited more intense conflicts than impersonal dilemmas (trolley) in both cultures. In contrast, Rehman and Dzionek-Kozłowsk (2020) reported that American participants made significantly more utilitarian decisions in the footbridge dilemma compared to Chinese participants. Meanwhile, Gold et al. (2014), comparing Chinese and British participants using hypothetical sacrificial dilemmas and a real scenario, found that British participants' utilitarian choices were higher than those of Chinese participants in both scenarios. The researchers suggested that this difference might be attributed to the fatalism prevalent in Chinese Taoism. Although the samples in these three studies were not from WEIRD societies, they still faced representativeness issues because the participants were undergraduate students.

There are also a few studies that include indigenous tribes. Research conducted with participants from the Yali indigenous tribe in Papua, Indonesia adapted the sacrificial dilemma to a culturally relevant scenario: knocking down a tree to save five people falling from it at the cost of killing another person. The results showed that Yali participants made the utilitarian decision approximately 73% less frequently than Canadian participants (Sorokowski et al., 2020). This difference was linked to cultural and religious influences revealed in the Yali participants' qualitative responses. In Yali culture, the family of the perpetrator also bears the consequences of a killing, creating additional moral weight. Additionally, their religious beliefs, which dictate that no one should interfere with another's life and health except by divine intervention. Conversely, a study with the Mayangna/Miskito indigenous people of Nicaragua found that they provided highly utilitarian responses to sacrificial dilemmas. The participants expressed concerns that the death of individuals would decrease the population of their communities, leading to a preference for saving the majority (Winking & Koster, 2021).

Recent studies have also tested the universality of the DPM's assumptions. Awad et al. (2020) analyzed responses from 70,000 participants across 42 countries to footbridge, trolley, and loop dilemmas. Unlike the footbridge and trolley dilemmas, the loop dilemma involves a speeding trolley being redirected onto another track, where it is stopped by the body of a person present, thus preventing it from returning to kill five people. Across all countries, the ranking of acceptability for causing harm was consistent: 81% for the trolley dilemma, 72% for the loop, and 51% for the footbridge dilemma. Relational mobility, the degree to which individuals can form and change social relationships, is the cultural factor found to affect utilitarian decisions. For instance, in societies with low relational mobility, like some Asian countries, relationships tend to be long-term but fewer in number. People in these cultures are more cautious in social interactions and avoid conflict to preserve their existing relationships. Low relational mobility was shown to contribute to the rejection of utilitarian decisions, as those who are willing to harm an innocent person in sacrificial dilemmas are perceived as less trustworthy and less desirable in social relationships (Everett et al., 2016; Sacco et al., 2017). Furthermore, Bago et al. (2022) collected data from 27,502 participants across 45 countries to assess the cultural universality and diversity of the DPM's assumptions. They found that the likelihood of endorsing utilitarian decisions was lower across all cultures when both deliberate action and the exertion of personal power were required. Contrary to expectations, the strength of this effect did not vary significantly between individualistic and collective cultures.

The universality of the negative influence of harm on utilitarian decision-making can be discussed based on the fact that the footbridge dilemma receives the lowest acceptance rate compared to the trolley and loop dilemmas in 42 countries (Awad et al., 2020), and the likelihood of making utilitarian decisions in these dilemmas is consistently lower across all cultures (Bago et al., 2022). Additionally, cultural factors such as relational mobility, which may strengthen or weaken this effect, should not be overlooked. The small sample sizes and inconsistent findings concerning cultural factors in studies predominantly involving undergraduate students (see Moore et al., 2001; Rehman & Dzionek-Kozłowsk, 2020) underscore the necessity of replicating these studies with larger and more diverse samples to better understand the cultural dimensions of moral decision-making.

