

Stable or Dynamic Value Importance?

The Interaction Between Value Endorsement Level and Situational Differences on Decision-Making in Environmental Issues

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In proposing that value endorsement level is dynamic rather than static, this study investigated how value importance judgments would vary with situation. Questionnaires were mailed to community residents ($N = 276$), using a scenario that described a realistic value conflict in an environmental issue. The results demonstrated that value importance judgments varied with situation, but the degree to which the situation influenced the judgment was moderated by the preexisting value endorsement level. Moreover, the study suggests that when 2 values are in conflict, the degree of difference in preexisting level of endorsement of the 2 values may be a better predictor of the judgments than the endorsement level of a single value.

Keywords: *values; value conflict; environmental issues; situational differences; internal value conflict; dynamic value hierarchy*

A conventional view of value hierarchies, such as that of Rokeach (Grube, Mayton, & Ball-Rokeach, 1994; Rokeach, 1973), is that one's ranking of values is relatively stable across situations. For example, Rokeach (1973) defined value hierarchy as "an enduring organization of

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beliefs concerning preferable modes of conduct or end-states of existence along a continuum of relative importance” (p. 5). This view of transsituationality of values was also adopted by Schwartz (e.g., 1992), mainly to study the structure among types of values at the same level. However, Schwartz acknowledged the importance of context of measurement and different situations: “Studies combining our abstract levels of measurement with contextually specific measures would increase our understanding of how values enter into concrete decision making” (1992, p. 47).

Contrary to the conventional view, a value system may be seen as dynamic, in that the hierarchy of values may change depending on specific issues and situations (Seligman & Katz, 1996; Seligman, Syme, & Gilchrist, 1994). The proponents of this view argue that value hierarchies may be reorganized within individuals depending on the issue. This multiple-value hierarchy perspective suggests that individuals construct differing value hierarchies depending on the situation. This distinction between the multiple and stable value hierarchies may parallel the one made between “assigned values” (situational values) and “held values” (deep-seated, enduring values) in the literature of natural resource allocation (Brown, 1984). In fact, Brown called for “an assigned value theory that incorporates concern for the role that held values and social influences play in determining assigned value” (1984, p. 244). The overall purpose of the present investigation is to examine more systematically the dynamics of value importance hierarchy, specifically in environmental issues in which two values are in conflict.

The issue of value conflict is very important in the environmental domain because most environmental issues involve value conflicts (Dietz & Stern, 1998; Dietz, Stern, & Rycroft, 1989; Lockwood, 1999; Vining & Schroeder, 1989; Wade-Benzoni et al., 2002). However, previous studies within the domain did not treat value endorsement level in a value-conflicting situation as dynamic. Some used three value orientations (egoistic, social-altruistic, and biospheric) proposed by Stern and his colleagues (e.g., Stern & Dietz, 1994; Stern, Dietz, & Kalof, 1993; Schultz, 2000). Others used Schwartz’s (1992) value concept, especially the two opposing value types as relevant in environmental psychology: self-transcendent values (combination of universalism and benevolence) and self-enhancement values (combination of power and achievement; e.g., Stern, Dietz, Abel, Guagnano, & Kalof, 1999; Nordlund & Garvill, 2002; Schultz & Zelezny, 1998, 1999). Either approach tended to assume that values are stable entities.

We propose that it is more realistic to consider that value endorsement levels change in a value-conflicting situation depending on the specifics of

the situation. Investigating the dynamics of value importance change across different situations should provide deeper understanding of the influence of value hierarchies on our decision-making.

The Present Investigation

The present studies, therefore, explore what we call the dynamic value hierarchy view. In this view, changes in the priority of values are conceptualized as resulting from the interaction between the preexisting level of one's value endorsement and the impact of situational variables. More specifically, value judgments made in one situation may be influenced by (a) the preexisting level of endorsement of a specific value, (b) the balance between the endorsement levels of the two conflicting values, (c) the impact of situational variables, and (d) the interactions between them. The purpose of this study is to examine the influence of these four factors, using an environmental issue in which two values are in conflict: protecting the environment versus pursuing economic development. Below, some of the focuses of this conceptualization are elaborated.

Interactive Nature of Value Hierarchy Change

Most studies of value hierarchy changes use an intervention between the first and second measurements of the value ranking to compare the difference between them (e.g., writing an essay about the issue in question [Seligman & Katz, 1996], completing a questionnaire on a relevant issue [Seligman, Syme, & Gilchrist, 1994], analyzing reasons why specific values are important [Maio & Olson, 1998], and priming specific values [Verplanken & Holland, 2002]). However, in this study, value hierarchy change is captured as the result (and the process) of interaction between the situational differences themselves and the preexisting individual differences in value preference, in an attempt to demonstrate a more dynamic nature of value importance changes.

Internal Value Conflicts

Value conflicts may be perceived internally and/or externally. For example, when one endorses both of the two opposing values very strongly, or at least to the same extent, he or she will presumably experience internal conflict. However, if a person places more importance on one value than the

other, less internal conflict should be experienced, even though the objective situation may appear to pose conflict between the two values. The extent of internal value conflict is likely to affect how the person perceives the situation and how situational differences influence the person's value hierarchy. The present study explores this relationship.

The literature on internal value conflict primarily concerns political reasoning and its effects on information processing (e.g., Suedfeld, Bluck, Loewen, & Elkins, 1994; Suedfeld & Wallbaum, 1992, Tetlock, 1986, 1999; Tetlock, Peterson, & Lerner, 1996). The value pluralism model of ideological reasoning (Tetlock, 1986) suggests that when individuals place high importance on both values (pluralistic), they are forced to engage in more complex information processing, which requires more integrative complexity. During such information processing, individuals try to specify "when, why, and to what degree, one value should prevail over another" (Tetlock et al., 1996, p. 28).

In a similar way, Braithwaite (1998) proposed a value balance model of political evaluations. Braithwaite created four groups according to the degree to which participants endorsed two opposing values (harmony vs. security). Within value-balanced persons (those who endorse both values to the same degree), she proposed that relativists (those who do not endorse either value) should behave differently from dualists (those who endorse both values strongly), in that relativists would be more likely to be influenced by specifics of the situation and self-interest. Braithwaite's results using frequency data suggested that her hypotheses were supported, but no systematic manipulation of situational variables was involved. Thus, the present study introduces manipulation of situational variables to address this point.

Situational Differences

Four variables were selected for this study as situational factors: self-interest, social norms, the immediacy of economic gain, and the immediacy of environmental damage. First, self-interest is a strong influence in everyday life; one could even argue that the main goals in our lives involve fulfilling self-interest. Self-interest can be a strong influence on preferences, especially in the domain of environmental issues (e.g., deciding on a site for a nuclear power plant or major water restrictions), in which one's perceived quality of life is at risk. Many environmental issues can be viewed as conflicts between the self-interests of the different stakeholders. Acting in pro-environmental ways (e.g., reducing one's car use, conserving energy) often calls for self-sacrifice: "When personal income and livelihood are affected,

issues such as the public good, procedural justice and environmental rights tend to take the 'back seat'" (Syme, Nancarrow, & McCreddin, 1999, p. 60). How to overcome self-interest to encourage more environmentally responsible behavior has long been a topic of discussion in environmental psychology (e.g., Kaplan, 2000).

Second, social norms can be a strong influence on attitudes and behavioral intentions. As defined in the theory of reasoned action (Fishbein & Ajzen, 1975) and the theory of planned behavior (Ajzen, 1991), social norms are those pressed by one's significant others and backed by their approval or disapproval of one's actions. A person sometimes must weigh these social norms against the desire to fulfill self-interest. Many studies have demonstrated the influence of social norms (together with one's attitudes and perceived difficulty of the action) on behavioral intentions in the domains of health (e.g., Baker, Little, & Brownell, 2003; Johnston & White, 2003), leisure (Ajzen & Driver, 1991), sexual behavior (e.g., Bryan, Fisher, & Fisher, 2002; Sheeran & Taylor, 1999), and environmental actions (e.g., Kaiser & Gutscher, 2003).

