

# What's bad is easy: Taboo values, affect, and cognition

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## Abstract

Some decision situations are so objectionable or repugnant that people refuse to make a choice. This paper seeks to better understand taboo responses, and to distinguish choices that are truly taboo from those that are merely difficult or confusing. Using 22 scenarios that describe potentially taboo issues, Experiment 1 explores reasons for disapproval of the scenarios. We measure a large number of possible reasons for disapproval and a variety of preference responses (including willingness to accept), in order to test for subtleties in taboo responses. We also test cognitive and affective responses to the scenarios. Experiment 2 further explores the interaction, found in Experiment 1, between affective and cognitive factors. Taken as a whole, our results show that people are able to indicate their disapproval consistently across a variety of preference elicitation methods, that their disapproval is better understood as an attitude measure than as an economic valuation (even when the measure is in monetary terms), and that taboo responses are driven primarily by affect.

Keywords: taboo, decisions, tradeoffs, values, risks, affect, cognition, refusals, willingness to accept (WTA).

## 1 Introduction

Decision making is characterized by the need to learn about and balance the pros and cons of various options and then, with use of this information, make a choice. This process typically involves making tradeoffs across multiple dimensions of value and subjectively weighing the anticipated gains and losses. Most people make it through their day's normal decisions without a crippling degree of effort: we spend money for groceries, we decide on commuting routes and vacation options, we vote for preferred candidates in elections, and so on, without much stress.

Choices that require picking the best option among several unattractive possibilities, however, typically induce a sizable degree of decision anxiety (Luce, Bettman, & Payne, 1997). For instance, many people find it worrisome to be faced with a choice among alternative cancer treatments, a vote on whether nuclear wastes should be stored above or below ground, or a decision about euthanizing stray cats. Not only do these decisions include unfamiliar tradeoffs, but they may involve moral and ethical concerns that people often are reluctant to think about or consider taboo to balance against other issues (Hogarth, 1987). In some situations, the reluctance associated with weighing the pros and cons associated with an objec-

tionable decision context leads to such a strong negative reaction that the individual may refuse to make a choice.

There are several ways in which a person may indicate that a choice is objectionable. One is simply to refuse to make it. Another is to make a decision but to do so only after indicating extreme reluctance. In the context of public choice surveys, for example, this reluctance often takes the form of a protest response to a question (Mitchell & Carson, 1989), such as indicating a willingness to pay millions of dollars for a beneficial action or indicating that all the money in the world would not provide acceptable compensation for a loss. Of course, there may be situations in which the risks or costs are so large (e.g., a substantial decline in the health of one's children) that most people would never seriously consider the proposed tradeoff no matter how large are the benefits, but this stance is especially notable when respondents continue to refuse to make the choice even when the disadvantage or risk or cost is reduced to a very small level (see Baron, 2001). In still other cases, an individual who feels that a choice is objectionable might respond but not use the desired metric; a response requested using dollars or a rating scale might instead be provided in terms of an essay or a picture or a single word. For instance, in surveys asking for dollar willingness to accept compensation for environmental changes, some respondents have written long diatribes in the margins of the survey, admonishing the experimenters for their insensitivity (Irwin, 1994, Irwin & Baron, 2001).

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Refusals to make a choice due to the objectionable nature of the required value tradeoff have captured the attention of researchers and writers from many fields, including economics, policy analysis, anthropology, the decision sciences, and political science as well as psychology (Gregory, 2002). Yet there has been little research on the important related question of separating what is truly taboo from what is instead a choice that we protest because it is difficult or confusing or it makes us angry. From the individual's perspective, however, it is important that others understand whether one's apparent refusal to make a choice reflects a deeply held belief or ethical standard, with the refusal therefore to be respected because it is in keeping with the person's underlying values, or whether it instead reflects difficulty or confusion, in which case help may be desired to facilitate engagement in a consequential personal or social decision. A similar distinction exists from society's perspective, in terms of whether those refusing to answer questions are simply exercising their rights or, alternatively, whether a poorly phrased or unnecessarily complicated or difficult description or question instead has the (unintended) result of denying access to individuals who would otherwise want to provide input to a difficult personal choice or a controversial policy debate.

Several previous research efforts have laid a sound foundation for research on these issues. Philip Tetlock and his colleagues, for example, have identified a number of taboo tradeoffs and value conflicts, referred to as transactions that transgress the spheres of justice (Tetlock, Peterson, & Lerner, 1996; Fiske & Tetlock, 1997). Tetlock's research has focused on the conditions under which people are likely to treat tradeoffs as taboo, typically as the result of a request to express something of value (such as the concept of freedom) in terms of a fundamentally unfamiliar metric (such as dollars), yielding what he terms a *disparate relationship* model. A second research effort, focusing on the concept of *protected values*, is most closely linked to Jonathan Baron and his colleagues (Baron & Spranca, 1997; Baron & Leshner, 2000; Irwin & Baron 2001). Protected values are characterized as those that resist tradeoffs with other values, particularly economic values, resulting in rules for decision making that apply irrespective of predicted consequences (e.g., "do not eat foods containing modified genes" regardless of what the food is, its relative cost, or which genes were modified). Although Baron's experiments show that individuals may recognize the existence of multiple dimensions, the concept of protected values asserts that in some cases they may feel that one element is infinitely more important than others (Baron & Spranca, 1997). Baron's research suggests that protected values often are characterized by three related properties: quantity insensitivity (one abortion is as bad as 100 abor-

tions), agent relativity (it matters who makes the tradeoff), and moral obligation (denoting a social, as well as personal, reference).

Many choices involve both cognitive and emotional or affective<sup>1</sup> dimensions of value, including the typically desirable choices faced by consumers (e.g., selecting one of two snacks; see Shiv & Fedorikhin, 1999) as well as more objectionable choices such as those involved in difficult decisions (e.g., selecting non-commodities such as pain; see Beattie & Barlas, 2001). Luce, Payne, and Bettman (2001) have argued that, when decision environments are both consequential and potentially threatening, individuals not only need to trade off the accuracy of decision strategies against the required effort (Payne, Bettman, & Johnson, 1993) but also need to add in the third objective of coping with negative emotions. In such cases, cognitive activity may have the effect of focusing the decision maker on the facts of the problem instead of on the associated emotion; the (typically unstated) assumption that this is both possible and beneficial lies at the heart of many problem-solving approaches such as cost-benefit analysis, negotiation analysis, and analytically-based personal therapy techniques. The presumption is that thinking may calm the respondents enough that they are able to deal with the negative emotion and form a coherent response. Yet the negative response itself also may carry important information about how individuals perceive the choice and why they would refuse to provide an answer (or, at least, what is considered to be an acceptable answer).

Although it has been recognized for some time that there is a link between deliberative and affective capabilities (e.g., Wilson et al., 1989), the interaction has received only limited examination in the context of response refusals. In this paper we seek to identify the cognitive and emotional reasons that could help to identify why some choices are seen as taboo and others are characterized by mere protest or disapproval. We also seek to study the reasons people give for rejecting a choice in light of the interaction between cognition and affect. Our interest in this paper is not directly to provide advice to decision makers (although we think our findings are relevant) but rather to understand more fully an individual's reasons for being reluctant to make a difficult choice and, in turn, to learn more about how to separate those choices for which people can be helped to make more informed tradeoffs from those that are truly taboo.

<sup>1</sup>We use the term affect as referring to people's positive and negative feelings toward an external stimulus, such as an activity or a proposed plan of action. These feelings persist over time as enduring emotional dispositions and, in contrast to mood shifts, are a relatively stable aspect of one's psychological response (Peters & Slovic, 2000). Cognitive or deliberative capabilities, in contrast, are related to the individual's ability to perceive information, hold it in memory, and process it.

## 2 Experiment 1

The goals for Experiment 1 were: (1) to explore whether mere disapproval can be distinguished from protest and from taboo, (2) to study the reasons for disapproval, and (3) to study the relationship between reasons and disapproval.

Experiment 1 was based on questionnaires that described 22 brief scenarios, covering a wide range of potentially taboo issues, including environmental protection, safety, human and animal rights, and human cell cloning. Four of the 22 scenarios were designed to be neutral (non-taboo); these were included as controls, to test the participants' ability to make discriminations among their evaluations. Approval or disapproval was measured by six different scales, including overall acceptability and dollar-based scales. Sixteen reasons for disapproval were presented for each scenario.

### 2.1 Participants

The participants were recruited through an advertisement in the University of Oregon student newspaper. Trained experimenters waited in a room on campus during the hours specified in the ad; participants could come in at a time of their own choosing. Participants received an information letter and a packet, the first task of which was this experiment. The packet also included a demographics sheet and several unrelated tasks. Each participant was paid \$10 upon leaving.

Of the 254 participants who completed this experiment, six were excluded because they gave notably inconsistent answers at least five times (out of 11) to two items which both asked for overall evaluations of the same scenario. Notably inconsistent means that they were on the extreme opposing ends of the scale for the two (functionally equivalent) questions. The remaining 248 participants were 126 males and 121 females, plus one who did not fill out the demographics sheet. Their ages ranged from 18 to 64; the median age was 20.

### 2.2 Design

#### 2.2.1 Scenarios

The stimuli were 22 mini-scenarios, each in two short paragraphs. The first paragraph of each scenario was written in bold type at the start of a page, followed by the acceptability and reasons scales (described later). In each case, this first paragraph explained a proposal, plan, or decision that might be viewed as controversial in that it entailed some costs but also would result in some benefits. For example, one scenario began with this paragraph:

The government is considering a plan to permit logging of old-growth trees on one portion of a National Park in order to harvest microscopic organisms that grow in their roots, because these organisms might lead to new pharmaceutical products that would help to fight MS (multiple sclerosis).

