

Is Utilitarianism Risky? How the Same Antecedents and Mechanism Produce Both Utilitarian and Risky Choices

Perspectives on Psychological Science
2015, Vol. 10(4) 541–548
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DOI: 10.1177/1745691615583130
pps.sagepub.com



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Abstract

Philosophers and psychologists have long been interested in identifying factors that influence moral judgment. In the current analysis, we compare the literatures on moral psychology and decision making under uncertainty to propose that utilitarian choices are driven by the same forces that lead to risky choices. Spanning from neurocognitive to hormonal to interpersonal levels of analysis, we identify six antecedents that increase both utilitarian and risky choices (ventromedial prefrontal cortex brain lesions, psychopathology, testosterone, incidental positive affect, power, and social connection) and one antecedent that reduces these choices (serotonin activity). We identify the regulation of negative affect as a common mechanism through which the effects of each antecedent on utilitarian and risky choices are explained. By demonstrating that the same forces and the same underlying mechanism that produce risky choices also promote utilitarian choices, we offer a deeper understanding of how basic psychological systems underlie moral judgment.

Keywords

utilitarianism, deontology, moral judgment, risk taking, affect regulation

When we first encounter utilitarianism, the kind of thinking it requires seems straightforward and commonsensical . . . As we try to analyze cases using utilitarian calculations, however, the work becomes increasingly difficult, more like weighing risks involved in various national defense strategies than common practical decisions.

—Freeman and McDonnell (2001, p. 191)

For centuries, philosophers have evaluated the quality of moral decisions on the basis of whether they promote the greatest good (utilitarian, or consequentialist, perspectives) or whether they adhere to moral rules and principles (deontological perspectives; Bentham, 1789/1948; Kant, 1785). Over the past few decades, psychologists have studied how utilitarian and deontological considerations affect the judgments and choices of individual decision makers (Baron & Spranca, 1997; Greene, Sommerville, Nystrom, Darley, & Cohen, 2001).

In the current analysis, we propose that the psychological processes that produce utilitarian choices in moral dilemmas are the same ones that produce risky choices

in decisions under uncertainty. Drawing on the moral psychology and decision making under uncertainty literatures, we identify seven common antecedents of utilitarian and risky choices (six antecedents that increase and one antecedent that reduces both). We also identify a single underlying mechanism: We discuss how the regulation of negative affect when faced with utilitarian or risky choices appears to account for the effect of each antecedent. Having established common antecedents and mechanism, we conclude with a discussion of how risk propensity might influence utilitarian choices in moral dilemmas.

Risky Choice

Risky choices are choices made without advance knowledge of their consequences (Kahneman & Tversky, 1984). Risk takers are those individuals who would choose

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alternatives with higher outcome variability (i.e., a wider range of possible outcomes) over alternatives with lower outcome variability (Figner & Weber, 2011). Traditionally, decision making under uncertainty has been studied by researchers using decisions that involve choosing between a safe or certain alternative (e.g., \$50 for sure) and a risky or uncertain alternative (e.g., a 50% chance of \$100; Tversky & Kahneman, 1981). Because uncertainty produces anticipatory fear and anxiety, risky choices are often rejected in favor of certain options even when their expected value is greater.

Utilitarian Choice

Utilitarianism asserts that the consequences of a decision are the only factor relevant to a choice (Mill, 1879). Utilitarian choice is primarily studied in the context of moral dilemmas (Foot, 1967; Greene et al., 2001) in which a utilitarian option, which optimizes benefits for an overall collective, is pitted against a deontic option based on moral rules that forbid certain kinds of acts, even when those acts have the best consequences. According to rational actor theories, utilitarian approaches lay out a simple normative framework for maximizing collective utility. However, in practice, utilitarianism is not so easily pursued. Limited time, money, and resources mean that maximizing utility for some involves trading off the utility of others. People often deviate from utility maximization in favor of alternatives that align with their moral intuitions and values.

It is the tension between wanting to maximize outcomes and upholding moral rules that make these dilemmas difficult to resolve. These dilemmas typically involve a hypothetical judgment or choice of whether to sacrifice one person's welfare to benefit the welfare of many others (e.g., kill one person to save five people). From the utilitarian perspective, sacrificing one person increases overall utility because only one life is lost rather than five lives. From the deontic perspective, treating the one life merely as a means to save the others is inappropriate. A classic scenario is the trolley dilemma (see Table 1, which highlights the utilitarian and deontological choices in two common versions of this dilemma: the switch and the footbridge trolley dilemmas). Another scenario to consider is the species preservation dilemma, which is also described in Table 1. Here, opening the dam is considered utilitarian because it produces the greatest good (saves 18 species), and not opening the dam is considered deontological because it upholds moral rules that proscribe direct harm. Respondents who care the most about preservation, and who view it as sacred, are often the least likely to endorse opening the dam, ironically resulting in fewer species saved (Baron & Spranca, 1997; Bartels & Medin, 2007).

