

Pro-Environmental Motivation:  
An Evolutionarily Informed Approach

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## ABSTRACT

Pro-environmental goals often pit immediate self-interest against future communal interest. Consequently, the motivation to behave in pro-environmental ways can be particularly difficult to maintain over time. By framing environmental ills as threats to one's chronic concerns, I suggest that chronic motivations, such as disease avoidance, can be leveraged to engender longer-lasting pro-environmental motivation. Specifically, I suggest that three distinct categories of environmental ills should be associated with distinct chronic concerns, and that the mechanisms that regulate these concerns should also regulate reactions to related environmental ills: pollution should engage a pathogenic disgust mechanism, wastefulness a moral disgust mechanism, and framing environmental outcomes as posing safety concerns should be linked to fear and anger mechanisms. Results of four experiments did not lend consistent support to the hypotheses. Neither situationally primed concerns nor motivation-relevant individual differences produced consistent results suggesting an association between the proposed motivations and the relevant environmental outcomes.

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## Chapter 1

### INTRODUCTION

#### **Overview**

Initially, I proposed a single experiment to test the hypothesis that activating specific fundamental motivations should elicit negative reactions to specific environmental ills. Specifically, I hypothesized that activating a disease avoidance mindset would lead to greater dislike for water pollution, that activating a cheater-detection mindset would lead to greater dislike for resource wastefulness, and that activating a self-protection mindset would lead to greater dislike for environmental outcomes framed as physical safety threats. Moreover, I proposed that individual differences in sensitivity to each of these goal domains would moderate the above effects. After reviewing the relevant literature, I present the results of the initially proposed experiment. I then briefly present three additional follow-up studies designed to investigate further my hypotheses.

#### **The Challenges of Creating and Maintaining Pro-Environmental Motivation**

There are certainly reasons why pro-environmental motivation is difficult to engage and sustain. First, people tend to focus their motivation on threats and opportunities that are more immediate than those that seem more distal. Most environmental problems, even when foreseeable, have consequences that will not be experienced until well into the future and perhaps in a location that seems far from oneself. For example, some behaviors that are beneficial for the environment have costs in the present (e.g., walking rather than driving), whereas the benefits of these behaviors to the self and environment (e.g., cleaner air) are not available until well in the future. The temporal distance of these outcomes decreases the relative importance placed on them. People tend to prefer immediate benefits to larger future benefits. For example, Hardisty and



Weber (2009) found that, just as people prefer less money now to more in the future, they also prefer fewer days of clean air now to more days of clean air in the future. In other words, environmental benefits that accrue far into the future are worth less to people (i.e., discounted) than are those that accrue immediately. Motivation to engage in pro-environmental behaviors may be difficult to engage or maintain relative to other goals because pro-environmental goals often lack a sense of immediacy.

A second challenge to engaging and maintaining pro-environmental goals is the uncertainty associated with the sense that one's behaviors will actually lead to the desired outcomes. Research on prosocial behavior (e.g., Batson, 1998; Latané & Darley, 1970) demonstrates that it becomes more likely when there is a direct and apparent causal connection between one's actions and the outcome—when individuals have the sense that they personally are in a position to help (Bickman, 1972). Uncertainty, in contrast, reduces people's likelihood of engaging in prosocial behavior. This is especially the case when individuals are uncertain as to whether others will share their sacrifices (Platt, 1973). For instance, if everyone in a community were to ride their bikes rather than drive their cars, an individual could be relatively assured that his or her efforts would lead to less smog. It's often costly, however, to ride one's bike rather than drive. Driving can reduce the amount of time to get to work, for instance—and the time savings could translate into more free time after work to do things one enjoys. Additionally, one would get to work in better condition—for example, sweat-free and in professional attire. To the extent that a bicyclist is uncertain whether others are also willing to sacrifice the benefits of driving, she is less likely to maintain the motivation to keep cycling.

Implicit in the above discussion is the idea that people have many goals they hope to achieve and that these goals are sometimes incompatible. Pro-environmental goals are often at odds with a person's other goals and, because of the lack of immediacy and certainty associated with pro-environmental goals, they may often be given a lower priority than other goals.

Unfortunately, many persuasive attempts to elicit and strengthen pro-environmental motivation rely on cold rationality and consideration of distal outcomes. For example, the trailer for the documentary based on the book *An Inconvenient Truth* (Gore, 2006) shows images of landscapes as they are predicted to be at some point in the future if current patterns do not change, implying that a change is necessary to prevent such dire outcomes. It should not be surprising when arguments based on rational consideration of future outcomes are insufficient to overcome immediate self-interest and desires. Metcalfe and Mischel's (1999) review of self-regulation describes a "cool" cognitive system—rational and strategic decision-making—often at odds with a "hot" emotion-driven system focusing on immediate states and outcomes and often seeking to undermine attempts at self-control. When confronted with psychologically immediate desires, a high degree of self-regulatory effort will be required to engage in and maintain pro-environmental motivation. Such motivation will likely be subject to attrition and goal fatigue (Muraven & Baumeister, 2000).

There would seem to be, then, much to gain by identifying solutions that work with, rather than against, the hotter, more psychologically immediate motivations (Kenrick, Griskevicius, Sundie, Li, Li, & Neuberg, 2009). By mapping pro-environmental outcomes not onto long-term, coldly-rational interests, but rather onto one's more immediate, more emotionally-laden self-interests—and

therefore requiring less active self-regulation and creating less goal fatigue—one might better enable persistence of pro-environmental behaviors. I propose that linking pro-environmental motivation to *fundamental motives* (Kenrick, Li, & Butner, 2003) may in fact do just this.

### **Leveraging Fundamental Motives**

Kenrick and colleagues (Kenrick et al., 2003; 2010a; 2010b) have argued that human beings evolved to have a distinct set of fundamental motives that enabled them to meet specific long-recurring survival and reproductive challenges. Those challenges include self-protection, disease avoidance, social affiliation, status acquisition, mate acquisition, mate retention, and kin care. Those who were attuned to and motivated to meet those challenges were more likely to survive and reproduce than were others. Over time, this differential reproductive success, combined with the heritability of these inclinations, led to a world largely populated by those naturally attuned to and motivated to address these domains of challenge.

These fundamental motives are readily engaged when success in these domains is threatened, leading to the activation of strategies for mitigating the threat (or approaching the opportunity). Moreover, these motives tend to be affectively “hot”—threats to their achievement tend to elicit strong emotions such as disgust, anger, resentment, and fear. Given the universality of these motives, the ease with which they are activated, and their tight connections to strong emotions, aligning pro-environmental behaviors with fundamental motives may be a more effective way of producing consistent and sustained behavioral change.

**Disease Avoidance.** Disease avoidance motivations, which operate via pathogenic disgust mechanisms (Oaten, Stevenson, & Case, 2009), engage

highly evolved processes designed to detect and avoid pathogen-infested objects and behaviors, thereby reducing the risk of contagion ( Neuberg, Kenrick, & Schaller, 2011; Rozin, Haidt, & McCauley, 2007). The disease avoidance system enables people to avoid disgust-elicitors without much effort or even conscious awareness. For example, one study by Mortensen et al. (2010) demonstrated that after viewing images of disgusting, germ-laden objects, individuals rated themselves as more introverted and less open to new experiences than did individuals who viewed neutral images. Although people were likely unaware that they rated themselves as more introverted and less open to experience than they would otherwise, this subtle change in self-characterization would likely lead them to behave in ways that limit their likelihood of exposure to pathogens against which one's body has yet to develop defenses (and which are more likely to lurk in the bodies of strangers and in novel environments). This finding is part of a larger body of work on what Schaller and colleagues (Schaller & Duncan, 2007; Schaller & Park, 2011 ) have labeled the behavioral immune system, which works to bias people toward behaving in ways to minimize exposure to pathogen threats.

Given the strong motivation to avoid disease, one might ask whether this motivation can be leveraged to reach specific environmental goals. Evidence suggests that physically disgusting objects are easily made salient and difficult to forget. Once created, disgust associations are difficult to extinguish (Baeyens, Crombez, van den Bergh, & Eelen, 1988; Olatunji, Forsyth, & Cheria, 2007). A growing body of evidence suggests that disgust reactions can be acquired, and that pairings between specific anti-environmental behaviors and disgust reactions may be created. For example, after getting ill from a food, people tend to dislike that food and avoid eating it in the future (Rozin, 1986). Children do not exhibit

contamination sensitivity or aversion to foul but nonirritant odors until ages 3 to 5 (Petó, 1936; Rosen & Rozin, 1993), and some evidence suggests that some elicitors of disgust seem to be acquired by observation facial displays of others (Tomkins, 1963). What is disgusting to children (and adults) in one culture may not be disgusting to members of a different culture. In sum, the research on disgust indicates that not only is it linked to the goal of disease avoidance, but that it is also possible to create associations between certain kinds of objects and disgust. Consequently if behaviors that are bad for the environment could be paired with disgust reactions, then the disease avoidance motivation could be leveraged to encourage a prolonged motivation to behave in pro-environmental (or not engage in anti-environmental) behaviors.

**Protecting against resource loss.** People want to defend themselves against disease. They also want to protect themselves against unfair losses of important, tangible resources, as may occur when others violate rules of social exchange, take more than their fair share, and the like. Reactions to those who violate such social norms often take the forms of moral disgust and anger.

Although moral disgust has several features in common with pathogenic disgust, it differs greatly in terms of its eliciting stimuli. Work by Tybur, Lieberman, and Griskevicius (2009) demonstrated a distinction between individuals sensitive to pathogenic (i.e., physical) disgust and individuals sensitive to moral disgust, suggesting that these are psychologically distinct constructs. Pathogenic disgust is theorized to have evolved first, with moral disgust building on the existing pathogenic disgust mechanisms in a way tailored to encourage the avoidance (or ostracism) of individuals anticipated to do social harm.

One particular form of social harm is cheating, or taking resources that have not been fairly earned. Humans are ultrasocial animals, and interpersonal trust is required for human groups to function effectively for their members. With this trust, however, comes a vulnerability to others who cheat, socially loaf, or otherwise take advantage of group efforts and resources. Consequently, people may have become attuned to detecting the presence of cheaters (Cosmides, 1989; Tooby & Cosmides, 1992, 2005). When individuals begin to feel that others have taken advantage of them or their group in some way, they begin to feel anger and moral disgust toward the perpetrator. These emotions are hypothesized to facilitate the punishment and/or ostracism of the perpetrator (Kurzban & Leary, 2001; Neuberg, Smith, & Asher, 2000).

Natural resources arguably do not belong to any one individual and, ancestrally, are likely to have been viewed as potential benefits to the entire group. Consequently, when an individual or group of individuals (or, in contemporary times, a business) uses so many natural resources that others have diminished access, members of a community may become angry towards, and morally disgusted by, the violators. Additionally, even when there are currently sufficient resources, when one uses more resources than necessary—that is, “wastes” resources—thereby showing careless disregard for communal resources or the needs of current and future generations, this too may be seen as a moral violation. As before, it would seem that one way to discourage wasteful behaviors in others is to leverage people’s natural inclination to protect resources by framing wasteful behaviors as morally disgusting.

**Self-Protection.** Self-protection motivations often arise when in the presence of real or perceived others who intend to do harm to oneself or close others, or when in potentially dangerous circumstances. Threats to self-

protection, or cues to physical danger, often elicit fear and consequently motivate one to avoid the threatening stimuli (Neuberg et al., 2011). Framing outcomes that are environmentally detrimental as posing an immediate physical safety threat may also motivate individuals to behave in ways designed to minimize or avoid that threat.

## Chapter 2

### EXPERIMENT 1

Despite the best of intentions to behave in pro-environmental ways, the motivation to do so must compete with many other more immediate goals, and individuals may not always be able to sustain their motivation. The solution proposed by this paper is to leverage fundamental motives—motives that are universal and which, when engaged, may be emotionally “hot” and particularly resistant to decay and fatigue. By understanding associations between environmental concerns and fundamental motives, it may be possible to leverage fundamental motivations to enhance and sustain pro-environmental behaviors. In particular, I propose that the motivation to avoid disease can be leveraged to enhance anti-pollution behaviors, that the motivation to avoid unfair exchanges can be leveraged to enhance anti-wasting behaviors, and that the motivation to protect oneself and others can be leveraged to decrease environmental outcomes framed as posing a safety threat.

One might expect such effects to be moderated by individual differences in felt vulnerabilities to the specific classes of threats. For instance, in work by Schaller and his colleagues, darkness (a manipulation of self-protection concern) increased the likelihood that outgroup men would be viewed as dangerous—but especially for individuals who believed already that the world is a dangerous place (Schaller, Park & Mueller, 2003). Applied here, I expect that individuals dispositionally concerned about contagious disease will be especially sensitive to interventions that link pollution to pathogens, individuals dispositionally concerned about unfair exchange will be especially sensitive to interventions that link the wasting resources to unfair exchange, and individuals who dispositionally



believe that the world is dangerous will be especially sensitive to interventions that link environmental outcomes to physical safety threats.

### **Method**

To test these hypotheses, the basic experiment was a 4 (Goal priming: control, disease avoidance, resource-protection, self-protection; between-participants) by 3 (Environmental concern: pollution, wasting resources, safety concern; within-participants) mixed design. I also assessed chronic individual differences related to these goals, as well as demographic characteristics.

**Participants.** 184 undergraduate students at Arizona State University participated in exchange for partial credit in their introductory psychology course. There were 83 males, 98 females, and 3 individuals who did not specify their gender. The median age was 18. In terms of political affiliation, 54 self-reported as Republican, 31 as Democrat, 40 as Independent, 36 as “none, I generally avoid politics”, and 23 fell into other categories or did not respond.