The second paragraph followed the first 11 of the acceptability/reasons scales and described in more detail how the decision would benefit the participant (unless this was specified in the first paragraph) and also asked for an evaluation of the scenario in terms of a willingness-to-accept (WTA) question. For the old-growth trees question, this second paragraph was:

The plan will require that the logging company pay the Park Service for the timber it logs. If new drugs are successfully developed using the root organisms, then additional payments will be made to the Park Service by the pharmaceutical firms. These payments would lower your taxes. In addition, successful treatment of MS would lower your medical insurance costs. What is the SMALLEST savings in taxes and insurance costs each year that you would require to approve of this plan?

Table 1 shows a summary of these 22 stimuli. (The scenario shown here is called MSLog.) The Appendix provides the full two-paragraph stimuli, starting with a brief label and ending with a code indicating in which packet, and in which order, the scenario appeared and a dollar amount, which will be explained later. (The label, code, and dollar amount were not presented to the participants.)

Eighteen of the scenarios described potentially taboo actions, such as a utility company wanting to reduce expenditures on pollution controls, a hospital wanting to harvest organs from patients in a deep coma, and an automobile company deciding not to fix a defect in their cars in order to keep prices low. The other four scenarios (these all start with "N" in Table 1) paralleled four of the bad scenarios but with the taboo aspect removed. For example, an insurance company proposal to charge higher rates to blacks than to whites was changed to charging higher rates to smokers than to non-smokers.

Each participant received 11 scenarios, one per page. Two neutral scenarios always appeared as the second and fifth pages, and no participant received both a neutral scenario and its bad counterpart. The scenarios were presented in one of two random orders.

Table 1: Summaries of scenarios used in Experiment 1

BanDrugs	Pharmaceutical company proposes to increase its profits by selling less-developed nations drugs that are banned in all industrialized countries.
CarCost	Automobile company decides not to recall 1999-model cars because costs of repairs are predicted to be high in relation to number of lives saved.
CarSuits	Automobile company decides not to recall 1999-model cars because costs of predicted lawsuits due to injuries and deaths are lower than recall costs.
CloneCell	Genetics company plans to clone human cells to aid serious burn patients.
*NCloneCell	Genetics company plans to grow artificial skin in Petri dish to aid serious burn patients.
Coma	Local hospital plans to harvest organs for transplants from patients in deep coma.
Dolphins	Commercial fishers propose technique to create employment and reduce fish prices but would increase dolphin deaths by about 35%.
DrugTest	Hospital decides not to halt a study of a new cancer drug and to continue giving half its patients a placebo although early results show the new drug saves lives.
*NDrugTest	Hospital proposes giving half its patients a promising new cancer drug and the other half a different promising cancer drug.
GenMod	World-wide conglomerate to sell genetically modified wheat with added vitamins to African countries.
GenRsch	Food conglomerate makes proposal to National Science Foundation to do research on genetic modification of wheat, leading to more drought-resistant strains.
Highway	State Dept. of Transportation decides not to improve dangerous highway for cost reasons.
*NHighway	State Dept. of Transportation decides not to improve dangerous highway because there have been no serious accidents.
LifeIns	Insurance company sets different life insurance rates for whites and blacks.
*NLifeIns	Insurance company sets different life insurance rates for smokers and non-smokers.
Military	Congress considers plan to allow military personnel or their families to buy their way out of foreign military service.
MSLog	Government considers logging old-growth forest to harvest microscopic organisms that might help lead to new drugs for treating MS (multiple sclerosis).
Pollute	Local utility company seeks permission to save ratepayers money but would increase pollution and deaths from childhood asthma.
Puppies	State legislature considers whether unwanted puppies and kittens should be sold to experimental labs.
RadioNuc	Congress proposes law to permit higher rates of radionuclide emissions from coal-fired power plants to lower electricity costs and reduce brownouts.
TreeTrade	Timber company proposes giving up large second-growth forested area near urban center in return for rights to harvest remote tract of virgin forest.
UnivMonk	University plans to breed monkeys for use in HIV/AIDS research despite lack of appropriate laboratory space.

*Note.* Scenarios shown here are one-sentence summaries of the full two-paragraph scenarios actually seen by participants, shown in the Appendix. The four neutral items immediately follow their non-neutral versions and are denoted by asterisks. The names of the scenarios were not shown to participants and are included here to facilitate discussion in the text.

### 2.2.2 Kinds of disapproval

Fourteen statements or questions about the scenario appeared on the same page as the scenario. Six of these, two presented to participants at the beginning (see Table 2, #1 and #2) and four at the end (#11–#14), concerned the overall acceptability of the scenario: Do individuals agree with what is proposed? What are their feelings about it? Is it right to think about an exchange of this type in terms of dollar values? Except for items #11 and #12, the participant was asked in each case to circle a number from 1 (*Disagree*) to 5 (*Agree*).

The disapproval statements (as shown in Table 2) were the same for all scenarios and all packets, except that the wording of item #12, the WTA item, differed for each scenario in order to make the question make sense. The exact wording is shown in the Appendix as the second paragraph for each item. The response scale for item #11 (“All in all, my feelings about this proposal are ...”), shown in Table 2, instructed the participant to continue to the last three items (which ask about dollar-based valuations) only if their response was negative or undecided (i.e., “1”, “2” or “3” on the five-point “highly negative” to “highly positive” scale).

### 2.2.3 Reasons

The middle items on each page were eight (of 16) statements designed to elicit the reasons that participants might find it difficult, or be unwilling, to approve of the scenario. Quite simply, these 16 were all the reasons we could think of to explain why a person might reject a scenario. The reasons are shown in Table 3. The 16 reasons were divided into two sets (I and II) such that each set contained at least one affective reason (e.g., “This proposal disgusts or repulses me.”) and at least one cognitive reason (e.g., “I think this proposal is complex, with many aspects to consider, so it’s hard to evaluate.”).<sup>2</sup> Each reason set appeared in two orders; one order had the cognitive reasons first and the affective reasons last, whereas the other order started with the affective reasons and ended with the cognitive reasons.

### 2.2.4 Instructions

The factorial combination of two sets of scenarios by two orders of scenarios by two sets of reasons by two orders of reasons produced 16 different versions. Each participant received one version of eleven pages plus an instructional cover page. The instructions said:

<sup>2</sup>Tables 2 and 3 show the word “proposal” in several items. This word was changed as appropriate to “plan” or “decision” to match the wording of the scenario.

In this task we are asking you for your opinions about eleven different plans, decisions, or proposals, each typed at the top of a page. There are no right or wrong answers; we are interested in your opinions. Please take your time, reading carefully and giving us your thoughtful opinions.

Some of these plans may seem somewhat yucky. Please don’t let your feeling for one of them affect your feelings for the next one. “Wipe the slate clean” as you turn each page.

## 2.3 Results

### 2.3.1 Order effects

The effects of scenario order, reasons order, and their interaction were tested for each scenario and for each scale (except the WTA scale). In all, 1,716 tests were conducted, of which 8.3% were significant at the .05 level, but of course these tests were not independent of each other. None of the order effects was theoretically instructive.

### 2.3.2 Kinds of disapproval

**General acceptability:** Three scales, #1, #2, and #11 (see Table 2), reflected the overall acceptability of each scenario and were answered by all participants. There was a large range of means for these items across scenarios (#1: 1.52 for CarCost to 4.32 for NCloneCell; #2: 1.67 for NCloneCell to 3.98 for CarCost; #11: 1.64 for CarCost to 4.04 for NCloneCell, all on a scale from 1 to 5); note that the best and worst scenarios were the same for all three acceptability measures. Thus, there was discrimination across the scenarios and strong agreement among the participants as to which scenarios were good and bad.

Further, we expected that the items constructed to be taboo would be rated as less acceptable than the neutral items. This was also the case: The average acceptability (as measured by the mean of scale 1, scale 11, and the reverse of scale 2) of the neutral scenarios was 3.95 versus 2.54 for the taboo scenarios,  $t = 25.8$ ,  $p < .0001$ , for both sets of scenarios combined.

**Appropriateness of valuing monetarily:** The two final scales (#13 and #14) concerned the appropriateness of getting paid to accept these scenarios. Both used 5-point scales to determine participants’ agreement with the statements “I don’t think it’s right to put a dollar value on something like this” (#13) and “You couldn’t pay me enough to approve of this proposal” (#14). The range of means across scenarios was 2.69 for NHighway to 4.47

Table 2: Acceptability Items

	Agree			Disagree	
1. I agree with this proposal (circle one number)	1	2	3	4	5
2. I would not approve of this proposal no matter how high the benefits	1	2	3	4	5
. . .	.	.	.	.	.
11. All in all, my feelings about this proposal are:					
Highly Negative	Undecided			Highly Positive	
1	2	3	4	5	
<i>If you circled "1," "2," or "3," continue to fill out the rest of this page before going on to the next page.</i>			<i>If you circled "4" or "5," go directly to the next page.</i>		
12. What is the SMALLEST reduction in your yearly cost for electricity that you would require to approve of this proposal to reduce expenditures on pollution controls? My saving would have to be at least \$_____ per year to approve of this proposal.					
13. I don't think it's right to put a dollar value on something like this.	1	2	3	4	5
14. You couldn't pay me enough to approve of this proposal.	1	2	3	4	5

Note. The wording in item #12 is for the Pollute scenario. The lead of this item was different for every scenario; see the Appendix.

for Military (for #13), and 2.21 for NlifeInsur to 4.18 for LifeInsur (for #14). The mean of 4.47 on Military for scale #13 indicates virtual unanimity among the disapproving or undecided participants, agreeing that they “don’t think it’s right to put a dollar value” on the item under consideration.

