

# Taboos and conflicts in decision making: Sacred values, decision difficulty, and emotions

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## Abstract

Previous studies suggest that choices are perceived as difficult as well as negatively emotion-laden when they tap into moral considerations. However, we propose that the involvement of moral issues and values can also facilitate decisions because people often insistently preclude them from trade-offs with other values. Because such values are treated as inviolable and absolute, they are called sacred values (e.g., Tetlock et al., 2000). Two experiments examined the influence of sacred values (measured by a recent self-report scale) and variation of trade-off type (taboo, tragic, routine trade-offs) on perceived decision difficulty and negative emotions. As hypothesized, decision difficulty and negative emotions show diverging patterns as a function of sacred values and trade-off types. When the decision situation involved two conflicting sacred values (i.e., tragic trade-off), people perceived the decision task as emotionally stressful and difficult. However, when the decision situation was associated with only one sacred value (i.e., taboo trade-off), people perceived the task as more negatively emotion-laden, but as easier to solve, compared to a situation not involving sacred values (i.e., routine trade-off). These findings suggest that reliance on sacred values may work as a heuristic.

Keywords: Sacred values, protected values, taboo, decision making, decision difficulty, emotion, morality.

## 1 Introduction

Most normative theories of decision making view it as a process that requires trade-offs between values. A trade-off means compensating for a disadvantage on one value with a benefit on some other value (e.g., Keeney & Raiffa, 1976; von Neumann & Morgenstern, 1947). For example, the choice between two job offers may imply a trade-off between salary and traveling distance to work. According to normative theories, any types of values or attributes can be traded off, in order to arrive at a choice that maximizes subjective utility.

Decision making research, however, has rejected this relatively simplistic view (e.g., Payne, Bettman, & Johnson, 1993). Decision tasks are sometimes perceived as difficult, negatively emotion-laden and distressing, and

that people often avoid making decisions (e.g., Anderson, 2003; Luce, 1998; Payne et al., 1993). We know from personal experience that choices differ greatly in their difficulty and emotional charge. For example, imagine two managers of global companies who are faced with rather different decision problems. One manager is faced with the problem of whether to improve the poor working conditions for which the company has been criticized by a human rights organization, or to invest in new production facilities in order to improve competitive capacity. The other manager has to decide whether to improve the poor working conditions for which the company has been criticized by a human rights organization, or to solve the company's widely criticized severe environmental pollution issues.

Comparing these choices — improved working conditions versus competitive capacity, on the one hand, and improved working conditions versus environmental issues, on the other — we believe that they vary in perceived decision difficulty and emotional charge. Both decisions may tap into moral or ethical considerations (such as human health, environmental protection), but they may differ in terms of how the choice options relate to moral values. In the first decision problem, just one option may be related to a moral value (i.e., safety at work), whereas the second decision problem may involve two conflict-

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ing moral values (i.e., safety at work vs. environmental protection). In general, we believe that a decision problem will be perceived as easier if people consider moral aspects for one but not the other option. More specifically, we argue that decisions become easier when one of the options reflects *sacred values*. As we will describe later in more detail, sacred values are values that are seen as absolute and thus protected from trade-offs with other values because they tap into moral or ethical principles. In contrast, a decision problem should be perceived as much more difficult and emotionally distressing if both options reflect sacred values. Such situations imply the necessity of trading off two moral values and, therefore, of sacrificing one of the values. Traditional normative views of decision making do not take into account such differences. They presume that people solve both decision problems in an equally rational and unemotional manner, and that people are able to make trade-offs among any conflicting values.

In this paper, we focus on decision problems involving moral considerations, and we attempt to specify the effects of sacred values on decision difficulty and emotions. We define decision difficulty as the level of perceived difficulty or ease of selecting among choice options. Previous studies have identified a plenty of factors that affect decision difficulty (for a review, see Anderson, 2003). For instance, some research suggests that decision difficulty may depend on the extent to which choices contain attributes that are difficult to *trade off*. This is the case, for instance, when trade-offs pertain to attributes that are associated with valued goals or potentially threatening consequences (e.g., the trade-off between safety and price attributes when buying a car). Luce and colleagues (Luce, 1998; Luce, Bettman, & Payne, 1997; Luce, Payne, & Bettman, 1999) have shown that difficult trade-offs elicited higher levels of negative emotions and stronger tendencies to avoid such trade-offs. Hence, the level of negative emotions reflects the degree of trade-off difficulty. Although it has not been measured explicitly, it is plausible to assume that difficult and negatively emotion-laden trade-offs may also increase perceived decision difficulty. Note that this would suggest a positive relationship between negative emotions and decision difficulty. In other words, choices eliciting negative emotions should also be perceived as difficult.

In the current study, however, we attempt to show that certain decisions are perceived as quite easy and straightforward even though they elicit negative emotions. We assume that this is particularly pronounced when decisions involve moral or ethical considerations. Compared to everyday choices (e.g., whether to buy newspaper A or B), decisions involving moral considerations are very likely to be more distressing and disturbing, probably since the decision-maker realizes that something partic-

ularly important and delicate is at stake.

## 1.1 Sacred values and trade-off types

The concept of *sacred values* (or *protected values*) was developed to express the idea that certain values and moral principles are seen as absolute and non-negotiable and thus are protected from trade-offs with other values (Baron & Spranca, 1997; Tanner & Medin, 2004; Tanner, Ryf, & Hanselmann, 2007; Tetlock, Kristel, Elson, Lerner, & Green, 2000). A sacred value has been defined as “any value that a moral community implicitly or explicitly treats as possessing infinite or transcendental significance that precludes comparisons, trade-offs, or indeed any other mingling with bounded or secular values” (Tetlock et al., 2000, p. 853). Values like human life, health, nature, love, honor, justice, or human rights are seen as absolute and inviolable — in effect sacred. Trading them off against secular values (e.g., money) is considered taboo. For instance, previous research has shown that people struggle to protect sacred values from trade-offs against other values and respond with strong moral outrage when faced with violations of such taboo trade-offs. Moreover, it has been suggested that even the mere contemplation of taboo trade-offs elicits strong negative feelings of distress and disturbance (Tetlock, 2003).