Sacrificial Dilemmas and Criticisms of the Dual Process Model

Sacrificial dilemmas, such as the trolley (Foot, 1967) and footbridge dilemmas (Thomson, 1976), originally developed by moral philosophers as thought experiments to elucidate the complexities of moral decision-making, have been empirically examined within the framework of the DPM. However, the sacrificial dilemmas employed to test this model have faced numerous methodological and conceptual criticisms. One methodological critique points out that utilitarian and deontological principles are measured using the same dilemmas, despite being independent processes (Conway & Gawronski, 2013). Gawronski et al. (2017) highlight the dilemmas' failure to adequately assess the significance of context in the scenarios, specifically the outcomes critical to utilitarianism and the norms central to deontological decision-making. Kahane (2015) also criticizes the sacrificial dilemmas for not theoretically measuring utilitarianism effectively, noting the correlation between utilitarian responses to trolley dilemmas and traits of psychopathy (see Aktas et al., 2017; Bartels & Pizarro, 2011; Gao & Tang, 2013; Paruzel-Czachura & Farny, 2023; Takamatsu, 2019). This section explores alternative methods and models that seek to address these limitations.

Process Dissociation

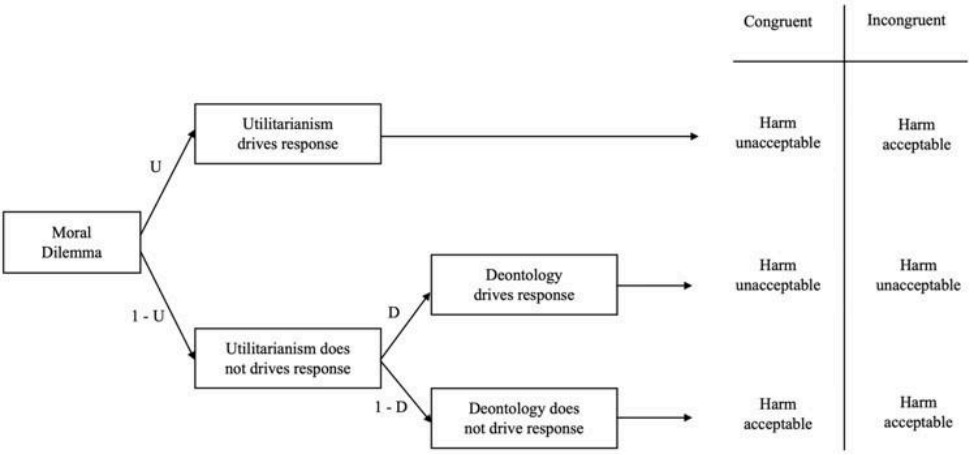
The DPM acknowledges that utilitarianism hinges on the outcomes of actions and deontology on the intentions behind them, positing that these two moral judgment processes function independently.

However, utilitarianism and deontology are treated as inversely proportional in existing studies; for instance, an increase in utilitarian tendencies is assumed to correlate with a decrease in deontological inclinations (Greene, 2007). This perspective introduces conceptual ambiguity about the independence of these aspects and the extent of an individual's leanings towards each (Conway & Gawronski, 2013). To address this issue, Conway and Gawronski (2013) suggested applying the Process Dissociation (PD) method, widely used in cognitive psychology, to the study of moral judgments. This approach involves framing sacrificial dilemmas as either congruent or incongruent[1]. Responses to incongruent dilemmas distinctly reflect utilitarian or deontological judgments. For instance, in a torture dilemma, participants might be asked if it is acceptable to torture a man to uncover and disable deadly explosives hidden around a city—a scenario deemed unacceptable by deontological standards but acceptable from a utilitarian viewpoint. Conversely, a congruent scenario would frame the action (e.g., torturing to find paint bombs that deface buildings without causing harm) as universally unacceptable, aligning both utilitarian and deontological responses against torture.

By presenting both congruent and incongruent versions of dilemmas, the PD method enables the separate calculation of utilitarian (U-parameter) and deontological (D-parameter) tendencies across ten different scenarios. This setup allows researchers to independently measure these parameters and explore their correlations with individual variables. Conway and Gawronski (2013) empirically tested the DPM's hypotheses using this method and found that the need for cognition positively correlated with the U-parameter, whereas manipulations of cognitive load diminished it. Conversely, the D-parameter was linked to empathy, perspective taking, and religious beliefs. Moreover, increasing empathy toward the victims in dilemmas boosted only the D-parameter, underscoring the validity of the DPM's assumptions about individual differences when using the PD method.