**Goal priming manipulation.** Participants read one of four guided visualizations designed to engage the motivational systems that underlie concerns with disease, resource wastage, and self-protection. These primes have been used extensively in previous studies on fundamental motivations (e.g., Mortensen et al, 2010) and have been tested to elicit the intended motivational state. See Appendix D for the full text of the guided visualization scenarios.

**Control.** In the control condition, participants read a scenario that guided them through the task of organizing materials at their desk.

**Disease avoidance.** In the disease avoidance condition, participants read a scenario in which they volunteered in the geriatric ward of a hospital; the scenario guided them through encounters and interactions with a range of disease-relevant, physically disgusting stimuli.

**Resource protection.** In the resource protection condition, participants were guided through a scenario in which they were assigned to work with another to complete a course assignment. They proceed to complete a majority of the work only to learn that their partner decided at the last minute not to finish the work, claiming to be ill. Participants were guided to suspect this excuse to be a lie, and to believe that they could not pass the course unless they completed the project. The scenario is designed to engage a motivational system focused on fair exchange, and thereby elicit concerns over resources.

**Self-protection.** Participants in the self-protection condition read a scenario in which they were home alone on a stormy night and heard the sounds of an intruder coming through the front door and towards the room in which they had been sleeping. The scenario is designed to elicit fear and concerns over one's physical safety.

**Environmental concern measures.** Following the goal primes, participants read three descriptions, in randomized order, of companies considering purchasing industrial space near their neighborhood. Each was described as having a different effect on the local water supply. In the *pollution* description, the company's factory was described as potentially emitting toxins into the water. In the *waste* description, the company's factory was described as consuming an unnecessarily large quantity of water that may exceed rates of replenishment. In the *safety* description, the company's factory was described as affecting the water pressure needed for municipal services such as fire hydrants (see Appendix E).

Participants then answered questions designed to assess their overall evaluation of each of the companies. Five evaluation questions were used to form the evaluation composite—how much they would like (or dislike) the

company, how much they would like to have it nearby, their overall favorability of the company, the positive and negative consequences they foresee if the companies came to town, and their belief that the local government should provide monetary incentives for the company to move into the space. After evaluating each company, they then ranked the three companies along several dimensions. Companies were ranked in terms of how much participants would like to have them nearby, the negative consequences of having them nearby, the positive consequences of having them nearby, and the desirability of the companies receiving monetary incentives from the local government (see Appendix F). Participants then responded to a manipulation check (see Appendix G) designed to assess the extent to which they experienced the emotions the guided visualizations were intended to elicit.

The company descriptions were intended to be presented in a counterbalanced order such that each company would be presented first to at least one subset of participants in each motivational prime condition. However, due to a computer programming error in the resource concern condition, participants who were supposed to view the pollution company first instead viewed the safety concern company first. Consequently, no participants in the resource concern condition were presented with the pollution company first, and twice as many participants viewed the safety concern company first as viewed the resource wasting company first.

**Individual difference measures.** Participants then completed a series of scales designed to assess individual differences in chronic vulnerability to threats posed by disease, unfair use of resources, and physical danger (see Appendix I).

***Personal Vulnerability to Disease (PVD).*** The PVD scale (Duncan, Schaller & Park, 2009) is designed to assess chronic individual differences in the

extent to which individuals feel personally vulnerable to germs and susceptible to disease. The *Germ Avoidance* subscale contains items such as “It really bothers me when people sneeze without covering their mouths,” and assesses the extent to which individuals feel uneasy in situations in which they may come into contact with communicable diseases. The *Susceptibility to Disease* subscale reflects a person’s believe that he or she is vulnerable to future health problems. It is measured by items such as “If an illness is 'going around', I will get it.” (See Appendix I, part 1, for complete scale.) The PVD scale has been demonstrated to predict an individual’s attitudes towards people heuristically associated with disease, including individuals with disabilities (Park, Faulkner, & Schaller, 2003), obese individuals (Park, Schaller, & Crandall, 2007), the elderly (Park et. al., 2003), and immigrants (Faulkner, Schaller, Park, & Duncan, 2004).

**Resource Concern.** A four-item scale was developed for this experiment and designed to assess the extent to which individuals are concerned about the use of shared resources. Two items assess the extent to which individuals believe that one should not waste resources or take more than their fair share. Two items focus particularly on community resources (see Appendix I, part 2). Because these items do not come from a validated scale, three additional scales were included that should be associated with responses to these items: The moral disgust subscale of the Three Domain Disgust Scale (Tybur et al., 2009, see Appendix I, part 3), The Moral Foundations Questionnaire (Graham et al., 2006, see Appendix I, part 4), and the Protestant work ethic scale (Fumham, 1990; as adapted by Hoskey, 1994, see Appendix I, part 5). It is expected that individuals who score highly on resource concern will be more prone to moral

disgust, place higher emphasis on reciprocity, and score higher in Protestant work ethic.

***Belief in a Dangerous World (BDW).*** Altemeier's (1998) Belief in a Dangerous World Scale consists of 12-items that assess the extent to which an individual believes in the ubiquity and unpredictability of crime, corruption, and threats to safety (e.g., "There are many dangerous people in our society who will attack someone out of pure meanness, for no reason at all," "If a person takes a few sensible precautions, nothing bad will happen to him. We do not live in a dangerous world" [reverse-scored]; see Appendix I, part 6). This measure is an assessment of an individual's chronic tendency to be concerned about physical safety and corresponds to the self-protection manipulation.

**Demographic information.** Last, participants responded to a series of questions in which they were asked to report their age, sex, ethnicity and a host of other demographic questions. They were also asked to report political party affiliation, and how conservative or liberal they viewed themselves to be—socially, economically, and overall.

## **Results**

**Manipulation check.** A series of questions was asked that assessed both the extent to which participants felt a desire to protect themselves from a given threat (germs, being taken advantage of, or danger) and the associated emotional response (physical disgust, moral disgust, anger/resentment, and afraid). Two separate mixed between/within-participants design ANOVAs were conducted, first on motivational responses, and next on affective reactions. Mean responses for each cell are presented in Table 1.

**Motivational responses.** The multivariate test of the 4 (motivational prime: control, disease avoidance, resource protection, self-protection; between-

participants) by 3 (motivational response: germs, taking advantage, danger) mixed ANOVA revealed a significant motivational prime by motivational response interaction,  $F(5.564, 332.759) = 58.583, p < .001, \eta_p^2 = .498$ . Because each focal hypothesis concerns whether a given prime elicits more of the intended motivational response than the remaining two, repeated-measures follow-up tests were run separately for participants who received each prime. All results are reported based on a Greenhouse-Geisser adjustment for sphericity.

*Control prime.* Among the 44 participants in the control prime condition, the repeated measures ANOVA on motivational reaction was not significant:  $F(2, 86) < 1$ . Consistent with expectation, participants in the control condition did not differ in the extent to which they felt desires to avoid germs, avoid being taken advantage of, and protect themselves from danger.

Table 1.  
Means and standard deviations for manipulation check.

	<i>Control</i>		<i>Disease Avoidance</i>		<i>Resource Protection</i>		<i>Self Protection</i>	
	<i>(n = 44)</i>		<i>(n = 46)</i>		<i>(n = 31)</i>		<i>(n = 60)</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Affective Reaction								
physical disgust	1.23 <sup>1</sup>	0.71	<b>4.52<sup>1</sup></b>	<b>1.93</b>	4.48 <sup>3</sup>	1.53	2.48 <sup>2</sup>	1.69
moral disgust	1.34 <sup>1</sup>	0.94	3.63 <sup>2</sup>	2.05	<b>5.16<sup>2</sup></b>	<b>1.72</b>	2.22 <sup>2</sup>	1.52
anger / resentment	1.25 <sup>1</sup>	0.78	3.48 <sup>2</sup>	1.94	<b>5.65<sup>1</sup></b>	<b>1.58</b>	2.33 <sup>2</sup>	1.69
fear	1.39 <sup>1</sup>	0.92	2.43 <sup>3</sup>	1.77	3.10 <sup>4</sup>	1.62	<b>5.37<sup>1</sup></b>	<b>1.16</b>
Desire to protect self from:								
germs	2.11 <sup>1</sup>	1.62	<b>4.93<sup>1</sup></b>	<b>1.95</b>	2.06 <sup>3</sup>	1.59	2.20 <sup>3</sup>	1.76
taking advantage	2.20 <sup>1</sup>	1.83	3.09 <sup>2</sup>	2.16	<b>5.48<sup>1</sup></b>	<b>1.75</b>	4.93 <sup>2</sup>	1.79
danger	2.11 <sup>1</sup>	1.91	2.48 <sup>3</sup>	1.75	2.87 <sup>2</sup>	1.82	<b>5.70<sup>1</sup></b>	<b>1.59</b>

*Notes.* Reactions expected to be elicited by the given prime are in **bold**. Within each column, the subscript 1 indicates the highest mean within the particular prime, unique subscripts indicate that a mean was significantly lower than the next highest mean. For example, in the disease avoidance condition, physical disgust was significantly greater than moral disgust so the superscripts are 1 and 2, respectively. However, anger/resentment did not differ significantly from moral disgust so the subscript 2 is used. Finally, fear was significantly less than anger/resentment, so a new subscript, 3, is used.

*Disease avoidance prime.* Among the 46 participants in the disease avoidance prime condition, the repeated measures ANOVA on motivational reaction revealed a significant main effect,  $F(2, 90) = 33.636, p < .001, \eta_p^2 = .428$ . Repeated measures contrasts comparing each of the means revealed that, as expected, participants in the disease avoidance condition reported feeling more motivated to avoid germs and disease than to avoid being taken advantage of ( $p < .001$ ) or to protect themselves from danger ( $p < .001$ ).

*Resource protection prime.* Among the 31 participants in the resource protection prime condition, the repeated measures ANOVA on motivational reaction revealed a significant main effect  $F(2, 60) = 33.401, p < .001, \eta_p^2 = .527$ . Repeated measures contrasts comparing each of the means revealed that, as expected, participants in the resource protection condition reported feeling significantly more motivated to avoid being taken advantage of than to avoid germs and disease ( $p < .001$ ) or protect themselves from danger ( $p < .001$ ).

*Self-protection prime.* Among the 60 participants in the self-protection prime condition, the repeated measures ANOVA on motivational reaction (germs, taking advantage, danger) revealed a significant main effect  $F(2, 118) = 108.035, p < .001, \eta_p^2 = .647$ . Repeated measures contrasts comparing each of the means revealed that, as expected, participants in the self-protection condition reported feeling significantly more motivated to protect themselves from danger than to avoid germs and disease ( $p < .001$ ) or be taken advantage of ( $p < .001$ ).

**Affective Responses.** The multivariate test of the 4 (motivational prime: control, disease avoidance, resource protection, self-protection; between-participants) by 4 (affective reaction: physical disgust, moral disgust, anger/resentment, fear) mixed ANOVA revealed a significant motivational prime by affective reaction interaction,  $F(8.02, 473.20) = 45.961, p < .001, \eta_p^2 = .438$ .

Again, because each focal hypothesis concerns whether a given prime elicits more of the intended affective response than the remaining three, repeated measures tests were run separately for participants who received each prime. All results are reported based on a Greenhouse-Geisser adjustment for sphericity in the data.

*Control prime.* Among the 44 participants in the control prime condition, the repeated measures ANOVA on affective reaction was not significant  $F(1.87, 80.26) = 1.882, p = .136$ . Consistent with expectation, participants in the control condition did not differ from each other in the extent to which they felt physically disgusted, morally disgusted, angry/resentful, or afraid.

*Disease avoidance prime.* Among the 46 participants in the disease avoidance prime condition, the repeated measures ANOVA on affective reaction revealed a significant main effect,  $F(2.40, 108.13) = 11.170, p < .001, \eta_p^2 = .199$ . Repeated measures contrasts comparing each of the means revealed that, as expected, participants in the disease avoidance condition reported feeling more physical disgust than moral disgust ( $p = .029$ ), anger/resentment ( $p = .014$ ), or fear ( $p < .001$ ).

*Resource protection prime.* Among the 31 participants in the resource protection prime condition, the repeated measures ANOVA on affective reaction revealed a significant main effect,  $F(2.15, 64.56) = 21.142, p < .001, \eta_p^2 = .413$ . Repeated measures contrasts comparing each of the means revealed that, as expected, participants in the resource protection condition reported feeling significantly more moral disgust and anger/resentment than physical disgust ( $p = .022$  and  $p < .001$ , respectively) or fear (both  $ps < .001$ ).

*Self-protection prime.* Among the 60 participants in the self-protection prime condition, the repeated measures ANOVA on affective reaction revealed a



significant main effect,  $F(2.38, 140.48) = 121.681, p < .001, \eta_p^2 = .673$ . Repeated measures contrasts comparing each of the means revealed that, as expected, participants in the self-protection condition reported feeling significantly more fear than physical disgust, moral disgust, or anger/resentment (all  $ps < .001$ ).

**Summary of manipulation check results.** In sum, each of the manipulation checks revealed that the prime elicited a higher degree of the intended affective reaction and motivational state than of any other state.

**Reliability of company evaluations.** In all, five evaluation questions (favorability, valence of consequences, liking, like to have nearby, willingness to give monetary incentives) were used, separately, to assess the desirability of each of the three companies. Separate reliability analyses were conducted for the pollution, waste, and safety threat evaluations. In all cases, reliabilities were high, with Cronbach alphas above .8, so three separate composites were formed that represented the mean evaluation of each company.