The aim of the present research is to examine the effects of sacred values on decision difficulty and emotions. More specifically, we study the effects of the following three distinct *trade-off types* on decision difficulty and emotions: *Taboo trade-offs* (i.e., a situation that pits a sacred value against a secular value), *tragic trade-offs* (i.e., a situation that pits two sacred values against each other) and *routine trade-offs* (i.e., a situation that pits two secular values against each other). Tetlock et al. (2000) indicated that such trade-off types and decision difficulty are closely related. The authors examined how participants judged *another person* who was faced with a taboo or a tragic trade-off situation and who reported the task to be easy or difficult. The authors found that decision-makers who evaluated taboo trade-off decisions as easy and tragic trade-off decisions as difficult were judged positively by the participants. However, decision-makers who evaluated taboo trade-off decisions as difficult and tragic trade-off decisions as easy were judged negatively. It is important to note that these findings rely on judgments made from an observer perspective. Our research will study relations between trade-off types and decision difficulty when participants are *themselves* in the role of the decision-maker.

We hypothesize that decision difficulty and negative emotions vary as a function of sacred values and trade-off type, and that decision difficulty and negative emotions are associated in a non-linear fashion. Specifically, com-

pared to routine trade-offs, we expect taboo trade-offs to be more negatively emotion-laden, because the decision maker may realize that sacred values are involved and something important and delicate is at stake. Despite provoking negative emotions, we suppose that the involvement of just one sacred value in taboo trade-offs will help to make decisions easier. Conversely, we expect decision situations that imply the necessity of trading off two sacred values and sacrificing one of them (tragic trade-offs) to be associated with higher levels of negative emotions and decision difficulty, compared to the other conditions.

## 1.2 Overview of experiments

We report two experiments that examined how sacred values and manipulation of trade-off types affect decision difficulty and negative emotions. In both experiments, participants were provided with decision scenarios that refer to hot issues as well as everyday decisions, such as poor working conditions, flood protection, or job selection. Each experiment includes a manipulation of trade-off type (i.e., taboo vs. tragic vs. routine trade-off scenarios), and each scenario provides a choice between two options.

As an important manipulation check, we examine the extent to which participants associate sacred values with the choice options and whether trade-off types really correspond with sacred value endorsements. To assess people's endorsement of sacred values, we utilize the recently developed *Sacred Values Measure* (SVM; Tanner et al., 2007). In Experiment 1, a previous version of the instrument is used, whereas Experiment 2 contains the improved final version (see Appendix B). This scale was designed to tap into important features of sacred values (e.g., unwillingness to sacrifice a value, incommensurability, trade-off resistance). Participants are provided with several items and asked to indicate the extent of their agreement on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

The SVM was shown to have good internal consistency in several studies, yielding  $\alpha$ 's higher than .79 (Tanner et al., 2007). In terms of construct validity, the scale was compared with measures of moral outrage (e.g., Tetlock et al., 2000) and attitude strength (e.g., Pomerantz, Chaiken, & Tordesillas, 1995). Although the moral outrage items represent a more "indirect" approach to sacred values (i.e., people's reactions to observed violations of sacred values are assessed), the SVM is designed to measure essential features of sacred values in a more "direct" manner. The studies revealed that moral outrage measures and our sacred values measure represent conceptually distinct factors, even though they are highly correlated ( $r_s > .76$ ). Furthermore, we found evidence in several studies that sacred values differ conceptually from

strong attitudes. As our focus in the current research lies on the decision-maker's perspective rather than the observer's perspective, sacred value measurement by the SVM seems to be more appropriate than the moral outrage approach.

In both experiments, the primary dependent variables were perceived decision difficulty and negative emotions. Decision difficulty was measured by a single item (Experiment 1) or by a short set of items regarding various aspects of decision difficulty (Experiment 2). Negative emotions were also assessed using various approaches. In Experiment 1, we present a set of five items focusing on emotional stress. In Experiment 2, we utilize the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988).

## 2 Experiment 1

Experiment 1 examines how sacred values and trade-off type are related to decision difficulty and negative emotions. As outlined in the introduction, we hypothesize that decision difficulty and negative emotions are associated in a non-linear fashion, depending on trade-off type. We call the three types: taboo, meaning that *one* of the values is sacred; tragic, meaning that both are sacred; and routine, meaning that neither value is sacred.

### 2.1 Method

#### 2.1.1 Participants and design

A sample of 84 students from the University of Zurich (65 women, 19 men) completed a paper-and-pencil questionnaire that contained three decision scenarios. Participants' ages ranged from 18 to 63 years ( $M = 25.39$ ). They were recruited by advertisements in several study courses. In return for their participation, respondents were given the opportunity to take part in a prize draw.

Participants were provided with one of two different scenario combinations, each consisting of a taboo, a tragic, and a routine trade-off scenario. Therefore, the design was a 3 (trade-off type: taboo vs. tragic vs. routine) X 2 (scenario combination: A vs. B) factorial design with trade-off type as within-subject factor and scenario combination as between-subject factor. Participants were randomly assigned to one of the two between-subject conditions. Dependent variables were sacred value endorsements, negative emotions, decision, and decision difficulty.

#### 2.1.2 Materials and procedure

Subjects were tested in small groups containing a maximum of five persons. Materials were written in German.

Table 1: Scale means (standard deviations) for sacred value endorsements, decision, decision difficulty, and negative emotions, for each scenario (n = 83).