Figure 1

A process tree illustrating the key components that influence judgments on the acceptability or unacceptability of harmful actions in both congruent and incongruent moral dilemmas.



Source: Conway & Gawronski, 2013.

Utilitarianism and Deontology in Context: The CNI Model

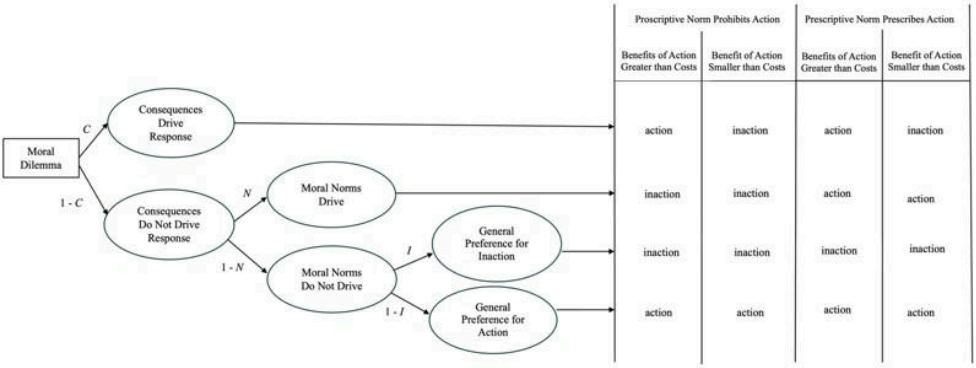
While utilitarianism is determined by the benefits resulting from an action's outcome, deontology is guided by adherence to moral norms. However, because these elements cannot be systematically manipulated in traditional sacrificial dilemmas, responses to such dilemmas often involve conceptual

[1] For further details on parameter calculations, see Conway & Gawronski (2013).

ambiguity (Gawronski et al., 2017). To address this issue, Gawronski and colleagues proposed the CNI model, which evaluates moral decision-making based on three key factors: sensitivity to consequences (C), sensitivity to moral norms (N), and a general tendency to inaction (I). In the mathematical computation of the C, N, and I parameters within the CNI model (Figure 2)[2], participants are presented with dilemmas in which both the cost-benefit magnitude of the outcome and normative considerations are systematically varied.

Figure 2

A multinomial processing tree model classifies moral dilemmas based on proscriptive and prescriptive norms, the magnitude of benefits and costs associated with an action's outcome, and predicts action and inaction responses to these dilemmas.



Source: Gawronski et al., 2017.

While manipulating the benefit-to-cost ratio conceptually frames utilitarianism, modifying the norm[3] by incorporating both proscriptive and prescriptive norms allows for a more comprehensive conceptualization of deontology. Sacrificial dilemmas within the CNI model are structured according to these four conditions (Table 1). The model's parameters are calculated based on a total of twenty-four scenarios derived from real-world events, with six distinct dilemmas presented under four different conditions. This distinction allows for the examination of how C, N and I parameters related to various predictors. For instance, the finding that sensitivity to consequences (C-parameter) decreased under time pressure and increased when there was no time constraint supports the DPM (Kroneisen & Steghaus, 2021). Regarding psychopathy, although no correlation was found between psychopathic traits and sensitivity to consequences (C), these traits were negatively correlated with sensitivity to moral norms (N) (Paruzel-Czachur & Farny, 2023). Therefore, the CNI model is proposed as an alternative framework that more effectively contextualizes moral judgments in sacrificial dilemmas by distinguishing various factors, allowing for the separate examination of their predictors (Gawronski & Ng, 2024).

[2]For details on parameter calculations, see Gawronski et al. (2017).

[3]Whereas the Process Dissociation method is restricted to moral dilemmas involving only prohibitive norms, the CNI model extends this framework by also accounting for the influence of prescriptive norms.

Table 1

An example scenario in which both the outcome and norm are manipulated to test the CNI model (Gawronski et al., 2017).

This introductory sentence appears in all scenarios, which are then framed by norm type and benefit or cost magnitude: "*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*".			
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**
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. Is it acceptable in this case to give the student the medication?	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. Is it acceptable in this case to give the student the medication?	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. Is it acceptable in this case to take the student out of quarantine to return her to her home country for treatment?	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. Is it acceptable in this case to take the student out of quarantine to return her to her home country for treatment?