Common Antecedents of Utilitarian and Risky Choices

We propose that the same psychological processes produce both utilitarian and risky choices. In this section, we review seven common antecedents of utilitarian and risky choices (six antecedents that promote and one antecedent that inhibits these choices; see Table 2).

Neurocognitive antecedent: Ventromedial prefrontal cortex (vmPFC) brain lesions

Patients with brain lesions—specifically, lesions associated with impaired ability to integrate emotion into their decisions—reveal similar patterns of increased utilitarianism and risk taking. In one study, Bechara, Damasio, Damasio, and Anderson (1994) measured risk taking in the Iowa Gambling Task, in which participants chose cards from riskier (i.e., high reward but larger punishment) and safer (i.e., lower reward but smaller punishment) card decks. Whereas participants with unlesioned brains learned to shift away from risky decks, patients with vmPFC damage continuously chose from the risky decks. In another study, Koenigs et al. (2007) examined the role of the vmPFC in moral judgment by having participants judge across multiple scenarios whether to sacrifice the welfare of one person for the welfare of many others (e.g., the surgeon dilemma in Table 1); patients with vmPFC brain lesions endorsed utilitarianism significantly more than control patients.

Neurocognitive antecedent: Psychopathology

Populations with psychopathic tendencies exhibit heightened risk taking and utilitarianism. Similar to patients with vmPFC brain lesions, individuals with psychopathic tendencies fail to learn to shift away from the risky decks in the Iowa Gambling Task (Blair, Colledge, & Mitchell, 2001; Mitchell, Colledge, Leonard, & Blair, 2002). Psychopathic populations also endorse more utilitarian choices compared with individuals without psychopathic tendencies (Koenigs, Kruepke, Zeier, & Newman, 2012). Similarly, psychopathic tendencies measured in a normal adult population predict endorsement of utilitarian choices (Bartels & Pizarro, 2011).

Neurochemical antecedent: Serotonin activity

Serotonin activity negatively predicts both risk taking and utilitarianism. In one study, those with the short allele of serotonin transporter 5-HTTLPR, which is associated with

Table 1. Examples of Moral Dilemmas in Which Deontological Values Are Pitted Against Utilitarian Outcomes

Dilemma	Text	Utilitarian choice	Deontological choice
Species preservation	As a result of a dam on a river, 20 species of fish are threatened with extinction. By opening the dam for a month each year, you can save these species, but two species downstream will become extinct because of the changing water level. Do you open the dam for a month each year to save the 20 species?	Open the dam, sacrificing two species to save 20 species	Do not open the dam
Switch trolley dilemma	You are at the wheel of a runaway trolley quickly approaching a fork in the tracks. On the tracks extending to the left is a group of five railway workmen. On the tracks extending to the right is a single railway workman. If you do nothing the trolley will proceed to the left, causing the deaths of the five workmen. The only way to avoid the deaths of these workmen is to hit a switch on your dashboard that will cause the trolley to proceed to the right, causing the death of the single workman. Do you hit the switch to avoid the deaths of the five workmen?	Hit the switch, sacrificing one workman to save five workmen	Do not hit the switch
Footbridge trolley dilemma	A runaway trolley is heading down the tracks toward five workmen who will be killed if the trolley proceeds on its present course. You are on a footbridge over the tracks, in between the approaching trolley and the five workmen. Next to you on this footbridge is a stranger who happens to be very large. The only way to save the lives of the five workmen is to push this stranger off the bridge and onto the tracks below where his large body will stop the trolley. The stranger will die if you do this, but the five workmen will be saved. Do you push the stranger onto the tracks to save the five workmen?	Push the stranger, sacrificing him to save five workmen	Do not push the stranger
Surgeon dilemma	You are a surgeon with several patients. Five of your patients need organ transplants. Each of them needs a different organ, or they will surely die. You have another patient who is healthy and would be an ideal organ donor for the others. If you transplant his organs (against his will) into the bodies of the other patients, they will live, but he will die. Do you perform this transplant?	Perform the transplant, sacrificing one patient to save five patients	Do not perform the transplant