Scenario	Sacred value <sup>a</sup>		Decision <sup>b</sup>	Difficulty <sup>c</sup>	Neg. emot. <sup>d</sup>
	Option 1	Option 2			
Taboo trade-offs					
Flood protection	4.77 (1.24)	3.14 (1.07)	1.26 (0.59)	1.83 (0.94)	2.58 (0.81)
Safety at work	4.93 (1.40)	3.09 (0.81)	1.59 (0.87)	2.85 (1.57)	3.98 (1.30)
Tragic trade-offs					
Flood protection	3.73 (0.94)	4.11 (1.01)	3.71 (1.71)	4.98 (1.67)	4.37 (1.39)
Safety at work	4.53 (1.29)	4.00 (1.19)	2.79 (1.35)	5.52 (1.47)	5.13 (1.31)
Routine trade-off					
Job offer	3.03 (0.77)	3.92 (1.23)	5.27 (1.87)	2.89 (1.65)	2.90 (1.20)

*Note.* All ratings were made on 7-point scales.

<sup>a</sup> The higher the scores, the higher the sacred value endorsements.

<sup>b</sup> The lower the score, the stronger the preference for option 1.

<sup>c</sup> The higher the score, the higher the level of perceived decision difficulty.

<sup>d</sup> The higher the score, the higher the level of negative emotions.

Each participant was presented with three scenarios, representing a taboo, a tragic or a routine trade-off, that were selected from a total set of five scenarios.

This set of scenarios involved three different topics (i.e., “flood protection”, “safety at work”, and “job offer”), based upon which two taboo trade-off scenarios, two tragic trade-off scenarios, and one routine trade-off scenario were constructed. In order to ensure that each participant received a taboo and a tragic trade-off scenario dealing with different topics, two scenario combinations were utilized as between-subject factor. More precisely, participants assigned to scenario combination A received the topic “flood protection” as the taboo, “safety at work” as the tragic, and “job offer” as the routine trade-off scenario, whereas those assigned to scenario combination B received the topic “safety at work” as the taboo, “flood protection” as the tragic, and “job offer” as the routine trade-off scenario. Within each scenario combination, scenarios were presented in an order randomized for each subject.

Each scenario provided a choice between two options. For instance, the taboo trade-off scenario with the topic “flood protection” was as follows (for a description of the other scenarios and tasks, see Appendix A).

Imagine that you are the president of the local authority of a village that has been severely affected by a flood. The local authority is discussing whether to invest a considerable amount of the annual budget in improved flood

protection measures. In this case, however, the village would have to forego a planned facelift for the village square. As president, you have to decide between the improvements in flood protection (option 1) and the facelift for the village square (option 2).

After presenting the scenario, participants were asked to respond to a previous version of the SVM consisting of 4 items ( $\alpha = .66$ ) (see Appendix B). This was done for each option separately. A set of 5 questions was then provided to assess negative emotions associated with the decision situation ( $\alpha = .89$ ; see Appendix B). These items were adapted following Luce et al. (1999) and Gaab, Rohleder, Nater, and Ehler (2005). Participants were asked to indicate their agreement on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) (e.g., “I am swamped with this decision”). After that, they had to make a choice between these two alternatives on a 7-point scale ranging from 1 (*clearly in favor of option 1*) to 7 (*clearly in favor of option 2*). Finally, participants were given one item to indicate the perceived decision difficulty on a 7-point scale ranging from 1 (*very easy*) to 7 (*very difficult*).

## 2.2 Results and discussion

One participant was excluded from analyses because of missing data. Table 1 shows scale means and standard deviations for sacred value endorsements, decision, per-

Table 2: Scale means (standard deviations) for sacred value endorsements as a function of trade-off type and option (n = 83).

	Sacred value		
	Taboo	Tragic	Routine
Option 1	<sup>a</sup> 4.85 <sub>x</sub> (1.31)	<sup>b</sup> 4.13 <sub>x</sub> (1.19)	<sup>c</sup> 3.03 <sub>x</sub> (0.77)
Option 2	<sup>a</sup> 3.11 <sub>y</sub> (0.94)	<sup>b</sup> 4.06 <sub>x</sub> (1.10)	<sup>b</sup> 3.92 <sub>y</sub> (1.23)

Note. Within a row, cell means with different subscripts (a, b, c) differ significantly at  $p < .001$  in Bonferroni-adjusted pairwise comparisons. Within a column, cell means with different subscripts (x, y) differ significantly at  $p < .001$  in Bonferroni-adjusted pairwise comparisons.

ceived decision difficulty, and negative emotions, listed for each scenario. Decision responses were not further analyzed as they are not of primary interest with regard to our hypotheses.

As a manipulation check, we first examined whether trade-off types corresponded with endorsements of sacred values (SVM). These endorsements were analyzed with a mixed model ANOVA (trade-off type X option X scenario combination), with trade-off type and option as within-subject factors and scenario combination as between-subject factor. The trade-off type X option interaction was significant,  $F(2, 162) = 80.95, p < .001$ . This interaction effect was analyzed by computing simple main effects for both trade-off type and option. Table 2 shows the main results revealed by Bonferroni-adjusted pairwise comparisons. Significant simple main effects of trade-off type were found for options 1 and 2,  $F_s(2, 80) > 29.71, ps < .001$ . Furthermore, options differed from each other in the taboo trade-off condition,  $F(1, 81) = 104.05, p < .001$ , to a lesser extent in the routine trade-off condition,  $F(1, 81) = 50.30, p < .001$ , but not in the tragic trade-off condition,  $F(1, 81) = 0.30, p = .586$ . Importantly, the results confirm that the (objective) manipulation of trade-off types corresponded with the (subjective) sacred value endorsements. In other words, people were likely to associate only one option with sacred values in taboo trade-off scenarios and both options in tragic trade-off scenarios. Contrary to our expectations, the endorsement for option 2 was somewhat higher for the routine trade-off scenario, indicating that the underlying issue also tapped into a sacred value.