Table 2.  
*Means and standard deviations for positive evaluations of each company, Experiment 1.*

	<i>Control</i>		<i>Disease Avoidance</i>		<i>Resource Protection</i>		<i>Self Protection</i>	
	<i>(n = 44)</i>		<i>(n = 46)</i>		<i>(n = 33)</i>		<i>(n = 61)</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Pollution	3.16	1.11	<b>3.30</b>	<b>1.32</b>	3.19	1.43	3.07	1.12
Waste	3.54	1.15	3.36	1.16	<b>3.41</b>	<b>1.19</b>	3.58	1.08
Safety Threat	3.08	0.92	2.81	1.00	3.10	0.99	<b>2.90</b>	<b>1.24</b>

*Note.* Those evaluations predicted to be lowest are in **bold**.

**Goal priming by environmental concern interaction.** I predicted that participants would particularly dislike the company posing the prime-relevant environmental risk. To assess this, a 4 (motivational prime: control, disease avoidance, resource protection, self-protection; between-participants) by 3 (environmental outcome: pollution, waste, safety; within-participants) mixed

ANOVA was conducted on the evaluation composite. The interaction was not significant  $F(6, 360) = 0.693, p = .656, \eta_p^2 = .011$ . (See Table 2 for the means and standard deviations.) In other words, no support was found for the hypotheses that priming disease avoidance motivations would lead to less positive evaluations of the pollution company, that priming resource protection motivations would lead to less positive evaluations of the company that wasted water, or that priming self-protection motivations would lead to a less positive evaluations of the company framed as posing a threat to one's safety. Because the interaction was nonsignificant, there is no support for the hypothesis that evaluations of each company varied as a function of prime.

***Between-participants design.*** The mixed between/within ANOVA design revealed no significant results. However, one possibility is that the effects of the primes were short-lived and results may have been strongest for the first company evaluated and weaker for the subsequent two companies. Consequently, one might expect that analyzing only the first company presented as a between-participants design might reveal the strongest pattern of means. Unfortunately, due to a programming error in the counterbalancing, there were no participants who both received the resource protection prime and were presented with the pollution company first, and twice as many participants in the self-protection prime condition were presented with the safety company first. Consequently, the data did not constitute a full 3 x 4 factorial design. Because distinct hypotheses were presented for each prime condition and environmental outcome, analyses were conducted involving the each of the available priming conditions separately on evaluations each company.

***Pollution.*** A one-way ANOVA was conducted with Prime (control, disease avoidance, self-protection) on evaluations of the pollution company. The cell

sizes were 16, 15, and 30, respectively. The main effect of prime was not significant  $F(2, 58) = .764, p = .479$ , indicating that prime had no effect on evaluations of the pollution company.

*Waste.* A one-way ANOVA was conducted with Prime (control, disease avoidance, resource-protection, self-protection) on evaluations of the wasting company. The cell sizes were 13, 16, 15, and 15, respectively. The main effect of prime was not significant  $F(3, 55) = .986, p = .406$ , indicating that prime had no effect on evaluations of the wasting company.

*Safety Threat.* A one-way ANOVA was conducted with Prime (control, disease avoidance, resource-protection, self-protection) on evaluations of the safety threat company. The cell sizes were 15, 15, 18, and 16, respectively. The main effect of prime was not significant  $F(3, 60) = .584, p = .647$ , indicating that prime had no effect on evaluations of the safety concern company.

**Perceived health threats and assets.** An integral part of the primary hypotheses is the notion that disease avoidance motivations would translate into disliking of pollution via the belief that pollution poses a health threat. One would expect that both (1) the pollution company would be evaluated as posing more of a health threat than the other two companies and (2) perceiving the polluting company as posing a health threat should be associated with more negative evaluations of that company. Neither result was expected to vary as a function of prime. To test the first question, a within-participants ANOVA on company description was run on ratings of the threat (low scores) or asset (high scores) posed by each company (pollution, wasting, fire concern). There was a significant main effect of company description,  $F(2, 366) = 52.168, p < .001, \eta_p^2 = .222$ . Simple repeated measures contrasts indicated that the pollution company

was rated closer to the threat (low) end of the scale ( $M = 2.46$ ), than the wasting ( $M = 3.62$ ) or fire concern ( $M = 2.96$ ) companies (both  $ps < .001$ ).

To test the second question, a correlational analysis was run to assess the relationship between threat / asset ratings and company evaluations. There was a positive correlation between rating the polluting company as an asset to one's health and positive evaluations of the polluting company,  $r = .712, p < .001$ . It is also worth noting that there were positive correlations between thinking that the wasting company was a health asset and positive evaluations,  $r = .594, p < .001$ , and thinking the fire concern company was a health asset and positive evaluations of that company  $r = .449, p < .001$ .

As a set, the results of perceived health threat and assets posed suggest that participants did consider the pollution company to pose a greater health threat than the other companies, and that the more they believed the company posed a health threat, the more negatively they evaluated the company. However, because the latter association also held for the wasting and fire concern companies, it is unclear whether this speaks to the specifics of pollution as a health concern or perhaps reflects a general negativity bias.

**Perceived resource threats and assets.** A similar repeated measures ANOVA was run to assess the extent to which participants rated each company as posing a threat or asset to their resources. The main effect of company was not significant  $F(2, 366) < 1$ . There were positive correlations between evaluations of the resource wasting company and thinking of it as an asset  $r = .496, p < .001$ , between evaluations of the pollution company and thinking of it as an asset  $r = .562, p < .001$ , and evaluations of the fire-concern company and thinking of it as an asset,  $r = .429, p < .001$ . As a set, these findings do not indicate that people perceived the resource wasting company as posing a

resource threat, but that, in general, thinking of a company as posing a resource threat was associated with more negative evaluations of that company.

**Perceived safety threats and assets.** Again, a repeated measures ANOVA was conducted on safety threat/asset ratings of the three companies. There was a significant main effect of company type,  $F(2, 366) = 34.497, p < .001, \eta_p^2 = .159$ . Simple repeated measures contrasts comparing the fire concern company to the other two indicated that the fire concern company ( $M = 2.64$ ) did not differ from the polluting company ( $M = 2.59$ ), but was rated as more of a threat than the resource concern company ( $M = 3.52$ ),  $p < .001$ . Also, as before, rating a given company as a safety asset was associated with more positive evaluations of that company for the fire concern company  $r = .364, p < .001$ , pollution company  $r = .632$ , and resource wasting company,  $r = .417, p < .001$ .

**Individual differences.** Although a set of individual differences was measured, each is theoretically relevant primarily to one environmental concern. For instance perceived vulnerability to disease was predicted to be relevant to pollution concern, but not to concerns about wasting resources or safety threat. The analyses below therefore focused on the relevant concern, and comparisons were made relative to the control condition. A complete table of correlations between individual difference measures and company evaluations within each goal priming condition is presented in Table 3.

**Perceived vulnerability to disease and pollution.** To test the possibility that negativity towards pollution concern would primarily occur among individuals who were both dispositionally and situationally averse to disease, a series of Pearson correlations associating personal vulnerability to disease and company evaluations were calculated on the 46 participants in the disease avoidance condition. Separate correlation analyses were calculated for each of the two

perceived vulnerability to disease (PVD) subscales (germ avoidance, perceived infectability) and evaluations of the pollution company. The results indicated that perceived infectability was not associated with evaluations of the company ( $r = -.102, p = .502$ ). Germ aversion, contrary to prediction, was *positively* correlated with favorable evaluations of the pollution company ( $r = .311, p = .035$ ), such that the more an individual was concerned about avoiding germs, the more positively they rated the polluting company.

Table 3.

*Table of correlations between individual differences and evaluations of each environmental concern within each goal priming condition.*

	Control	Disease Avoidance	Resource Protection	Self Protection
<b>Pollution</b>				
PVD: Perceived Infectability	0.17	<b>-0.10</b>	-0.43*	0.29
PVD: Germ Aversion	0.09	<b>0.31*</b>	-0.05	-0.15
Pathogenic Disgust Sensitivity	0.05	<b>-0.08</b>	0.17	-0.10
Resource Concern	-0.03	0.09	0.18	-0.17
BDW	0.09	0.14	-0.09	-0.21
<b>Waste</b>				
PVD: Perceived Infectability	-0.08	0.08	0.38*	0.60
PVD: Germ Aversion	0.19	0.04	0.19	0.12
Pathogenic Disgust Sensitivity	0.01	-0.12	0.16	-0.04
Resource Concern	0.16	-0.15	<b>-0.12</b>	0.15
BDW	-0.05	-0.15	-0.10	-0.20
<b>Safety threat</b>				
PVD: Perceived Infectability	-0.15	-0.04	-0.36*	0.33
PVD: Germ Aversion	0.17	0.11	-0.30	0.05
Pathogenic Disgust Sensitivity	0.12	0.01	-0.17	-0.18
Resource Concern	0.16	-0.15	-0.12	-0.19
BDW	0.21	-0.03	0.19	<b>-0.17</b>

*Note.* The correlations hypothesized to be significant are in **bold**. All bolded correlations were hypothesized to be negative, indicating that the more relevant a given concern was to a person, the more negatively they evaluated the company posing a relevant threat.

Alternatively, one might hypothesize an association between individual differences in chronic concern about disease and evaluations of pollution *across* all conditions, and not be limited to those in the disease avoidance prime condition. To test this hypotheses a series of correlational analyses was run of

the full sample of 184 participants who completed the two PVD subscales. Those analyses were also nonsignificant: Neither the perceived infectability ( $r = .020$ ,  $p = .784$ ) nor the germ aversion ( $r = .061$ ,  $p = .407$ ) subscales were associated with changes in evaluations of the polluting company.

**Resource concern and resource wasting.** A reliability analysis of the four resource concern items indicated that the items were highly correlated, Cronbach's alpha = .80, so a composite of the questions was used as a single measure of resource concern. A correlation between resource concern and evaluations of the three companies was conducted only on the 45 participants in the resource protection condition (four participants were omitted because they did not complete the resource concern questionnaire). Resource concern was not associated with evaluations of the wasting company ( $r = -.117$ ,  $p = .532$ ). The effect was also not significant in the full sample of the 179 participants who completed the resource concern measure ( $r = .034$ ,  $p = .652$ ).

**Belief in a dangerous world and safety concern.** There was no significant correlation between BDW and evaluation of the safety threat company either among the 61 participants in the self-protection condition ( $r = -.168$ ,  $p = .205$ ) or among the 178 participants across all goal priming conditions who completed the BDW measures ( $r = .005$ ,  $p = .994$ ).

Finally, to test for the possibility that the relationship between each of the individual differences and relevant outcomes differed as a function of prime, a series of regression analyses were run comparing slopes for the control and relevant prime conditions. For example, two regression analyses were run to compare the relationship between PVD and liking of the pollution company, one for each PVD subscale. Each analysis included the control prime as the reference group, and the relevant goal priming group as a dummy coded group;

the other two priming conditions were excluded from the analysis. For example, in the germ aversion X prime regression analysis, prime, germ aversion, and the prime by germ aversion interaction were entered into a single model. Four regression analyses were run in total: disease avoidance and PVD germ avoidance on pollution, disease avoidance and PVD infectability on evaluations of the polluting company, resource protection and resource concern on evaluations of the wasting company, and self-protection and BDW on evaluations of the safety threat company. All four-regression analyses were nonsignificant indicating that the slope between each individual difference and the relevant prime did not differ from the control slope for the same company evaluation.

***Preference for clean water.*** As one of the potential moderators, participants were asked to what extent they would be bothered by the presence of polluted water in their community. There was a negative correlation between this question and positive evaluations of the wasting company,  $r = .163$ ,  $p = .023$ , indicating that dispositional preferences about the local water supply did, in fact, predict evaluations of the company described as potentially polluting it.

***Exploratory analyses on political orientation.*** Attitudes about environmental outcomes differ as a function of political affiliation (e.g., Gallup, 2010). Democrats have historically been more likely to believe in anthropogenic, or human-caused, global warming, and more likely to endorse legislation aimed at environmental preservation, relative to Republicans. Moreover, although economic benefits may be valued equally positively regardless of political orientation, these benefits may be more likely to be discounted by political liberals because of the environmental detriments they pose. Because each of the companies was described as bringing economic benefits to the community, one



possibility is that political conservatives may be more likely to evaluate all three companies more positively.

These hypotheses are exploratory. Additionally, no clear theoretical distinctions are made between Democrats and liberals, or Republicans and conservatives, although both measures were assessed. Liberalism and conservatism were measured as continuous variables on three separate dimensions: social, fiscal, and overall. Conservatism was at the low end of the rating scale, and liberalism at the high end, consequently, the scale is referred to hereafter as *liberalism*. Political affiliation was measured categorically, and many participants did not identify as belonging to any of the major analyses. Because there was no theoretical distinction made between political attitudes measured continuously, and political affiliation measured categorically, and because analyses on political affiliation would systematically exclude a large number of participants, I have reported analyses based on political attitudes.

***Political orientation and environmental concern.*** Based on the above rationale one might expect that liberals would evaluate the pollution and wasting companies less favorably than would conservatives. Because the safety-threat company was not presented as an environmental threat, but rather as a safety concern—a universal concern, unrelated to political ideology—differential evaluations of the safety threat company by political orientation were not expected. To examine whether the correlation between liberalism and liking of a given company differed between the control group and the relevant goal prime group, three distinct dummy-coded regression analyses were run with the control as the reference group: pollution evaluations regressed on liberalism and prime (control, disease avoidance), waste evaluations regressed on liberalism and prime (control, resource protection), and safety threat evaluations regressed on

liberalism and prime (control, self-protection). None of the three regression models predicted a significant proportion of variance in evaluations of the relevant company. Finally, as shown in Table 4, there were no significant correlations between overall liberalism and evaluations of any of the three companies, in any condition or overall.

Table 4.