**Willingness to accept:** Scale #12 was the fill-in-the-blank WTA question. The instructions made clear that this scale (and scales #13 and #14) should not be answered if participants were positive or highly positive in their feelings about the scenario (see Table 2). Across all data, 31% of all responses fell in this category. (For this and all other analyses, when participants filled in the last 3 items contrary to instructions, their responses were discarded.) An additional 23% of the responses were blank (even though item #11 was scored lower than 4, indicating negative or undecided feelings), 7% were “0,” and 39% were a positive dollar amount.

**2.3.3 Additional participant responses**

The participants were not asked to write comments and there was not much space to do so. Nevertheless, some participants did write comments. Almost all of the comments were about WTA and most of them indicated a refusal to answer the question (e.g., to CarSuits one participant answered “0” and then wrote “I would not buy

car A”; another participant left a blank for WTA for Dolphins and wrote, “You could not pay me to increase dolphin deaths”). In addition, one of the experimenters asked several participants, after they had completed and turned in their questionnaires, why they didn’t fill in item #12. Almost always, they replied to the effect that no amount of money was appropriate. Other participants wrote in ridiculously high amounts of money, up to ten billion dollars, in response to the WTA question.

**2.3.4 Construction of the Protest measure**

We constructed a Protest measure for WTA to include all the responses that seemed to be refusals to give a WTA amount. This measure included all of the “0” responses (because it makes no sense to say, for example, that you have negative feelings about the CarSuits scenario yet you are willing to buy Car A for the same cost as Car B), some of the blanks (depending on the context for these responses), and dollar responses that were unrealistically high. Interpretation of the upper limit for an acceptable dollar amount of compensation (above which the response is coded as a Protest) necessarily reflected judgments of the experimenters, because these amounts differed across scenarios. For example, it is at least remotely possible that you could save \$12,500 on the cost of a \$25,000 car but absurd to suppose that your home electrical bill could be cut by \$12,500 per year. The par-

Table 3: Reasons statements.

Set I:	
3/10	Complex: I think this proposal is complex, with many aspects to consider, so it's hard to evaluate.
4/9	Phony: Asking me to approve or reject this proposal is a phony choice; there is a better way to deal with this situation.
5/6	Not Me: I don't feel competent to judge this proposal; somebody else should.
6/8	Future: I worry that there will be bad consequences from this proposal in the future (1, 5, or 50 years from now).
7/7	Not Trust: I don't trust the managers of this situation.
8/4	Moral: The proposal is morally or ethically wrong.
9/5	Norms: This proposal violates the norms of our society/culture.
10/3	Disgust: This proposal disgusts or repulses me.
Set II:	
3/10	Conflict: It is hard to evaluate this proposal because its good and bad elements are in conflict.
4/9	Not Enuf Info: You haven't given me enough information to make a careful evaluation of this proposal.
6/8	Slippery: This is a slippery slope. Accepting this now will encourage new, worse proposals in the future. We've got to draw the line here.
7/7	Send Message: An important reason for reversing this proposal is to send a message to the people who proposed it.
5/6	Not Party To: It might be okay for this to happen elsewhere but I don't want to be a party to it by agreeing it.
9/5	Uncomfort: It makes me uncomfortable to think about this topic.
8/4	Religious: I have religious objections to this proposal.
10/3	Anger: This proposal makes me angry.

*Note.* The names of the reasons were not given to the participants; they are included to facilitate discussion in the text. The numbering shows the two orders in which the reasons were presented. The word "proposal" was changed to "plan" or "decision" as appropriate. All appeared with a 5-point rating scale (1 = *Disagree*; 5 = *Agree*).

enthetical dollar amounts shown at the end of each scenario in the Appendix give the upper limits for WTA answers; above these limits the response was considered a Protest. In all cases, these limits were intentionally set quite high, ranging from \$450 (Coma) to \$12,500 (Car-Cost and CarSuits).

Leaving the WTA item blank is an ambiguous response; it might indicate that the participant couldn't figure out what number to give (e.g., for BanDrugs, one participant left it blank and wrote "Need to know more about the likelihood of litigation arising from this proposal") or it might be a refusal to answer (e.g., for Dolphins one participant left WTA blank and wrote "I would never approve of this proposal"). The responses to scales #13 ("not right to put dollar values on this") and #14 ("you couldn't pay me enough to approve") can clarify this ambiguity; agreement with either of them shows a rejection of the WTA question.

Accordingly, the coding rules for construction of the Protest measure were:

0 if the response to item #11 was positive (4 or 5).

1 if the WTA was greater than zero and equal to or smaller than the upper limit shown in the Appendix, *or* if WTA was blank and both items #13 and #14 were 3 or less.

2 if WTA was greater than the upper limit shown in the Appendix, *or* if WTA was equal to zero, *or* if WTA was blank and either #13 or #14 was greater than 3.

Table 4 shows the frequencies and percents for all responses to the WTA item, for neutral and non-neutral scenarios separately.

Table 4: Frequencies and percentages for WTA responses, Experiment 1.

	Neutral Scenarios				Non-neutral scenarios			
	Totals		Subtotals		Totals		Subtotals	
	f	%	f	%	f	%	f	%
Item #11 > 3	332	67			513	23		
Blank	38	8			584	26		
Blank protest			24*	5			510*	23
Blank non-protest			14	3			74	3
Zero	18*	4			169*	8		
Positive WTA	108	22			966	43		
WTA w/in range			92	19			621	28
WTA too high			16*	3			345*	15
Total	496				2232			
* Protest = 2	58	12			1024	46		

**Our primary dependent measure: Disapproval.**

With the five acceptability scales (#1, #2, #11, #13, and #14) and the Protest measure from WTA, we had six measures of the overall acceptability (or approval) of each scenario. These six measures were highly intercorrelated. Using the mean across participants for each scenario, the absolute values of the intercorrelations across scenarios for the six measures ranged from .86 to .99, with a median of .95. With such high correlations, it seemed appropriate to combine these measures into one Disapproval measure, the simple sum of the other six measures, added or subtracted as appropriate:

$$Disapproval = -\#1 + \#2 - \#11 + \#13 + \#14 + Protest + 9.$$

We added a constant 9 to the Disapproval measure to avoid a meaningless zero point. In calculating the Disapproval measure, if items #13 or #14 were blank because the response to item #11 was positive (4 or 5), the participant was given a value of 0 on those items. Thus, the Disapproval measure has a potential range of 0 (most approving) to +24 (most disapproving). As shown in Table 5, the actual range of mean Disapproval scores across scenarios is 3.85 to 18.51, with a mean of 12.80 and median of 14.48. Only one of the scenarios (which involved cloning human cells to aid burn patients) was rated as acceptable by participants; 9 of the 18 taboo scenarios were rated as 16 (rounded) or higher, in the upper one-third of the range for the Disapproval measure. Standard deviations, not shown, ranged from 5.4 to 8.5. The n's ranged from 114 to 124.

Table 5: Disapproval scores for the 22 scenarios in Experiment I.

Scenario	Disapproval	Scenario	Disapproval
CarCost	18.51	UnivMonk	14.46
LifeIns	18.41	TreeTrade	13.18
Pollute	18.21	MSLog	11.20
BanDrugs	17.99	DrugTest	10.82
Military	17.94	GenRsch	9.26
CarSuits	17.76	GenMod	8.73
Dolphins	17.18	NDrugTest	8.17
Puppies	15.98	CloneCell	5.66
RadioNuc	15.68	NLifeIns	4.44
Coma	15.06	NHighway	4.30
Highway	14.52	NCloneCell	3.85
		Mean	12.80

Table 5 also shows that the four scenarios rewritten to be neutral (NCloneCell, NHighway, NLifeInsur, and NDrugTest) did have the lowest Disapproval scores, along with the CloneCell scenario.

**Analysis of large WTA:** As previously noted, many participants gave very large WTA responses. Does a response of, say, one million dollars indicate greater disapproval than an equally absurd response of \$100,000? Table 6 shows that the answer to this question is, surprisingly, yes. For this analysis large WTA responses were



Table 6: Mini-disapproval and rated WTA for large dollar-based WTA.

\$WTA	Experiment 1			Experiment 2		
	n	Mini-disapproval <sup>a</sup>		n	Rated WTA <sup>b</sup>	
		Mean	Median		Mean	Median
\$1,000	126	-1.12	-2	163	4.63	4
\$1,001-4,999	98	-0.84	-1	115	4.50	4
\$5,000-9,999	99	-0.11	0	94	3.78	3
5 digits	135	1.10	2	84	3.56	3
6 digits	40	1.03	2	11	3.27	2
7 digits	30	1.43	2	23	1.65	1
8 or more digits	37	1.68	3	15	1.40	1
Totals	565	(53% of positive \$WTA)		505	(37% of positive \$WTA)	

<sup>a</sup> Mini-disapproval was -#1 + #2 - #11; range -9 for least disapproval to +3 for most disapproval.

<sup>b</sup> A 1-10 scale was used for Rated WTA, with 1 = *Never* and 10 = *Definitely* willing to accept.

compared with a mini-disapproval score excluding the items concerned with WTA:

$$\begin{aligned} \text{Mini-Disapproval} = & -\#1 \text{ (agree)} \\ & +\#2 \text{ (do not approve)} \\ & -\#11 \text{ (positive feelings)} \end{aligned}$$

As shown in Table 6, this mini-disapproval measure is systematically related to the size of the WTA responses (the correlation between log WTA and this score for WTA  $\geq$  \$1,000 is .30;  $p < .0001$ ).