Next, we tested our hypothesis that decision difficulty and negative emotions vary as a function of trade-off type. A MANOVA was conducted to examine the effects of trade-off types on decision difficulty and negative emotions. Significant effects were further analyzed

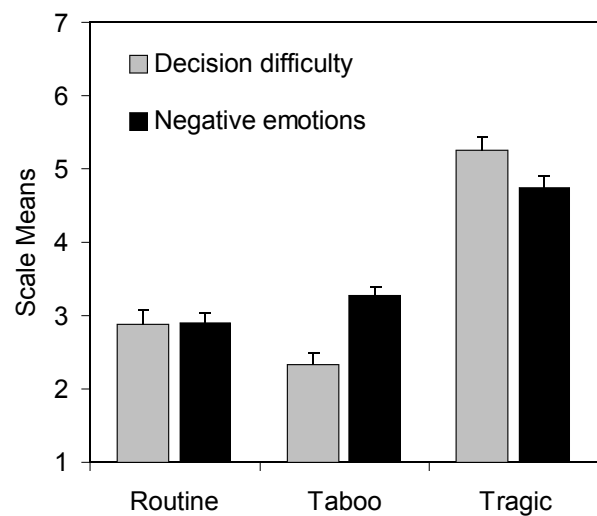


Figure 1: Scale means (+ SE) for decision difficulty and negative emotions as a function of trade-off type (n = 83).

by Bonferroni-adjusted pairwise comparisons. Most importantly, the findings provide support for the hypothesis that decision difficulty and negative emotions vary as a function of trade-off type, Wilks'  $\Lambda = .23, F(4, 78) = 66.35, p < .001$ . For decision difficulty, a significant main effect of trade-off type emerged,  $F(2, 162) = 94.42, p < .001$ . Compared to the routine trade-off condition ( $M = 2.89$ ), the decision was perceived as easier in the taboo trade-off condition ( $M = 2.34$ ), and as considerably more difficult in the tragic trade-off condition ( $M = 5.25$ ). Pairwise comparisons showed that all mean differences with regard to decision difficulty were significant ( $ps < .05$ ). Additionally, in line with our expectations, we found a significant main effect for negative emotions,  $F(2, 162) = 91.31, p < .001$ . Compared to the routine trade-off condition ( $M = 2.90$ ), participants felt slightly more negative in the taboo trade-off condition ( $M = 3.28$ ) and considerably more negative in the tragic trade-off condition ( $M = 4.75$ ). Pairwise comparisons yielded significant mean differences ( $ps < .05$ ).

As can be seen in Figure 1, taboo trade-offs were perceived as easier compared to routine trade-offs, while tragic trade-offs were perceived as most difficult. Negative emotions also showed the expected pattern, though the scores reflected in general only moderate levels of emotions. Compared to routine trade-off scenarios, negative emotions were somewhat stronger in taboo trade-off scenarios and considerably stronger in tragic trade-off scenarios. Altogether, the findings lend initial support to the proposition that perceived decision difficulty and negative emotions vary as a function of trade-off types (and indirectly also as a function of sacred value endorsements).

### 3 Experiment 2

Experiment 2 aimed to replicate previous findings by addressing four possibly critical points. First, we wished to improve the measure for decision difficulty by using multiple items instead of a single item. Second, with regard to negative emotions, we wished to replicate our findings using the PANAS scale (Watson et al., 1988), a well-established and validated instrument. Third, in order to strengthen the manipulation of trade-off type, we slightly modified the content of some scenarios. Fourth, we wanted to ensure that the measurement of sacred value of option 1 and 2 is not influenced by any direct trade-offs among these options. We therefore improved our design to uncouple sacred value assessments from the subsequent trade-off and choice processes.

#### 3.1 Method

##### 3.1.1 Participants and design

A sample of 130 students from the University of Zurich (90 women, 40 men) completed an online questionnaire that contained two hypothetical decision scenarios. Subjects' ages ranged from 18 to 46 years ( $M = 24.37$ ). They were recruited by advertisements via e-mail. In return for their participation, respondents obtained course credit points and were given the opportunity to take part in a prize draw.

Two different scenario combinations, each consisting of a taboo, a tragic, and a routine trade-off scenario, were utilized. In each combination, the scenarios varied in topic. Participants were randomly assigned to one of the two scenario combinations. From this combination, participants were provided with only two of the three trade-off types, which were also randomly selected. For our analyses, we extracted a trade-off type variable (i.e., taboo vs. tragic vs. routine trade-off) based on these combinations. Thus, trade-off type and scenario combination were used as independent variables. The dependent variables were sacred value endorsements, negative emotions, decision difficulty, and decision.

##### 3.1.2 Materials and procedure

Materials were written in German. Again, a total set of five scenarios was utilized. This set involved the same three topics as in Experiment 1 (i.e., "flood protection", "safety at work", and "job offer"), based upon which two taboo scenarios, two tragic scenarios, and one routine trade-off scenario were constructed. In order to ensure that each participant received two scenarios representing two different trade-off types as well as two different topics, two scenario combinations were used. More precisely, scenario combination A included the topic "flood

protection" as the taboo, "safety at work" as the tragic, and "job offer" as the routine trade-off scenario, whereas scenario combination B included the topic "safety at work" as the taboo, "flood protection" as the tragic, and "job offer" as the routine trade-off scenario. As mentioned above, participants were randomly assigned to one of these two scenario combinations, and were presented with only two of three trade-off types, which were randomly selected from the respective scenario combination.

The description of the choice options referring to some scenarios was slightly modified. In particular, we tried to improve the routine trade-off scenario, making it less likely to be associated with sacred values (for a description of scenarios, see Appendix A). Furthermore, different from the previous study, the choice options were presented sequentially (rather than simultaneously), and sacred value endorsements for each option were assessed before any trade-off task was salient to the participant. Note that the order of the options was randomly selected throughout the experiment, and that the instructions as well as the descriptions of the scenarios were adjusted accordingly. An example of the procedure is the following (tragic trade-off dealing with conflicting issues "safety at work" vs. "environmental protection"; see Appendix A for a description of the other scenarios).