*Correlations between evaluations of each company type and liberalism, Experiment 1.*

	<i>N</i>	Pollution	Waste	Safety
Control	44	0.052	0.114	0.196
Disease Avoidance	46	-0.078	-0.017	0.025
Resource Protection	33	-0.043	-0.174	0.125
Self Protection	61	0.185	0.133	-0.043
Overall	184	0.035	-0.018	0.038

*Note.* There were no significant correlations.

Similar analyses were run on the four affiliations that had more than 30 participants: Democrat, Republican, Independent, and “apolitical” as predictors of evaluations of the polluting company. The results did not differ from those of the continuous overall political attitudes measure; of the three regression models, none accounted for a significant proportion of variance in evaluations of the companies.

**Summary of Results.** The hypothesized relationship between pathogenic concern and dislike of pollution received no empirical support either for those situationally primed with disease concern, for those chronically concerned about disease, or for the situational prime by disposition interaction. Similarly, the hypothesized relationship between concern over resources and dislike of resource-wasting received no support among those dispositionally or situationally primed to be concerned over resources. Finally, the hypothesized relationship between physical safety concern and dislike of outcomes framed as

posing a physical safety threat also received no support among those dispositionally or situationally primed with that concern. There were no effects of political affiliation on evaluations of the three forms of environmental concern.

## Chapter 3

### EXPERIMENT 2

Experiment 1 did not yield results in the anticipated pattern. Because disease avoidance and pollution constitute perhaps the most clear conceptual case, Experiment 2 was designed to focus exclusively on the link between disease concern and reactions to pollution. One possible reason for the absence of predicted findings on pollution may be the type of pollution considered. For example, pathogenic threats may have more characteristics in common with air pollution than water pollution. Olfactory cues are especially strong triggers for pathogenic disgust reactions (Petó, 1936) and may be more noticeable via air than water pollution. Similarly, it may be much more common for individuals to be infected by airborne than waterborne pathogens.

Moreover, it is not clear what degree of pollution severity is needed to elicit the hypothesized effect. One might expect that severe forms of pollution would be offensive to everyone and mild forms of pollution offensive to no one. It is unclear how severe pollution needs to be to—or how perceptible the pollution needs to be—for people to react to it. Therefore, Experiment 2 participants were presented with descriptions of a company that would move into their neighborhood and emit several tons of air pollution daily. The descriptions varied in the extent to which pollution might be visible to residents of the neighborhood or in terms of the expected health consequences of that pollution. The purpose of this experiment was to better understand which aspects of pollution might be differentially bothersome to individuals under disease avoidance motivation.

Finally, to address the possibility that the student sample at ASU is more homogeneous in their attitudes about environmental outcomes than the

population at large, Experiment 2 was conducted on a large sample of residents within the United States.

## **Method**

**Participants.** Participants were recruited from an online survey website (Mechanical Turk), and were required to be residents of the United States over 18 years of age. There were 222 participants, each of whom was paid \$0.25 to participate. There were 91 males, 126 females, and 5 who did not indicate their gender. Ages ranged from 18 to 73 with a mean age of 35.98 years. Forty-five participants self-identified as Republicans, 70 as Democrat, 54 as Independents, and the remaining 53 participants either declined to respond or reported belonging to other parties or being unaffiliated.

**Goal priming manipulation.** Participants were guided through either the control or disease avoidance scenarios used in Experiment 1.

**Pollution concern measures.** Participants were presented with a similar paradigm in which they were instructed to imagine that a manufacturing plant would be moving near their neighborhood, would bring 2000 much-needed jobs, and have a positive impact on the local economy (see Appendix K). The *no-mention control condition* simply stated that the company may “affect the community in other ways as well.” The *smokestack-only condition* included the same information as the no-mention control, but also noted that “The company that will move into your neighborhood would have several smokestacks that emit several tons of pollutants into the air daily.” The remaining four conditions contained the same information and wording as the smokestack-only condition but included an additional sentence about the consequences of the pollutants. In the *low visibility condition*, participants were told that the “smoke would be visible in the area immediately surrounding but might not be noticeable in residential

areas.” In the *moderate visibility condition*, the wording was the same except that “might not be noticeable” was changed to “might *also* be noticeable in residential areas.” In the *small health risk condition*, participants were told that “although there is a small amount of disagreement, most experts agree that, with the expected exposure, the risks of serious health problems are small.” Participants in the *moderate health risk condition* received the same wording except the word “small” was changed to “moderate.”

The evaluations of the companies were identical to the first set of evaluation questions asked in Experiment 1 (see Appendix L).

## Results

**Goal priming by pollution description.** To examine how the evaluations of each of the companies varied as a function of prime, a 2 (goal priming: control, disease avoidance) by 6 (Company Description: no mention, smokestack only, low visibility, moderate visibility, low health risk, moderate health risk) between-participants ANOVA was conducted on positive evaluations of the companies; see Table 5 for means and standard deviations of each cell. There was no significant prime by company description interaction  $F(5, 210) = 1.372, p > .2$ , and no main effect of prime  $F(1, 210) < 1$ . There was, however, a significant main effect of company description  $F(5, 210) = 11.147, p < .001$ . Pairwise comparisons were conducted on the marginal means of each of the company descriptions. The company with no mention of pollution received the highest positive evaluation ( $M = 4.26$ ) and was higher than all other company descriptions (all  $p$ 's  $< .001$ ). Other than that, the only two significant pairwise comparisons involved the low visibility company ( $M = 2.48$ ), which received the lowest evaluation. The moderate visibility ( $M = 3.15$ ) and the small health risk ( $M = 3.19$ ) companies were the most positive evaluated companies that did mention

pollution, and both were evaluated significantly more positively than the low visibility company ( $p = .032$ , and  $p = .034$ , respectively). The moderate health risk ( $M = 2.59$ ) and smokestack-only ( $M = 2.57$ ) companies were evaluated fourth and fifth most positively, and did not differ significantly from any company descriptions other than the one that did not mention pollution.

In sum, priming individuals to feel motivated to protect themselves from disease did not affect evaluations of any of the companies, and did not interact with company description. However, any mention of pollution caused the companies to be evaluated more negatively than the company with no such mention.

**Degree of health risk and evaluations of company.** The hypothesized relationship between disease concern and evaluations of pollution are expected due to associations individuals may have with pollution as a potential health risk. By comparing the two companies which explicitly mention the degree of health risk, it may be possible to more directly test this hypothesis. Specifically one might expect that by negating the health risk (explicitly stating that it is small), any association between disease concern and dislike of pollution may be alleviated. To test this a 2 (health risk: small, moderate) by 2 (prime: control disease avoidance) between-participants ANOVA was conducted on only those participants who read either the small or moderate health risk company descriptions. The interaction was not significant  $F(1, 63) = 2.723$ ,  $p = .194$ , ( $n = 16-18$  for each cell,  $N = 67$  overall), and did not support this possibility. However, the cell sizes were small, so this test may have been underpowered.

Table 5

*Table means and standard deviations of evaluations by company description and prime, Experiment 2.*

Company Description	Control			Disease Avoidance		
	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
No Mention of Pollution	4.42	1.33	25	4.12	1.04	28
Smokestack Only	2.67	1.56	12	2.52	1.25	27
Low Visibility	2.14	1.08	15	2.82	1.37	16
Moderate Visibility	2.92	1.64	20	3.54	1.77	12
Small Health Risk	2.95	1.17	17	3.46	1.75	16
Moderate Health Risk	2.86	1.36	18	2.28	1.01	16

*Note.* Higher scores indicate more positive evaluations.

**Chronic pathogen concerns and pollution description.** To understand the relationship between PVD and evaluations of the companies, correlations were assessed using both PVD Germ Avoidance and PVD Perceived Infectability, collapsing across all conditions. Neither PVD subscale predicted evaluations of the company. However, to test whether such a relationship existed but was obscured by prime, two separate dummy-coded regression analyses were conducted with the control prime as the reference group, and the disease avoidance prime as the dummy-coded group. Each model also included one of the PVD subscales and the prime by PVD subscale interaction as predictors of company evaluations. Neither analysis was significant, and no evidence was found to support the hypothesis that increases in chronic pathogen concerns would be associated with decreased liking of companies that pollute.

**Summary.** Experiment 2 did not find support for the hypothesized association between disease concern and dislike of pollution, either situationally (due to goal priming) or dispositionally. The experiment did, however reveal a main effect of company description such that *any* mention of pollution—regardless of visibility or health consequences—caused a company to be evaluated less positively.



## Chapter 4

### EXPERIMENT 3

Experiments 1 and 2 failed to find support for the hypothesis that concern about germs and disease, whether dispositional or situational, would lead to greater disliking of pollution. The purpose of Experiment 3 was to address the possibility that there was a mismatch between the type of health concern elicited by the primes, on the one hand, and the outcomes being considered, on the other. Whereas pollution, as emitted by a factory in the neighborhood, is intangible and impersonal, the disease concern manipulation scenario was both tangible and highly interpersonal (i.e., imagining interacting with old, sick people). Experiment 3 employed two new disease avoidance primes—one interpersonal (e.g., encountering sick, sweaty, and foul-smelling people) and one impersonal (e.g., encountering moldy food, dog poop, and a cockroach).

This experiment also addressed the possibility that pollution, in the absence of countervailing factors, may universally be negatively evaluated. Moreover, in the absence of a broader context including extremely negative events and circumstances, negative evaluations of polluting companies may be quite high and show little variability—making it difficult to detect potential effects of predictor variables. To address this issue, I embedded evaluations of air pollution within a list of other events and circumstances universally held to be bad, including some—such a famine and genocide—likely to be evaluated more negatively than pollution. I also employed a ranking measure, thereby forcing participants to differentiate among the highly negative events.

Last, given that a typical dislike for air pollution might be tempered when competing motivational concerns are salient, such as economic concern, I also included an economic concern prime in this experiment.

## Method

**Participants.** Participants were recruited online via Mechanical Turk and were paid \$0.25 for their participation. The sample of 122 participants consisted of 51 males and 71 females from within the United States. One male did not respond to the water pollution rating question, so analyses involving water pollution are from a sample of 121.

**Goal manipulation primes.** There were four motivational prime conditions. Each was elicited by a series of three statements participants were asked to visualize and write about (see Appendix N). In the *control condition* participants were asked to imagine themselves seeing a dog running through the park, a ball rolling across the floor, and fitting an extra book into a full bookshelf. Items for the interpersonal and impersonal disgust primes were modified from the pathogenic disgust subscale of Tybur et al. (2009) three domain disgust scale. In the *interpersonal disgust condition*, they were asked to imagine themselves sitting next to someone who had red sores on their arm, shaking hands with a stranger who has sweaty palms, and standing close to a person who had body odor. In the *impersonal disgust condition* they were asked to imagine themselves stepping in dog poop, seeing some mold on leftovers in their refrigerator, and seeing a cockroach run across the floor. Finally, in the *economic concern condition*, participants were asked to imagine a man hanging an “out of business” sign on a door, a young person holding a “will work for food” sign, and watching a coworker receive a pink-slip (lay-off notice). The control, interpersonal disgust, and impersonal disgust goal primes were piloted in a separate experiment, which indicated that those who received either disgust prime reported feeling significantly more “grossed out” than participants in the control condition. The financial concern manipulation was not piloted.

**Evaluation measures.** The focal evaluations of pollution were presented in a list of generally negative things, including genocide, famine, and war. Participants also evaluated several additional environmental concerns, including climate change and overpopulation, and evaluated financial concerns such as income tax evasion and insider trading on the stock market (see Appendix O). Participants were asked to rate each of the 18 items on the list from “not at all bad” (1) to “extremely bad” (7). After rating all of the items, participants completed two separate ranking tasks, dividing the 18 items into two sets of 9. The ranking sets were separated into two smaller groups to reduce the cognitive burden on participants that might have arisen from making too many comparisons. Water pollution and air pollution were assigned to separate ranking lists; all other items were arbitrarily assigned to lists. Lower scores indicated that an item was frequently ranked as worse than other items.

## **Results**

**Manipulation Check.** To test the effectiveness of the new goal primes, I conducted a mixed ANOVA with goal prime (control, interpersonal disgust, impersonal disgust, financial concern) as a between-participants measure, and affective reaction (grossed out, protect self from germs, concern about finances, think about economy) as a repeated measure. The manipulation check was administered near the end of the experiment and asked participants to think back to the imagery task and indicate the extent to which they felt grossed out, felt a desire to protect themselves from germs and disease, felt concerned about their finances, and thought about the economy. There was a significant goal prime by affective reaction interaction,  $F(6.274, 250.952) = 6.870, p < .001$ , after a Greenhouse-Geisser adjustment for sphericity in the data. As in Experiment 1, because the focal questions have to do with whether each condition elicited the

intended affective reaction, follow-up tests were conducted separately for each condition (see Table 6 for means and standard deviations).

**Control.** The repeated measures ANOVA on the 30 participants in the control prime condition revealed no main effect on affective reaction  $F(2.506, 72.682) = 2.116, p = .116$ , indicating that, as expected, participants in the control condition did not experience any one affective reaction significantly more than the others.

Table 6.  
Table of means and standard deviations for manipulation check, Experiment 3.

	Control ( <i>n</i> = 29)		Interpersonal Disgust ( <i>n</i> = 26)		Impersonal Disgust ( <i>n</i> = 32)		Financial Concern ( <i>n</i> = 31)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Grossed out	3.14 <sup>1</sup>	2.18	<b>3.38</b> <sup>1</sup>	2.04	<b>4.72</b> <sup>1</sup>	1.84	2.90 <sup>2</sup>	2.06
Germs and disease	3.17 <sup>1</sup>	2.11	<b>3.58</b> <sup>1</sup>	1.98	<b>4.31</b> <sup>1</sup>	2.18	3.03 <sup>2</sup>	2.14
Concerned about finances	2.86 <sup>1</sup>	2.12	2.50 <sup>1</sup>	2.03	3.00 <sup>3</sup>	2.14	<b>4.19</b> <sup>1</sup>	2.20
Think about economy	2.62 <sup>1</sup>	1.72	2.92 <sup>1</sup>	2.04	3.56 <sup>2</sup>	2.30	<b>4.71</b> <sup>1</sup>	1.97

*Note.* Those evaluations predicted to be highest are in **bold**. Within each column, the subscript 1 indicates the highest mean within the particular prime, unique subscripts indicate that a mean was significantly lower than the next highest mean. Non-consecutive comparisons are not reported in the table, but substantively relevant differences are reported in the text of the results.

