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Influence of deontological versus consequentialist orientations on act choices and framing effects: When principles are more important than consequences

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Abstract

A long tradition in decision making assumes that people usually take a consequentialist perspective, which implies a focus on the outcomes only when making decisions. Such a view largely neglects the existence of a deontological perspective, which implies that people are sensitive to moral duties that require or prohibit certain behaviors, irrespective of the consequences. Similarly, recent research has also suggested that people holding "protected values" (PVs) show increased attention to acts versus omissions and less attention to outcomes. The present research investigates the role of deontological versus consequentialist modes of thought and of PVs on framing effects and act versus omission choices. In a modification of Tversky and Kahneman's (1981) risky choice framing paradigm, we manipulated the framing of the outcomes (positive, negative), as well as whether the certain outcome was associated with an act or inaction. The main results suggest that act versus omission tendencies are linked to deontological focus and PVs. Framing effects, on the other hand, are driven by a consequentialist focus. Copyright © 2008 John Wiley & Sons, Ltd.

The lion's share of research on judgment and decision making has focused on secular goods such as consumer choices or monetary payoffs. There is, however, a growing body of evidence concerning the moral aspects of choice, particularly for the case of tradeoffs. For instance, many people think that it is morally wrong to assign a monetary value to human lives or to have a free market in body parts or a futures market betting on terrorist acts. Recently, terms such as *protected values* (PVs) (Baron & Spranca, 1997; Ritov & Baron, 1999), *sacred values* (Tetlock, Kristel, Elson, Green, & Lerner, 2000), or *taboo values* (Lichtenstein, Gregory & Irwin, 2007) have been developed to express the idea that some values are thought of as absolute and protected from tradeoffs with other values, particularly secular values (e.g., economic benefits). A person who engages in or contemplates making such tradeoffs may trigger moral outrage in others and may induce both harsh reactions toward and intention to punish the violator (Tetlock et al., 2000). In addition, people may also be highly motivated to engage in activities that protect these values from threat and violation (Skitka, 2002).

There is also general agreement that these moral values have an impact on information processing and have an influence on what aspects of a decision people deem to be relevant (e.g., Baron & Spranca, 1997; Ritov & Baron, 1999). Perhaps the most striking contrast is between deontological and consequentialist perspectives on decisions. The focal point of deontology is the concept of duty; deontology is derived from the Greek word *deon* (duty). Duties are morally mandated actions or prohibitions, such as the duty to keep promises or the duty not to lie (Broad, 1930). The distinctive idea of deontological approaches is that the morality of a behavior is assessed by application of a rule or principle that requires or prohibits certain behaviors. It is the nature of the act *per se* in which moral rightness or wrongness resides (e.g., ''I did it because it was the right thing to do.''). Consequences *per se* are at best secondary. The most influential deontological moral theory has been that advanced by Kant (1797), who introduced the idea of the categorical imperative.

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Deontological theories of morality are usually contrasted with consequentialism (e.g., Anscombe, 1958; Birnbacher, 2003; Broad, 1930). A long tradition in decision making assumes that people's decisions are aimed at maximizing some benefit function, without being affected by rules or factors external to outcomes. In consequentialist analyses, conclusions about what is right or wrong are based on the consequences.

Although there is nothing inherent in consequentialism that precludes its application to moral decision making, previous work suggests that sacred or PVs are often linked with deontological decision rules (e.g., Baron & Spranca, 1997). The present work explores the cognitive consequences of deontological versus consequentialist orientations for framing effects. A secondary goal is to explicitly examine the relationship between PVs and deontology and the relation between PVs and framing effects. In the next few paragraphs, we briefly review framing effects and then turn to the relationship between deontological and consequentialist orientations.

FRAMING EFFECTS

The classic example of framing effects involves the Asian disease problem, in which participants are told that an outbreak of disease threatens to kill 600 people (Tversky & Kahneman, 1981). People are asked to choose between a risky option and a certain option having the same expected value. In the positive frame, the outcomes are described in terms of the numbers of lives saved and in the negative frame in terms of lives lost. The common finding is that participants tend to choose the certain option when the problem is framed in terms of gains, but choose the risky option when the problem is framed in terms of losses (see Kühberger, 1998; Rothman & Salovey, 1997, for reviews).

Framing effects have inspired many researchers for both theoretical and practical reasons. A number of studies have revealed that framing effects are not uniformly found (e.g., Levin, Schneider, & Gaeth, 1998; Schneider, 1992) but rather are affected by factors such as topics of scenarios (e.g., Fagley & Miller, 1997; Schneider, 1992), size of social group for which a decision problem is described (e.g., Wang, 1996), and self-relevance of the task (Krishnamurthy, Carter, & Blair, 2001).

Given that many framing tasks involve hypothetically affecting the lives of others (such as life–death scenarios), it seems likely that moral questions about which behavior is morally or ethically right are relevant to such tasks. Despite the apparent link to morality, it is surprising that the ethical or moral side of decisions has been largely neglected in previous research on framing effects.