Two-Dimensional Model of Utilitarianism

One of the most striking findings in recent research on sacrificial dilemmas is the positive relationship between psychopathy and utilitarian decision-making. Various studies have shown that utilitarian choices in sacrificial dilemmas are positively associated with traits including lower levels of empathy (Patil & Silani, 2014), psychopathy, and rational egoism (Kahane et al., 2015). Additionally, Machiavellianism, a perceived sense of meaninglessness in life (Bartels & Pizarro, 2011), and scores on various psychopathy scales (Aktas et al., 2017; Gao & Tang, 2013; Paruzel-Czachura & Farny, 2023; Takamatsu, 2019) have also been linked to utilitarian decision-making in these dilemmas. Conversely, traits such as generosity and a strong sense of connection to humanity have been negatively correlated with utilitarian choices (Kahane et al., 2015). Given that the fundamental aim of utilitarian morality is to maximize overall welfare, one would expect individuals who prioritize the well-being of others—rather than those with psychopathic tendencies—to exhibit stronger utilitarian inclinations. These findings suggest that sacrificial dilemmas highlight a critical aspect of utilitarian morality: the extent to which utilitarian decision-making is contingent on the necessity of causing harm.

Kahane (2015) critiques the use of sacrificial dilemmas, arguing that they fail to capture the gratuitous acts of utilitarian morality observed in real life. He contends that a multidimensional approach is necessary to fully understand ordinary people's utilitarian moral reasoning. Building on this premise, Kahane et al. (2018) proposed the *Two-Dimensional Model of Utilitarianism*, which consists of two sub-dimensions: *impartial beneficence* and *instrumental harm*. The *impartial beneficence* dimension

embodies the principle that every individual's welfare is equally important, independent of personal ties or proximity. This dimension reflects commitment to improving overall well-being without causing harm (e.g., advocating for organ donation). In contrast, *instrumental harm* refers to the acceptability of inflicting harm to achieve greater good. An example of instrumental harm is the willingness to push an individual to their death in order to save multiple lives, as depicted in the *footbridge dilemma*. Based on this distinction, it has been argued that sacrificial dilemmas predominantly measure the instrumental harm aspect of utilitarianism (Everett & Kahane, 2020).

To empirically assess impartial beneficence and instrumental harm, Kahane et al. (2018) developed the *Oxford Utilitarianism Scale* (OUS), which has been validated in 15 languages (Oshiro et al., 2024). An example of an item assessing impartial beneficence is, *"If the only way to save another person's life during an emergency is to sacrifice one's own leg, then one is morally required to make this sacrifice."* An item assessing instrumental harm reads, *"If the only way to ensure the overall well-being and happiness of the people is through the use of political oppression for a short, limited period, then political oppression should be used."* In a study conducted in Türkiye, Kumova and Bahçekapılı (2021) found that psychopathy and Machiavellianism were positively associated with instrumental harm, whereas impartial beneficence was positively related to empathy and perspective-taking. Additionally, a systematic review revealed that anxiety related to empathy was positively associated with impartial beneficence but negatively associated with instrumental harm (Nasello & Triffaux, 2023). Capraro et al. (2019), who experimentally tested the Two-Dimensional Model alongside the assumptions of the *Dual-Process Model*, demonstrated that intuitive thinking reduces instrumental harm without affecting impartial beneficence, in contrast to analytical thinking. However, subsequent research indicated that the manipulations used to experimentally induce analytical thinking in this study did not significantly enhance analytical performance compared to control groups (Isler & Yilmaz, 2023). Consequently, the effects observed in this study may be attributed to intuitive thinking rather than deliberative reasoning.

Although the OUS findings suggest that utilitarian moral reasoning consists of two opposing dimensions, Kahane et al. (2018) maintained that both dimensions theoretically align with principles of utilitarianism, a conclusion reached through consultations with moral philosophers during scale development. On the other hand, Mihailov (2023) critiqued the impartial beneficence items in the OUS, arguing that they primarily assess commitment to moral goodness and an expanded sense of moral responsibility through extreme scenarios rather than the core utilitarian principle of maximizing overall welfare. He thus proposed that impartial beneficence should be analyzed as a concept distinct from utilitarianism.