**Interpersonal Disgust.** The repeated measures ANOVA on the 28 participants in the interpersonal disgust condition revealed a marginally significant main effect on affective reaction  $F(2.032, 54.870) = 3.062, p = .054$ . Pairwise comparisons revealed that participants reported feeling significantly more concerned about germs and disease than concerned about their finances ( $p = .004$ ). No other comparisons were significant.

**Impersonal Disgust.** The repeated measures ANOVA on the 33 participants in the interpersonal disgust condition revealed a significant main effect on affective reaction  $F(2.279, 72.915) = 9.638, p < .001$ . Pairwise comparison follow-up tests indicate that participants reported feeling significantly

more “grossed out” than concerned about their finances ( $p < .001$ ) or the economy ( $p = .007$ ). Similarly, participants reported feeling more desire to protect themselves from germs and disease than either concern about their finances ( $p = .001$ ) or the economy ( $p = .066$ ). Participants in the impersonal disgust condition did not differ in the extent to which they felt grossed out and the extent to which they felt the desire to protect themselves from germs and disease.

**Economic Concern.** The repeated measures ANOVA on the 33 participants in the financial concern condition revealed a significant main effect on affective reaction  $F(1.518, 50.606) = 7.112, p = .004$ . Pairwise comparison follow-up tests indicate that participants differed slightly, but not significantly, in the extent to which they thought about the economy or felt concerned about their finances ( $p = .056$ ). They did, however, report feeling significantly more worried about their finances than they felt “grossed out” ( $p < .028$ ), or concerned about avoiding germs and disease ( $p = .037$ ). Similarly, participants reported thinking about the economy more than they felt grossed out ( $p = .002$ ) or concerned about avoiding germs and disease ( $p = .005$ ).

In sum, the manipulation checks revealed that, in general, the manipulations elicited more relevant emotion and motivation than irrelevant emotion or motivation. This effect was somewhat weaker in the interpersonal disgust condition, but pilot testing and the results of Experiment 4 (below) indicated that this manipulation indeed often elicited the expected affective and motivational reactions.

**Motivational prime on evaluations of air pollution ratings.** To test the effects of the motivational primes on evaluations of air pollution, a one-way ANOVA was run with prime as a predictor of air pollution ratings. The main effect

of prime was not significant  $F(3, 115) = 1.701, p = .169$  (see Table 7 for means and standard deviations).

Table 7.

*Table of means and standard deviations for badness ratings, Experiment 3.*

	Control ( <i>n</i> = 29)		Interpersonal Disgust ( <i>n</i> = 26)		Impersonal Disgust ( <i>n</i> = 32)		Financial Concern ( <i>n</i> = 31)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Ratings								
Water Pollution	5.66	1.05	5.31	0.84	5.91	1.17	5.16	1.55
Air Pollution	5.45	0.95	5.04	1.08	5.47	1.41	4.77	1.61

*Note.* Higher scores indicate greater negativity.

**Motivational prime on evaluations of water pollution ratings.** To test the effects of the primes on evaluations, a one-way ANOVA was run with prime as a predictor of water pollution ratings. The main effect of prime was not significant  $F(3, 115) = 2.160, p = .097$ .

**Motivational prime on evaluations of air pollution rankings.** To test the effects of the primes on air pollution *rankings*, a one-way ANOVA was run with prime as a predictor of the rankings of air pollution. The main effect of prime was not significant  $F(3, 115) < 1, p > .5$ ; see Table 8 for mean rankings.

**Motivational prime on evaluations of water pollution rankings.** To test the effects of the primes on water pollution rankings, a one-way ANOVA was run with prime as a predictor of the ranking of water pollution. The main effect of prime was not significant  $F(3, 115) = < 1, p > .5$ .

**Impersonal disgust versus financial concern on pollution ratings.** The impersonal disgust prime was hypothesized to elicit the greatest increase in negative evaluations of pollution relative to control. Conversely, the financial concern was hypothesized to make pollution seem less negative, relative to control. To test whether these two means, which were expected to show the

greatest difference, actually differed, two separate t-tests (one for air pollution, one for water pollution) were run between just the participants in the impersonal disgust and financial concern conditions. These two groups differed significantly in the extent to which they rated water pollution as bad,  $t(63) = 2.042, p = .045$  with those in the impersonal disgust condition rating water pollution as worse ( $M = 5.91$ ) than did those in the financial concern condition ( $M = 5.16$ ); these groups did not differ, however, in their evaluations of air pollution  $t(64) = 1.341, p = .185$ .

Table 8.

*Table of means and standard deviations for badness rankings, Experiment 3.*

	Control ( <i>n</i> = 29)		Interpersonal Disgust ( <i>n</i> = 26)		Impersonal Disgust ( <i>n</i> = 32)		Financial Concern ( <i>n</i> = 31)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>List A</i>								
Genocide	2.52	2.44	1.93	2.15	1.67	1.76	2.41	2.76
Toxic Waste Dumping	3.97	1.59	3.89	1.89	3.58	1.39	4.50	1.97
<b>Water Pollution</b>	<b>4.14</b>	1.83	<b>4.19</b>	1.27	<b>4.36</b>	1.52	<b>4.81</b>	1.82
Famine	4.59	2.31	3.74	2.01	3.94	2.52	3.88	2.38
Homelessness	4.93	2.37	4.89	2.21	4.94	2.00	4.81	2.29
Overpopulation	5.59	2.10	6.37	2.15	6.55	1.80	5.94	2.21
Climate Change	6.03	2.26	5.78	1.93	6.58	1.75	6.22	1.96
Income Tax Evasion	6.38	2.35	6.89	1.67	6.33	2.19	6.03	2.44
Shoplifting	6.86	2.97	7.33	2.66	7.06	2.59	6.41	2.71
<i>List B</i>								
Child Abuse	1.72	1.36	1.81	1.69	1.94	1.46	3.00	2.77
War	3.07	2.42	3.04	2.07	2.64	2.06	2.94	2.30
Poverty	4.72	1.94	4.70	2.15	4.36	2.03	4.94	2.15
<b>Air Pollution</b>	<b>5.10</b>	1.68	<b>5.41</b>	1.42	<b>5.12</b>	1.83	<b>5.13</b>	1.81
Identity Theft	5.28	2.19	5.33	2.48	5.42	2.60	4.97	2.40
Racial Discrimination	5.41	2.32	4.74	2.28	4.88	2.09	4.97	2.52
Global Warming	6.31	2.44	6.15	1.75	6.58	1.73	6.28	1.90
Insider Trading	6.41	2.49	6.48	2.64	6.76	1.85	5.94	2.58
Expanding Landfills	6.97	1.55	7.33	1.71	7.30	1.79	6.84	2.00

*Notes. The focal items, air pollution and water pollution, are in bold. A ranking on 1 represented the worst item on the list.*

**Chronic pathogenic concerns by condition.** As with the previous studies, the relationship between the two PVD subscales and rating of pollution

was evaluated in two ways: the overall correlation and the interaction with condition. First, a correlational analysis was conducted on the full sample of participants who completed the PVD measure. Neither the germ aversion nor the perceived infectability subscales were significantly correlated with ratings of either air or water pollution.

Next, to evaluate whether the effects of chronic pathogenic concern on ratings of air and water pollution varied as a function of condition, 4 distinct regression analyses were run, each with condition dummy coded with the control prime as the reference group. Each analysis investigated either the germ aversion or the perceived infectability subscale of PVD, and the outcome was either water pollution or air pollution.

Neither of the analyses on air pollution was significant (both  $F$ 's < 1, both  $p$ 's > .5). The germ aversion by condition regression analysis on water pollution was also not significant ( $F(7, 115) = 1.298, p = .258$ ). The regression analysis on water pollution involving perceived infectability by condition, however, was marginally significant,  $F(7, 115) = 2.033, p = .057$ , and accounted for about 11 percent of the variability in ratings of water pollution. It is likely this effect was driven by the financial concern condition. At the mean level of perceived infectability, none of the conditions differed from the control group on ratings of water pollution, and the slopes for the interpersonal and impersonal disgust conditions did not differ from control. However the slope for perceived infectability was significantly more positive ( $b = .540, se = .239, t = 2.256, p = .026$ ) for participants in the financial concern condition than the slope for participants in the control condition. For every one unit increase in perceived infectability, participants in the financial concern condition rated water pollution as .328 units worse, whereas in the control condition the nonsignificant trend was to rate water



pollution as .212 units better for every unit they increased in perceived infectability. The trend was in the opposite direction of the hypothesized relationship. That is, whereas one might expect individuals who had greater chronic infectability concern would rate water pollution more harshly, we see instead that as perceived infectability increased, the trend was for evaluations of water pollution to become less harsh.

**Political attitudes and pollution ratings.** A correlational analysis was run to investigate the extent to which people’s self-reports of being conservative or liberal—socially, fiscally, and overall—were associated with their ratings of air and water pollution. Rating oneself as liberal was positively correlated with harsher ratings of environmental items such as air pollution, water pollution, and climate change (see Table 9). However, the associations between overall political attitudes and water pollution and air pollution did not differ as a function of condition, as indicated by a set of nonsignificant condition x overall political attitudes on water pollution and air pollution.

Table 9  
*Table of correlations between political attitudes (liberalism) and (negative) ratings of environmental outcomes, Experiment 3.*

Environmental Concern	Dimension of Liberalism		
	Overall	Social	Economic
Water Pollution	0.128	0.098	0.164
Air Pollution	0.209*	0.083	0.282**
Climate Change	0.474***	0.414***	0.500***
Global Warming	0.469***	0.384***	0.527***
Toxic Waste Dumping	0.185*	0.076	0.201*
Expanding Landfills	0.325***	0.213*	0.338***
Overpopulation	0.297***	0.212*	0.299***

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .

*Note. Positive correlations indicate that as liberalism increased an item was evaluated more harshly.*

**Summary.** Experiment 3 did not find support for the hypothesis that dispositional or situationally primed concern about disease would be associated with increased negative evaluations of either air or water pollution.

## Chapter 5

### EXPERIMENT 4

Experiments 1 through 3 did not find the hypothesized association between pathogenic concern and aversion to pollution. The purpose of this fourth experiment was to investigate other contextual factors that may come into play when individuals are considering the pros and cons of pollution. One of the aims of this line of research was to find a way to address some motivational difficulties of engaging in pro-environmental behaviors. Specifically, in the context of many competing goals, pro-environmental goals may become relatively low priority. I designed Experiment 4 to test the possibility that people might trade off their environmental concerns and become more tolerant of pollution to gain another good, such as the economic well-being of a community.

#### **Method**

**Participants.** Participants from the United States were recruited online via Mechanical Turk and were paid \$0.25 for their participation. The sample of 83 participants consisted of 37 males, 45 females, and one person who did not report gender.

**Goal manipulation primes.** I employed a similar manipulation as in Experiment 3, in which participants read a brief statement and imagined themselves in the scenario. The goal primes included control, interpersonal disgust, impersonal disgust, and financial concern conditions. As before, participants were asked to write 2-3 sentences about what they pictured. One change was made, however, to the final financial concern statement: The wording was changed from “Imagine seeing a coworker getting a pink-slip (lay-off notice)” to “Imagine watching a coworker packing up belongings after getting laid

off,” to be more visually concrete and avoid confusion for participants who may be unfamiliar with the concept of a pink slip.

**Budget paradigm.** Participants were asked to consider how they might spend municipal funds, if the decision were up to them. They were told that they had a \$10 million budget to allocate as they wished among 6 different options—economic development, clean air and water, transportation, public safety, public services (such as parks and libraries), and civic justice (court systems). Each option was followed by a list of a few concrete uses for the funds to ensure that people had an equal understanding of each option (see Appendix P). The clean air and water option was presented as a set of policies to limit air and water pollution. Participants were asked to indicate the percent of the budget they would allocate to each option, with the requirement that their allocations sum to 100%. After completing the initial budget measure, they were asked to imagine that the government had a surplus and could spend an additional \$10 million on any combination of options they would like, with the additional option of not spending the funds. The purpose of the surplus measure was to be able to assess separately those options that individuals viewed as necessary from those they viewed as nice to have, given sufficient funds.

## **Results**

**Goal prime and budget allocations to clean air and water.** A one-way ANOVA revealed no main effect of goal priming (control, interpersonal disgust, impersonal disgust, financial concern) on allocation to clean air and water in either the initial budget  $F(3, 79) < 1, p > .9$ , or surplus budget,  $F(3, 79) < 1, p > .9$ . See Table 10 for means and standard deviations of allotments to each budget category.

**Pathogenic concern and initial budget allocations to clean air and**

**water.** There was no significant correlation between germ aversion and allocations to clean air and water in the initial budget. However, there was a positive correlation between perceived infectability and allocations to clean air and water in the initial budget,  $r = .264$ ,  $p = .016$ , indicating that individuals who perceived themselves to be more susceptible to infectious disease were willing spend more of the annual municipal budget on clean air and water.

Table 10.