Recently, Tanner and Medin (2004) tested the idea that PVs increase attention to acts versus omissions and decrease attention to outcomes in value-related scenarios. They ran a study that combined the gain/loss and act/omission distinction by modifying Tversky and Kahneman's (1981) risky choice framing paradigm. Rather than describing only the outcomes in terms of lives saved or lives lost, one option was described as an active choice and the other as a default consequence. With regard to the classic Asian Disease problem, for example, participants might be told that if they adopt Plan A, 200 people will be saved for sure but if they do nothing, there is a one-third chance that all 600 will be saved and a two-thirds chance that no one will be saved. Both the framing of the outcome focus (positive vs. negative outcomes) and the certainty of the outcomes (risky vs. certain) associated with the options were varied and counterbalanced.

Tanner and Medin (2004) presented people with four environmental scenarios and asked them to make choices that were framed as gains and losses and as actions versus default outcomes. Two results are noteworthy: first, people who indicated PVs for the environmental issues were more likely to prefer acts over omissions. Second, people with PVs were insensitive to the framing of the outcomes. The results suggest that for people with PVs, the act/omission distinction was salient. Notably, it was not relevant for PV-people whether the alternatives were associated with gains or losses, and risky or certain outcomes. This conclusion is consistent with previous literature (Baron & Spranca, 1997) arguing that PVs is associated with deontological rules. The present study directly examines the relationship between deontology and framing effects.

RELATIONSHIPS BETWEEN DEONTOLOGICAL AND CONSEQUENTIALIST ORIENTATIONS

It is natural to see deontological and consequentialist orientations as mutually exclusive, at least for a particular decision maker or for a particular problem. Broadly speaking, one might either pay attention to the nature of the act (its moral correctness) or to anticipated outcomes. However, what makes an action right or wrong may not be definable without considering its link with consequences in some form or another. Deontological orientations seldom disregard consequences entirely. For instance, if two equally moral acts have different consequences, even a deontologist may take

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outcomes into account. Similarly, consequentialism may also include deontological components. In integrating short-term with long-term considerations, it may be sensible to apply general rules for action and to rationalize them with consequentialist justifications (Brandt, 1992; Harsanyi, 1977). In addition, if outcomes are equivalent, the nature of the act may come into consideration. Our research involves choices between act and omissions with equal expected values which may allow for greater deontological contributions to choice. In addition, we also examine whether deontological and consequentialist orientations are really mutually exclusive.

The main purpose of the following experiment is to examine the influence of deontological versus consequentialist perspectives and PVs on act versus omission bias and on framing effects. Note that explanations of framing effects as proposed by prospect theory are predominately based on the evaluation of the outcomes as gains versus losses and their riskiness or certainty. Because consequentialism is associated with focus on consequences and framing causes participants to view the outcomes as gains or losses, we would expect results that are in line with prospect theory (Tversky & Kahneman, 1981); positive framing associated with risk aversion and negative framing associated with risk seeking. With more or less strict forms of deontology, however, we would expect insensitivity to framing (as was found by Tanner & Medin, 2004). Finally, if consequentialist concerns are combined with deontological concerns we might expect both attention to act versus omissions and greater attention to outcomes, yielding framing effects.

We also wished to explore the effects of another measure of PVs. Most previous studies have used a single question or probe to assess a PV, a practice that may lead to low reliability. In this paper, we added a scale consisting of multiple items that were aimed at deriving a more stable measure. These items were designed to tap on important features of protected or sacred values, for example, tradeoff resistance, unwillingness to sacrifice a value, unwillingness to compromise or to question one's position (Tetlock et al., 2000). Based on the claim that PVs derive from deontological principles, we expect to find similar patterns with PVs to those with deontology.

To summarize, the following research tested several related questions: (1) what is the relation between deontological and consequentialist orientations, and (2) how are these orientations related to act versus omission choices and framing effects? (3) How are PVs associated with deontological and consequentialist orientations, and (4) how are PVs related to act versus omission choices and framing effects?

EXPERIMENT

In order to study the role of deontological versus consequentialist perspectives and PVs, we included a set of multiple items to assess deontological versus consequentialist orientations, and a set of items probing for PVs. We also included some items to measure general caring or personal concern about the problems described in the scenario. This was done to verify that having PVs is not more or less the same or identical to having greater concern about the problem. PVs were expected to correlate only modestly with personal concern.

With regard to deontological/consequentialist orientations, we expected to find that these two kinds of reasoning have different effects on action preferences and framing effects. Specifically, we hypothesized that a deontological orientation and PVs should be associated with a bias toward acts rather than omissions and a tendency to be insensitive to framing effects. Consequentialism, on the other hand, should be associated with framing effects.

Given the practical relevance of act versus omission tendencies and framing effects, we also wished to examine such effect in samples not just comprised of psychology students. For this purpose, we recruited a more heterogeneous sample by undertaking the experiment on the internet.