The Relationship Between Hypothetical Sacrificial Dilemmas and Actual Behavior

The external validity of sacrificial dilemmas used to test the DPM, particularly their generalizability to real-world decision-making, has been criticized due to their artificial nature. People often perceive the *footbridge dilemma* as highly unrealistic, making it difficult to engage with the scenario, which in turn may hinder its ability to activate genuine psychological processes involved in moral decision-making (Bauman et al., 2014). Additionally, the lack of specific attributes, such as race and gender of the individuals involved in the dilemmas, further limits their realism (Hester & Gray, 2020; Schein, 2020). However, some studies suggest that the perceived *plausibility* of a dilemma is more important than its realism in shaping participants' responses (Carron et al., 2022; Körner et al., 2019; Kusev et al., 2016).

Various efforts have been made to place sacrificial dilemmas in more realistic contexts. One study that highlighting the unrealistic nature of sacrificial dilemmas presented members of medical research ethics committees with dilemmas related to vaccine development. These scenarios depicted

a potential vaccine that could save thousands of lives in the future, yet posed a risk of death for the test subjects during the trials. The findings revealed no correlation between board members' decisions on vaccine dilemmas and their responses to classic trolley dilemmas (Dahl & Oftedal, 2019). A seminal article by Bostyn et al. (2018) also highlighted the inadequacy of hypothetical dilemmas in predicting actual behavior. In their study, participants were informed that five mice in a cage would receive an electric shock within twenty seconds unless they redirected the shock to another cage containing a single mouse. While hypothetical choices in sacrificial dilemmas successfully predicted participants' hypothetical decisions regarding the mice, they failed to predict actual behavior when participants had to physically redirect the shock from five mice to one. However, the reaction time of utilitarian responses to hypothetical dilemmas was correlated with actual utilitarian behavior, suggesting that trolley dilemmas are limited but not entirely ineffective in capturing real-world utilitarian decision-making. To enhance the ecological validity of these classical dilemmas, researchers have also examined them in virtual reality (VR) environments, which provide a more immersive and realistic setting. Studies have found that utilitarian decisions are made more frequently in VR settings compared to text-based hypothetical dilemmas (Cecchini et al., 2023; Maćkiewicz et al., 2023; Patil et al., 2013).

Building on the need for better ecologically valid tools in moral dilemma research, Clarkson (2022) argues that economic games offer a promising method for assessing real-life utilitarian behavior, as they more closely resemble actual moral trade-offs people face in everyday life. In line with this perspective, Bostyn et al. (2019) developed the Monetary Trolley Dilemma (MTD) game, inspired by the classic trolley dilemma. Participants were informed that they were part of a group of seven, where two randomly selected individuals would receive $0.60 each, while the remaining five would receive only $0.20. Subsequently, each participant was told that they had been randomly chosen as one of the two lucky recipients of $0.60. They were given the option to redistribute the allocation by reducing the other high recipient's payment from $0.60 to $0.40, thereby increasing the payments to the remaining five participants. Participants who opted to redistribute the money were categorized as making a utilitarian decision, while those who maintained the original allocation were considered to have made a deontological choice, as they refrained from financially harming the first recipient. The study found that responses to classic trolley dilemmas were correlated with behavior in the MTD game. However, unlike hypothetical dilemmas, MTD behavior was not associated with psychopathy, suggesting that traditional dilemmas may conflate utilitarian reasoning with antisocial traits.