Finally, whether an environmental damage is urgent or economic gain is imminent can make an important difference. For example, the scarcity of a forest resource influences judgments of the importance of the competing goals of preserving wilderness versus maintaining a maximum level of timber production (Schroeder, 1981). Urgency may also moderate the influence of self-interest or social norms. For example, the influence of self-interest may be weaker if the situation is urgent than if it is not. On the other hand, the urgency of the situation may magnify the influence of self-interest, as was shown in a study of water allocation (Syme et al., 1999).

Questions and Hypotheses

This study addresses four questions. The first question concerns the effects of situational variables on value importance judgments. We hypothesize that the four situational variables will have different degrees of influence on value importance judgments (Hypothesis 1A) and that the effects of the situational variables will interact with each other (Hypothesis 1B).

The second question concerns the interaction between the situational factors and the preexisting level of value endorsement. We predict that an individual's preexisting degree of value endorsement will influence (i.e., interact with) the impact of situational variables (Hypothesis 2A). More specifically, we hypothesize that the impact of situational variables declines as the degree of preexisting value endorsement increases, because one is more likely to be

guided by the value than by the situational differences if the value was strongly held before the situation was encountered (Hypothesis 2B).

Third, does taking two conflicting preexisting values into account better explain the influence of values on decision-making than considering only a single value? To take into account both preexisting values (protecting the environment and pursuing economic gain), four groups will be created: dualists (according to the term by Braithwaite, 1998, those who strongly endorse both values), situationalists (those who do not endorse either value very strongly), prodevelopment (those who endorse economic development more strongly than protecting the environment), and pro-environment (those who endorse protecting the environment more strongly than economic development). The prodevelopment and pro-environment groups will have a clear hierarchy of values, whereas dualists and situationalists will not. Taking both preexisting values into consideration may permit better predictions of situational value importance than the endorsement level of a single value (cf. Braithwaite, 1998). This may especially be true when a situation involves clear conflict between the two values. Therefore, we hypothesize that a preexisting value endorsement pattern based on two conflicting values will predict situational value importance judgments better than the endorsement level of a single preexisting value (Hypothesis 3).

Finally, we predict that this preexisting value endorsement pattern will interact with the effects of situational variables, in that the effects of situational variables vary depending on the pattern (Hypothesis 4A). More specifically, we predict that the effects of situational variables will be strongest when an individual does not endorse either value very strongly. To put it in terms of the group membership described earlier, we expect that situationalists would be most influenced by situational differences among the four groups (Hypothesis 4B).

How would the effects of situational variables be when an individual endorses both of the two values strongly (i.e., dualists)? As for dualists, one can imagine contradictory effects of situational factors. When a single preexisting value is considered, the effects of situational differences might become weaker as value endorsements become stronger. However, when two conflicting values are considered, the opposite may be found. On the basis of Tetlock et al.'s (1986) reasoning, one may expect that the effects of situational variables might be stronger when individuals experience high internal conflict, as dualists would, because they are likely to engage in more deliberate thinking, taking all the situational factors into account. The literature does not offer a clear answer to this question, and the effects of situational influence on dualists on their value importance judgments will be explored without a specific hypothesis.

Method

Sample and Procedures

One thousand questionnaires were hand delivered to randomly selected community residents (selected to represent different socioeconomic levels) in a western mid-sized Canadian city. Two reminders were sent out at 1-week intervals. Three lottery prizes of \$250 in Canadian currency were introduced to encourage the completion of the entire questionnaire.

A total of 284 questionnaires were returned (return rate, 28.4%), of which 8 were omitted because of a large number of missing values, resulting in 276 completed questionnaires. The age of the participants ranged from 18 to 87 ($M = 49.8$ years, $Mdn = 51$). Among them, 66.1% were female. The annual income of participants ranged from C\$1,000 to C\$275,000 ($M = C\$60,731$, $Mdn = C\$50,000$). As for education, 12.8% had finished high school, 37.2% had finished some postsecondary degree, 28.8% had earned a bachelor's degree, and 21.2% had earned more advanced degrees. Compared with the most recent (2001) census information for the city, this sample had slightly more females and individuals with a slightly higher range of incomes. Nonetheless, it covers a wide range of age, income, and education groups and was relatively representative of the city's residents.

Materials

The questionnaire consisted of three parts: a value survey, some filler items, and a scenario. The Schwartz Value Survey (1992) was used to measure preexisting value importance, with a list of 56 separate values, each followed by a short explanatory phrase. Each of these 56 items represents a distinctively different single value, and these values are further categorized into 11 motivationally distinct types of values. In addition to these values from the original Schwartz Value Survey, one item, "pursuing economic development" was added to create a value directly relevant to the context of the scenarios. The response format, following the original Schwartz survey, was a 9-point, Likert-type scale ranging from -1 (*opposed to my value*) to 0 (*not important*) to 7 (*of supreme importance*).

The second part of the questionnaire consisted of 18 filler items to avoid the possible influence of general value ratings in the first part of the questionnaire on the responses for scenario questions that followed in the third part.

The Scenario

The third part was a scenario. The scenario was designed to describe a situation in which two values are in conflict with each other. Within environmental issues, conflicting values often are between the value placed on material or economic gain versus that placed on protecting the environment (e.g., Kimmelmeier, Krol, & Kim, 2002), and so these were used as conflicting values in this scenario.

To ensure that the two values were perceived as conflicting, the scenario was pretested. Thirty-five students in a third-year psychology course were asked to read the scenario and answer the question, "In this situation, two values, protecting the environment and pursuing economic gain, are implied. Do you think they are in conflict?" All but 1 participant answered "yes" to this question.¹

An environmental issue for the scenario was selected to reflect an actual controversy so the scenario would be engaging and realistic for community residents. Recently, in responding to the pressure from oil and gas companies, the Government of British Columbia asked the Government of Canada to consider lifting a federal moratorium on oil and gas activities offshore of British Columbia. This met outrage from environmental organizations. The scenario described a situation in which the participants attended one of the public hearing sessions on this issue and were asked to express an opinion in public when their significant others were also present. (See the Appendix for the full scenario.) The two conflicting values in this scenario were protecting the environment versus pursuing economic gain. Participants rated the importance of each value separately for each of the 16 situations (discussed later).

Design and Procedure

This study used a mixed-design analysis of variance (ANOVA) with scenarios, with one between-subject variable and four within-subject variables. These four variables, each with two categories, were manipulated in the scenarios, creating 2 (self interest: lifting the moratorium vs. not lifting the moratorium) \times 2 (social norm: lifting the moratorium vs. not lifting the moratorium) \times 2 (immediacy of economic gain: immediate vs. gradual) \times 2 (immediacy of environmental damage: immediate vs. gradual) combinations, for a total of 16 (see Appendix also for the manipulated levels of each variable). The order of presenting the scenarios was counterbalanced.

One of the two variables, the general value ratings (either for protecting the environment or pursuing economic development) or value endorsement

pattern, served as a between-subject variable, in separate analyses. In the first, the participants' preexisting value rating (for protecting the environment or for pursuing economic development) was a between-subject variable. In the second, the participants' value endorsement pattern was used as a between-subject variable, to take both values into account in a single analysis.

Value endorsement pattern was created by categorizing participants into four groups using median-splits based on their preexisting values: those who rated both values high (dualists), those who rated economic development high and protecting the environment low (prodevelopment), those who rated economic development low and protecting the environment high (pro-environment), and those who rated both values low (situationalists).

Gender was also included to control for the possible gender differences.²

Dependent Measures

The participants were asked to rate separately the importance of each of the two values (protecting the environment and pursuing economic gain) to them, after reading each of the 16 scenario variations. The response format ranged from 1 (*not important at all as the guiding principle for this decision*) to 10 (*very important*). The 16 variations were presented in a counterbalanced order. These dependent measures will henceforth be referred to as *situational value judgments* to distinguish them from the preexisting general value ratings.

Results

Descriptive Statistics

Table 1 lists the means and standard deviations for each situational value judgment for both values. The importance ratings for protecting the environment were substantially higher across all the 16 situations, compared with those for economic development.