METHOD

Participants and Design

A total of 248 people participated in the web experiment that was conducted in German. Of this sample, 65% were women and 35% were men. The respondents ranged in age from 15 to 70 ($M = 32$ years). The nationality composition was 46% from Switzerland, 50% from Germany, and 4% from other countries. Most people (89%) had the equivalent of some college and 34% had at least the equivalent of a bachelor's degree.

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We manipulated framing (positive vs. negative) and act certainty (act with certain vs. risky outcomes). Deontological versus consequentialist orientation and PVs were assessed by separate items. The dependent variables were choices of acts or choices of risky options (when we talk about framing effects).

Procedure and Materials

To recruit participants, a link to the web experiment was presented on the first author's homepage and on the web experimental psychology lab of the University of Zurich (http://genpsylab-wexlist.unizh.ch/). People were initially informed about the purpose and procedure of the study and then presented with scenarios and asked to make a choice. The study incorporated two environmental scenarios (drinking water contamination, genetically engineered crops) and a social scenario (sick elderly people) (see Appendix A). Participants were provided with two of those three scenarios. Each scenario contained a choice between an act and an omission (e.g., vaccination vs. not vaccinating children suffering from having drunk contaminated water). In accordance with Tversky and Kahneman's (1981) classic framing paradigm, the choice alternatives were framed either positively or negatively. In the positive frame condition, the outcomes were described in terms of gains (e.g., human lives or insect species saved). In the negative frame condition, the outcomes were described in terms of losses (e.g., lives lost, insect species harmed). Act certainty was manipulated by changing the likelihood of the outcomes associated with the act. This was either certain (when the omission outcome was risky) or risky (when the omission outcome was certain), but of equal expected value.

After making their decision, participants were given a set of deontological and consequentialist probes consisting of eight items (see Appendix B for the English translation of the German verbatim). They were asked to indicate the relevance of various possible reasons for their choice on a five-point scale ranging from *not important at all* to *very important*. People were later provided with two items to indicate personal concern of the problems described in the scenarios on a five-point scale ranging from *strongly disagree* to *strongly agree* (''This issue is personally important to me.'' ''I am concerned about this problem.''). After completing these tasks for a given scenario, participants were given five items designed to measure PVs and asked to indicate their extent of agreement on a five-point scale ranging from *strongly disagree* to *strongly agree* (see Appendix B for the English translation of the German verbatim; one item with a highly skewed response distribution was eliminated; see below). This procedure was repeated for the second scenario.

Finally, people were asked to indicate whether they took the tasks seriously before they were debriefed. This is a common strategy in web studies to exclude those people from the experiment who had interests other than participating in the study (e.g., just clicked through the pages to take a look). Only people who filled out the whole questionnaire and answered this final question positively were included in the final dataset.

Participants were randomly assigned to one of the experimental groups corresponding to the four possible combinations from two frames (positive or negative), two kinds of outcomes associated with an act or omission (certain or risky). There were three combinations of two scenarios, and each combination had two orders (e.g., scenarios A and B, or scenarios B and A). Participants were randomly assigned to one combination and order. These variations had no effect on the results.

RESULTS AND DISCUSSION

First, we will describe the analyses of the measures, that is, deontological versus consequentialist orientation, PV, and personal concern. These analyses revealed that deontological and consequentialist orientations were not mutually exclusive and not negatively correlated.

Analyses of Deontological Versus Consequentialist Orientation and Protected Value Measures

We conducted a factor analysis based on the item mean scores was based on the item mean scores across scenarios, in order to avoid missing values given that participants did only two of the three scenarios. After eliminating one of the PV items

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with a highly skewed response distribution, the deontological/consequentialist, PV items, and concern items were entered into principal component factor analyses with promax rotation.

This analysis revealed four factors which accounted for 62% of the variance (for item scores and factor loadings see Table 1). Overall, four items consistent with the deontological mode of reasoning loaded on one factor, four items consistent with the consequentialist reasoning style loaded on the second factor, four items consistent with PVs loaded on the third factor, and two items consistent with personal concern loaded on the fourth factor. The reliabilities of the scales assessed by Cronbach's α were .81, .62, .64, and .84 for the deontological, consequentialist, PV, and personal concern measure, respectively.

Note that if the deontological versus consequentialist orientations were at opposite ends of a contrasting dimension, we would have expected to observe negative correlations between answers to the two types of questions, a single factor solution, and factor loadings of opposite signs. Instead, the overall correlation of the deontological and consequentialist answers was quite small and positive ($r = .03$, *n.s.*), and two factors clearly emerged.

Consequentialism was also more or less orthogonal with the PV score ($r = -.08$, *n.s.*). Deontological orientation and PVs represented two separate, but relatively highly correlated factors ($r = .55$, $p < .001$). In addition, deontological and PV scores are reliably but somewhat modestly correlated with personal importance (rs = .33 and .39, respectively, ps < .001). Overall, these results confirm that PVs are closely associated to a deontological orientation, less closely to personal concern, but relatively independent of a consequentialist orientation.