**Reasons.** We measured participants' reasons for disapproval, with an expectation that the reasons would capture both cognitive and affective reasons for disapproving of the scenario.

The means of the ratings (1 = *Disagree*; 5 = *Agree*) for the 16 reasons across the 22 scenarios ranged from 1.26 (Religious on NLifeIns) to 4.44 (Future on BanDrugs and Future and Moral on CarCost). Two of the reasons scales best discriminated among the scenarios: Anger (the means ranged from 1.49 for NHighway to 3.95 for CarCost) and Disgust (from 1.62 for NHighway to 4.20 for CarCost). There were five reasons scales that the participants did not agree with for any scenario (i.e., the largest mean across the scenarios was less than 3.0, the mid-point of the scale): Not Party To, Religious, Uncomfortable, Phony, and Not Me.

### 2.3.5 Factor analysis

We conducted a factor analysis on the full matrix of reasons ratings for each scenario. (In essence, this analysis

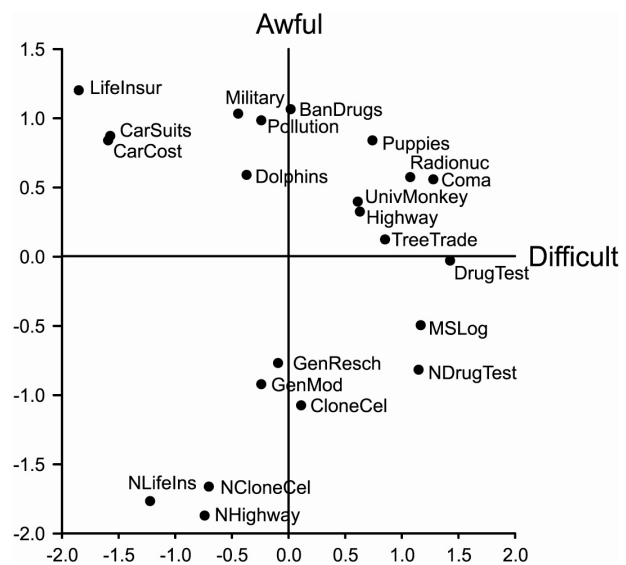


Figure 1: Plot of 22 scenario factor scores on 2 factors, Experiment 1.

accounts for correlations among the reasons. Each correlation used the available data from all subjects and scenarios.) After first examining the data averaged by scenario to see if there were any patterns, we averaged the factor data by participant. This yielded, for each participant, a mean factor score for each factor, which was then used to predict mean scenario disapproval scores. This analysis allowed us to test whether particular classes of reasons best predicted taboo responses.

A principal components factor analysis using an orthogonal (Varimax) rotation revealed two factors with

eigenvalues greater than 1.0. The analysis produced a clean solution, accounting for 82.4% of the variance in the items. Factor 1 included many of the reasons, with Anger and Disgust leading the list, followed by Not Trust, Send Message, and Uncomfortable: it is clearly an affective factor. Factor 2 was primarily characterized by the Conflict, Not Me, and Not Enuf Info scales; it is apparently a cognitive factor. One reason scale, Phony, loaded on both factors; it loaded most heavily on Factor 2. Nine of the 11 reasons loading on Factor 1 and four of the five reasons loading on Factor 2 have loadings of .80 or greater, showing high intercorrelations of these items with the factor.

**Affective and cognitive factors by scenario.** Figure 1 shows the 22 scenarios in the factor space. Note the U-shape in the figure: Scenarios that are judged to be highest in affect tend also to be judged easiest to think about. Scenarios that are judged difficult to think about are intermediate in affect. Scenarios that are judged lowest in affect are also judged easy to think about.

**Regressing disapproval on the cognitive and affective factors.** From the factor analysis, factor scores can be computed for each individual and each scenario, based on the responses given to the reason items. Averaging these factor scores across the scenarios yields, for each individual, mean factor scores. Likewise, each participant can be characterized with a mean Disapproval, the mean across scenarios. We regressed the mean factor scores on the mean Disapproval scores, across individuals, to test whether Disapproval was related to Affect, Cognition, or both. As Table 7 shows, both Affect and Cognition were related to Disapproval, in opposite directions: more Affect led to more disapproval, but more Cognition led to less disapproval.

There was also, for both Reasons sets, a significant interaction, as shown in Figure 2. This figure shows that when Affect is low, Cognition has little or no effect on Disapproval. But for those individuals who showed both high Affect and low (easy to think about) Cognition, Disapproval was especially high — higher than would be predicted from the main effects of Affect and Cognition.

This interaction can be interpreted in two ways. One possibility is that Cognition exerts a moderating influence on Disapproval; that is, if participants think hard about a strong-affect scenario, they will find it less awful.

The other possibility is that when a scenario strikes a participant as being really bad, it therefore seems quite simple; no need to delve into the details because the proposal is just wrong. We will call this the *bad-easy* hypothesis. This second interpretation draws some support from the relationship between disapproval and cognition across the 22 scenarios, as shown in Figure 3. The best and worst

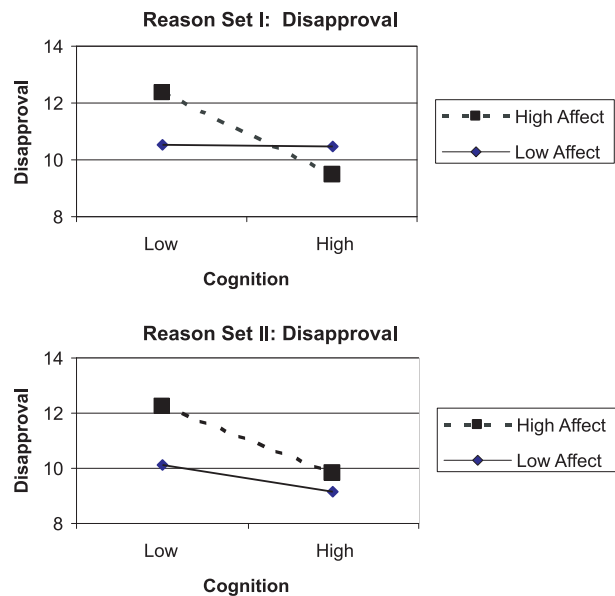


Figure 2: Slopes showing the interaction between Affect and Cognition, Experiment 1.

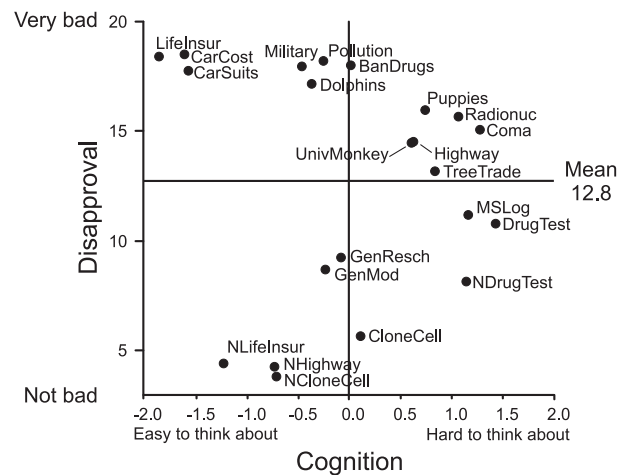


Figure 3: Disapproval versus cognition factor scores across the 22 scenarios, Experiment 1.

scenarios are the easiest to think about. For the 13 scenarios with Disapproval scores above the mean, the correlation between Disapproval and Cognition is  $-.80$ ; for the 9 low-Disapproval scenarios this correlation is  $+.82$ .

### 3 Experiment 2

We had three goals for Experiment 2: (1) Replicate the interaction between Affect and Cognition found in Experiment 1. (2) Test whether we can manipulate the moderating influence of cognition, and (3) Remedy a defect

Table 7: Regression results: slopes of the significant effects in experiment 1

Reason Set	Significant unstandardized regression coefficients			R <sup>2</sup>
	Affective Factor	Cognitive Factor	Interaction	
I	5.27****	-1.45****	-1.42**	0.62
II	3.96****	-1.56**	-2.23****	0.45

\*\*p<.01, \*\*\*\*p<.0001

in Experiment 1 by requiring all participants to give a dollar-based WTA response, thus allowing a more thorough examination of WTA responses.

### 3.1 Method

#### 3.1.1 Participants

Participants in this study were 719 students at the University of Texas, recruited either as part of a course requirement or as volunteers paid \$5 for their participation in this and other experiments. The pattern of responses did not differ between the unpaid and paid participants.

#### 3.1.2 Design

**Scenarios.** Experiment 2 used three of the scenarios from Experiment 1 (slightly rewritten). Table 8 presents the scenarios. The scenarios were presented either following order or the reverse: Highway, Animal (based on Puppies of Experiment 1), and Terrorism (based on Military in Experiment 1).

**Cognitive manipulations.** Experiment 2 had two cognitive manipulations, presented in a complete 2x2 factorial design. In the *Memory Load* manipulation, participants were asked at the beginning of the task to memorize a seven-digit number; later, they were asked to recall the number. This is a standard manipulation for cognitive load (e.g., Shiv & Fedorikhin, 1999). In the *Scrambled* manipulation, the sentences of the scenario were presented in scrambled order, which made the scenario difficult, but not impossible, to understand. The Scrambled version of Terrorism is shown at the bottom of Table 9. This manipulation has also been used in previous research (Sweller, 1994) to increase cognitive load.