higher serotonin activity, were significantly less likely to invest their money in a risky gamble than to select a riskless but less lucrative option (Kuhnen & Chiao, 2009). Researchers who have manipulated serotonin through the dietary intake of tryptophan have found a negative relationship between serotonin activity and impulsive choice—that is, forgoing larger gains in the future to select smaller present gains (Crockett, Clark, Lieberman, Tabibnia, & Robbins, 2010). Utilitarianism is also negatively predicted by serotonin activity. In one study, the 5-HTTLPR short allele, associated with higher serotonin activity, was negatively correlated with willingness to endorse utilitarian actions (Marsh et al., 2011). When serotonin activity is manipulated with citalopram, a serotonin reuptake inhibitor, lower serotonin levels predict endorsement of utilitarian choices, particularly in dilemmas that involve emotionally salient harm (Crockett, Clark, Hauser, & Robbins, 2010).

Hormonal antecedent: Testosterone

Both risk-taking and utilitarian choices are predicted by elevated testosterone. In one study, Ronay and von Hippel (2010) measured the effects of testosterone on risk taking and found that the presence of an attractive female elevated the testosterone of skateboarders, which led to an increase in the riskiness of the skateboarders' tricks. Other studies show that people high in endogenous testosterone allocate more money toward risky investments (Apicella et al., 2008) and are more likely to select from risky decks in the Iowa Gambling Task (Stanton, Liening, & Schultheiss, 2011; but also see Stanton, Mullette-Gillman, et al., 2011). Testosterone has also been linked to utilitarianism. In a study of Master's of Business Administration (MBA) students who were obtaining a master's degree in business administration, Carney and Mason (2010) found a correlation between

Table 2. Summary of How the Seven Antecedents Relate to Utilitarian Choice, Risky Choice, and Negative Affect Regulation

Antecedent	Risky choice	Utilitarian choice	Negative affect
vmPFC brain lesions	↑ Bechara, Damasio, Damasio, & Andersong, 1994	↑ Koenigs et al., 2007	↓ S. W. Anderson, Bechara, Damasio, Tranel, & Damasio, 1999
Psychopathology	↑ Blair, Colledge, & Mitchell, 2001; Mitchell, Colledge, Leonard, & Blair, 2002	↑ Bartels & Pizarro, 2011; Koenigs, Kruepke, Zeier, & Newman, 2012	↓ Blair, 1995
Serotonin	↓ Crockett, Clark, Lieberman, Tabibnia, & Robbins, 2010; Kuhnen & Chiao, 2009	↓ Crockett, Clark, Hauser, & Robbins, 2010; Marsh et al., 2011	↑ Hariri et al., 2002; Lesch et al., 1996
Testosterone	↑ Apicella et al., 2008; Ronay & von Hippel, 2010; Stanton, Liening, & Schultheiss, 2011	↑ Carney & Mason, 2010; Montoya et al., 2013	↓ van Honk & Schutter, 2007; van Wingen, Ossewaarde, Backstrom, Hermans, & Fernandez, 2011
Power	↑ Anderson & Galinsky, 2006; Carney, Cuddy, & Yap, 2010	↑ Cote, Piff, & Willer, 2013; Rock & Janoff-Bulman, 2012	↓ Keltner et al., 2003
Social Connection	↑ Chou & Nordgren, 2015; Levav & Argo, 2010	↑ Lucas & Livingston, 2014	↓ Beckes & Coan, 2011; Cooper, Shaver, & Collins, 1998; Wei, Vogel, Ku, & Zakalik, 2005
Positive Affect	↑ Isen & Geva, 1987; Knutson, Wimmer, Kuhnen, & Winkielman, 2008; Nygren, Isen, Taylor, & Dulin, 1996	↑ Strohmingner, Lewis, & Meyer, 2011; Valdesolo & DeSteno, 2006	↓ Diamond & Aspinwall, 2003; Folkman & Moskowitz, 2000

Note: Arrows indicate the positive or negative relationship between the two factors (e.g., vmPFC brain lesions increase risky choice). vmPFC = ventromedial prefrontal cortex.

salivary testosterone levels and endorsement of utilitarian choices in the switch and footbridge trolley dilemmas. Similarly, testosterone administration to women increased the perceived permissibility of utilitarian actions in a series of trolley-like dilemmas (Montoya et al., 2013).