*Table of means and standard deviations for allocations from initial budget by prime, Experiment 4*

	Control ( <i>n</i> = 29)		Interpersonal Disgust ( <i>n</i> = 26)		Impersonal Disgust ( <i>n</i> = 32)		Financial Concern ( <i>n</i> = 31)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<b>Initial Budget</b>								
Economic Dev.	15.1	7.3	15.3	9.9	21.3	11.4	22.9	13.2
Clean Air and Water	15.1	8.7	16.6	9.7	14.3	5.2	14.4	6.7
Transportation	18.3	5.6	18.5	6.9	14.2	5.0	15.7	5.0
Public Safety	21.1	8.4	22.6	13.2	22.8	9.3	20.2	7.6
Public Services	15.5	7.9	12.0	4.7	13.3	4.9	13.0	5.1
Civic Justice	14.8	6.4	15.1	8.1	14.0	6.3	13.8	5.3
<b>Surplus Budget</b>								
Economic Dev.	9.0	12.4	10.5	8.6	13.2	11.5	25.9	22.7
Clean Air and Water	10.0	11.3	9.7	6.8	10.0	9.0	10.7	9.0
Transportation	8.0	9.4	12.3	7.8	9.9	7.7	11.1	6.8
Public Safety	7.7	9.2	14.2	10.6	14.7	13.0	11.6	8.6
Public Services	11.3	13.0	9.6	6.9	10.1	9.1	8.7	7.7
Civic Justice	12.7	25.6	9.6	6.9	9.0	7.9	8.6	7.0
Keep Surplus	41.3	38.9	34.1	35.0	33.1	35.6	23.5	26.4

*Note. Numbers represent the mean percentage of the budget (either initial or surplus) allocated to each option.*

Two separate regression analyses (one for each PVD subscale) were run to test whether the above relationships varied as a function of goal prime. Each model included the control prime condition as the reference group, the three other primes as dummy coded groups, the relevant PVD subscale, and the interactions with that subscale and each of the dummy coded groups. Neither regression model accounted for a significant amount of variance in allocations to

clean air and water, indicating that goal priming did not affect the above correlations. Additionally, the nonsignificant effect of perceived infectability by condition indicates that the positive relationship there is not affected by goal priming state.

**Pathogenic concern and surplus budget allocations to clean air and water.** Neither the perceived infectability nor the germ aversion subscales were significantly correlated with allocations of the surplus budget to clean air and water.

A pair of regression analyses analogous to those run for the initial budget, were run to test whether the relationship between either PVD subscale and surplus budget allocations to clean air and water varied as a function of goal prime. Neither regression model accounted for a significant amount of variance in allocations to clean air and water, indicating that goal priming did not affect the above correlations.

**Political attitudes and budget allocations to clean air and water.** There was no significant correlation between overall political attitude (liberalism) and allocations to clean air and water in either the initial or surplus budget condition. Additionally, separate goal prime by political attitude regression analyses on the initial and surplus budgets did not account for a significant amount of the variability in allocations to clean air and water for either budget.

## Chapter 6

### GENERAL DISCUSSION

Four experiments tested the hypothesis that the salience of concerns about one's fundamental goals (disease avoidance in all experiments, resource protection and self-protection in Experiment 1) would predict disliking of environmental outcomes associated with those threats (pollution in all experiments, wasting resources and safety threats in Experiment 1). Across all experiments, making disease avoidance motives salient via visualization tasks did not lead to more negative evaluations of pollution (Experiments 1 through 3) or increased budgetary allocations to clean air and water (Experiment 4). This was the case whether participants imagined being part of an elaborate scenario that involved interpersonal disgust (Experiments 1 and 2), imagined themselves encountering others who exhibited disease cues (Experiments 3 and 4), or imagined themselves encountering impersonal disease cues (Experiments 3 and 4). Similarly, chronic disease concern (as measured by two separate PVD subscales) did not predict negative evaluations of pollution, whether for those situationally primed with disease concern or collapsing across all primes. However, individuals who believed themselves susceptible to catching contagious diseases (i.e., those who scored high on the infectability subscale of PVD) allocated larger portions of the initial municipal budget to clean air and water policies in Experiment 4.

The overall lack of significant findings is not likely due to a failure to elicit the intended motivational state. Manipulation checks revealed that people reported experiencing the intended affective and motivational states. It is also not likely that the descriptions of pollution failed to catch the attention of participants: Experiment 2 indicated that any mention of pollution or smokestacks caused

participants to evaluate the target company more negatively than a company not described as emitting pollutants. Additionally, in Experiment 3 when participants were asked to rank air and water pollution relative to a host of other objectively bad items, water pollution was ranked 4.4 out of 9 (where 1 represented the worst item)—almost as bad as famine, and slightly worse than poverty. Air pollution was ranked 5.2 out of 9 and was considered worse than identity theft, global warming, and overpopulation.

One area that merits more research is the role of context and conflicting goals in the consideration of environmental outcomes. The only evidence for the connection between motivational state and preferences about pollution was found in Experiment 4 when participants had to choose between several competing options. Those individuals who perceived themselves as likely to catch communicable diseases allocated funds to clean air and water—and, by extension, to spend less on alternatives such as economic development, transportation, and other municipal services.

On the whole, then, no support was found for the hypothesis that priming individuals with disease avoidance concerns would lead to particularly negative evaluations of pollution, or other relevant environmental outcomes, and limited support was found for the hypothesized association between chronic pathogenic concerns and preference for environmental outcomes.

### **Possible explanations for null findings.**

Across four experiments, no consistent support was found for the hypotheses. Two possibilities exist to explain the lack of support: (1) the hypotheses are incorrect and the proposed relationship does not exist; or (2) the hypothesized relationship exists, but was not detected. To examine the first possibility, it is important to consider whether both the independent and



dependent variables corresponded to the theoretical variables they were intended to represent (construct validity), and whether both moved in conjunction with other variables that should be theoretically relevant (Greenwald, 1975). The manipulation checks elicited the intended motivational and affective responses, so it is unlikely that the null results were due to a failure of the independent variables to elicit the intended states. To better understand whether the null results were due to a failure to capture adequate variability on the DV, it is important to establish that evaluations of pollution, for example, covary with items that should theoretically be related. Although there was no strong pattern establishing that political attitudes predicted disliking of pollution in Experiment 1, people who reported that they would be bothered by the presence of polluted water in their neighborhood evaluated the polluting company less positively. Similarly, in Experiment 3, which employed different methods, there was a positive association between liberalism and evaluating air pollution (but not water pollution) as worse. Additionally, in Experiment 2, there was a main effect of company type such that any company that mentioned pollution was evaluated more negatively than the company description that did not mention pollution. Overall then, there was modest evidence suggesting that assessments of pollution covaried when they, theoretically, were predicted to do so. These findings, as a set, suggest that the experiments, as designed, could have detected the hypothesized relationship if it had, in fact, existed, and lend support to the possibility that the hypotheses were incorrect.

#### **Theoretical Misspecification: Toxin Avoidance rather than Disease**

**Avoidance?** Most health risks associated with pollution are from exposure to toxins, not germs. Öhman and Mineka (2001) suggest that fear, such as that elicited by exposure to venomous creatures, is learned fairly automatically upon

exposure to stimuli. Similar to disease avoidance, then, toxin avoidance mechanisms, such as fear, may confer similar advantages in terms of universality and may lend itself well to sustained motivation. Like germ cues, toxin cues may be elicited by smell, sight, or taste, and may also elicit the same avoidant physical reactions (e.g., contracting nose and mouth muscles, and moving away from the threatening object). Both may share similar biological and learned aversion characteristics (e.g., olfactory cues, and learned aversion to any object that has previously made one ill). Nonetheless germ-avoidance and toxin-avoidance may be distinct mechanisms, and the concerns may be elicited by distinct cues. Perhaps the smells associated with germ-laden substances (e.g., rot) differ from the smells associated with toxins (e.g., sulfur). Perhaps individuals attend to slightly different cues when thinking about how to avoid toxins (e.g., don't eat the red berries that made me sick last time) than to avoid germs (e.g., don't sit next to the man with red sores.) Unlike germ-avoidance, toxin avoidance is likely to be linked not to cues from interpersonal interactions, but rather, environmental cues. Such cues may be much more similar to the impersonal disgust manipulations used in Experiments 3 and 4, than to the interpersonal disgust manipulations. Better yet might be a manipulation that primed exposure to toxins such as encountering snakes or spiders. Future studies should investigate differences between priming scenarios that indicate a disease-laden environment and those that indicate a toxic environment.

**Lack of salient connection between threats.** The current experiments relied on leveraging participants' existing associations between the given environmental outcome and fundamental motive. However, it is possible that for many people there is no salient link between, for example, pollution and health concerns. In Experiment 1, participants were asked to report the extent to which

they felt each company posed a threat to their health. Those who believed the company posed a health threat evaluated it less positively. However, such associations were also present between thinking that the wasting and fire concern companies posed a health threat and disliking those companies, respectively. Consequently, it is difficult to discern whether this association reflects a genuine relationship between perceived health threat and disliking of pollution, or may, instead, merely reflect general negativity toward a company.

It is also worth noting that any mention of pollution resulted in negative evaluations of companies in Experiment 2. If participants had no negative associations with pollution, whether due to health concerns or otherwise, it seems unlikely that these results would have been obtained. Contrary to the possibility that the company never elicited a health concern, another possibility is that mention of pollution *universally* elicited health concerns. If such were the case, then, consistent with current findings, one would expect to see no effect of situationally or dispositionally primed health concern. One might, however, expect to see effects of health-irrelevant concerns such as financial concern, to the extent that those concerns overrode health concerns.

More research is needed to understand how and whether people currently think about pollution as a health threat. If it is the case that people hold no salient association with pollution as a health threat, then making explicit this association may lead to harsher evaluation of entities that pollute. However, if this association is ubiquitous, then activating it will have no effect. Rather, perhaps motivating individuals to take greater care of their health (and that of future generations) may be more likely to lead to subsequent changes in the importance people place on reducing pollution.

## **Future Directions**

Given the current findings, it does not seem fruitful to continue to prime pathogenic concern in an attempt to increase concerns about pollution. As suggested above, however, priming toxin avoidance may have such effects. Future studies should seek to increase the degree of specificity between the motivational state (e.g., contagion avoidance versus toxin avoidance), the elicitors of that state (e.g., rotten versus bitter smells), and the environmental outcome being evaluated (e.g. environmental ills associated with animal slaughter versus air pollution).

Perhaps more fruitful than investigating the nuances of matching the specific fundamental motives to specific types of environmental outcomes would be better understanding how individuals manage competing goals. If, for instance, people may hold the belief that manufacturing is bad for air quality but good for the economy, then perhaps increased concern for the economy would lead to less concern for air quality. Experiments 3 and 4 began to investigate this possibility, but more work needs to be done to examine a range of competing motivations, both situational and dispositional.

One possibility is that such research would shed light on which priorities are most likely to cause others to devalue negative environmental consequences. Such an understanding could, in turn, lead to the development of advertising campaigns that help people consider ways in which these competing goals can be attained in environmentally friendly ways. For instance, current cap and trade programs allow manufactures to essentially pay for credits to emit carbon dioxide. This may imply to the general population that emissions standards are a hindrance to economic development. Although on the one hand, it makes sense to create economic incentives to decrease emissions, on the

other, this may unnecessarily pit two goals against each other in the minds of the general public, and may lead individuals who are concerned about the economy to devalue the importance of clean air standards.

Alternatively, one might direct more focus to the development of green technologies and how they may simultaneously reduce carbon emissions, create jobs, and lower industrial overhead costs, thereby leading people to consider clean air standards not as something that hinders economic development but instead enhances it. If such changes in mentality occurred on a large scale, perhaps the problems associated with conflicting motivations would be eliminated, or even reversed. For this to happen, one must better understand what goals most often “compete” with environmental outcomes, and how those concerns might be reframed in a more constructive manner.

### **Implications**

The current experiments sought to better understand ways in which universal motivations such as disease avoidance might be leveraged to engender pro-environmental motivation. These experiments tested the hypothesis that priming certain motivational states would lead to more negative evaluations of relevant environmental outcomes. It is important to understand how a host of competing goals work together to influence the way people think about environmental outcomes. In a context in which environmental outcomes are pitted against more immediate, tangible, and affectively laden goals, it is likely that pro-environmental goals would often be trumped by other goals. However, by framing environmental outcomes as working with rather than against multiple goals, then it may be possible to bring about large-scale social change for the betterment of the environment.

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APPENDIX A  
EXPERIMENT 1 LAYOUT

- Recruitment Information (Appendix B)
- Participants read and sign cover Letter (Appendix C)
- Guided Visualization Manipulation (Appendix D)
  - Participants will be randomly assigned to conditions.
  - This is a between-participants manipulation.
- Company Description (Appendix E)
  - The company description manipulation consists of a scenario in which one of three companies will be moving into a manufacturing facility near their neighborhood. The description of each scenario contains three sentences, one for each type of environmental concern (pollution, wasting, or safety). Each company will always be described as presenting one environmental detriment and two benefits. The detriment will always be listed first.
  - The order of the three statements will be counterbalanced within the company descriptions using the following Latin Squares pattern

Order of Statements in Company Description

Pollution	Waste	Safety
Safety	Pollution	Waste
Waste	Safety	Pollution

- The order of the three companies will also be counterbalanced following the same Latin Squares pattern.