Analyses With a Single Preexisting Value

A mixed-design ANOVA with four within-subject variables (self-interest: lifting the moratorium vs. not lifting the moratorium; social norm: lifting the moratorium vs. not lifting the moratorium; immediacy of the impact on economic development: immediate economic gain vs. gradual economic

Table 1
Descriptive Statistics for Dependent Variables (Situational Importance Judgments)

Situation	<i>n</i>	<i>M</i>	<i>SD</i>
For situational importance judgments of pursuing economic gain			
SI 1, SN 1, IMECO 1, IMENV 1	275	6.31	2.42
SI 1, SN 1, IMECO 1, IMENV 2	276	5.92	2.70
SI 1, SN 1, IMECO 2, IMENV 1	274	5.51	2.70
SI 1, SN 1, IMECO 2, IMENV 2	276	5.28	2.79
SI 1, SN 2, IMECO 1, IMENV 1	276	5.81	2.66
SI 1, SN 2, IMECO 1, IMENV 2	274	5.72	2.68
SI 1, SN 2, IMECO 2, IMENV 1	275	5.07	2.72
SI 1, SN 2, IMECO 2, IMENV 2	274	5.09	2.78
SI 2, SN 1, IMECO 1, IMENV 1	276	5.40	2.65
SI 2, SN 1, IMECO 1, IMENV 2	275	5.36	2.69
SI 2, SN 1, IMECO 2, IMENV 1	274	4.85	2.81
SI 2, SN 1, IMECO 2, IMENV 2	275	4.87	2.81
SI 2, SN 2, IMECO 1, IMENV 1	275	5.13	2.79
SI 2, SN 2, IMECO 1, IMENV 2	275	5.00	2.78
SI 2, SN 2, IMECO 2, IMENV 1	276	4.43	2.87
SI 2, SN 2, IMECO 2, IMENV 2	276	4.37	2.83
For situational importance judgments of protecting the environment			
SI 1, SN 1, IMECO 1, IMENV 1	276	8.25	1.87
SI 1, SN 1, IMECO 1, IMENV 2	276	8.42	1.82
SI 1, SN 1, IMECO 2, IMENV 1	274	8.76	1.66
SI 1, SN 1, IMECO 2, IMENV 2	276	8.91	1.46
SI 1, SN 2, IMECO 1, IMENV 1	276	8.39	1.84
SI 1, SN 2, IMECO 1, IMENV 2	274	8.42	1.83
SI 1, SN 2, IMECO 2, IMENV 1	275	8.77	1.54
SI 1, SN 2, IMECO 2, IMENV 2	275	8.85	1.53
SI 2, SN 1, IMECO 1, IMENV 1	276	8.64	1.62
SI 2, SN 1, IMECO 1, IMENV 2	275	8.67	1.51
SI 2, SN 1, IMECO 2, IMENV 1	274	9.02	1.38
SI 2, SN 1, IMECO 2, IMENV 2	275	9.02	1.32
SI 2, SN 2, IMECO 1, IMENV 1	275	8.65	1.54
SI 2, SN 2, IMECO 1, IMENV 2	275	8.72	1.45
SI 2, SN 2, IMECO 2, IMENV 1	275	9.08	1.30
SI 2, SN 2, IMECO 2, IMENV 2	275	9.12	1.25

Note: SI: self-interest; SN: social norm; IMECO: immediacy of economic gain; IMENV: immediacy of environmental damage. 1 = for favoring economic development, and 2 = protecting the environment. Sixteen situations were created by combining these four variables.

gain; and immediacy of the impact on environmental damage: immediate environmental damage vs. gradual environmental damage) and one between-subject variable (preexisting value rating; protecting the environment vs. pursuing economic development) was conducted on situational value judgments for each value separately, controlling for gender.

Situational value judgments for economic development. All four situational variables had significant main effects: For self-interest, $F(1, 265) = 55.25$, $p < .001$, $\eta^2 = .17$; for social norm, $F(1, 265) = 9.62$, $p < .01$, $\eta^2 = .04$; for immediacy of economic gain, $F(1, 265) = 57.17$, $p < .001$, $\eta^2 = .18$; and for immediacy of environmental damage, $F(1, 265) = 75.50$, $p < .001$, $\eta^2 = .22$. These significant main effects of the situational factors confirm the effects of the manipulation. When self-interest was for lifting the moratorium, the importance rating of economic development was higher ($M = 5.58$) than when self-interest was for protecting the environment ($M = 4.92$). When social norm was for lifting the moratorium, the rating was higher ($M = 5.31$) than when it was not for lifting the moratorium ($M = 5.19$). When economic profit was immediately available, the rating was higher ($M = 5.43$) than when profit was not immediately available ($M = 5.07$). When environmental damage was immediate, the rating was lower ($M = 4.93$) than when it was not immediate ($M = 5.57$).

One significant three-way interaction was found, involving self-interest, social norm, and immediacy of economic gain, $F(1, 265) = 10.53$, $p < .001$, $\eta^2 = .04$. When economic gain was immediate, and self-interest favored lifting the moratorium (i.e., both are in favor of lifting the moratorium), whether the social norm was for or against lifting the moratorium had a significant effect. However, when self-interest was against lifting the moratorium, social norm had no effect. When economic gain was not immediate, and self-interest was against lifting the moratorium, social norm had a significant effect in that the rating of economic development was higher when one's significant others supported lifting the moratorium (see Figure 1).

The preexisting value rating for economic development was also significant, $F(1, 265) = 10.81$, $p < .001$, $\eta^2 = .04$. A significant interaction between the immediacy of economic gain and the preexisting value for economic development, $F(1, 265) = 4.66$, $p < .05$, $\eta^2 = .02$, qualified this relation. When the preexisting value was strongly held, whether economic gain was immediate had less influence; the situational value was strongly endorsed in both cases (see Figure 2). Gender was also significant, $F(1, 265) = 7.06$, $p < .01$, $\eta^2 = .03$; males tended to value economic development higher ($M = 5.77$) than females ($M = 4.97$) across situations. However, no significant interactions involved gender.

Figure 1
A Three-Way Interaction Plot Between Self-Interest, Social Norm, and Immediacy of Economic Gain