Analysis of Act Choices and Framing Results

A multiple regression analysis was conducted that conformed to a 2 (positive vs. negative frame) × 2 (act with certain vs. risky outcomes) × deontological × consequentialist orientation analysis of variance, with the last two factors as continuous variables. The continuous variables were centered (Cohen, Cohen, West, & Aiken, 2003). Prior inspection of each scenario indicated that age and personal concern were not relevant factors in any of the scenarios, and we therefore dropped them from further consideration. Gender, however, was statistically significant, though only in the social scenario.[1] Gender was therefore also included in the equation to control for it.

Relevant to our current concerns, having a deontological orientation was a significant predictor for act choices, indicating that people high in deontological orientation were more likely than people low in deontological orientation to prefer acts over omissions ($\beta = .23$; $p < .001$). Furthermore, the significant frame × act certainty interaction ($\beta = -.17$; $p < .001$) reflected the typical framing effects as demonstrated by Tversky and Kahneman (1981). These framing effects were moderated by consequentialist orientation, as reflected by a (marginally) significant interaction of frame × act certainty × consequentialist orientation ($\beta = -.13$; $p = .06$). It indicated that people higher in consequentialist orientation showed larger framing effects. More interestingly, framing effects were also qualified by a frame × act certainty × deontological orientation × consequentialist orientation ($\beta = -.11$; $p < .05$) interaction.

To better understand this interaction and the different role of deontological versus consequentialist focus, it is useful to describe their effects on act choices and framing effects separately. For this purpose, we created four subgroups of participants corresponding to low and high consequentialist (ConsHigh, ConsLow) and low and high deontological orientations (DeonHigh, DeonLow), based on median splits on these variables.

[1]Inspection of the each scenarios revealed that the environmental scenarios revealed essentially the same pattern, while the social scenario showed a somewhat different pattern. A tendency for framing effects and act biases were found among the environmental scenarios, while the social scenario only showed act biases but no typical framing effects. Furthermore, it appeared that gender was particularly sensitive to the social issue "sick elderly," which may be the reason for the varying pattern with the social scenario. Unlike the other scenarios, gender was a relevant factor in the social scenario, with women showing a stronger tendency than men to prefer acts. The main regression results with framing, act certainty, deontological/consequentialist orientation and gender as predictors, and act choices as criterion were as follows: The results across the environmental scenarios (drinking water contamination and genetically engineered crops) showed that people higher in deontological concerns were more likely to prefer acts over omissions ($\beta = .11$, $p = .09$). The significant frame × act certainty interaction was indicative for the typical framing effects ($\beta = -.24$, $p < .001$). The significant interaction frame × act certainty × consequentialist orientation ($\beta = -.17$, $p < .05$) was moderated by the interaction frame × act certainty × deontological × consequentialist orientation ($\beta = -.17$, $p < .05$). Simple comparisons among subgroups of high and low deontological and high and low consequentialism confirmed that differences in risky choices under negative and positive frame, consistent with framing effects, were found among groups high in consequentialism (Fs > 5.19, $p < .05$). The social scenario (sick elderly) revealed that women and people higher in deontological concerns were more likely to prefer acts over omissions ($\beta = .12$, $p < .08$ and $\beta = .48$, $p < .001$, respectively). In addition, the significant interactions sex × act certainty ($\beta = .24$, $p < .01$) and sex × frame ($\beta = .15$, $p = .05$), reflected the fact that women were more likely to prefer acts when the options represented risky acts and were framed positively. No overall framing effects were found.

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Table 1. Item scores, factor loadings, and scale reliabilities

	Mean	SD	Factor loadings	α
Deontological scale				.81
Deon 1	2.99	1.06	.83	
Deon 2	3.26	1.18	.83	
Deon 3	2.48	1.20	.67	
Deon 4	2.57	1.15	.82	
Consequentialist scale				.62
Cons 1	2.73	1.21	.45	
Cons 2	3.74	0.97	.76	
Cons 3	3.02	1.17	.67	
Cons 4	3.65	1.02	.77	
Protected value scale				.64
PV 1	3.34	0.99	.72	
PV 2	3.66	1.02	.48	
PV 3	2.53	1.06	.66	
PV 4	3.16	1.03	.70	
Personal concern				.84
Concern 1	3.32	1.04	.88	
Concern 2	3.31	1.11	.89	

Looking first at how deontological versus consequentialist orientations affect act choices, Table 2 reveals the important trends. As can be seen, act preferences were larger for the two high deontological groups (ConsLow/DeonHigh = 0.63, ConsHigh/DeonHigh = 0.60) than for the two low deontological groups (ConsLow/DeonLow = 0.43, ConsHigh/DeonLow = 0.45). These patterns suggest that act choices are likely to be a function of deontological focus. The low deontology subgroups, if anything, showed an omission bias.