Imagine that you are the CEO of a global company that has been criticized for poor working conditions in a Chinese factory. You are attending a meeting of the management. There is a discussion of whether measures to improve safety at work should be taken. You now have to consider your position on improving safety at work, because there will be a vote at the end of the meeting.

Participants were then given the final version of the SVM (5 items,  $\alpha = .81$ ; see Appendix B for items) to assess the extent to which "safety at work" was associated with sacred values. After completing this task, participants were provided with the continuation of the scenario and the second option.

Before the final vote, further topics are discussed. Your company has come under fire because large amounts of waste and pollutants are being discharged by the factories. There is a discussion about whether measures for environmental protection should be taken. You should now consider your position on environmental protection, because there will be a vote at the end of the meeting.

Again, respondents were given the SVM, this time to examine the extent to which "environmental protection"

Table 3: Scale means (standard deviations) for sacred value endorsements, decision, decision difficulty, and negative emotions, for each scenario (n = 223).

Scenario	Sacred value <sup>a</sup>		Decision <sup>b</sup>	Difficulty <sup>c</sup>	Neg. emot. <sup>d</sup>
	Option 1	Option 2			
Taboo trade-offs					
Flood protection	4.07 (1.13)	2.82 (1.01)	1.67 (0.71)	3.51 (1.77)	2.07 (0.73)
Safety at work	5.18 (1.13)	2.33 (1.13)	2.08 (1.77)	2.71 (1.23)	2.06 (0.74)
Tragic trade-offs					
Flood protection	3.78 (1.23)	4.32 (1.16)	3.96 (1.95)	4.26 (1.70)	2.36 (0.85)
Safety at work	5.49 (1.31)	5.41 (1.17)	3.93 (2.07)	5.01 (1.51)	3.11 (0.75)
Routine trade-off					
Job offer	2.77 (0.81)	2.46 (0.80)	2.74 (1.64)	3.77 (1.46)	1.86 (0.70)

*Note.* Ratings for sacred values, decision, and decision difficulty were made on 7-point scales, whereas ratings for negative emotions were made on 5-point scales.

<sup>a</sup> The higher the scores, the higher the sacred value endorsements; for each scenario, scores refer to the order of options as it is shown in the method section and the appendix.

<sup>b</sup> The lower the score, the stronger the preference for option 1.

<sup>c</sup> The higher the score, the higher the level of perceived decision difficulty.

<sup>d</sup> The higher the score, the higher the level of negative emotions.

was associated with sacred values. Finally, the decision task was introduced and participants were asked to make a choice between options 1 and 2.

This is the end of the meeting, and both suggestions, investing in safety at work and in environmental protection, have been approved. Because the implementation of both projects would exceed the available budget, you as CEO have to make the final choice between investing in safety at work (option 1) and investing in environmental protection (option 2).

After being presented with the final decision situation, participants were given the PANAS (20 items) to measure positive and negative emotions associated with the decision situation (Watson et al., 1988; German translation by Krohne, Egloff, Kohlmann, & Tausch, 1996; see Appendix B). Participants were asked to indicate their feelings on 5-point scales ranging from 1 (*very slightly or not at all*) to 5 (*extremely*) (e.g., “afraid”, “jittery”). The positive emotion items were also included, although we only used the negative emotion items in this study ( $\alpha = .90$  for negative emotions subscale).

Perceived decision difficulty was assessed using 5 items ( $\alpha = .89$ ), designed to measure various aspects of decision difficulty (such as ambivalence, certainty of decision, readiness to decide, or need for additional time).

People are asked to indicate their extent of agreement on 7-point scales ranging from 1 (*very easy*) to 7 (*very difficult*) or from 1 (*strongly disagree*) to 7 (*strongly agree*) (e.g., “I feel very ambivalent about this decision”) (see Appendix B).

Finally, they indicated their decision on a 7-point scale ranging from 1 (*clearly in favor of option 1*) to 7 (*clearly in favor of option 2*).

### 3.2 Results and discussion

Data collection yielded a total of 260 scenarios, completed by 130 subjects. Due to failures in data transfer, 37 scenarios had to be excluded. Therefore, data analyses are based upon the remaining 223 scenarios. Table 3 shows scale means and standard deviations for sacred value endorsements (SVM), decision, perceived decision difficulty, and negative emotions, listed for each scenario. Decision responses were not further examined as they are not of primary interest with regard to our hypotheses.

As a manipulation check, we first examined whether trade-off types corresponded with endorsements of sacred values. These endorsements were analyzed with a mixed model ANOVA (trade-off type X option X scenario combination), with trade-off type and scenario combination as between subject factors and option as within-subject factor. As a result, a significant trade-off type X option interaction emerged,  $F(2, 217) = 60.09, p < .001$ . This in-

Table 4: Scale means (standard deviations) for sacred value endorsements as a function of trade-off type and option ( $n = 223$ ).

	Sacred value		
	Taboo	Tragic	Routine
Option 1	${}_a 4.63_x (1.13)$	${}_a 4.63_x (1.27)$	${}_b 2.77_x (0.81)$
Option 2	${}_a 2.57_y (1.07)$	${}_b 4.86_x (1.16)$	${}_a 2.46_y (0.80)$

*Note.* Scores refer to the order of options as it is shown in the method section and the appendix. Within a row, cell means with different subscripts (a, b) differ significantly at  $p < .001$  in Bonferroni-adjusted pairwise comparisons. Within a column, cell means with different subscripts (x, y) differ significantly at  $p < .05$  in Bonferroni-adjusted pairwise comparisons.

teraction was further analyzed by computing simple main effects for both trade-off type and option. Table 4 shows the main results revealed by Bonferroni-adjusted pairwise comparisons. Simple main effect analyses yielded significant effects of trade-off type for options 1 and 2,  $F_s(2, 217) > 75.76$ ,  $p < .001$ . Moreover, options differed from each other in the taboo trade-off condition,  $F(1, 217) = 163.09$ ,  $p < .001$ , and, to a lesser extent, in the tragic trade-off condition,  $F(1, 217) = 2.57$ ,  $p = .11$ , as well as in the routine trade-off condition,  $F(1, 217) = 5.31$ ,  $p < .05$ . Thus, the results confirm that the sacred value endorsements varied as expected and the manipulation of trade-off type was therefore successful for the taboo and tragic trade-off condition. For the routine trade-off condition, however, the difference between options 1 and 2 was not expected, but the considerably low endorsements indicate that participants perceived the options as not being associated with sacred values.