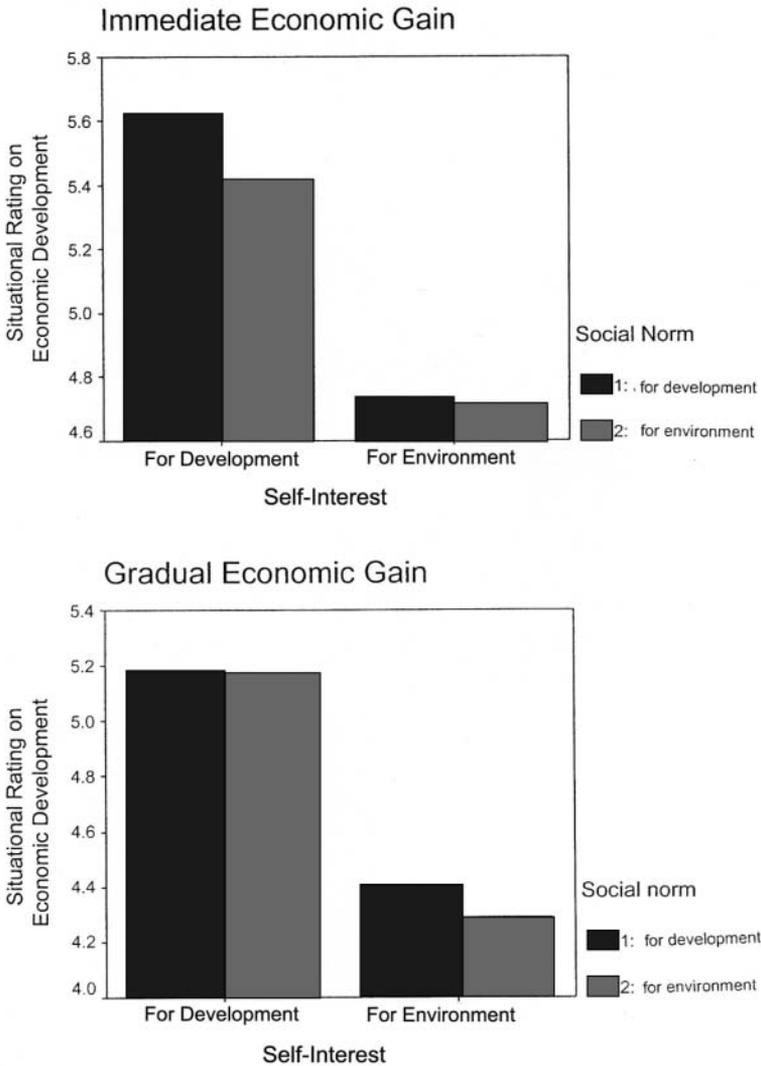
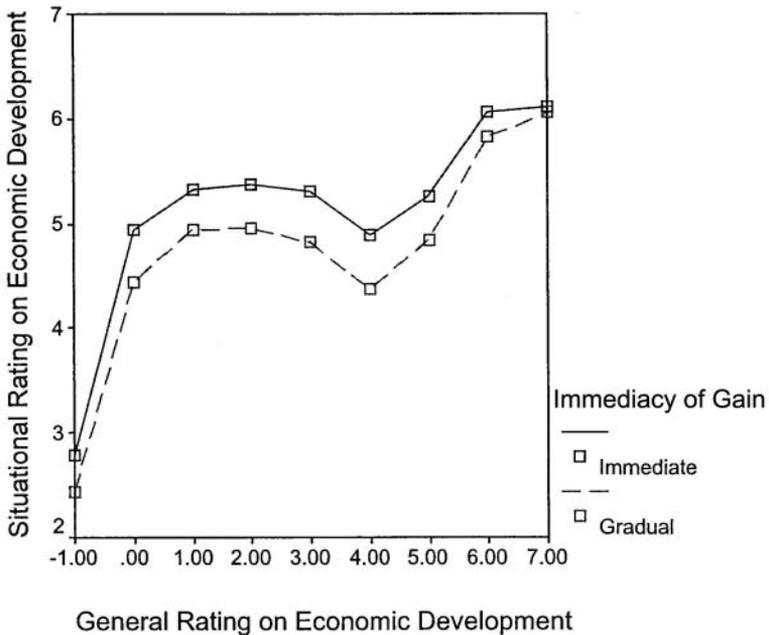


Figure 2
An Interaction Plot Between General Rating of Economic Development and Situational Variable, Immediacy of Economic Gain



Situational value judgments for protecting the environment. All four situational variables—including social norm—significantly influenced situational value importance: For self-interest, $F(1, 263) = 23.80, p < .001, \eta^2 = .08$; for social norm, $F(1, 263) = 10.73, p < .001, \eta^2 = .04$; for immediacy of impact on economic development, $F(1, 263) = 3.86, p < .05, \eta^2 = .02$; and for immediacy of impact on environmental damage, $F(1, 263) = 64.89, p < .001, \eta^2 = .20$. The direction of effects was as expected by the manipulation. When self-interest was for protecting the environment, the importance of the value of protecting the environment was greater ($M = 8.88$) than when it was for economic development ($M = 8.62$). When social norm was for lifting the moratorium, the value was more weakly endorsed ($M = 8.72$) than when it was against lifting the moratorium ($M = 8.79$). When economic gain was immediate, the importance of the value was less ($M = 8.73$) than

when it was not immediate ($M = 8.77$). When environmental damage was immediate, the value was more important ($M = 8.96$) than when it was not immediate ($M = 8.54$).

The preexisting value rating for protecting the environment was significant as a between-subject variable, $F(1, 263) = 103.74, p < .001, \eta^2 = .28$, and had the largest effect size among the significant effects, indicating that the preexisting value strongly guided the situational values. Gender was not significant.

These effects of situational variables varied depending on the level of preexisting value. The effect of self-interest was qualified by it, $F(1, 263) = 4.34, p < .05, \eta^2 = .02$, in that the effect of self-interest decreased when the preexisting value was more strongly held. This was also true of the effect of immediacy of impact on environmental damage, $F(1, 263) = 7.82, p < .01, \eta^2 = .03$; and the nature of the interaction was the same (see Figures 3 and 4).

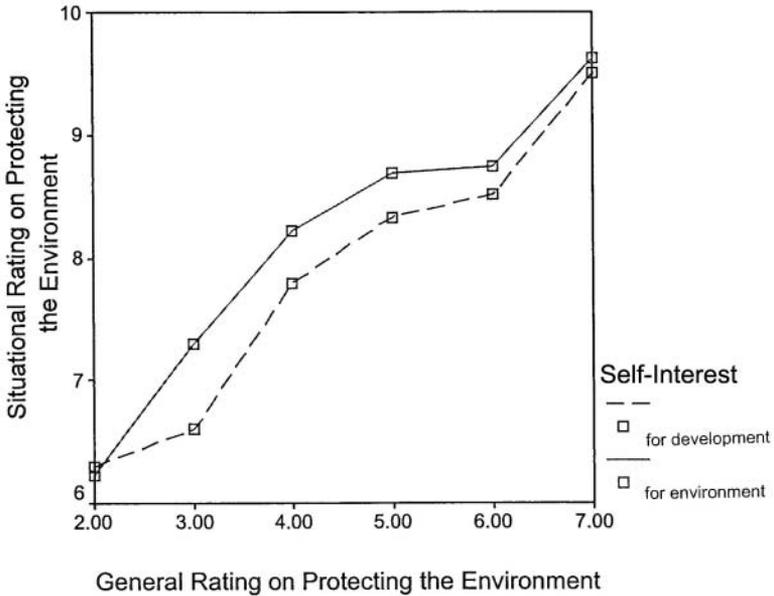
A significant three-way interaction involving two situational variables (self-interest and immediacy of impact on environmental damage) and preexisting value rating was found, $F(1, 263) = 4.60, p < .05, \eta^2 = .02$. When self-interest was against lifting the moratorium (i.e., for protecting the environment), no interaction occurred between immediacy of the environmental damage and preexisting value importance. However, when self-interest was for lifting the moratorium (i.e., for oil and gas development), whether environmental damage was immediate or gradual mattered more. This tendency was pronounced when the importance of the preexisting value was low. If environmental damage was not immediate (i.e., gradual), protecting the environment (for this particular situation) was not as important (see Figure 5).

Analyses With Value Endorsement Pattern

In the second set of mixed-design ANOVA analysis, the endorsement pattern based on the two preexisting values was used as a between-subject variable. The effects of interest here are those of value endorsement pattern as a between-subject variable, and its interaction with situational variables. Gender was again included to control for its possible influence on situational value judgments.

Frequencies of the four groups. Four groups were created by median-split. The median values were 5 and 6 for economic development and protecting the environment, respectively. Table 2 displays the frequencies for the median-split groups. The situationalist group (those who did not endorse either value very strongly) was largest among the four.

Figure 3
An Interaction Plot Between Self-Interest and the General Value Rating of Protecting the Environment



The effect of value endorsement pattern. Value endorsement pattern was a significant between-subject variable for situational value judgments for both economic development, $F(3, 261) = 6.42, p < .001, \eta^2 = .07$; and for protecting the environment, $F(3, 264) = 20.47, p < .001, \eta^2 = .19$. Comparing these effect sizes with those obtained in the first set of analysis (a direct test of Hypothesis 3) revealed that the effect size of the value endorsement pattern for situational value judgments of economic development was larger than that of the general rating of the single value ($\eta^2 = .04$). However, the effect size of value endorsement pattern on situational value judgments of protecting the environment was smaller than that of the general value rating of that single value ($\eta^2 = .28$).