Figure 1 clarifies the four-way interaction of the regression analysis based on median splits on the consequentialist and deontological orientation variables. The figure displays the mean proportions of risky choices to examine framing effects. As can be seen, larger framing effects were found among people high in consequentialist concerns. Both groups high in consequentialism (ConsHigh/DeonLow, ConsHigh/DeonHigh) showed modest to large framing effects with reliable differences between risky choices under negative versus positive frames ($F(1, 61) = 3.63$, $p = .06$, and $F(1, 51) = 19.24$, $p < .001$, respectively). People low in consequentialism (ConsLow/DeonLow, ConsLow/DeonHigh) showed no reliable difference between risky choices under negative and positive frames (Fs < 0.70, *n.s.*). These results provide support for the view that framing effects are a function of a consequentialist focus.

Given the fact that PV scores are correlated with a deontological but not a consequentialist orientation, combinations of PVs and consequentialism should provide very similar results to those found with the subgroups of low versus high

Table 2. Act preference proportions as a function of subgroups of consequentialist and deontological orientations (or protected values)

	Overall act choices
Subgroups of consequentialist/deontological orientation	
Group ConsLow/DeonLow	0.43
Group ConsLow/DeonHigh	0.63
Group ConsHigh/DeonLow	0.45
Group ConsHigh/DeonHigh	0.60
Subgroups of consequentialist orientation/protected values	
Group ConsLow/PVLow	0.46
Group ConsLow/PVHigh	0.57
Group ConsHigh/PVLow	0.40
Group ConsHigh/PVHigh	0.64

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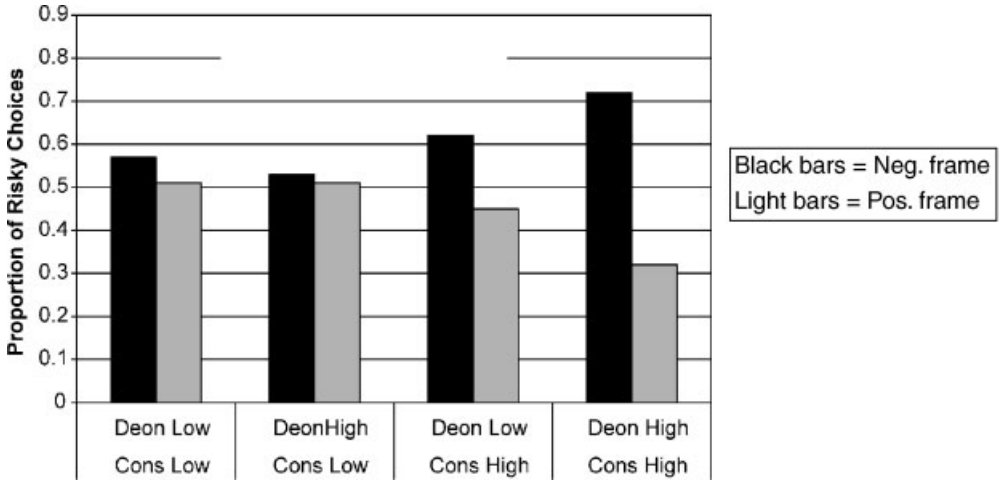

Figure 1. Proportions of risk preferences as a function of frame and subgroups of deontological and consequentialist orientations

deontological or consequentialist orientations. To test this expectation, a second multiple regression analysis was performed in which frame, act certainty, PV, consequentialist orientations, their interactions, and gender were used to predict proportions of act choices.

As expected, the presence of PVs revealed as main predictor for act choices. People with strong PVs showed a greater tendency to prefer acts over omissions ($\beta = .21$; $p < .001$). Framing effects were confirmed by a significant frame × act certainty interaction ($\beta = -.18$; $p < .01$). These framing effects were, however, moderated by PV and consequentialist orientation, as reflected by a significant interaction of frame × act certainty × consequentialist orientation ($\beta = -.17$; $p < .01$), and by a significant interaction frame × act certainty × PV × consequentialist orientation ($\beta = -.16$; $p < .05$).

Table 2 again displays the mean proportion of act choices of subgroups based on median split of low versus high PV and consequentialist orientations. As can be seen, the two high PV groups (ConsLow/PVHigh, ConsHigh/PVHigh) showed a stronger tendency for act bias (mean of act choices were .57 and .64, respectively) than the two low PV groups (ConsLow/PVLow, ConsHigh/PVLow) (mean of act choices were .46 and .40, respectively).