**Scales.** Immediately following the presentation of the first scenario, participants rated their WTA: “Would you be willing to accept a reduction in taxes (i.e., a rebate check) for this proposal?” on a scale with 1 labeled *Never* and 10 labeled *Definitely*. We will term this measure

“Rated WTA.” Next the participants specified a dollar amount: “My savings would have to be at least \$\_\_\_\_\_ per year to approve of this proposal (please put the smallest amount).”<sup>3</sup> We term this measure “\$WTA.”

After all three scenarios, the Memory Load participants recalled the seven-digit number. Following that, participants rated all three scenarios on the following six reasons, using scales from 1 to 9 with 1 labeled “Not very” and 9 labeled “Very” (key words in the text, italicized to denote the names of the scales, were not italicized for participants):

How *complex* was the highway [animal, terrorism] scenario?

To what extent did the highway [animal, terrorism] scenario involve *morality*?

How *difficult* was the highway [animal, terrorism] scenario to understand?

How *disgusting* was the highway [animal, terrorism] scenario?

How *phony* was the highway [animal, terrorism] scenario?

How *angry* did the highway [animal, terrorism] scenario make you?

### 3.2 Results

#### 3.2.1 Disapproval

As expected, the three scenarios were not highly regarded by participants. The mean Rated WTA was 4.68 for Highway, 5.10 for Animal, and 4.00 for Terrorism, all below the midpoint (5.50) of the scale. The means (antilog of mean log, excluding blanks and zeros) of \$WTA were \$534, \$273, and \$572, respectively. The correlations between Rated WTA and log \$WTA (excluding blanks and zeroes) were significant: Highway -.42, Animal -.48, and Terrorism -.44.

<sup>3</sup>Due to an error in preparing the stimuli, 321 participants were not given the dollar-based WTA query for the Animals scenario only.

Table 8: Scenarios Used in Experiment 2.

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**Highway Safety:** As part of their budget preparations for the coming year, the state Department of Transportation (located at 1275 Oak Street) has decided not to add an extra lane to a dangerous section of a three-lane highway. This decision will lower their budget request. Although they acknowledge that there have been more deaths than expected in recent years along this stretch of highway, their analysis (conducted by Robert Jones) shows that comparing the cost of improvements with the number of excess deaths implies that each life saved is worth \$20 million. They consider this amount too expensive.

Because of this decision not to improve the dangerous section of highway, the legislature will lower the Department of Transportation's annual budget to reflect the savings. This will lower your taxes and *result in a rebate check sent to all citizens*. What is the SMALLEST yearly tax savings that you would require to approve this decision? NOTE: Even if you do not pay taxes currently, assume that you would receive a check for the amount that you put. Would you be willing to accept a reduction in taxes (a rebate check) for this proposal?

**Animal Shelters:** There are many organizations throughout the state charged with taking care of stray and abandoned animals. For instance, there are animal pounds and shelters such as Town Lake Animal Shelter. These organizations receive many more puppies and kittens than they can place in adoption. In order to deal with this problem, the State Legislature is now considering a proposal to sell a proportion of unwanted puppies and kittens to experimental labs for research into causes of blindness.

This proposal to sell puppies and kittens to labs will reduce the cost of running the pounds and thus will reduce your taxes. Assume you pay taxes each year. Would you be willing to accept a reduction in your taxes from the proposal passing?

**Terrorism** Currently, there are 653,284 active and reserve military personnel in the United States Armed Forces. The United States Congress (the Senate and House of Representatives) is considering a plan to allow military personnel or their families to pay large sums of money to buy their way out of being sent to another country to fight against terrorism. Under this plan, military personnel would be guaranteed, once the payment is made, that they would not be sent into combat. Someone else would go instead. This plan would raise large sums of money for the government and the defense system and also would lower taxes.

This plan would raise money for the government and thus reduce your taxes. Would you be willing to accept a reduction in taxes (i.e., in the form of a rebate check) for this proposal?

**Terrorism [Scrambled]** The United States Congress currently is considering a plan. The Congress consists of the Senate and the House of Representatives. Someone else would go to another country to fight against terrorism, with this plan. Military personnel would be guaranteed, once the payment is made, that they would not be sent into combat. By paying large sums of money, military personnel or their families would buy their way out of going. Currently, there are 653,284 active and reserve military personnel in the United States Armed Forces. This plan would raise large sums of money for the government and the defense system and also would lower taxes.

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*Note.* Highway Safety and Animal Shelters also had scrambled versions, not shown here.

Table 9: Frequencies and percentages for WTA responses, Experiment 2

	Totals		Subtotals	
	f	%	f	%
Blank	413*	23		
Zero	40	2		
Positive WTA	1383	75		
WTA w/in range			1079	59
WTA too high			304*	16
Total	1836			
* Protest = 1	717	39		

As shown in Table 6, the use of very large WTA responses was systematically related to Rated WTA, replicating the results of Experiment 1 with a different comparison measure.

We constructed a Protest measure using the \$WTA data. Protest was defined as equal to 1 if \$WTA was blank or greater than \$1,500 for Highway and Animals or \$2,500 for Terrorism; Protest was equal to 0 if \$WTA was in the acceptable range. Using other cutoffs for unacceptably large \$WTA's gave essentially the same results; these cutoffs are consistent with Experiment 1. Table 9 shows the distribution of responses to the \$WTA item; 39% of all responses were protests. Both the \$WTA responses that were blank and those that were larger than the cutoffs were associated with Rated WTA scores that were significantly ( $p < .0001$ ) lower (i.e., more disapproving) than the Rated WTA scores for participants who gave positive \$WTA responses within the prescribed limits, for each of the three scenarios. However, the few (40) zero \$WTA responses were not systematically related to Rated WTA; they were excluded from the protest measure and treated as missing data.

### 3.2.2 Reasons

The varimax rotation factor analysis revealed the same two factors: Complex and Difficult loaded strongly on one (the Cognitive factor) and Disgusting, Morality, and Angry on the other (the Affective factor). Both factors had eigenvalues above 1. Phony was not correlated with the other reasons scales; it will not be discussed further. The factor loadings were high and the factors well distinguished; as measures of the two factors we therefore took the mean of the ratings across the relevant reasons scales.

Table 10: Mean (antilog of mean log) dollar willingness to accept for memory load versus no load (excluding blanks and zeroes) in Experiment 2

	Highway	Animal	Terrorism
Memory load	\$396	\$210	\$448
No memory load	\$647	\$365	\$705
	$p < .05$	$p < .05$	$p < .09$

### 3.2.3 Cognitive manipulations

Scrambling the scenarios had almost no effect on any measure. Even the effect that seems most likely, an increase in the Cognitive measure (showing that the scenario was rated more difficult/complex when scrambled), was significant only for the Terrorism scenario (without correction for multiple tests). There was no effect of Scrambling on the Disapproval measures.

Requiring participants to remember a seven-digit number (Memory Load) also had essentially no effects; a significant increase in the Cognitive measure was found only for the Highway scenario. Memory Load did affect \$WTA, however; as shown in Table 10, participants under Memory Load gave lower dollar amounts for all three scenarios, although this result was only marginally significant ( $p < .09$ ) for Terrorism. (All significance tests are uncorrected.)

There were no interaction effects for Scrambling and Memory Load; even a double dose of cognitive stress did not affect the Disapproval measures or the Cognitive and Affective scores.

In a third, otherwise unreported, experiment, we tried to influence participants to focus on either their cognitions or their affect. A total of 274 paid participants (in Eugene, OR, recruited and run as in Experiment 1) were given six of the scenarios used in Experiment 1 (Puppies, NCloneCell, DrugTest, Dolphins, CarCost, and LifeIns, always in that order) with the same rating scales. After reading the first paragraph of each scenario, but before making any ratings, half the participants were told "Please reread this scenario while thinking hard about it. Try to consider all the different aspects presented in or relevant to the scenario. Then, on the lines below, make a list of these various considerations." The other half of the participants were told, "Please reread this scenario and let your feelings flow. What are your emotional reactions to this scenario? Take a moment to listen to your feelings. Then, on the lines below, make a list of these various feelings." Nine blank lines followed these instructions. The next page repeated the scenario at the top and followed with the same scales, in the same format, as Experiment

1. These manipulations were entirely unsuccessful; only a small, uninterpretable scattering of significant effects was found. Many of the “think hard” participants, as well as the “feelings flow” participants, listed emotive (and, sometimes, quite vulgar) considerations.

### 3.2.4 Regressing disapproval on the cognitive and affective factors

As in the first experiment, we regressed average disapproval on average affective and cognitive factor. The results were similar to the results from the first experiment. Because there were only three scenarios in this experiment, we present results by scenario.

Table 11 shows the significant slopes from the regressions of the Disapproval measures onto the Affect and Cognition scores for each scenario across participants. The main effect of Affect is that disapproval was higher for participants who rated the scenario more highly on the affective reasons. The main effect of Cognition, significant for some but not all of the analyses, shows the reverse effect: The higher the cognitive ratings, the lower the Disapproval measures. The interaction between Affect and Cognition found in Experiment 1 was replicated here in 7 of the 9 tests. Figure 4 illustrates three of these interactions (the others were similar). Again, the greatest Disapproval comes from those who give high Affect ratings and low (easy to think about) Cognitive ratings.

## 4 General discussion

The three goals of these studies were (1) to discriminate mere disapproval from protest responses and true taboo, (2) to explore the reasons people give for rejecting scenarios, and (3) to study the relationship between reasons and rejection.