Next, we tested our hypothesis that decision difficulty and negative emotions vary as a function of trade-off type. A MANOVA provided further support that decision difficulty and negative emotions vary as a function of trade-off type, Wilks'  $\Lambda = .74$ ,  $F(4, 432) = 17.99$ ,  $p < .001$ . For decision difficulty, a significant main effect of trade-off type emerged,  $F(2, 217) = 15.91$ ,  $p < .001$ . Bonferroni-adjusted pairwise comparisons revealed that the means showed the expected pattern: Compared to the routine trade-off condition ( $M = 3.77$ ), the decision was perceived as more difficult in the tragic trade-off condition ( $M = 4.64$ ), and as easier in the taboo trade-off condition ( $M = 3.11$ ). Pairwise comparisons showed that all mean differences were significant ( $ps < .05$ ). Furthermore, we found again a significant main effect for negative emotions,  $F(2, 217) = 28.37$ ,  $p < .001$ . Closer ex-

amination of the emotions revealed the expected tendencies, even though the pattern was somewhat less prevalent than in Experiment 1. Compared to the routine trade-off condition ( $M = 1.86$ ), participants tended to feel more negative in the taboo trade-off condition ( $M = 2.07$ ); although this difference failed to reach significance ( $p = .326$ ). In the tragic trade-off condition, the reported level of negative emotions ( $M = 2.74$ ), however, was significantly higher than in the other trade-off conditions ( $ps < .001$ ).

Overall, the patterns tend to replicate those of Experiment 1, in that decision difficulty and negative emotions are associated in a non-linear fashion as a function of distinct trade-off types and sacred value endorsements.

## 4 General discussion

The present research helps to clarify how decision difficulty and emotions are associated with trade-off types and sacred values. Our main findings were as follows: First, trade-offs involving sacred values tended to be more negatively emotion-laden than trade-offs not involving sacred values. This applied particularly to situations that pit one sacred value against another sacred value (i.e., tragic trade-off), and to a lesser extent to situations that pit one sacred value against a secular value (i.e., taboo trade-off). Second, the decision difficulty varied as a function of trade-off types. Compared to routine trade-off situations (i.e., two opposing secular values), decisions were perceived as easier when they involve taboo trade-offs, but, conversely, as more difficult when they involve tragic trade-offs. Third, negative emotions and perceived decision difficulty showed a non-linear relationship. In the taboo trade-off condition, people perceived the tasks as more negatively emotion-laden, but as easier to solve, compared to the routine trade-off condition. However, in the tragic trade-off condition, people perceived the decision tasks as most stressful and difficult.

The finding that trade-offs involving sacred values are relatively more negatively emotion-laden than routine trade-offs is in line with Tetlock's (2003) assumption that the *mere contemplation* of trade-offs that touch on sacred values elicits negative feelings of distress and disturbance. We believe that the emotions function as a signal to the decision-maker that something delicate and important is at stake that has to be protected. In this sense, the emotions may play an "advisory" or "informational" role in decision making (e.g., Damasio, 1994; Finucane et al., 2000; Schwarz & Clore, 1996; Zajonc, 1998; see also Pfister & Böhm, 2008, and Zeelenberg et al., 2008).

Trade-off types and decision difficulty were related in that taboo trade-off situations were perceived as easy, whereas tragic trade-off situations were perceived as dif-



difficult. At least with regard to the supposed association between taboo trade-off situations and decision difficulty, our findings are consistent with recent findings from Lichtenstein, Gregory, and Irwin (2007). In order to examine people's reactions to decision tasks addressing "taboo values" (i.e., sacred values), Lichtenstein et al. utilized a variety of preference measures (e.g., willingness to accept). Consistent with our research, they showed that decisions involving taboo values provoke negative emotions, while being perceived as easy to judge and as not demanding extensive thought. However, the authors did not examine trade-offs involving several conflicting values. As to tragic trade-offs, our findings suggest that the necessity of sacrificing one of these values intensifies both negative emotions and decision difficulty.

Our findings on how taboo and tragic trade-offs are linked to perceived decision difficulty can, in a sense, be seen as complementary to findings by Tetlock et al. (2000). As mentioned above, these authors examined the relationship between trade-off type and decision difficulty by letting participants judge *other people's decision making*. Their results provide an idea of which associations between trade-off type and decision difficulty are socially approved or disapproved. In contrast, we examined the relationship between trade-off type and decision difficulty by examining *participants' own decision making*. We found that taboo trade-off situations were perceived as easy and tragic trade-off situations were perceived as difficult. In line with this, Tetlock et al. showed that people will gain social approval when they perceive the relationship between trade-off type and decision difficulty in this mentioned way. However, people will gain social disapproval when they evaluate taboo trade-off decisions as difficult and tragic trade-off decisions as easy.

As mentioned, decisions involving taboo trade-offs appear to be perceived as easy. This suggests that one function of sacred values could be to facilitate decisions (as long as they do not conflict with other sacred values). As stated, sacred values are protected from trade-offs with other values (i.e., secular values), therefore triggering noncompensatory decision strategies. Perhaps a form of "one-reason decision making" (Gigerenzer, Todd, & the ABC Research Group, 1999) might apply here, with sacred values providing a sufficient reason for preferring a particular option. Sacred values may work as a kind of moral heuristic or choice rule (e.g., Haidt, 2001; Luce, 1998; Sunstein, 2005). Of course, future research is needed to examine more thoroughly how sacred values affect decision processes.