Thus, the general value rating of the single value was a better predictor for the situational value judgments of protecting the environment, whereas

Table 2
Frequencies for Median-Split Grouping

Group	Frequency	%	Valid %
Dualist	40	14.5	14.6
Prodevelopment	44	15.9	16.1
Pro-environment	56	20.3	20.4
Situationalist	134	48.6	48.9
Total	274	99.3	100
Missing	2	0.7	
Grand total	276	100	

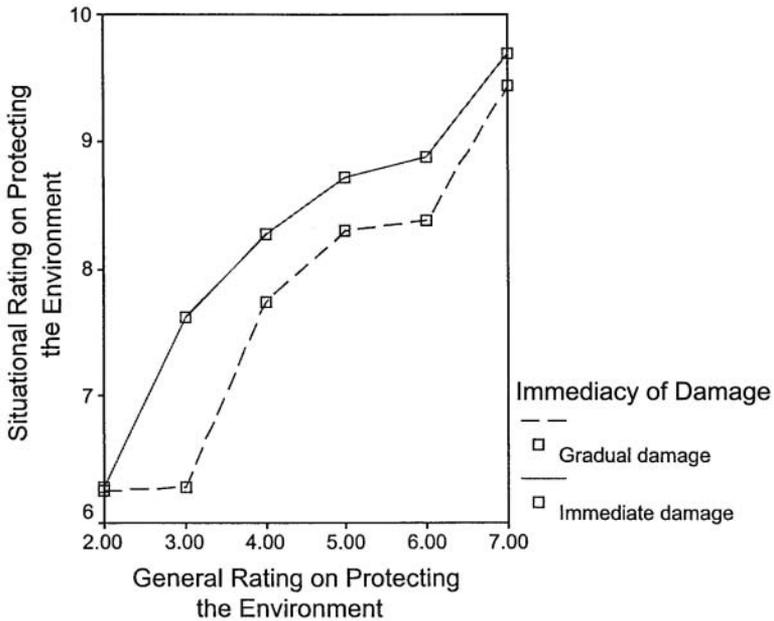
for the situational value judgments of economic development, value endorsement pattern performed better as a predictor.

Examination of the marginal means for the situational value judgments for economic development revealed that they were highest, as expected, for the prodevelopment group ($M = 6.50$), followed by the dualists ($M = 5.48$), situationalists ($M = 5.11$), and the pro-environment group ($M = 4.36$). A post hoc probe using Tukey's honestly significant difference at a familywise error rate of .05 showed that these mean situational value judgments were significantly different for the prodevelopment and pro-environment groups, and for the prodevelopment and situationalist groups. The dualists and situationalists did not significantly differ in their mean situational value judgments.

Marginal means for the situational value judgments for protecting the environment were highest for the dualist ($M = 9.59$) and pro-environment ($M = 9.54$) groups, followed by the situationalist ($M = 8.33$) and prodevelopment groups ($M = 8.27$). The same post hoc probe revealed no difference between the dualists and the pro-environment group. These two groups both held this value significantly stronger than did the situationalists and prodevelopment group, and the latter two groups were not different. Thus, for the situational value judgments of protecting the environment, the pre-existing strength of the value for economic development did not exert much influence; the situational value judgments depended only on how strongly participants held the value of protecting the environment. This point was reflected in the comparison of effect size described earlier.

Gender was significant only for situational value judgments for economic development, $F(1, 261) = 4.19$, $p < .05$, $\eta^2 = .016$, with the same direction as before; males tended to value economic development higher. No significant interactions involved gender.

Figure 4
An Interaction Plot Between Immediacy of Environmental Damage
and the General Value Rating of Protecting the Environment



The effects of situational variables and their interaction: For the situational value judgments of economic development. All four main effects of the situational variables were significant: For self-interest, $F(1, 261) = 35.91, p < .001, \eta^2 = .12$; for social norm, $F(1, 261) = 9.34, p = .001, \eta^2 = .04$; for immediacy of economic gain, $F(1, 261) = 31.51, p < .001, \eta^2 = .11$; and for immediacy of environmental damage, $F(1, 261) = 68.64, p < .001, \eta^2 = .21$. Immediacy of environmental damage had the strongest effect among the four, followed by self-interest, immediacy of economic gain, and social norm. The directions of the effects were all as intended by the manipulation.

A significant three-way interaction qualified the relation among three of the situational variables: self-interest, immediacy of economic gain, and social norm, $F(1, 261) = 8.38, p < .01, \eta^2 = .03$. When the social norm and self-interest were against lifting the moratorium, immediacy of economic gain had a stronger effect. When social norm was against lifting the moratorium, but self-interest favored it,

Figure 5
A Three-Way Interaction Plot Between Self-Interest, Immediacy of Environmental Damage, and General Rating of Protecting the Environment

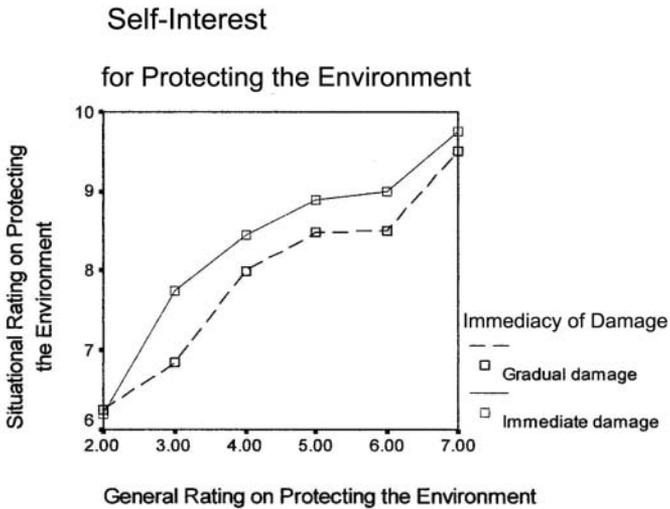
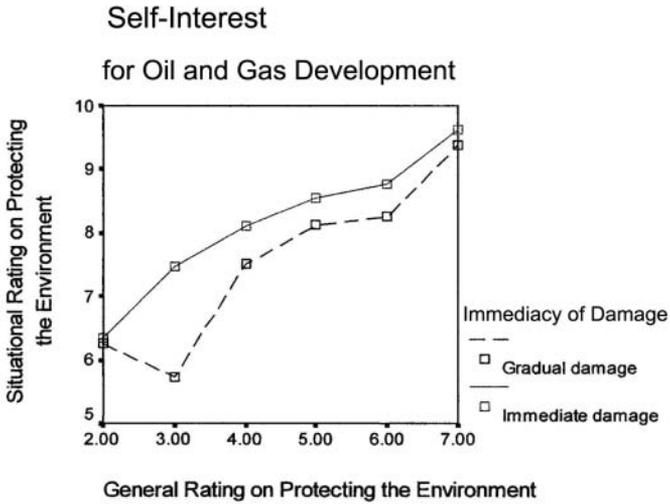


Figure 6
A Three-Way Interaction Plot Between Self-Interest, Social Norm, and Immediacy of Economic Gain