As for the first goal, the set of scenarios drew a wide range of responses on all measures and strong agreement as to whether the scenarios were considered good or bad. The scenarios intended to be neutral had the lowest Disapproval scores, which was reassuring. However, our effort to discriminate among kinds of disapproval was unsuccessful; no matter how we worded the question, our participants seemed to be telling us only one thing: to what extent they disapproved of each scenario. This result may be due to participants’ view that WTA responses are not serious expressions of monetary values but are, instead, expressions of attitude (Kahneman, Ritov, & Schkade, 1999); if so, one would expect the high correlations we found between WTA and the rating scales.

The high rates of WTA refusals, the large number of zero responses (in Experiment 1), and the high number

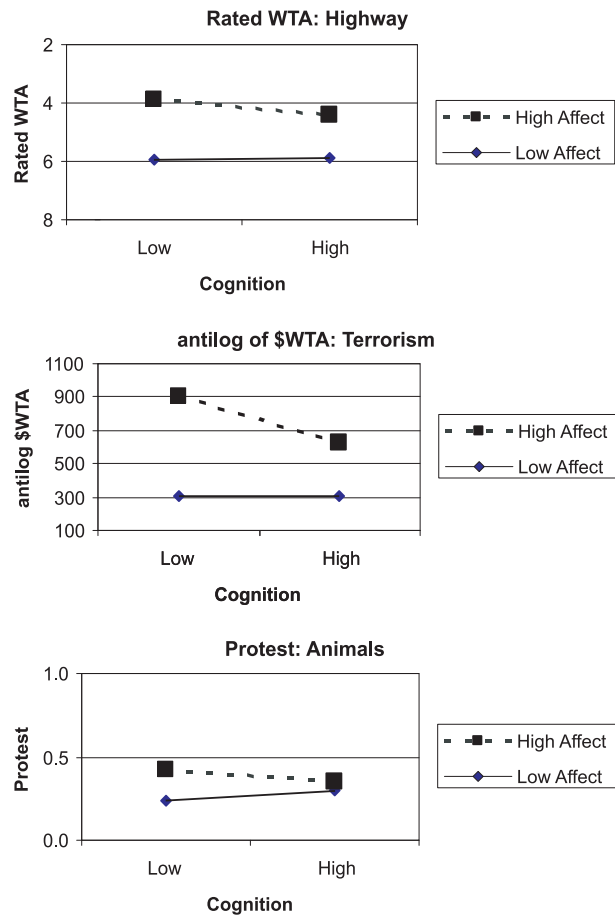


Figure 4: Slopes showing the interaction between Affect and Cognition, Experiment 2.

of very large responses also echo previous results in suggesting that WTA expresses an attitude, not a monetary value (Kahneman et al., 1999). For example, consider the Puppies/Animal scenario. The market for puppies and kittens for use in experimental labs within a state is quite limited, while the supply is vast. Surely, then, a per-household savings of \$1.00 is unrealistically high. But for a PETA supporter to respond “75 cents” is to suggest an unacceptable cold-heartedness. This is probably why the Animal scenario (in Experiment 11) had a mean \$WTA of \$273. Additional support for the attitude view of WTA, and the first such finding as far as we know, is shown in Table 6: The larger the WTA, the greater the disapproval, even among absurdly large amounts (e.g., \$100,000 vs. \$1,000,000).

Our second and third goals, the analysis of reasons for disapproval, yielded rich results. The finding of two clear factors, affect and cognition, is as expected, both because we used several scales for each of these concepts and because of the large literature showing the influence of both these factors on decision making (for a summary, see

Table 11: Regression results: slopes of the significant effects in Experiment 2.

	Highway			Animal			Terrorism		
	Rated WTA	\$WTA	Protest	Rated WTA	\$WTA	Protest	Rated WTA	\$WTA	Protest
Affect	-.66	.43	.08	-.95	.58	.08	-.83	.44	.09
Cognition	.23		-.02				.29	-.26	-.07
A x C	.09	-.07	-.01	.14		-.02		-.09	-.01
R <sup>2</sup>	.30	.12	.14	.49	.21	.17	.39	.15	.23

Lichtenstein & Slovic, 2006). With these highly objectionable scenarios, affect was predominant, accounting for almost all the variance ( $R^2 = .97$ ) in the disapproval scores across the scenarios. But cognition was also related to disapproval, curvilinearly across scenarios; both the best and the worst scenarios were deemed easiest to think about.

In analyzing individual differences, we found that disapproval was again strongly positively related to affect. In addition, we found that disapproval was negatively related to cognition (i.e., people who tended to rate the scenarios as easier to think about were more disapproving) and that there was an interaction between cognition and affect in predicting disapproval: When affect was low, cognition was not related to disapproval, but when affect was high, disapproval was especially strong for those people who rated the scenarios as cognitively easy.

One possible interpretation of this interaction is that cognition serves as a moderating influence: If you have to think hard about a scenario, it therefore doesn't seem so bad. We tested this interpretation by increasing cognitive load in two different ways and by requiring participants to "think hard" versus "feel hard." These efforts yielded only meager results. We thus favor the other interpretation of the interaction: Very bad scenarios are rated as easy to think about because it is not necessary to consider the details to know that they are wrong.

This bad-easy interpretation also explains the curvilinear relationship between disapproval and cognition across scenarios. Other research has shown that affective responses tend to be faster than cognitive responses (Peters, 2006). Thus, when scenarios are quickly recognized as extremely bad or good, disapproval/approval is recorded without much thought *and* these scenarios are rated as easy to understand. Deep reflection (or as one participant called it, "rocket scientist thinking") simply isn't needed when one's basic norms are violated.

On the other hand, our results are also not inconsistent with the possibility that cognitive difficulty helps disrupt the strong link between affect and disapproval. This possibility is intriguing because it is similar to recent work showing that cognitive load can decrease propensity to-

ward decision biases (Drolet & Luce, 2004). Just as load seems to disrupt whatever processes lead them toward biased decisions, cognitive engagement may disrupt the strong influence affect can have on decision making. Our work suggests that the interplay between emotion and reasoning in moral judgment is complex, a finding supported by fMRI work (Greene, Sommerville, Nystrom, Darley, & Cohen, 2001).

The word "taboo" was never presented to our participants nor did we use it in presenting the design and results of our experiments. Nevertheless, we believe that this paper does address the nature of taboo values, in part because the scenarios we used are similar to those used in previous taboo research (although, unlike some earlier studies, we chose only those scenarios that also had some sort of benefit). On the basis of our results, we tentatively suggest that taboo situations have two essential, perhaps defining, characteristics: They evoke strong negative affect (like anger or disgust) and they are easy to judge without much thought. The scenarios that are hard to think about are those that evoke only a moderate affective response. Given that we tried hard to write quite ghastly stories, we were surprised at the high number of scenarios that fell into this "difficult but not taboo" category.

This interpretation of our findings has implications for the definition and understanding of taboo values. Research by Baron and Leshner (2000), for example, has concluded that what they term protected values appear to be more "labile and amenable to challenge" (p. 183) than previously thought (e.g., see Baron & Spranca, 1997). One example they present (page 184) is that unreflective overgeneralizations (e.g., people who say they would never trade off life for money) should yield to simple challenges such as specific counter examples (e.g., do these same people approve of an increase in the health care budget large enough to screen everyone for colon cancer?). Our results suggest a different interpretation. Endorsements of general statements are just that: broad expressions of moral or ethical belief, lacking predictive ability for specific decisions. Response refusals that appear in the context of more specific choices, such as the

counterexamples introduced by Baron and Leshner or the scenarios used in our study, will be of two types: some that evoke only moderately negative affect and thus are difficult for people but not taboo, and others that evoke strongly negative affect and are taboo. Our results suggest that this latter set of choices will be unresponsive to change or challenges. Indeed, in the seven experiments reported by Baron and Leshner, although a significant number of participants yielded their protected values, there was always a hard core (often a majority) of protected-value responses that continued to be protected after the experimental manipulation. For example, with a set of scenarios about genetically modified wheat, 61.8% of the respondents who were characterized as having strict protected values for a particular scenario refused to accept that scenario even when the probability of harm was lowered to 1/10,000,000 and the probability of benefit was increased to 1.00. Our findings suggest that differences in affect might explain why some people yield their apparently protected values and others do not.

Our findings also have implications, more generally, for the elicitation of preferences in complex or controversial policy settings that involve choices across objectionable alternatives (Calabresi, 1968; Fischhoff, 1991). Much has been written (including papers we have written) about the benefits of structuring values or encouraging people to think carefully about their concerns in the light of personal actions or societal policy options that require tradeoffs across multiple benefits and costs and risks. In recent years, this desire to help people think about a difficult topic has been joined by a recognition that it is also important to acknowledge affective responses, with affect seen as conditioning and at times guiding cognitive responses (Peters, 2006). Here our results are mixed. Many of the scenarios judged to be bad were also hard to think about, and for these it is expected that help with the decision would be welcomed. For taboo scenarios, however, our results suggest that it will be difficult to get people to accept assistance in carefully considering or thinking through tough decisions. For example, it does not matter *how much* a white person can save in life insurance premiums if blacks are charged more than whites. If it's bad enough to be taboo, then it's easy to know what to do, and help with thinking carefully is not likely to be accepted when a proposal is so clearly wrong.