Intrapsychic antecedent: Positive affect

Positive affect increases both risk taking and utilitarianism. Positive affect is consistently found to reduce the perceived riskiness of risky alternatives (Isen & Geva, 1987;

Nygren, Isen, Taylor, & Dulin, 1996). In one study, male participants who anticipated viewing erotic pictures (a positively anticipated task) took more financial risks than those who did not anticipate viewing erotic pictures (Knutson, Wimmer, Kuhnen, & Winkielman, 2008). When people are made to experience positive affect, they endorse significantly more utilitarian choices in the footbridge trolley dilemma than do control participants (Valdesolo & DeSteno, 2006). Furthermore, positive feelings of mirth increase the permissibility of utilitarian choices; however, feelings of elevation do not (Strohmingner, Lewis, & Meyer, 2011).

Interpersonal antecedent: Power

The link between power and risk taking is well established. For instance, participants are more likely to endorse having unprotected sex after being asked to recall experiences with power compared with recalling powerless experiences (C. Anderson & Galinsky, 2006). Inducing feelings of power through a posture manipulation increases risk taking when participants choose between \$2 or a 50% chance of winning \$4 (Carney, Cuddy, & Yap, 2010). Researchers have also found a link between power and utilitarianism. Individuals primed with high power rate utilitarian actions as more acceptable than individuals primed with low power (Rock & Janoff-Bulman, 2012). Similarly, people with greater power in society (i.e., upper social class) make more utilitarian choices (Cote, Piff, & Willer, 2013). Cote et al. (2013) found that upper-class participants as measured by total household income, are more likely to take resources from one person to benefit a collective and to choose the utilitarian option in the footbridge trolley dilemma than are lower-class participants.

Interpersonal antecedent: Social connection

Feeling socially connected to others can increase risk taking. People make more risky decisions—they choose cards with higher volatility (higher risk, higher reward) in a card gambling task—in the presence of others, particularly in-group members, than when deciding in solitude (Chou & Nordgren, 2013). Similarly, a female experimenter's touch on the shoulder (but not a male experimenter's touch) leads both male and female participants to feel more secure and to select riskier gambles (Levav & Argo, 2010). Social connection is also linked to utilitarianism. Lucas and Livingstone (2014) found that participants who worked for 20 min with a partner reported feeling more socially connected and endorsed more utilitarian choices in the footbridge dilemma compared with participants who worked alone. In another of their experiments, participants who were asked to recall a close other endorsed more utilitarian choices than individuals who were asked to recall a distant other (Lucas & Livingstone, 2014).

Effective Regulation of Negative Affect Increases Utilitarianism and Risk Taking

We propose that the regulation of negative affect is a common mechanism that promotes both utilitarianism and risk taking. In moral dilemmas and in decisions under uncertainty, people experience negative affect

when they consider violating moral rules or accepting uncertainty. As a result, finding a way to down-regulate this negative affect promotes utilitarian and risky choices. We use the term *emotion regulation* broadly to include any factor that mitigates the influence of aversive affect.

Identifying a common mechanism helps explain why six of the antecedents increase utilitarianism and risk taking and why one decreases them. To establish why negative affect regulation promotes utilitarianism and risk taking, we first discuss emotion regulation in the context of dominant theoretical models. We then review evidence that the six antecedents that increase risky and utilitarian choices also promote the effective regulation of negative affect and that the one antecedent that decreases these choices also inhibits the effective regulation of negative affect.

Dominant models of decision making under uncertainty and moral decision making emphasize the dynamic between cognition and emotion (Greene & Haidt, 2002; Haidt, 2001; Loewenstein, Weber, Hsee, & Welch, 2001; Slovic, Finucane, Peters, & MacGregor, 2007). These models highlight how the prospect of choosing utilitarian and risky choices increases negative affect and why people need to regulate negative affect to make these choices.

Theoretical models of choice under uncertainty suggest that people choose risky gambles (a) when the rewards are sufficient to overpower the anxiety associated with uncertainty or (b) when people have sufficient cognitive capacity to reason through the decision and override these affective reactions (Loewenstein et al., 2001). Similarly, dual process models of moral decision making suggest that utilitarian choices result when cognitive processes are able to override the influence of moral affect (Greene et al., 2001). This can result from factors that increase cognitive capacity or factors that reduce negative affect. Empirical evidence supports this dual-process model: Utilitarian choices uniquely recruit cognitive resources, are attenuated by cognitive load, and are promoted by the need for cognition (Conway & Gawronski, 2013; Greene, Morelli, Lowenberg, Nvstrom, & Cohen, 2008). In investigations of emotion regulation, researchers have found that emotion suppression increases utilitarian preferences (Lee & Gino, 2015) and that emotion reappraisal increases deliberation and reduces the influence of moral intuitions (Feinberg, Willer, Antonenko, & Oliver, 2012). These studies demonstrate the two distinct routes—cognitive and affective—through which the impact of negative moral affect can be regulated.