Figure 2 shows the trends with regard to preferences for risky choices. As can be seen, the differences between risky choices under negative and positive frames were larger for people high in consequentialism (ConsHigh/PVLow, ConsHigh/PVHigh). Individual tests showed that framing effect were statistically significant for both groups (Fs > 4.4,

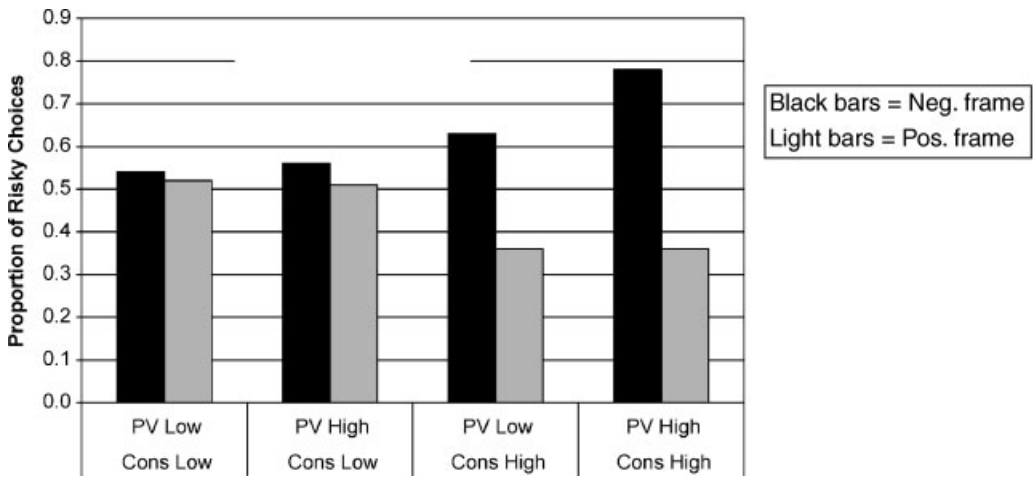

Figure 2. Proportions of risk preferences as a function of frame and subgroups of consequentialist orientation and protected values

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*p*s < .05). People low in consequentialism (ConsLow/PVLow, ConsLow/PVHigh) provided no evidence of framing (*F*s < 0.81, *n.s.*).

In sum, the results suggest that deontological versus consequentialism are not opposites, but instead are orthogonal. Moreover, these two kinds of reasoning have different effects on action preferences as well as on framing effects. A deontological orientation is associated with a bias toward acts rather than omissions. Consequentialism, on the other hand, was associated with framing effects. The largest framing effects were found among people high in consequentialism and deontological concerns (ConsHigh/DeonHigh). People being more strict or ''pure'' deontologists (i.e., low in consequentialism, high in deontological concerns) were insensitive to framing effects.

The findings of the present study provide further support for the idea that PVs are likely to be based on deontological reasoning. The results were similar to those with the low versus high deontological/consequentialist combinations. Consistent also with prior research by Tanner and Medin (2004), we found PV-people (ConsLow/PVHigh) who tended to prefer actions over omission and who were insensitive to framing effects. People high in PV and high in consequentialism, however, showed large framing effects as well as a preference for acts.

It should be mentioned, however, that this pattern of results was not consistent across scenarios. Unlike the environmental scenarios, the social scenario (sick elderly people) revealed act biases but no typical framing effects. Detailed inspection showed that gender was a relevant factor in the social scenario, with women showing a stronger tendency than men to prefer acts.[1] It seems that gender was particularly sensitive to the social issue, ''sick elderly,'' which may be the reason for the varying pattern with the social scenario.

GENERAL DISCUSSION

The present results help clarify the role of deontological versus consequentialist orientations and PVs in both framing effect and act biases. Of theoretical interest are the findings that (1) deontological and consequentialist modes of thinking are not directly opposed and (2) that PVs are strongly associated with deontology. Most importantly, however, the studies provide evidence that deontological/consequentialist orientations and PVs are key factors in both act bias and framing effects. The main results in this regard are as follows: (1) people high in deontology showed a stronger tendency to prefer acts than people low in deontology, (2) people holding PVs revealed a stronger preference for action than people without PVs, (3) people focusing on consequences were sensitive to framing effects rather than on act-omission distinctions, (4) people with strong PVs or deontological orientations combined with low consequentialism did not show framing effects. Overall, the results suggest that deontological orientations are more sensitive to distinctions between acts and omissions, while a consequentialist orientation appears to be more neutral between acts and omission.

Deontological Versus Consequentialist Orientations and Relation to Protected Values

The two basic moral orientations, deontological and consequentialist modes of thinking, are key factors in decision making. The experiment showed that deontological and consequentialist orientations were very weakly correlated. This differs from traditional positions, arising primarily in moral philosophy, where deontology and consequentialism are often thought to be rival theories and to be directly opposed. One reason why they may be conceptualized in this way is that philosophers have invented (extreme) moral dilemmas (e.g., the trolley problem) that bring them into direct conflict. However, it appears that people may combine or mix deontological and consequentialist thoughts or even integrate them.