## References

- Baron, J. (2001). Measuring value tradeoffs: Problems and some solutions. In E. Weber, J. Baron, & G. Loomes (Eds.), *Conflict and tradeoffs in decision making: Essays in honor of Jane Beattie* (pp. 231–259). UK: Cambridge University Press.
- Baron, J. & Leshner, J. (2000). How serious are expressions of protected values? *Journal of Experimental Psychology: Applied*, 6, 183–194.
- Baron, J. & Spranca, M. (1997). Protected values. *Organizational Behavior and Human Decision Processes*, 70, 1–16.
- Beattie, J., & Barlas, S. (2001). Predicting perceived differences in tradeoff difficulty. In E. U. Weber, J. Baron, & G. Loomes, (Eds.), *Conflict and tradeoffs in decision making: Essays in honor of Jane Beattie* (pp. 25–64). UK: Cambridge University Press.
- Calabresi, G. (1968). Transaction costs, resource allocation and liability rules — A comment. *Journal of Law and Economics*, 11, 67–73.
- Drolet, A., Luce, M. F. (2004). The rationalizing effects of cognitive load on emotion-based trade-off avoidance. *Journal of Consumer Research*, 31, 63–77.
- Fischhoff, B. (1991). Value elicitation: Is there anything in there? *American Psychologist*, 46, 835–847.
- Fiske, A., & Tetlock, P. (1997). Taboo trade-offs: Reactions to transactions that transgress spheres of justice. *Political Psychology*, 18, 255–297.
- Greene, J. D., Sommerville, R. B., Nystrom, L. E., Darley, J. M. & Cohen, J. D. (2001). An fMRI investigation of emotional engagement in moral judgment. *Science*, 293, 2105–2108.
- Gregory, R. (2002). Incorporating value trade-offs into community-based environmental risk decisions. *Environmental Values*, 11, 461–488.
- Hogarth, R. (1987). *Judgment and choice* (2nd ed.). New York, Wiley.
- Irwin, J. R. (1994). Buying/selling price preference reversals: Preference for environmental changes in buying versus selling modes. *Organizational Behavior and Human Decision Processes*, 60, 431–457.
- Irwin, J. & Baron, J. (2001). Values and decisions. In S. J. Hoch, H. Kunreuther, & R. E. Gunther (Eds.), *Wharton on making decisions* (pp. 308–327). New York: Wiley.
- Kahneman, D., Ritov, I. & Schkade, D. (1999). Economic preferences or attitude expressions? An analysis of dollar responses to public issues. *Journal of Risk and Uncertainty*, 19, 203–235.
- Lichtenstein, S., & Slovic, P. (2006). The construction of preference: An overview. In *The construction of preference* (pp. 1–40). New York: Cambridge University Press.
- Luce, M.F., Bettman, J. & Payne, J. (1997). Choice processing in emotionally difficult decisions. *Journal of Experimental Psychology: Learning, Memory & Cognition*, 23, 384–405.
- Luce, M. F., Payne, J., & Bettman, J. (2001). The impact of emotional tradeoff difficulty on decision behavior. In E. U. Weber, J. Baron, & G. Loomes (Eds.), *Conflict*



- and tradeoffs in decision making (pp. 86–109). UK: Cambridge University Press.
- Mitchell, R. C., & Carson, R. T. (1989). *Using surveys to value public goods: The contingent valuation method*. Washington, DC: Resources for the Future.
- Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). *The adaptive decision maker*. New York: Cambridge University Press.
- Peters, E. (2006). The functions of affect in the construction of preferences. In S. Lichtenstein & P. Slovic (Eds.), *The construction of preference* (pp. 454–463). New York: Cambridge University Press.
- Peters, E. & Slovic, P. (2000). The springs of action: Affective and analytical information processing in choice. *Personality and Social Psychology Bulletin*, 26, 1465–1475.
- Shiv, B. & Fedorikhin, A. (1999). Heart and mind in conflict: Interplay of affect and cognition in consumer decision making. *Journal of Consumer Research*, 26, 278–282.
- Sweller, J. (1994). Cognitive Load Theory, learning difficulty, and instructional design. *Learning and Instruction*, 4, 295–312.
- Tetlock, P. E., Peterson, R. S., & Lerner, J. S. (1996). Revising the value pluralism model: Incorporating social content and context postulates. In C. Seligman, J. M. Olson, & M. P. Zanna (Eds.), *The Psychology of values: The Ontario Symposium on Personality and Social Psychology*. Mahwah, NJ: Erlbaum.
- Wilson, T. D., Dunn, D. S., Kraft, D., & Lisle, D. J. (1989). Introspection, attitude change, and attitude-behavior consistency: The disruptive effects of explaining why we feel the way we do. *Advances in Experimental Social Psychology*, 22, 287–343.

## Appendix: Experiment 1 scenarios

**BanDrugs** A major pharmaceutical company has proposed to sell to less-developed nations drugs that are banned in all industrialized countries. This proposal, if adopted, would increase the company's profits.

Assume that you hold shares of stock now worth \$5,000, in this pharmaceutical company. The proposal, if approved, has the potential to make you money by increasing the profits of the company through increased pharmaceutical sales in less developed countries. What is the SMALLEST yearly increase in the value of your stock shares (above and beyond increases if the company did not sell banned drugs) that you would require to approve of this proposal? My stock shares would have to increase in value by at least \$\_\_\_\_\_ per year to approve of this proposal. [B 9/6, \$5000]

**CarCost:** A major automobile company decides not to recall all their 1999 compact-model cars, which have a known defect, because they have done an internal analysis showing that the cost of repair is very high in relation to the small number of lives that would be saved. By not spending the money on a recall, the company can lower the prices of their new cars.

Assume that you are about to buy a new car. You have decided on one of two cars that seem identical to you. One of the cars (call it Car A) is made by the company described above, although it is NOT the model of car that suffers from the defect. The other car (Car B) is made by some other major automobile company. Car B costs \$25,000. Car A is cheaper. What is the SMALLEST savings that you would require in order for you to buy Car A rather than Car B? My savings would have to be at least \$\_\_\_\_\_ for me to buy Car A. [B 6/9, \$12,500]

**CarSuits:** A major automobile company decides not to recall all their 1999 compact-model cars, which have a known defect, because they have done an internal analysis showing that the amount of money the company would have to pay out to settle lawsuits arising from injuries and deaths resulting from the defect is less than the amount of money needed to recall and fix the defect. By not spending the money on a recall, the company can lower the prices of their new cars.

Assume that you are about to buy a new car. You have decided on one of two cars that seem identical to you. One of the cars (call it Car A) is made by the company described above, although it is NOT the model of car that suffers from the defect. The other car (Car B) is made by some other major automobile company. Car B costs \$25,000. Car A is cheaper. What is the SMALLEST savings that you would require in order for you to buy Car A rather than Car B? My savings would have to be at least \$\_\_\_\_\_ for me to buy Car A. [A 6/11, \$12,500]

**CloneCell:** A genetics company is planning to clone human cells in a petri dish for two weeks so that new tissue sources can be produced to aid the recovery of serious burn patients.

This plan will reduce the cost of treating burn patients because it will help them to recover faster. Thus it will decrease the annual cost of health insurance. Also, it will lower taxes because tax money pays the costs for many severely burned patients. What is the SMALLEST decrease in your yearly taxes and medical insurance that you would require to approve of this plan? My tax and insurance savings would have to be at least \$\_\_\_\_\_ per year to approve of this plan. [B 7/8, \$5,000]

**NCloneCell:** A genetics company is planning to grow artificial skin in a petri dish for two weeks so that new tissue sources can be produced to aid the recovery of serious burn patients.

This plan will reduce the cost of treating burn patients because it will help them to recover faster. Thus it will decrease the annual cost of health insurance. Also, it will lower taxes because tax money pays the costs for many severely burned patients. What is the SMALLEST decrease in your yearly taxes and medical insurance that you would require to approve of this plan? My tax and insurance savings would have to be at least \$ \_\_\_\_\_ per year to approve of this plan. [A 2/5, \$5,000]

**Coma:** Many people now die because of a severe shortage of organs (heart, lungs, etc.) available for transplanting. A local hospital has proposed a plan to harvest organs for transplants from patients in deep coma. Harvest decisions would be made by a team of two doctors and an ethicist.

Assume that you need to go to a hospital for a routine operation using only local anesthetics. Your medical insurance will pay only a portion of the total costs, and you expect that your out-of-pocket expenditures will be about \$500. You have the choice of going to the hospital that is proposing to harvest organs (call it Hospital A) or to another one that is not (call it Hospital B). Otherwise, the hospitals are the same, and you would have the same surgeon. Hospital A is cheaper because of its organ-harvesting program. What is the SMALLEST savings in the cost of your operation such that you would go to Hospital A? The operation at Hospital A would have to be at least \$ \_\_\_\_\_ cheaper for me to go there. [A 11/9, \$450]

**Dolphins:** Commercial fishers have proposed using a new fishing technique that would reduce the cost of catching fish but would also increase the number of dolphin deaths due to fishing. It is estimated that adoption of this technique would reduce the price of fish and provide for more employment among fishers, but the number of dolphin deaths each year would increase by about 35%.

Assume that you and your family eat fish often and spend about \$1,000 per year on fish. If the new fishing technique is adopted, you would save money on the cost of fish. What is the SMALLEST yearly savings that you would require to approve of this proposal? My savings would have to be at least \$ \_\_\_\_\_ per year to approve of this proposal. [A 3/8, \$500]

**DrugTest:** One-half of the patients in Hospital A with an otherwise fatal type of cancer are given a new drug that potentially could help them whereas the other half are

given a placebo (non-active pill). Although early results indicate that the new drug is saving lives, the Hospital has decided to continue giving a placebo to half the patients for as long as originally planned, in order to fully test the new drug and help scientists understand its benefits and risks.