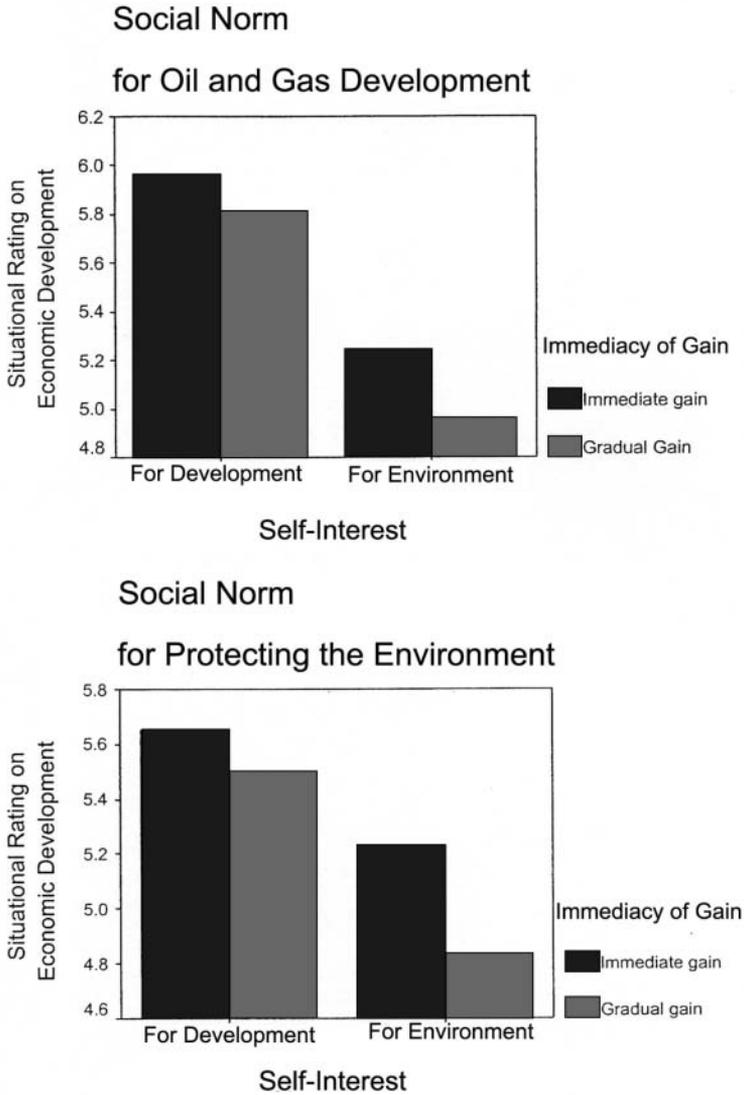
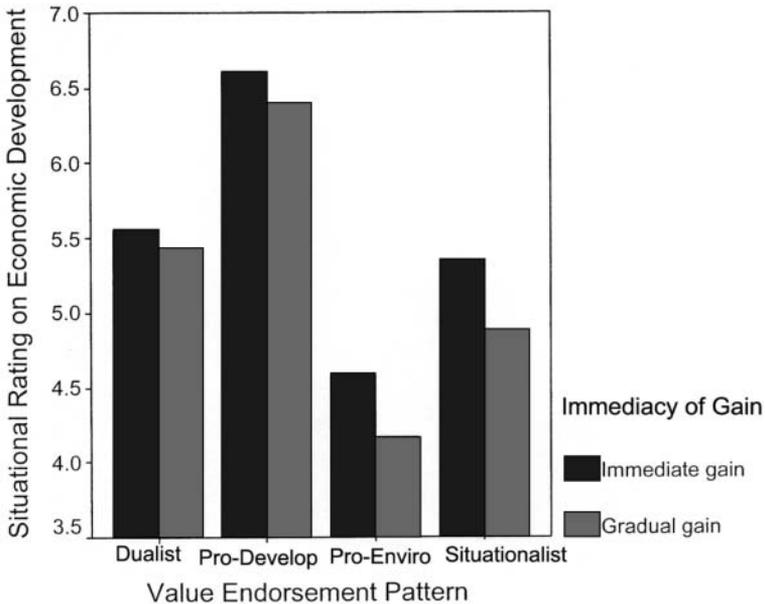


Figure 7
An Interaction Plot Between Value Endorsement Pattern
and Immediacy of Economic Gain for the Situational Value
Judgments of Economic Development



the effect of immediacy of economic gain had a smaller effect (see Figure 6). This tendency was the same for all the three-way interactions. When two of the three situational variables were in the same direction, the effect of the third variable was enhanced.

A two-way interaction showed that the effect of immediacy of economic gain was qualified by value endorsement pattern, $F(3, 261) = 2.98, p < .05, \eta^2 = .03$, in that the effect was stronger for the situationalist and pro-environment groups than it was for the dualist and pro-development groups (Figure 7).

The effects of situational variables and their interaction: For the situational value judgments of protecting the environment. All main effects of the situational variables were also significant for the situational value judgments

of protecting the environment: For self-interest, $F(1, 261) = 11.25, p < .001, \eta^2 = .04$; for social norm, $F(1, 261) = 7.44, p < .01, \eta^2 = .03$; for immediacy of economic gain, $F(1, 261) = 3.68, p < .05, \eta^2 = .02$; and for immediacy of environmental damage, $F(1, 261) = 35.60, p < .001, \eta^2 = .12$. Immediacy of environmental damage again had the strongest effect among the four, followed by self-interest, social norm, and immediacy of economic gain.

The effect of immediacy of environmental damage varied depending on value endorsement pattern, $F(3, 261) = 3.07, p < .05, \eta^2 = .03$: The effect was stronger for the situationalist and prodevelopment groups (see Figure 8). A significant three-way interaction was found between self-interest, immediacy of economic gain, and value endorsement pattern, $F(3, 261) = 2.76, p < .05, \eta^2 = .03$. When economic gain was gradual, self-interest had an effect only on the situationalists. When economic gain was immediate, self-interest had an effect on all groups except the dualists (see Figure 9).

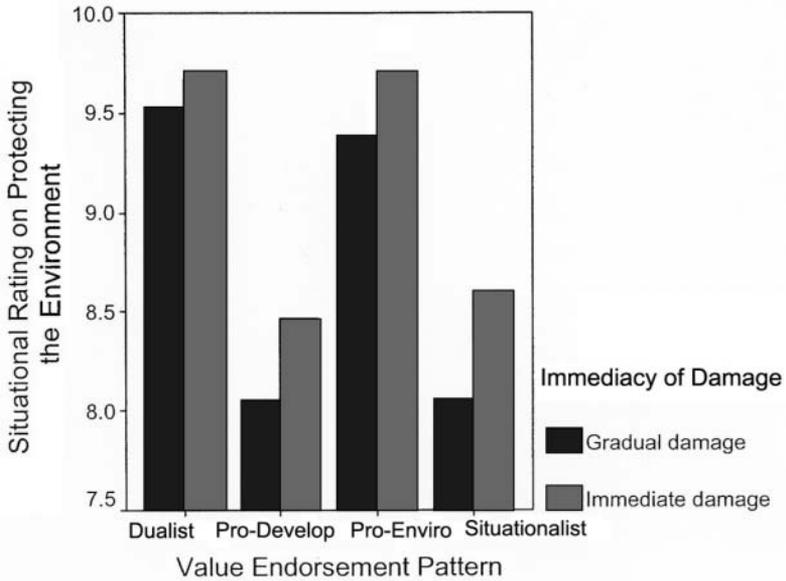
Discussion

The present investigation explored how the ratings of one's values may change across situations. Almost all of our hypotheses were confirmed: Each situational variable had a varying degree of significant effect (Hypotheses 1A), and they interacted with each other (Hypothesis 1B); there were interactions between the preexisting level of value endorsement and the effect of situational variables (Hypothesis 2A), in that the effect of situational variables declined as the level of value endorsement increased (Hypothesis 2B); taking into account both of the two values in conflict together in analysis made a better prediction for the situational importance judgment of economic development (a partial confirmation for Hypothesis 3); and the effects of situational variables varied depending on the value endorsement pattern of the two conflicting values (Hypothesis 4A), in that the situationalists were most influenced by the situational factors among the four groups (Hypothesis 4B). These points are discussed in more detail later.