How the Seven Antecedents Impact the Regulation of Negative Affect

Here, we discuss evidence that the six antecedents that promote risk-taking and utilitarian choices also facilitate

the effective regulation of negative affect and that the one antecedent that decreases risk-taking and utilitarian choices impairs negative-affect regulation.

The six positive antecedents each regulate negative affect by either (a) blunting emotional processing and reactivity or (b) facilitating emotion-regulation strategies. Brain lesions, psychopathy, and testosterone promote utilitarian and risky choices through blunting emotional reactivity. VMPFC brain lesions and psychopathy are linked to deficits in social and emotional processing (S. W. Anderson, Bechara, Damasio, Tranel, & Damasio, 1999; Blair, 1995), and testosterone has been found to blunt vigilance toward and reactivity from emotional stimuli (van Honk & Schutter, 2007; van Wingen, Ossewaarde, Backstrom, Hermans, & Fernandez, 2011).

In contrast, positive affect, power, and social connection reduce negative affect by facilitating emotion-regulation strategies. Positive affect is thought to facilitate emotion regulation (Diamond & Aspinwall, 2003), stress coping (Folkman & Moskowitz, 2000), and dopamine regulation (Ashby, Isen, & Turken, 1999). Power promotes successful goal pursuit, which requires the regulation of affect and attention (Galinsky, Gruenfeld, & Magee, 2003; Guinote, 2007a, 2007b). Power also produces an abstract mind-set (Smith & Trope, 2006), which focuses attention on broader goals—a critical component of affect regulation (Fujita, 2011). Social connection has also been linked to emotion regulation. People with secure attachment styles develop more appropriate emotion-regulation strategies than their peers who are insecure (Cooper, Shaver, & Collins, 1998; Wei, Vogel, Ku, & Zakalik, 2005). Similarly, the ability to down-regulate threatening affect is facilitated by the presence of close others (Beckes & Coan, 2011).

Serotonin activity, the one antecedent that decreases utilitarianism and risk taking, has been linked to affective reactivity (Lesch et al., 1996). In one study, individuals with the 5-HTTLPR short allele (associated with higher serotonin activity) displayed greater amygdala activity in response to fearful stimuli compared with individuals with the long allele variant (Hariri et al., 2002).

This section has illustrated that the impact of the seven antecedents of utilitarianism and risk taking can be predicted by their relationship to the regulation of negative affect. When unregulated, negative affect inhibits both risky and utilitarian choices.

How Risky Is Utilitarianism?

We have reviewed evidence that utilitarian and risky choices share common antecedents and the same underlying mechanism. Future research is needed to determine whether utilitarianism and risk taking share a deeper

connection. Here, we offer a theoretical proposition that begins with the observation that deontological choices are rooted in moral values, which offer moral certainty (Skitka, 2010; Turiel, 1983). People are more confident about the correctness of their attitudes, judgments, and behaviors when they are rooted in moral rules, values, and intuitions. In contrast, utilitarianism is purely rooted in calculation. A utilitarian arrives at the greater good decision to pull the trolley switch or to donate to impoverished communities because the balance sheet suggests that it is appropriate. We propose that when moral rules are ignored, subverted, or violated by a utilitarian alternative, pursuing that alternative will feel less morally certain and, consequently, will feel more risky than deontological alternatives that uphold those same rules. In these cases, the regulation of negative affect will be particularly important.

General Discussion

We have demonstrated that the same seven antecedents and common mechanism drive utilitarian and risky choices. We, however, recognize limitations in the present literature. For instance, in many moral judgment studies, researchers use a paradigm in which utilitarianism is action oriented, and deontology involves inaction. A benefit of researchers consistently using a single paradigm is comparability across studies. However, future work should include dilemmas that involve a wider range of violations and decisions (e.g., Piazza & Landy, 2013). Future researchers should also investigate moral dilemmas that involve real consequences rather than hypothetical choices.

In moral psychology, psychologists seek to understand the psychological processes that underlie moral judgment. Our analysis suggests the intriguing possibility that risk propensity may underlie utilitarian choices. From this perspective, utilitarian choices can be seen as risky choices.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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