Though there are many various forms of moral theories which are hotly debated within moral philosophy, little empirical research has been conducted that assesses the factual status of deontological and/or consequentialist claims among people (Waterman, 1988). To our knowledge, this is the first study that provides empirical support for the view that deontological and consequentialistic positions are not mutually exclusive. The results strongly suggest that in addition to what one might call ''pure deontologists'' and ''pure consequentialists,'' there is also a mixed form consisting of people who reflect both deontological and consequentialist orientations. Our results are more in line with contemporary theories which try to expand consequentialism with deontological reasons and *vice versa* (e.g., Brandt, 1992; Cummiskey, 1996; Harsanyi, 1977).

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Consistent with past literature (e.g., Baron & Spranca, 1997), the experiment also found that PVs scores were highly correlated with deontological orientation (but fairly independent of consequentialist orientation). We speculate that PVs may sometimes express both deontological and consequentialist reasons. This also has implications for the question of tradeoff reluctance. Pure (deontological) PVs are assumed to show tradeoff reluctance based on rules that specify that certain actions should be taken or not taken, irrespective of the outcomes. PVs that are combined with consequentialist orientation, on the other hand, may base their resistance to making tradeoffs on the conviction that one should follow rules because they yield better consequences over the long-term.

Preferences for Action

The results showed that deontological orientations and PVs are positively related to action. It is noteworthy that other research has found that deontological rules and PVs are more closely related to omission biases (e.g., Ritov & Baron, 1999). Though it is the case that both our measures of PVs and the paradigm used to assess act versus omission bias differ from that used by Baron and his associates, the contrasting results regarding the relationship between PV/deontological rules and act versus omission biases are not necessarily inconsistent. Deontological rules can refer either to negative duties (e.g., do not harm, do not lie) or positive ones (e.g., take care of your children, bring about good) (Gert, 1973; Nunner-Winkler, 1984), with the former encouraging acts of omissions, and the latter encouraging acts of commission. It is possible that our scenarios (primarily environmental scenarios) were more likely to induce positive than negative obligations. We suspect that the pattern of prohibitions and obligations may vary both across situations and cultures, so the safest generalization is that a deontological orientation is relatively more sensitive to the distinction between acts versus omissions than to the consequences.

A continuing methodological issue is the challenge of further improving the assessment of PV and deontological orientations. Though our items measuring deontological and consequentialist modes of thinking seem to do a reasonable job tapping the constructs, further research is needed to validate them. In addition, further studies should try to manipulate deontological and consequentialist modes independently of the judgment context to find stronger support for the causal role of these two modes. For instance, as one reviewer of this article suggested, one possibility would be to prime one or the other orientation and search for response dissociations. Though the present study has provided a first promising step, further work is needed to improve the reliability and validity of the measure of PVs. We believe that our items probe aspects of PVs that are close to Tetlock's understanding of PVs (sacred values): such values are neither tradeable, compromisable, nor can they even be questionable (Tetlock et al., 2000). In this sense, our items were designed to tap various, but correlated features of PVs.

An additional avenue of future research concerns the role of domains. Though we varied the problem descriptions broadly in this and our previous research (e.g., Tanner & Medin, 2004), most of scenarios concerned environmental decision making. In the study presented here, the social scenario (sick elderly people) revealed gender differences that were not otherwise observed.[1] Clearly, additional research is needed to examine the role of domain and associated contextual factors.

Framing Effects

The most striking effects are those on framing. Generally, the findings suggest that people who are more concerned with consequences are the ones who are particularly susceptible to framing effects, while people who are more concerned with duties are more sensitive to act-omission distinctions. We found insensitivity to framing effects among strict deontologists (high deontology, low consequentialism). Furthermore, we found strong act preferences as well as large framing effects among people that combined both deontological and consequentialist concerns. Given that these people showed preferences for action (over omission) and framing effects, their principle may be best described as ''you have a duty to act but act in way that produces better outcomes.''

We found that PVs are linked with deontological concerns. Insensitivity to framing effects was therefore also found among ''pure PVs'' that focused exclusively on deontological concerns (i.e., participants high in PVs and low in

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consequentialism). Those people who appeared to combine PVs with consequentialist concerns also showed strong act preferences and large framing effects.

On the surface, the results contradict the Tanner and Medin (2004) results. They found no framing for participants high in PVs and robust framing in participants low in PVs. Both our present study population and our measure of PVs varied from those of Tanner and Medin (2004). They did not obtain a measure of deontological and consequentialist orientations. Our best guess is that our sampling and selection yielded different mixtures of deontological versus consequentialist orientations across the various studies. The present study would suggest that those people revealing no framing effects in Tanner and Medin (2004) were not just participants high in PVs but also low in consequentialism. On the other hand, those participants showing robust framing effects were not just low in PVs but also high in consequentialism. The present study therefore appears to replicate and to extend the Tanner and Medin (2004) results by including more explicitly the deontological and consequentialist orientations. When participants are sorted by deontological and consequentialist orientations, we consistently find consequentialism to be associated with framing effects, regardless of whether a consequentialist orientation is or is not coupled with a deontological orientation or PVs.