Assume that you need to go to a hospital for a routine operation – cancer is not involved. Your medical insurance will not pay the total cost, so there will be out-of-pocket costs to you of about \$1000. You have the choice of going to Hospital A, which is doing the drug test, or to Hospital B, which does not do such tests. Otherwise, the hospitals are the same, and you would have the same surgeon. Hospital A is cheaper. What is the SMALLEST savings for your stay in the hospital such that you would go to Hospital A? Hospital A would have to be at least \$ \_\_\_\_\_ cheaper for me to go there. [B 11/1, \$950]

**NDrugTest:** Hospital A is proposing that half its patients with otherwise fatal cancers be given a new drug that potentially could help them and the other half be given a different new promising drug. No patient would be given both drugs, so as to help scientists understand the benefits and risks from the drugs.

Assume that you need to go to a hospital for a routine operation – cancer is not involved. Your medical insurance will not pay the total cost, so there will be out-of-pocket costs to you of about \$1000. You have the choice of going to Hospital A, which is proposing the drug test, or to Hospital B, which never does such tests. Otherwise, the hospitals are the same, and you would have the same surgeon. Hospital A is cheaper. What is the SMALLEST savings for your stay in the hospital such that you would go to Hospital A? Hospital A would have to be at least \$ \_\_\_\_\_ cheaper for me to go there. [A 5/2, \$950]

**GenMod:** A world-wide food conglomerate has decided to sell genetically modified wheat to countries in Africa. This wheat, which incorporates selected genetic material from pigs, has higher yields and also contains higher levels of Vitamins A and D than conventional wheat, and thus will reduce malnutrition in Africa.

This food conglomerate (call it Company A) sells a wide variety of canned, frozen, and packaged foods in your grocery store, as does another food conglomerate (call it Company B). You judge that the products sold by Company A and Company B are equal in quality, but Company A's products are cheaper. Assume that you do the grocery shopping for a family of four people and that you spend about \$3,000 yearly on the products sold by these companies. What is the SMALLEST yearly savings in your food costs that you would require to buy Company A's products instead of Company B's products? My

savings would have to be at least \$\_\_\_\_\_ per year to buy Company A's products. [A 9/3, \$1,500]

**GenRsch:** A world-wide food conglomerate has made a proposal to the National Science Foundation for funds to do basic and applied research on the genetic modification of wheat. The company anticipates that the research will lead to a more drought-resistant strain of wheat.

This food conglomerate (call it Company A) sells a wide variety of canned, frozen, and packaged foods in your grocery store, as does another food conglomerate (call it Company B). You judge that the products sold by Company A and Company B are equal in quality, but Company A's products are cheaper. Assume that you do the grocery shopping for a family of four people and that you spend about \$3,000 yearly on the products sold by these companies. What is the SMALLEST yearly savings in your food costs that you would require to buy Company A's products instead of Company B's products? My savings would have to be at least \$\_\_\_\_\_ per year to buy Company A's products. [B 8/3, \$1,500]

**Highway:** As part of their budget preparations for the coming year, the state Department of Transportation has decided not to add an extra lane to a dangerous section of a three-lane highway. This decision will lower their budget request. Although they acknowledge that there have been more deaths than expected in recent years along this stretch of highway, their analysis shows that comparing the cost of improvements with the number of excess deaths implies that each life saved is worth \$20 million, which they consider too expensive.

Because of this decision not to improve the dangerous section of highway, the legislature will lower the Department of Transportation's annual budget to reflect the savings. This will lower your taxes. What is the SMALLEST yearly tax savings that you would require to approve of this decision? My savings would have to be at least \$\_\_\_\_\_ per year to approve of this decision. [A 4/10, \$1,500]

**NHighway:** As part of their budget preparations for the coming year, the state Department of Transportation has decided not to add an extra lane to a section of a three-lane highway because there have been no deaths or serious accidents on that stretch. This decision will lower their budget request.

Because of this decision not to improve the highway, the legislature will lower the Department of Transportation's annual budget to reflect the savings. This will lower your taxes. What is the SMALLEST yearly tax savings that you would require to approve of this decision? My savings would have to be at least \$\_\_\_\_\_ per year to approve of this decision. [B 5/2, \$1,500]

**LifeIns:** Company A, a major life insurance company, has decided to establish two sets of rates for life insurance, one set for whites and another, more expensive set for blacks. They argue that this is fair because whites, on average, live longer than blacks.

Assume that you are white and that you need to buy a \$200,000 life insurance policy to protect your family. You can buy it from Company A, with different rates for whites and blacks, or from Company B, which has the same rates for whites and blacks. Because of their two sets of rates, Company A is cheaper for you. What is the SMALLEST savings in the annual premium that you would require to buy your life insurance from Company A? My savings would have to be at least \$\_\_\_\_\_ per year to buy from Company A. [A 7/4, \$2,000]

**NLifeIns:** Company A, a major life insurance company, has decided to establish two sets of rates for life insurance, one set for non-smokers and another, more expensive set for smokers. They argue that this is fair because non-smokers, on average, live longer than smokers.

Assume that you are a non-smoker and that you need to buy a \$200,000 life insurance policy to protect your family. You can buy it from Company A, with different rates for smokers and non-smokers, or from Company B, which has the same rates for smokers and non-smokers. Because of their two sets of rates, Company A is cheaper for you. What is the SMALLEST savings in the annual premium that you would require to buy your life insurance from Company A? My savings would have to be at least \$\_\_\_\_\_ per year to buy from Company A. [B 2/5, \$2,000]

**Military:** Congress is considering a plan to allow military personnel or their families to pay large sums of money to buy their way out of being sent to another country to fight against terrorism. Under this plan, military personnel would be guaranteed, once the payment is made, that they would not be sent into combat. Someone else would go instead. This plan would raise money for the government and thus lower taxes. This plan would raise money for the government and thus reduce your taxes. What is the SMALLEST reduction in your yearly taxes that you would require to approve of this plan? My tax savings would have to be at least \$\_\_\_\_\_ per year to approve of this plan. [B 10/4, \$2,500]

**MSLog:** The government is considering a plan to permit logging of old-growth trees on one portion of a National Park in order to harvest microscopic organisms that grow in their roots, because these organisms might lead to new pharmaceutical products that would help to fight MS (multiple sclerosis).

This plan will require that the logging company pay the Park Service for the timber it logs. If new drugs are successfully developed using the root organisms, then additional payments will be made to the Park Service by the pharmaceutical firms. These payments would lower your taxes. In addition, successful treatment of MS would lower your medical insurance costs. What is the SMALLEST savings in taxes and insurance each year that you would require to approve of this plan? My savings would have to be at least \$\_\_\_\_\_ each year to approve of this plan. [A 8/1, \$5,000]

**Pollute:** Your local utility company has applied for permission from federal regulators to reduce expenditures on pollution controls. This proposal, if approved, would save money for ratepayers but increase the incidence of deaths from childhood asthma.

What is the SMALLEST reduction in your yearly cost for electricity that you would require to approve of this proposal to reduce expenditures on pollution controls? My savings would have to be at least \$\_\_\_\_\_ per year to approve of this proposal. [A 1/6, \$1,200]

**Puppies:** Animal pounds and animal shelters across the state receive more puppies and kittens than they can place in adoption. The State Legislature is now considering a proposal to sell all unwanted puppies and kittens to experimental labs for research into causes of blindness.

This proposal to sell puppies and kittens to labs will reduce the cost of running the pounds and thus will reduce your taxes. What is the smallest reduction in your taxes each year that you would require to approve of this proposal? My tax savings would have to be at least \$\_\_\_\_\_ per year to approve of this proposal. [A 10/7, \$1,500]

**RadioNuc:** Congress is proposing a law to allow higher amounts of radionuclide emissions from coal-fired power plants because a careful analysis shows that the current limits imply a value of \$10 million for each life saved. Leaders of Congress consider this to be an unreasonably high value. The new limit would lead to lower electrical bills and make brownouts less likely.

This proposal, if approved, would decrease the cost of electricity. Assuming that all cost savings are passed on to ratepayers in the form of lower electricity bills, what is the SMALLEST yearly reduction in your electricity bills that you would require to approve of this proposal? My savings would have to be at least \$\_\_\_\_\_ per year to approve of this proposal. [B 3/11, \$1,200]

**TreeTrade:** A large timber company has proposed exchanging a parcel of forested lands with the US Forest Service. The company would give to the Forest Service a tract of second-growth forest that is close to a major east-coast population center and will be a good recreation area. In return, the timber company would receive a tract of virgin forest in Montana. It would harvest the trees in Montana and thus increase its profits.

Assume that you own stock, now worth \$5,000, in the timber company. If the proposed land exchange is approved, the company's profits will increase and the value of your stock will go up. What is the SMALLEST yearly increase in your stock (above and beyond increases that would occur if the land exchange does not happen) that you would require to approve of this proposal? My stock would have to increase in value by at least \$\_\_\_\_\_ per year for me to approve of this proposal. [B1/10, \$5,000]

**UnivMonk:** State University A plans to breed monkeys for use in its own experimental laboratories as part of research into vaccines for HIV/AIDS. Some of the researchers have complained that the allocated space is too small so that the living conditions for the monkeys will be horrific, but the University says it can't afford more space.

Imagine that you are about to go to college. You have been accepted by University A, which plans to breed monkeys for research, and also by University B, which does not. Otherwise, the two universities are the same for you. University A has lower tuition. What is the SMALLEST savings in tuition that you would require in order to attend University A? University A would have to be at least \$\_\_\_\_\_ cheaper per year. [B 4/7, \$2,000]