Presentation Order for Companies

Pollution	Waste	Safety*
Safety	Pollution	Waste
Waste	Safety	Pollution

- Evaluation of Environmental Outcomes (Dependent Variables) (Appendix F)
- Manipulation Checks (Appendix G)
- Moderators (Appendix H)
- Individual Differences (Appendix I)
- Demographic Information (Appendix J)

*\* Due to a computer programming error no participants in the resource concern prime condition viewed companies in the order of pollution, waste then safety, and twice as many participants viewed companies in the order of waste, safety, then pollution.*

APPENDIX B  
RECRUITMENT INFORMATION, EXPERIMENT 1

*\*This is the information submitted to Don Homa for participant request.*

EXPERIMENT TITLE: Community Preferences

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PLEASE READ THE FOLLOWING BEFORE YOU SIGN UP FOR THIS EXPERIMENT:

DESCRIPTION OF PROCEDURE:

As a participant, you would read several scenarios that might affect the community in which you live and indicate your preferences for each option. You would also provide information about your unique personality characteristics, demographics, and respond to questions about any other impressions you may form during the course of the survey.

APPENDIX C

COVER LETTER, ALL EXPERIMENTS

## Attitudes and Behaviors

Date: April 15<sup>th</sup> 2011

Dear Participant:

I am a graduate student under the direction of Professor Steven Neuberg in the Department of Psychology at Arizona State University.

I am conducting a research study to investigate how people view certain behaviors. I am inviting your participation, which will involve about ten minutes of your time completing a survey.

Your participation in this study is voluntary. You can skip questions if you wish. You may choose not to participate or to withdraw from the study at any time without penalty. You must be 18 or older to participate in this study.

Although there are no direct benefits to you for participation, your responses will help researchers to better understand the reactions people have to specific behaviors. There are no foreseeable risks or discomforts to your participation.

Your responses on the survey will be anonymous. The results of this study may be used in reports, presentations, or publications but your name will not be known, and results will be presented only in aggregate form.

If you have any questions concerning the research study, please email Anna Berlin ([anna.berlin@asu.edu](mailto:anna.berlin@asu.edu), or call (480) 965-4070), or Dr. Steven Neuberg ([Steven.Neuberg@asu.edu](mailto:Steven.Neuberg@asu.edu), or call 480-965-7845). If you have any questions about your rights as a participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

Responding to questionnaire will be considered your consent to participate.

Sincerely,

Anna Berlin, M.S.  
Department of Psychology  
Arizona State University

APPENDIX D  
INDEPENDENT VARIABLE: GUIDED VISUALIZATION,  
EXPERIMENTS 1 AND 2

Instructions: Please listen carefully to the following scenario. As you're listening, try to put yourself in the shoes of the main character and experience the emotions that they are feeling.

#### APPENDIX D1: Control Scenario Experiments 1 and 2

Imagine you're in your house, in the room where you study. You have decided to organize your workspace, because the semester has just begun and you want to be organized. You have already bought your books for classes, and you have a syllabus and some initial paperwork for each class. You are taking five classes: Botany, Math, Psychology, History, and English. For math, you will be handing in a lot of assignments on notebook paper, and you decide that those will be most easily ordered and maintained in a three-ring binder. You take the syllabus and assignment list for that class, and three-hole-punch them and put them at the front of the folder. Then you place four dividers in the folder and label them Test 1, Test 2, Test 3, and Test 4, so that you can put material that will be covered on each test in those sections. Then you take the four folders that you recently bought, and choose a separate color for each remaining class, and put your syllabus and any other handouts you have received in those folders. You choose green for Botany, because plants are green. You choose blue for Psychology, because people see psychologists when they are feeling blue. For English, you choose yellow, because your teacher wore an obnoxious yellow dress the first day- now the color just seems to be associated with the class. And finally, you make the white folder History, because that's the only one left. You have learned from previous semesters that if you create too many folders, you never seem to remember to grab the right one before you leave for school in the morning, so this year you decide to get a five-subject notebook for taking notes. That way, you won't have to think about which notebook to take to class. If you receive a handout, you can just put it into the appropriate folder when you get home.

Now that you have everything for your classes, you decide to put them all on the bookshelf. You clear the top shelf of all of the books, and put your class books on first, ordering them by size. Next to those, you put your three-ring binder, and then your notebook and four folders. You contemplate what the best strategy is for organizing all of your other books on the shelves below. First, you think that you might do it by author within each genre, so that the books are easy to find, but then you realize that you will probably be too busy with school this semester to do any fun reading, and you decide to just organize it by the size of the books so it looks nice. Also, you are able to get it done much faster that way. All you have left now is your desk. Only your top drawer is really out of order, but all you have to do is grab up all of your loose pens, pencils, paper clips, rubber bands, staples, tacks, and binder clips and separate them into their own compartment in the tray in your drawer. Your workspace looks pretty good now, but you still need to clean the rest of your room. Your classes are not too demanding on your time yet, so you decide that you'll take a break for a little while, and get back to it later tonight.



## Appendix D2: Disease Avoidance Scenario

It's the middle of the semester and most of your classes are going pretty well. However, you're not so sure about your biology class. It's the one class that you don't really enjoy. A couple weeks ago you had to dissect a pig preserved in a foul-smelling formaldehyde solution. Next week's assignment is volunteer work in the geriatric ward of a local hospital. You recall visiting your great-grandmother in the hospital, and remember how the sight and smell of all those elderly patients made you feel a bit queasy.

Arriving at the hospital, you immediately confront the same unpleasant stench you experienced years before. You grab your stomach and think about leaving. Just then, the volunteer coordinator greets you and brings you to an activity room. "Wait here for a moment," she says. You look around the room and see several old people. One is sitting in a chair in the corner slumped over. You're concerned at first, but then you realize you can hear him loudly wheezing as he breathes. Every once in a while he coughs and it sounds pretty bad.

Also, you notice a woman sitting at a table playing cards by herself. She is surrounded by what looks like used tissues and you keep staring at the tubes running into her wrists. You wince and try to look around for something else to focus on, but there's not much else. The walls are a dull yellow and look like they haven't been washed in a while. You can barely see out the only window in the room because it's so dirty. The air is thick and stale and you try not to breathe too deeply. Why does every hospital seem to smell like this?

Just then the volunteer coordinator comes back with a very elderly man shuffling along in a walker. His wrinkled hand reaches out to shake yours, and you notice he has very little muscle tone. You can't help staring at the liver spots on his hand, and the yellowness of his finger nails.

Your first task is to help him eat by spoon-feeding him. You take a seat at the table with the old woman playing cards and her used tissues. You take a look at the food you're supposed to feed him. It is mushy and colorless and the thought of having to eat such food makes you feel sick. You take a look at the elderly man's aging body, which is obviously wasting away. He needs help because his arthritic hands are no longer strong enough to grasp a spoon. As you raise the first spoonful to his mouth, you feel a bit repulsed as the spoon rubs against one of his few remaining teeth. His poor muscle tone causes him to drool, and after every few spoonfuls, you need to wipe his chin. After one spoonful, he sneezes and your hand is covered with a fine spray of soup and saliva. You look around for a tissue to wipe it off, but there aren't any clean ones around. You tell the old man you'll be back in a minute and go to find a tissue or paper towel or anything to get the snot off your hand as soon as possible. On your way back to the table, you run into the volunteer coordinator. She must have noticed the look of disgust you were trying to suppress, and suggests you take a break. You go to the hospital cafeteria, happy to leave the smells and sights of the ward behind.

Although your stomach is still a bit queasy and all you can think of is the colorless mush you just saw, you are starving because you missed breakfast that morning. The food selection is limited, but you settle on a hamburger and a bowl of pudding. When you bite into the hamburger, however, the smell of the ward still lingers in your nose, so you push it aside after forcing down one mouthful. The pudding is blandly lukewarm and soupy, and when you spill some on your finger you are reminded of the old man sneezing onto that same hand. Your

appetite completely disappears when you notice a human hair mixed in with your pudding. This whole experience has been sickening.

When you return to the ward, things only get worse. You are asked to change the bandages on an elderly patient with a distended swelling on the upper thigh. As you remove the bandage, you are shocked to see a large open sore. You involuntarily pull your head back from the putrid stench and sight of puss. You are overwhelmed with nausea, as you taste the half-digested hamburger returning into your mouth. You close your eyes for a moment and take a short breath to collect yourself. You focus on finishing the job changing the bandages, but when you're done, you tell the volunteer coordinator that you have to leave. You can't stand being there any longer.

### Appendix D3: Resource Protection Scenario

Imagine you are taking a class required for your major. The third week into this class you realize that this class is very difficult and challenging, and that you will have to work very hard in order to get a decent grade. You know you will not be able to stay in your major unless you get a C or better, so you complete all the homework and study for long hours for this class.

One day, the professor reminds you that 50% of your grade will come from two team projects. Every team will get a grade for each project and both members of that team will get the same grade. As everyone in the class scrambles to find a partner, someone taps you on the shoulder and says 'hey, do you want to work together?' Since you don't know anyone in the class and don't want to be left without a partner, you decide to say 'yes'.

A week before it's due, you and your partner start working on the first class project. You are eager to start because you know it has such a large bearing on your final grade. Your partner seems to be eager to start also, and you make plans to get together the next day to do some work.

The two of you meet at the library the next day. You work together to come up with ideas for the project, and divide the amount of work to be done in about half. At this point, you feel that your workload is a little more than your partner's, but you decide not to say anything because it's close enough to not warrant mentioning. That same night, you start on your part of the project. You make a lot of progress and finish everything you need to do pretty quickly. You feel extremely happy with what you accomplished and feel confident you will get a good grade. You decide to call your partner with the good news. To your surprise, your partner hasn't even started yet. You feel a little upset by this, because the project is due in 3 days. However, your partner assures you that it will be finished in the next couple of days and that it will be of the highest quality. As you hang up the phone, you still feel a little worried but decide to trust your partner. You spend the next 2 days perfecting your portion.

The night before you are to present your project to the class, just as you are about to go to bed, your partner calls you. 'I'm sorry, I can't finish the project', your partner says, 'I am really sick'. You feel a rush of panic as you hear those words. Then, as you start to come to your senses, you hear loud music and laughter in the background. Horrified, you realize your partner must be at a party. You ask your partner if that is the case, but don't get a straight answer. Instead, your partner tells you not to worry – most of the work is done, and you just need to tidy it up a little to make it presentable to the class. Angry, but not knowing what else to do, you agree to finish the rest of it up.

When you receive your partner's portion of the project by e-mail, though, you find out that not only is most of it NOT finished, but the part that is finished is not well done at all. As you read over your partner's work you get a sinking feeling in your stomach. You know that you will never get the grade you need with half of the project as it is right now. You call your partner again to find out whether the right document had been sent. However, your partner does not answer the phone. You try several more times, but your call just keeps going to voicemail. It seems pretty clear to you now that your partner is ignoring your calls.

You are angry and tired, but you know you'll have to pull an all-nighter just to have a chance at a passing grade. Even so, a good grade seems out of

the question-even though you're sure you did 'A' work on your portion. You end up spending most of the night going over the project and fixing your partner's mistakes. You fall asleep, exhausted, while working and almost oversleep on the day of the presentation. You hurry to gather everything together and make some finishing touches. As you arrive for your class, you see your partner laughing and chatting with another student, not looking sick at all. You start to fume as you think about the fact that your partner will benefit from all the work you've done. As you walk to your seat, all you can think about is how you've been taken advantage of . . .

#### Appendix D4: Self-protection Scenario

Imagine that it's the middle of the semester and you are getting a little stressed out from everything you have to do. To unwind, you decide to have a quiet evening at home tonight by yourself to get away from all of the hassles and stress.

Tonight is a particularly windy night. As the wind howls, tree branches sway from side to side. A small crescent moon is barely visible, making it feel a little darker than usual. Few people would want to be outside, and it makes the house feel cozy. You initially watch some TV on the couch to relax. But you soon decide to go to the bedroom and curl up with a book you've been meaning to read. You feel relaxed and comfortable in your bed, and you notice how everything seems so quiet when you're home by yourself. All you can hear is the rumble of the wind. It makes you feel a little chilly, so you get more comfortable in your sheets and slowly become engrossed in your book.

Silence envelops the room, and you hear the front door rattle. Although you know it's just the wind, the noise makes you feel a little uneasy. You think back to whether you locked the door, and you think you did. Out of the corner of your eye you notice a sudden movement. You quickly turn your head to look, but there's nothing there. You are a little jittery. You try to go back to the book, but you have a hard time concentrating. You hear the wind outside getting stronger. Tree branches brush against the outside walls, making it sound as though something is scraping against the house. You get an eerie feeling, and you try to calm yourself down, hoping to get back into the story you were just reading.

Suddenly, you hear a loud clang outside that jolts your entire body. Sitting up in your bed you are now highly alert. You can feel your heart beating faster than before, and you begin to feel uncomfortable in your own home. You wish you weren't alone, and you wish it was daytime. Your bedroom light flickers momentarily, then goes out altogether. The room becomes pitch black. You look at your electric alarm clock, but it's not working. The electricity is gone. Your muscles tense up and you find it more difficult to breathe.

You look around the room, but you can't see anything. You can't even make out your own hand right in front of you. You are wide awake. Your chest is pounding. You try to remember where you keep the flashlight, recalling that it's in the kitchen. You collect yourself and decide to try to slowly feel your way over to the flashlight. With both hands feeling the walls, you slowly feel your way to the bedroom doorway in absolute darkness.

Then, you hear a petrifying sound: The handle on the front door rattles and the door squeaks as it opens. You've heard that noise a hundred times, but it has never been this frightening. You are sure the door was locked and you're not expecting anyone. You want to tell yourself it's your imagination, but you are not so sure. Your body presses up against the wall. Unsure of what to do, you call out: "is anyone there?" There's no response. Just daunting silence. Gripped with a new jolt of fear, your arms clench up against your body. All of your senses are heightened; you can hear your own breathing. You strain your ears for the slightest noise.

You hear a footstep. Then another. There is someone in your house. Your eyes open wide, and you begin to feel panicked inside. Your instinct

tells you to scream, but nothing comes out. Suddenly, you hear a crashing lamp in the living room. The noise sends your heart throbbing and makes your hands begin to shake.