The idea of a heuristic function of sacred values has some affinity with theories of moral judgment that refer to dual process models (e.g., Bargh & Chartrand, 1999; Chaiken & Trope, 1999). It has been proposed that moral judgment is primarily based on intuitive (i.e., fast and

effortless) rather than deliberative (i.e., slow and effortful) processes (Haidt, 2001). It is possible that taboo trade-offs engage intuitive or affective processes, whereas tragic trade-offs engage deliberate processes. In the former case, the presence of just one sacred value option allows a quick choice in the sense of the mentioned moral heuristic. This notion is in accordance with Lichtenstein et al.'s findings (2007) that responses to taboo scenarios are driven primarily by affect. However, in the case of a tragic trade-off (i.e., two conflicting sacred values), our findings of high negative emotions as well as high decision difficulty suggest stronger deliberate reasoning, in addition to emotional processes. This interpretation is in accordance with findings based on manipulated differences of the attractiveness of choice options (e.g., Dhar, 1997; Luce, 1998; Luce et al., 1997): Conflict between similarly attractive options was found to increase negative emotions, vigilant and information-acquisitive processing, and preference for avoidance options, if available. Moreover, the suggestion of simultaneous affective as well as reasoning processes of moral judgments was supported by recent findings from cognitive neuroscience (Greene & Haidt, 2002). In difficult moral dilemmas comparable to tragic trade-off situations, increased activities in brain regions associated with conflict, emotions (e.g., contempt and disgust) as well as with abstract reasoning and utilitarian judgments have been found (Greene et al., 2004).

Clearly, future research is needed to uncover in more detail the nature of processes underlying the facilitating effects of sacred values. With respect to the measurement of decision difficulty, additional or alternative measurement methods (e.g., reaction times or neural indicators) may be considered in future designs. Another methodological issue will also be further improving the assessment of emotions and clarifying the role of emotions when decisions tap into sacred values. It is important to note that our experiments evoked, on the whole, relatively mild emotions. Even though the emotional ratings in the situations containing taboo trade-offs tended to be perceived as more negative than in the routine trade-off situations, the emotional intensities and differences were smaller than expected. Recently, research also examining the emotional reactions to taboo trade-offs has found considerably stronger emotions triggered by taboo issues (Ginges et al., 2007; Lichtenstein et al., 2007). It may be that our scenarios were not vivid enough to provoke stronger emotions. Furthermore, recall that we used two different measures for negative emotions. These measures might not be entirely comparable (i.e., focus on emotional stress vs. negative affect in general); this could possibly explain why we found a significant difference in negative emotions between taboo and routine trade-off scenarios in the first but not in the second experiment.

In conclusion, sacred values as a possible source of decision difficulty, conflict, and emotions have mostly been neglected in prior research. Our findings suggest that sacred values may play a distinctive role in decision making because people preclude sacred values from trade-offs with other values. By introducing the role of sacred values and trade-off reluctance, we believe that our approach contributes significantly to the growing body of research on moral intuition and moral heuristics.

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## Appendix A

### Decision scenarios used in Experiment 1

Note. The following scenarios are described in an abbreviated version; the original was in German. The taboo trade-off “flood protection” scenario is omitted here since it is provided in the text.

**Taboo trade-off, “safety at work”.** Imagine that you are the CEO of a global company that has been criticized for poor working conditions in a Chinese factory. The management is discussing whether substantial investments to improve safety at work should be made. In this case, however, you would have to give up the goal of a profit increase. As CEO, you have to decide between investing in safety at work (option 1) and increasing profit (option 2).

**Tragic trade-off, “flood protection”.** Imagine that you are the president of the local authority of a village that has been severely affected by a flood. The local authority is discussing whether to invest a considerable amount of the annual budget in improved flood protection measures. In this case, however, the village would have to forego a planned project for vocational training and integration for unemployed adolescents. As president, you have to decide between the improvements in flood protection (option 1) and the project for vocational training and integration (option 2).

**Tragic trade-off, “safety at work”.** Imagine that you are the CEO of a global company that has been criticized for poor working conditions in a Chinese factory.

The management is discussing whether substantial investments to improve safety at work should be made. In this case, however, you would have to accept the layoff of a third of the workforce due to financial reasons, thereby jeopardizing the future of many families. As CEO, you have to decide between investing in safety at work (option 1) and preserving jobs (option 2).

**Routine trade-off, “job offer”.** Imagine that you, as a parent, are solely responsible for your family’s livelihood. You have made several applications to find a new job. You have just received two offers, and it is now up to you to select one of them. Company A offers you an annual salary of CHF 80,000 [USD 66,000] and 20 vacation days per year, whereas company B offers you an annual salary of CHF 60,000 [USD 50,000] and 30 vacation days per year. You now have to decide between the job with a greater annual salary (option 1) and the job with a greater number of vacation days per year (option 2).

### Decision scenarios used in Experiment 2

Note. The following scenarios are described in an abbreviated version; the original was in German. The tragic trade-off “safety at work” scenario is omitted here since it is provided in the text. Numbers in parentheses at the beginning of each paragraph were not given to the participants; they represent the position in the sequential experimental procedure, that is, (1) presentation of option 1, (2) presentation of option 2, and (3) presentation of the final decision situation.

**Taboo trade-off, “flood protection”.** (1) Imagine that you are the president of the local authority of a village that has been severely affected by a flood. Currently, you are attending a meeting of the authority. There is a discussion about whether measures to improve flood protection should be taken. You now have to consider your position on improving flood protection, because there will be a vote at the end of the meeting.

(2) Before the final vote, further topics are discussed. Your village square has been in a pitiful condition due to unauthorized parking and damaged paving. There is a discussion about whether measures for a facelift for the village square should be taken. You should now consider your position on the facelift for the village square, because there will be a vote at the end of the meeting.