CONCLUSION

Previous research has largely ignored the influence of deontological versus consequentialist theories and PVs on framing effects. The current study offers three important findings. First, deontological and consequentialist modes of thinking are not mutually exclusive. Second, PVs are strongly associated with deontological orientations but they may be combined with consequentialist orientations. Third, framing effects are only clearly demonstrated for participants high in consequentialism. Together, the experiment suggests that deontological/consequentialist orientations and PVs have pervasive effects on act bias and framing effects.

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APPENDIX A

Choice Scenarios Used in the Studies (Original Scenarios Are in German)

Drinking Water Contamination

Imagine a refinery that processes petroleum products. An investigation found that because of tank leaks, both soil and drinking water in the area of the refinery have become contaminated. Due to this contamination, 720 children from the adjacent village may get a fatal disease. A medicine (vaccine) for this disease has been developed and tested. However, the medicine can sometimes cause side effects that can be fatal, too.

Imagine that you are the head of the local hospital. You are asked whether to prescribe the medicine or not. Please choose one of the two options. Assume that the estimates are as follows:

1. Negatively framed, act with certain outcomes:
   (a) If the vaccination is adopted, the health of 480 children will be damaged for sure.
   (b) If no vaccination is adopted, there is a one-third probability that the health of none of the 720 children will be damaged, and a two-thirds probability that the health of all of them will be damaged.

2. Negatively framed, act with risky outcomes:
   (a) If the vaccination is adopted, there is a one-third probability that the health of none of the 720 children will be damaged, and a two-thirds probability that the health of all of them will be damaged.
   (b) If no vaccination is adopted, the health of 480 children will be damaged for sure.

3. Positively framed, act option with certain outcomes:
   (a) If the vaccination is adopted, the health of 240 children will be saved for sure.
   (b) If no vaccination is adopted, there is a one-third probability that the health of all of the 720 children will be saved, and a two-thirds probability that the health of none of them will be saved.

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4. Positively framed, act option with risky outcomes:

   (a) If the vaccination is adopted, there is a one-third probability that the health of all of the 720 children will be saved, and a two-thirds probability that the health of none of them will be saved.
   (b) If no vaccination is adopted, the health of 240 children will be saved for sure.

Genetically Engineered Crops

Some years ago, in the village where you live the farmers adopted eight new genetically engineered crops to save costs. Experts are concerned that the population of nine species of beneficial insects have already decreased dramatically and that these species could even become extinct. One of the reasons may be that the insects eat pollen from genetically modified corn. The local government is considering enacting a law that would limit the use of genetically engineered crops from eight to two.

You are a member of the government and you have to decide whether you want to lobby for this law or not. Please choose one of the two options. Assume that the estimates are as follows:

1. Negatively framed, act with certain outcomes:

   (a) If the law is enacted, six insect species will become extinct.
   (b) If the law is not enacted, there is a one-third probability that none of the nine insect species will become extinct, and a two-thirds probability that all of them will become extinct due to other reasons.

   (The other conditions were performed in analogy to the description above.)

Sick Elderly

In the village where you live, 60 elderly (older than 70 years) have a malignant lung disease. A novel operation can save their lives or at least improve their quality of life, but also leads to certain risks and very high costs—not a marginal problem, seeing that the hospital management is expected to do something against increasing health care costs. It is discussed to exclude people older than 70 years from certain costly operations (including the above-named lung operation), in order to reduce costs and gain resources for other cases.

The hospital has now to decide whether this 60 sick people older than 70 years will be operated or not. Either all of them will be operated or nobody, there are no other options. You are the head physician and you can plead for or against it. Please choose one of the two options. Assume that the estimates are as follows:

1. Negatively framed, act with certain outcomes:

   (a) If the operation is implemented, 40 people will die for sure.
   (b) If the operation is implemented, there is a one-third probability that none of the 60 people will die, and a two-thirds probability that all of them will die.

   (The other conditions were performed in analogy to the description above.)

APPENDIX B

Measures of Deontological Versus Consequentialist Orientation (Original Items Are in German)

I chose this option...
...because this alternative is consistent with principles one have to follow (= Deon 1).
...because I have the moral duty to behave that way (= Deon 2).

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. . .because some behaviors are definitely right or wrong, irrespective of the consequences (= Deon 3).
. . .because the other alternative is morally forbidden (= Deon 4).
. . .because cost-benefit analyses make sense at this topic (= Cons 1).
. . .because this option can be justified by their consequences (= Cons 2).
. . .because the outcomes of the chosen option produce the best net value (= Cons 3).
. . .because the positive outcomes outweigh the negative consequences (= Cons 4).

Measures of Protected Values (Original Items Are in German)

– I think that a compromise between both sides of this debate is an acceptable outcome (= PV 1).
– This issue is about something we should not sacrifice (= PV 2).
– I would not change my opinion, no matter what the costs (= PV 3).
– I would have problems making any concessions on this topic (= PV 4).

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