While Bostyn et al. (2019) examined the trolley dilemmas in a monetary context, whether utilitarian or deontological decisions in the MTD are driven by cognitive or emotional processes remains an open question. To address this gap, Vurgun et al. (2025) revised the MTD game and investigated whether actual utilitarian behavior aligns with the prediction of DPM. In the revised game, participants were placed participants in a passive role and informed that one of the six other participants would receive a payment. They were then given the option to redistribute the payment—taking it from one individual and giving the same amount to each of the remaining five. Opting for redistribution was classified as a utilitarian behavior. At time 1, participants' cognitive reflection and the scores on the OUS were measured. After 17 months, their responses to the monetary dilemma, along with their moral justifications, were measured. Results showed that utilitarian behavior was positively associated with cognitive reflection even after 17 months, supporting the DPM hypothesis. However, neither instrumental harm nor impartial beneficence subscales of OUS predicted utilitarian behavior. Additionally, participants who scored in utilitarian justification were more likely to choose utilitarian options. On the other hand, among the moral justifications assessed, impartial beneficence was positively correlated with deontological, utilitarian, inequality aversion, and virtue-ethical justifications, but not with amoral justification. These findings suggest that the monetary dilemma game is a valid tool for measuring

real-world utilitarian decision-making, whereas impartial beneficence appears ineffective in capturing either actual behavior or self-reported utilitarian justification.

Both Bostyn et al. (2019) and Vurgun et al. (2025) provide empirical support for Clarkson's (2022) argument that economic games offer a more ecologically valid approach to assessing real-world utilitarian behavior. By integrating monetary incentives and social trade-offs, these games may provide a more accurate reflection of the complex moral decisions people face outside the laboratory.

Conclusion

In this chapter, we examine the models and methods used to study utilitarian and deontological normative morality in the moral psychology literature. We discuss the fundamental assumptions of the DPM, the most extensively studied framework in the field, along with empirical studies that test its validity using measures of judgment, behavior, brain imaging, and physiological responses. While the universality of the model and its applicability across cultures have been questioned, some findings suggest that it has cross-cultural validity (Awad et al., 2020; Bago et al., 2022). However, DPM has also been subject to both conceptual and methodological criticisms, particularly concerning the sacrificial dilemmas commonly used to test the model.

Although hypothetical sacrificial dilemmas may be inadequate for assessing real-life utilitarianism, they have been valuable tools for testing Greene's (2008) DPM due to the cognitive conflict they induce. By isolating whether moral judgments are primarily driven by emotional or analytical reasoning, these dilemmas enabled the study of moral cognition in controlled laboratory settings. While such methods have advanced our understanding of why individuals make different decisions across dilemmas—findings that have been corroborated by alternative frameworks such as the revised CNI Model—they remain insufficient for explaining the cognitive origins of real-life utilitarian behavior.

When evaluated using the Process Dissociation method, the assumption that utilitarian and deontological moral judgments rely on distinct cognitive processes has received empirical support (Conway & Gawronski, 2013). Similarly, the CNI Model suggests that adherence to utilitarian and deontological principles is driven by different sources of information. However, both of these approaches continue to rely on hypothetical sacrificial dilemmas, which are limited in their ability to explain real-world utilitarian behavior, leading to concerns about their ecological validity.

Another major criticism of sacrificial dilemmas is the association between utilitarian decision-making and psychopathy, which arises from the condition that utilitarianism necessarily involves instrumental harm (Kahane, 2015). To address this limitation, the Two-Dimensional Model of Utilitarianism introduced an additional dimension—impartial beneficence—which emphasizes the altruistic aspect of utilitarianism beyond its association with harm. While this model aims to capture impartial beneficence as a core component of lay utilitarian morality, the Oxford Utilitarianism Scale (OUS), developed to measure these dimensions, remains limited as it primarily assesses general moral concern rather than specifically utilitarianism (Vurgun et al., 2025). Furthermore, the validity of the impartial beneficence dimension has been conceptually challenged (Mihailov, 2023), further questioning the ability of the OUS to measure real-life utilitarianism.

The persistent gap between intentions and behavior has been a limitation across all existing models, and developing incentivized behavioral tasks to capture actual utilitarian behavior remains an underutilized approach (for exceptions, see Bostyn et al., 2019; Vurgun et al., 2025). This shortcoming underscores the lack of consensus on how to effectively measure utilitarianism and highlights the need for future research to prioritize behavioral measures.

Future research should, therefore, focus on developing behavioral tools that allow for the measurement of various forms of real-world utilitarian behavior, both in laboratory settings and field experiments. Integrating ecological validity with a rigorous experimental design will significantly enhance our understanding of how utilitarian decision-making operates beyond controlled hypothetical scenarios.

List of Basic Texts and Further Readings

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