Preexisting Values as a Framework

This study presents a conceptual framework within which the dynamics of value priority change can be understood more systematically, in a situation in which two values are in conflict. As the results show, value priorities do change across situations when situational factors change. However, the way they change is guided by the level of value endorsement at an

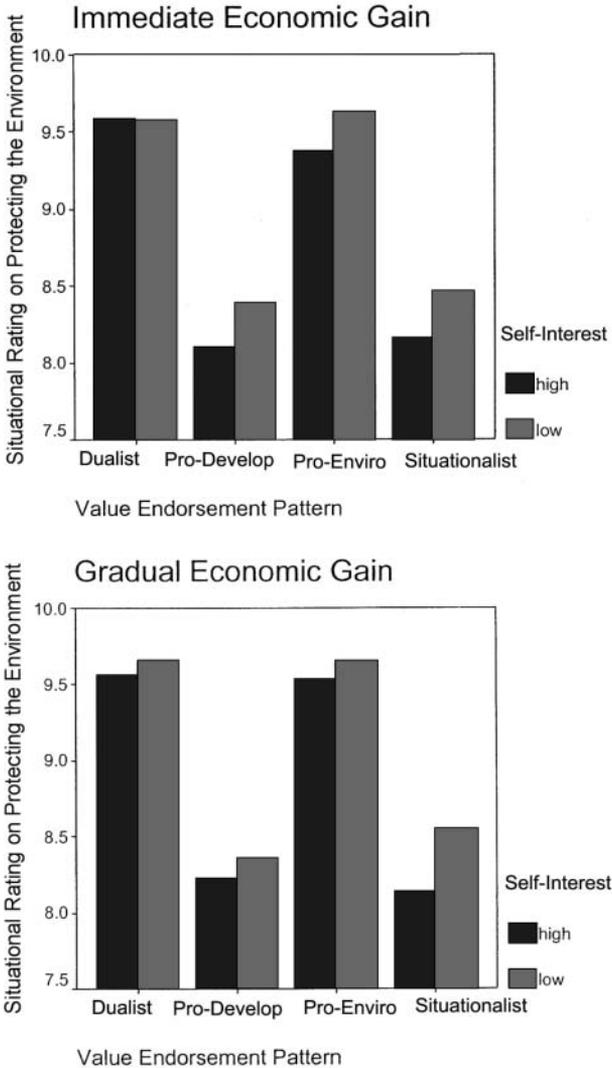
Figure 8
An Interaction Plot Between Value Endorsement Pattern and
Immediacy of Environmental Damage for the Situational Value
Judgments of Protecting the Environment



abstract or context free level; that is, when they are assessed before the introduction of a specific issue. The levels of preexisting value endorsement provide a framework for the change, in that the effects of situational factors vary depending on them.

This conceptualization is consistent with Brown's (1984) held versus assigned values, as well as with Syme et al.'s (1999) suggestion that values at an abstract level (universal fairness, in their example) and a specific level (situational fairness) interact. They interact in that global values provide a framework within which local contexts may be evaluated, and the specific values in turn may influence global values. A normally stable and enduring hierarchy among global values may well exist, but that hierarchy may change as those global values are expressed in real-life situations as a function of contextually and temporally varying circumstances. This perspective

Figure 9
A Three-Way Interaction Plot Between Self-Interest, Value Endorsement Pattern and Immediacy of Economic Gain for the Situational Value Judgments of Protecting the Environment



is the happy medium between the two extreme views (that the value hierarchy is always stable and that the value hierarchy is always changing).

However, the degree to which preexisting value endorsement levels can influence situational value judgments seems to depend on the specific value that is being considered. The results of this study suggest that situational value importance judgments for protecting the environment are more strongly guided by the preexisting endorsement level of the value than those of economic development are by its preexisting endorsement level. Protecting the environment is classified as universalism in Schwartz's value typology. Universalism values (e.g., wisdom, unity with nature, a world of beauty) are considered to be self-transcendent and so may be less likely to be influenced by situational differences. In contrast, pursuing economic development (although it was not an original value in Schwartz's typology) resembles other values in the power (e.g., social power, wealth) and achievement (e.g., success, ambition) domains, which is at the opposite end of the self-transcendence versus self-enhancement dimension. Values in the self-enhancement category appear to be more influenced by situational differences.

Situational Factors and Their Interactions

Among the four situational differences, the immediacy of environmental damage had the strongest effect. Community participants clearly disregarded the information on immediate economic profit when they assessed their situational value for protecting the environment.

The immediacy of environmental damage also had the strongest effect in the situational value judgments for economic development, in that the importance judgments of economic development became much higher when environmental damage is not immediate. Apparently immediate environmental damage works like a suppressor; if it looms, individuals feel unable to seek what they actually want, but if it is absent, they feel free to endorse the value for economic gain.

The various situational differences interacted as hypothesized. A three-way interaction occurred in the situational values both for protecting the environment and for economic gain. The nature of these interactions suggests that when two of the three situational variables point in the same direction (e.g., whether to support or oppose lifting the moratorium), the effect of the third variable was enhanced (it depended more on the third variable). This combined influence among situational variables in affecting value importance has important implications for everyday value-related decision-making, because the effect of one situational factor may change in nature or strength when other situational factors are salient.

Thus, all the salient situational factors in a given situation should be considered, and they must be understood as an integrated dynamic system in which each may influence the others.

The present study also demonstrates that situational variables interact not only with each other but with the preexisting level of value endorsement. One of the main purposes of the study was to better understand the nature of these interactions. When preexisting values were considered individually, the effects of situational differences declined as the preexisting endorsement level of the value increased, which confirmed the hypothesis. Not incidentally, this treatment of value endorsement as a continuous variable is an approach that has not been tried, to the best of our knowledge.

Influence of Value Endorsement Pattern

Another way of capturing the interaction is to consider both conflicting values together, by creating distinct groups to represent value endorsement patterns: those who endorse both values strongly (dualists), those who do not endorse either value strongly (situationalists), and those who endorse one value over the other values (the prodevelopment and the pro-environment groups in this study). This approach led to two major hypotheses.

The first hypothesis was that taking both values in consideration would better explain situational value endorsement, especially when two values are in conflict. However, this was not always the case. Value endorsement pattern was a better predictor of situational value judgments only for economic gain. In contrast, the preexisting endorsement level for the protecting the environment (alone) was a better predictor of the situational value for protecting the environment.

This suggests that when situational value importance judgments are strongly guided by the level of endorsement of a single preexisting value, that value can be a better predictor than the two values considered together, because the endorsement level of the second value does not seem to influence the judgment very much. However, the situational value judgments for economic gain were not as strongly guided by its corresponding preexisting value. In this case, taking the other (competing) value into consideration resulted in a stronger overall prediction.

These results expand Braithwaite's (1998) finding that taking both values into account can explain one's decision better than considering only one value, by offering a possible moderating factor. Considering both values does not always provide better predictions; predictive power apparently depends on which two specific values are considered and how much each value influences one's judgment on its own.

The second hypothesis concerned the nature of the interaction between situational factors and the value endorsement pattern. The effects of situational variables were expected to be stronger for those who did not endorse either value strongly (situationalists); because they are not strongly guided by either value, they should be more influenced by situational differences. This hypothesis was generally supported in this study. The situationalists were most influenced, compared with other groups, by immediacy of economic gain for the situational value judgments of economic development. For the situational value judgments for protecting the environment, again the situationalists were most influenced by the immediacy of environmental damage. In a three-way interaction, situationalists were also most influenced by self-interest when economic gain was not immediate. By demonstrating the susceptibility of the situationalists to specific situational influences, these findings expand Braithwaite's (1998) results. The inclusion and manipulation of situational factors allowed the present study to demonstrate this more clearly.

However, the behavior of the dualists is still not fully explored. This study found that the dualists are less influenced by situational factors than by their levels of preexisting value endorsement. Two possible explanations may underlie this finding. First is the nature of two conflicting values. In this study, one of the two conflicting values—protecting the environment—is the self-transcendent value, and for those who endorsed this value strongly, it may be “sacred” (Tetlock, Kristel, Elson, Green, & Lerner, 2000) and “non-compensatory” (Lockwood, 1999). That is, individuals are not willing to trade off this value with other values. In a situation in which sacred values and more “secular” values are in conflict, individuals may choose sacred values over the secular values when they are required to choose one.

One might debate which value is sacred. In this study, only two values, protecting the environment and pursuing economic gain, were contrasted. Protecting the environment could be sacred when contrasted with the value of pursuing economic gain. In fact, in contingent valuation contexts, a typical example of “protected values” (a concept that is similar to sacred value) that individuals refuse to trade off with other values is one placed on natural resources, such as endangered species and old-growth forests (Baron & Spranca, 1997). Thus, protecting the environment may well have been treated as a sacred value. On the other hand, there is a possibility that those with a strong philosophical commitment to free-market capitalism and economic growth may hold economic gain as a sacred value. Comparison of these two groups with different sacred values may be fruitfully conducted in further research.