(3) This is the end of the meeting, and both suggestions, improvements in flood protection as well as the facelift for the village, have been approved. Because the implementation of both projects exceeds the available budget, you as president have to make the final choice between improvements in flood protection (option 1) and facelift for the village square (option 2).

**Taboo trade-off, “safety at work”.** (1) Imagine that you are the CEO of a global company that has been criticized for poor working conditions in a Chinese factory. You are attending a meeting of the management. There is a discussion of whether measures to improve safety at work should be taken. You now have to consider your position on improving safety at work, because there will be a vote at the end of the meeting.

(2) Before the final vote, other topics are discussed. Your company has come under pricing pressure, because many competitors have a higher production volume. Hence, in order to cut prices, it has been suggested that production should be increased through additional facilities. You should now consider your position on increasing the production through additional facilities, because there will be a vote at the end of the meeting.

(3) This is the end of the meeting, and both suggestions, improving safety at work as well as increasing the production, have been approved. Because the implementation of both projects would exceed the available budget, you as CEO have to make the final choice between investing in safety at work (option 1) and increasing the production (option 2).

**Tragic trade-off, “flood protection”.** (1) Imagine that you are a member of the local authority of a village that has been severely affected by a flood. Currently, you are attending a meeting of the authority. There is a discussion about whether measures for improved flood protection should be taken. You now have to consider your position on improving flood protection, because there will be a vote at the end of the meeting.

(2) Before the final vote, further topics are discussed. Your village has been faced with growing juvenile violence and delinquency. Hence, there is a discussion about whether a project for vocational training and integration for unemployed adolescents should be launched. You should now consider your position on the project for vocational training and integration, because there will be a vote at the end of the meeting.

(3) This is the end of the meeting, and both suggestions, improvements in flood protection as well as the project for vocational training and integration for unemployed adolescents, have been approved. Because the implementation of both projects exceeds the available budget, you as president have to make the final choice between improvements in flood protection (option 1) and the project for vocational training and integration (option 2).

**Routine trade-off, “job offer”.** (1) Imagine that you, as a parent, are solely responsible for your family’s livelihood. One day, you hear about a vacant position in another division, which provides a better salary than your

current one. You now have to consider your opinion about the level of your income.

(2) A couple of days later, you hear about a vacant position at another branch office, which requires a shorter traveling distance to work than is currently the case. You should now consider your opinion about the traveling distance to work.

(3) Your boss informs you that the division you are working for is going to be closed, but that he intends to employ you further. He offers you the same two jobs that you have already heard about. The first offer provides a better salary, but requires a longer traveling distance to work since it has been relocated to another branch. The second offer requires a shorter traveling distance to work, but provides a lower salary. You now have to decide between a better salary (option 1) and a shorter traveling distance to work (option 2).

## Appendix B

### Sacred value measure

Note. Each item is followed by a 7-point scale ranging from 1 [*strongly disagree*] to 7 [*strongly agree*].

**Experiment 1 (previous version of SVM).** Please rate your level of agreement with the following statements about [insert option 1 or 2; e.g., improving safety at work].

1. My stance on this issue might change over time.
2. I would not change my opinion, no matter what the costs.
3. I would have problems making any concessions on this topic.
4. There are principles involved in this topic that we should defend under any circumstances.

**Experiment 2 (final version of SVM).** Please rate your level of agreement with the following statements about [insert option 1 or 2; e.g., improving safety at work]: [Insert option 1 or 2] is about something...

1. ...that we should not sacrifice, no matter what the benefits (money or something else).
2. ...which one cannot quantify with money.
3. ...for which I think it is right to make the cost-benefit analyses.
4. ...that involves issues or values which are inviolable.
5. ...for which I can be flexible if the situation demands it.

## Negative emotions measures

**Experiment 1 (scale of 5 items).** Note. Each item is followed by a 7-point scale ranging from 1 [*strongly disagree*] to 7 [*strongly agree*].

Please rate your level of agreement with the following statements, with respect to the current decision situation.

1. I am afraid to make the wrong choice.
2. This choice is threatening to me.
3. I am afraid to make a choice.
4. I am swamped with this decision.
5. This decision leaves me cold.

**Experiment 2 (PANAS; Watson et al., 1988).** Note. Instruction: "In the following you are presented with a number of words that describe different feelings and emotions. Read each item and then mark the appropriate level of intensity on the scale next to that word. You can select from five levels." Each item is followed by a 5-point scale ranging from 1 [*very slightly or not at all*] to 5 [*extremely*]. <sup>a</sup>Negative emotion items, <sup>b</sup>positive emotion items.

In the current decision situation, I am feeling: alert<sup>b</sup>, afraid<sup>a</sup>, proud<sup>b</sup>, upset<sup>a</sup>, hostile<sup>a</sup>, strong<sup>b</sup>, irritable<sup>a</sup>, ashamed<sup>a</sup>, nervous<sup>a</sup>, active<sup>b</sup>, distressed<sup>a</sup>, scared<sup>a</sup>, attentive<sup>b</sup>, guilty<sup>a</sup>, determined<sup>b</sup>, interested<sup>b</sup>, enthusiastic<sup>b</sup>, excited<sup>b</sup>, jittery<sup>a</sup>, inspired<sup>b</sup>.

## Decision difficulty measures

**Experiment 1 (single item).** How easy or difficult was it for you to decide? For me, this decision was... (7-point scale ranging from 1 [*very easy*] to 7 [*very difficult*])

**Experiment 2 (scale of 5 items).** Note. Each item is followed by a 7-point scale ranging from 1 [*strongly disagree*] to 7 [*strongly agree*], except for item 1.

Please rate your level of agreement with the following statements, with respect to the current decision situation.

1. For me, this decision is... (7-point scale ranging from 1 [*very easy*] to 7 [*very difficult*])
2. I would need more time to decide.
3. I would not ponder for a long time on this decision.
4. I feel very ambivalent about this decision.
5. For this decision, I feel certain which option to choose.