Second, the present study suggests that paying more attention to situational differences may not be the only way to solve possible internal value conflicts that individuals experience when they strongly endorse both values. Faced with a situation in which two values are in conflict, individuals may turn inward to resolve the dilemma instead of paying much attention to external situational factors.

Implications for Decision Making

The results provide some useful guidance for investigating the influence of values on decision making in real-world settings. At least in studies of environmental issues, merely considering a person's preexisting level of endorsement for only one value (or one at a time) has been usually used to understand the influence of values on decision making. However, this approach does not seem to suffice. A number of other factors that are involved play an important role: Which values are salient in a given issue, and which ones may be in conflict with each other? Do most individuals perceive them to be in conflict? If some do not, why not? Which situational factors influence one's decision in that issue? Which situational factor exerts the strongest influence? Which value among others is most influenced by which situational factor? How do situational factors interact with each other? When do individuals experience internal value conflict? How does internal value conflict influence susceptibility to the effect of situational variables? The answers to these questions would help policy makers understand how the public thinks, or decides which side to support, in a controversial issue.

Limitations

Some of the limitations of this study need to be mentioned. First, in this study, only the decision-making tendencies of the dualists were explored, and the possible internal value conflict might not have been captured well enough. Ideally, more detailed thought processes of respondents could have been collected and analyzed, such as those in some analyses of integratively complex information processing (Lavalley & Suedfeld, 1997; Tetlock et al., 1986).³ For example, the think-aloud method (e.g., Backlund, Skanuer, Montgomery, Bring, & Strender, 2003) might illuminate internal value conflicts more fully.

However, when researchers measure public opinion using a large sample, such qualitative methods may not be feasible. Combining a large-sample

opinion survey with qualitative analyses of small groups or case studies may address this problem better.

Second, although the present study used a within-subject design to investigate the effects of various situational factors, this approach might not have been optimal. Because of a large number of combined situations (16), answering for all of the situations could have been taxing, and there is a concern for demand characteristics in that participants could have guessed what the researchers were trying to manipulate. This is a typical dilemma that a researcher faces when choosing between within-subject and between-subject designs.

Readers must be also mindful that some of the effect sizes for significant effects were relatively small and that the extent that the results of this study, which used scenarios, can be applied to real-life situations may be limited.

Directions for Future Investigation

The present study points toward some new directions for future investigation. First, a number of issues concerning situational factors might be considered. For example, in the manipulation of one situational variable, respondents were informed as to whether environmental damage would be immediate. However, in reality, whether environmental damage is perceived to happen immediately is itself an individual difference with various moderating factors, as is the case with global climate change (e.g., Heath & Gifford, 2006). Individuals tend to interpret the same information differently depending on their preexisting beliefs and preferences, as in motivated reasoning (e.g., Ditto, Munro, Apanovitch, Scepansky, & Lockhart, 2003; Redlawsk, 2002). Thus, whether environmental damage is perceived as to be imminent can itself provide information about the person's values. Moreover, individuals vary in the degree of trust in the information provided by authorities, such as government officials (e.g., Slovic, 1997). In a similar vein, individuals may differ in the degree to which they perceive that two values are in conflict in a given situation.

Second, the present investigation could be extended in a few ways. For example, in this study, only the individual's preexisting value endorsement level was used as a factor to provide a framework for value importance change across situations. Future studies could include other higher order factors (e.g., cultural differences) that might further influence situational value changes.

Another way to extend this study would be to investigate more fully the influence of situational variables. In the present study, only the differential

strength of the effects among situational factors was examined. However, more detailed examination of the relations among situational factors could be investigated, including possible causal relations among them. Furthermore, researchers could examine whether such relation may vary according to the preexisting value endorsement pattern.

We are also aware that these situational factors may interact with a subject's life situation at a given moment; for example, the influence of monetary incentive is likely to have differential effects according to the financial situation of the subject. Although our present study did not include such situational differences, further study can also explore a more intricate network of situational influences.

Third, future studies may usefully explore possible boundary conditions of situational value importance judgment changes, to identify situations in which individuals are less influenced by situational variables. These boundary conditions may be a function of a person's preexisting value endorsement level; when someone endorses a certain value strongly enough, he or she may no longer be influenced by situational differences. This was the case with the dualists in this study and might be in the case of sacred values. Turning this around, boundary conditions may be defined by the situation itself. For example, when an environmental damage becomes too severe, that situation may dominate judgments without being influenced by any other situational factors. Ultimately, severe environmental situations may force people to pay attention to a different value, such as saving life, and nothing else may matter any longer.

These points should be investigated to more fully explore the dynamics of the interaction between value endorsement levels and salient situational information that produces variation in the importance of situational values. The present study is a first step toward elucidating such interactions in a systematic way.

Appendix **The Scenario**

Consider lifting the moratorium on oil and gas development offshore of British Columbia (Queen Charlotte Basin: QCB). This issue has been controversial, creating a conflict between oil and gas industry, which emphasizes the potential economic profit of the development, and environmental groups, which are concerned with protection of ecosystems.

(continued)

Appendix (continued)

Here is the information to support either side:

Economic Potential

Although there has not been any actual commercial discovery, the QCB has potential for oil and gas. Current estimates suggest that there are enough fields of oil that produce 1.3 billion barrels, worth approximately C\$50 billion, and 9.8 trillion cubic feet of recoverable gas, worth about C\$60 billion. This hydrocarbon potential of the QCB is similar to that of mature Cook Inlet oil and gas fields in Alaska and to that of the currently developed or developing fields in the Jeanne d'Arc Basin offshore of Newfoundland.

Precious Ecosystems

The QCB offers a habitat for more than 20 ecologically sensitive species (16 of them are designated as endangered, threatened, or special concern), such as whales, sea otters, and colonial seabirds (for some, this area is the only place on earth for their colonies). The basin also contains a series of sponge reefs that is unique in the world. Exploration and production of oil and gas is considered to have serious negative effects on these ecosystems. For example, seismic surveys use air gun acoustic sources, which are seriously harmful to marine mammals and fish. Exploratory and production drilling will produce harmful waste that is detrimental to organisms on the seabed. Transportation of oil poses a concern because of the possibility of major or minor oil spills.

Now, please imagine that you are at one of the public hearings to provide policy makers with information of public reaction to this issue. You are going to **voice your opinion in public** whether you support or not support the lifting of the moratorium.

Manipulation of Variables

Self-Interest

You own stock in the oil and gas company that will develop the QCB, and it is certain that its stock price will go up once the development starts.

You have no prospect of receiving any profit from the oil development. Moreover, you have been thinking about visiting that area for ecotours and water sports, like kayaking and fishing. You would rather keep the area unspoiled.

(continued)

Appendix (continued)

Immediacy of Profit

It is estimated that the QCB oil and gas development will produce in a short term many jobs and a large profit annually.

It is estimated that oil is unlikely to be produced for at least 15 years, and the condition of the area will be improved only over the long term as the oil and gas production increases.

Immediacy of Environmental Damage

It is estimated that even at the exploration stage, serious damage to ecosystem will happen almost immediately.

It is estimated that the damage to the ecosystem should occur only gradually, giving the time for animals and plants to adjust to the environmental changes.

Social Norm

Several of your friends and significant others are present at the public hearing, and all of them are clearly supporting lifting the moratorium, and they tell you that is what you should be doing too.

Several of your friends and significant others are present at the public hearing, and all of them are clearly supporting NOT lifting the moratorium, and they tell you that is what you should be doing too.

Notes

1. Ideally, the pretest should have been performed with community residents, rather than university students. However, the time and funding constraints of the project made it difficult to do so.
2. Other demographic variables, such as income, could have been included in the analysis.
3. Integrative complexity coding actually transforms qualitative data into quantitative data. Here, our emphasis is the type of the data collected for the subsequent analysis (i.e., qualitative data as opposed to numerical data).

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