You decide to try to call 911, but it's almost impossible to find the phone in the darkness. In a panic, you run back into the bedroom. But in the confusion, you trip on the corner of the bed. You stumble and fall onto the bedroom floor. Turning your head toward the doorway, you hear the sound of heavy footsteps coming down the hall towards your room...

## APPENDIX E

INDEPENDENT VARIABLE: COMPANY DESCRIPTION, EXPERIMENT 1

Within-Participants Manipulation  
Experiment 1

We would like to get your opinion about factors that may affect the community you live in. Please read the scenario below and then respond to the questions that follow.

Imagine that a manufacturing plant is going to be built near your neighborhood. Currently there are three different companies interested in the property. Each would bring in 2,000 much-needed jobs for local residents and have the same positive impact on the local economy. Although they are very similar in terms of economic benefits to the community, each of them pose different challenges to the local ecology, specifically, the water supply. Next, you will read a brief description of the first company and respond to some questions about it, then do the same for the remaining two companies.

Company One [Pollution]

Company One uses manufacturing procedures that, under some circumstances, can lead to pollutants leaking into local streams and groundwater. If that were to happen, the company would treat residential water with a chemical process designed to ensure that it meets safety standards for household water use. The company uses water efficiently and at a constant rate that poses no risk to the water pressure needed for municipal services such as the fire department. The company would bring in 2,000 jobs for local residents and have a positive impact on the local economy.

*[Complete first round of DVs]*

Booster 1:

Recall the story you listened to at the beginning of the study. Please describe what happened in as much detail as you can recall.

Again, imagine that a manufacturing plant is going to be built near your neighborhood. Below is the description of the second of company interested in the property. Please read the description below and respond to the questions that follow.

Company Two [Wasting]

Company Two uses manufacturing procedures that use water inefficiently. Particularly, it uses much larger quantities of water than do companies that produce similar products, and at a rate that may exceed the capacity to replenish it, depending on the rainfall. The company adheres to high water-quality standards so that all water coming from the plant would be pollutant-free, and the company uses water at a constant rate and poses no risk to the water pressure needed for municipal services such as the fire department. The company would bring in 2,000 jobs for local residents and have a positive impact on the local economy.

*[Complete second round of DVs]*

Booster 2:



Recall a time in your life when you felt [physically disgusted / cheated or deprived of resources due to you / afraid for your physical safety]. Please describe what happened in as much detail as you can recall.

Again, imagine that a manufacturing plant is going to be built near your neighborhood. Below is the description of the final company interested in the property. Please read the description below and respond to the questions that follow.

Company Three [Safety Concern]

Company Three uses manufacturing procedures that consume large quantities of water in short bursts several times per day. As a result, at times there could be temporary decreases in the water pressure needed for municipal services. Specifically, at times there may be insufficient pressure to enable water from fire hoses to quench large fires and prevent them from spreading to other buildings. The company uses water efficiently and adheres to high water quality-standards so that all water coming from the plant would be pollutant-free. The company would bring in 2,000 jobs for local residents and have a positive impact on the local economy.

APPENDIX F

DEPENDENT VARIABLE: COMPANY EVALUATIONS, EXPERIMENT 1

*The first 8 questions will be asked after each company description.*

1. How favorable is your view of this company?
  - 1 = Extremely unfavorable
  - 2 = Mostly unfavorable
  - 3 = Slightly unfavorable
  - 4 = Slightly favorable
  - 5 = Mostly favorable
  - 6 = Extremely favorable
2. To what extent are the consequences of having this company nearby positive or negative?
  - 1 = All negative
  - 2 = Mostly negative
  - 3 = Slightly negative,
  - 4 = Slightly positive
  - 5 = Mostly positive
  - 6 = Extremely positive
3. How much would you like or dislike having this company occupy the site nearby?
  - 1 = Extreme dislike
  - 2 = Mostly dislike
  - 3 = Slightly dislike
  - 4 = Slightly like
  - 5 = Mostly like
  - 6 = Extremely like
4. How comfortable would you feel having this company occupy the site nearby?
  - 1 = Extremely uncomfortable
  - 2 = Mostly uncomfortable
  - 3 = Slightly uncomfortable
  - 4 = Slightly comfortable
  - 5 = Mostly comfortable
  - 6 = Extremely comfortable
5. To what extent should your local government provide monetary incentives to encourage this particular company to move into the site nearby?
  - 1 = The government should definitely not give tax incentives.
  - 6 = The government should definitely give tax incentives.
6. To what extent would having this company near your neighborhood make you feel physically disgusted?
  - 1 = Not at all
  - 7= Extremely
7. To what extent would having this company near your neighborhood make you feel morally disgusted?
  - 1 = Not at all
  - 7= Extremely
8. To what extent would having this company near your neighborhood make you feel angry or resentful?
  - 1 = Not at all
  - 7= Extremely
9. To what extent would having this company near your neighborhood make you feel fearful?
  - 1 = Not at all

7= Extremely

*After all companies have been viewed, the three companies will be presented again, together.*

10. Please rank the three companies from the one you would most like (1) to have near your neighborhood, to the one you would least like to have near your neighborhood (3).

\_\_\_ Company 1  
\_\_\_ Company 2  
\_\_\_ Company 3

1 = An extreme asset  
2 = An asset  
3 = Slightly more of an asset than a threat  
4 = Slightly more of a threat than an asset  
5 = A threat  
6 = An extreme threat

11. To what extent is Company 1 an asset or threat to your health?  
12. To what extent is Company 1 an asset or threat to your resources?  
13. To what extent is Company 1 an asset or threat to your safety?  
14. To what extent is Company 2 an asset or threat to your health?  
15. To what extent is Company 2 an asset or threat to your resources?  
16. To what extent is Company 2 an asset or threat to your safety?  
17. To what extent is Company 3 an asset or threat to your health?  
18. To what extent is Company 3 an asset or threat to your resources?  
19. To what extent is Company 3 an asset or threat to your safety?

Please rank each company on each of the following attributes. Put a 1 in front of the company for which the statement is most true, and a 3 for the least true.

1. Has the most negative consequences. (1 = most negative consequences, 3 = least negative consequences)  
\_\_\_ Company 1  
\_\_\_ Company 2  
\_\_\_ Company 3
2. The most favorable. (1 = most favorable, 3 = least favorable)  
\_\_\_ Company 1  
\_\_\_ Company 2  
\_\_\_ Company 3
3. The greatest threat to your health. (1 = greatest threat, 3 = least threat)  
\_\_\_ Company 1  
\_\_\_ Company 2  
\_\_\_ Company 3
4. The greatest threat to your resources. (1 = greatest threat, 3 = least

threat)

- Company 1
- Company 2
- Company 3

5. The greatest threat to your safety. (1 = greatest threat, 3 = least threat)
  - Company 1
  - Company 2
  - Company 3
6. Which company should your local government provide the most monetary incentives to, in order to encourage them to come? (Please rank: 1 = most incentives, 3 = least incentives)
  - Company 1
  - Company 2
  - Company 3
7. Which company made you feel most physically disgusted? (Please rank: 1 = most physically disgusted, 3 = least physically disgusted))
  - Company 1
  - Company 2
  - Company 3
8. Which company made you feel most morally disgusted? (1 = most morally disgusted, 3 = least morally disgusted)
  - Company 1
  - Company 2
  - Company 3
9. Which company made you feel most angry / resentful? (1 = most angry/resentful, 3 = least angry/resentful)
  - Company 1
  - Company 2
  - Company 3
10. Which company made you feel most afraid? (1 = most afraid, 3 = least afraid)
  - Company 1
  - Company 2
  - Company 3

APPENDIX G  
MANIPULATION CHECKS

### Experiment 1

Think back to the story you read at the beginning of the study.

1 = Not at all

7 = Extremely

1. To what extent did you feel physically disgusted?
2. To what extent did you feel morally disgusted?
3. To what extent did you feel angry / resentful?
4. To what extent did you feel afraid?
5. To what extent did you feel a desire to protect yourself from germs and disease?
6. To what extent did you feel a desire to protect yourself from being taken advantage of?
7. To what extent did you feel a desire to protect yourself from physical danger?

### Experiment 2

Think back to the story you read at the beginning of the study.

1 = Not at all

7 = Extremely

1. *To what extent did you feel grossed out?*
2. *To what extent did you feel contemptuous?*
3. *To what extent did you feel a desire to protect yourself from germs and disease?*
4. *To what extent did you feel a desire to protect yourself from being taken advantage of?*

### Experiments 3 and 4

Think back to the statements you read at the beginning of the study, and to how you felt as you read them.

1 = Not at all

7 = Extremely

1. To what extent did you feel grossed out?
2. To what extent did you feel a desire to protect yourself from germs and disease?
3. To what extent did you think about the possibility that you might get sick?
4. To what extent did you feel concerned about your finances?
5. To what extent did you think about disease?
6. To what extent did you think about the economy?

APPENDIX H  
MODERATORS



### Experiment 1

Please read each statement and indicate how much you agree or disagree

1. Water quality is an important issue to me.
2. I would be bothered by the presence of polluted water in my neighborhood.
3. I drink tap water.
4. The Earth will always have enough clean water to sustain human life.
5. It is important to use only what you need.
6. It is wrong to waste water.
7. My community would be a more dangerous place without the public safety services (e.g., police, fire, ambulance) that are currently in place
8. Have you ever used public safety services (police, fire, ambulance)?
9. In the past, has the use of public safety services directly benefited the security of you or someone close to you?

### Experiments 2, 3 and 4

Please read each statement and indicate how much you agree or disagree

- 1 = Strongly Disagree,
- 2 = Disagree
- 3 = Somewhat Disagree
- 4 = Neither
- 5 = Somewhat Agree
- 6 = Agree
- 7 = Strongly Agree

1. I drink tap water.
2. I enjoy fishing.
3. Air quality is an important issue to me.
4. I would be bothered by the presence of smokestacks or other sources of air pollution in my neighborhood.
5. I have respiratory or other health issues that are exacerbated by poor air quality.
6. The Earth will always have enough natural resources (e.g., clean air, clean water, and land) to sustain human life.
7. It is important to recycle whenever possible.
8. It is wrong to waste things.

APPENDIX I  
INDIVIDUAL DIFFERENCES

Appendix I, part 1  
Perceived Vulnerability to Disease  
(Duncan, Schaller & Park, 2009)  
All Experiments

Please read each statement and indicate how much you agree or disagree.

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Somewhat Disagree
- 4 = Neither
- 5 = Somewhat Agree
- 6 = Agree
- 7 = Strongly Agree

1. It really bothers me when people sneeze without covering their mouths.
2. If an illness is 'going around', I will get it.
3. I am comfortable sharing a water bottle with a friend. (R)
4. I don't like to write with a pencil someone else has obviously chewed on.
5. My past experiences make me believe I am not likely to get sick even when my friends are sick. (R)
6. I have a history of susceptibility to infectious diseases.
7. I prefer to wash my hands pretty soon after shaking someone's hand.
8. In general, I am very susceptible to colds, flu, and other infectious diseases.
9. I dislike wearing used clothes because you don't know what the past person who wore it was like.
10. I am more likely than the people around me to catch an infectious disease.
11. My hands do not feel dirty after touching money. (R)
12. I am unlikely to catch a cold, flu, or other illness, even if it is going around. (R)
13. It does not make me anxious to be around sick people. (R)
14. My immune system protects me from most illnesses that other people get. (R)
15. I avoid using public telephones because of the risk that I may catch something from the previous user.

Subscale 1 (Perceived Infectability): Items 2, 5, 6, 8, 10, 12, 14

Subscale 2 (Germ Aversion): Items 1, 3, 4, 7, 9, 11, 13, 15

Appendix I, part 2  
Resource Concern  
Experiment 1

Please read each statement below and indicate how much you agree or disagree.

1 = Strongly Disagree

7 = Strongly Agree

1. It is wrong for people to take more than their fair share.
2. People should not take more resources than they need.
3. People should be especially careful not to waste community resources.
4. When people use a particular community resource, they should replace that same resource.

Appendix I, part 3  
Three Domain Disgust Scale  
Experiments 1 and 2  
(Tybur, Lieberman & Griskevicius, 2009)

Please read each statement and indicate how disgusting you find it to be.

1 = Not at all disgusting  
7 = Extremely disgusting

1. Shoplifting a candy bar from a convenience store
2. Hearing two strangers having sex
3. Stepping on dog poop
4. Stealing from a neighbor
5. Performing oral sex
  
6. Sitting next to someone who has red sores on their arm
7. A student cheating to get good grades
8. Watching a pornographic video
  
9. Shaking hands with a stranger who has sweaty palms
10. Deceiving a friend
11. Finding out that someone you don't like has sexual fantasies about you
  
12. Seeing some mold on old leftovers in your refrigerator
13. Forging someone's signature on a legal document
14. Bringing someone you just met back to your room to have sex
  
15. Standing close to a person who has body odor
16. Cutting to the front of a line to purchase the last few tickets to a show
17. A stranger of the opposite sex intentionally rubbing your thigh in an elevator
  
18. Seeing a cockroach run across the floor
19. Intentionally lying during a business transaction
20. Having anal sex with someone of the opposite sex
  
21. Accidentally touching a person's bloody cut

Appendix I, part 4  
Moral Foundations Questionnaire  
Experiment 1  
(Graham, Haidt & Nosek, 2009)

When you decide whether something is right or wrong, to what extent are the following considerations relevant to your thinking? Please rate each statement using this scale:

[0] = not at all relevant (This consideration has nothing to do with my judgments of right and wrong)

[1] = not very relevant

[2] = slightly relevant

[3] = somewhat relevant

[4] = very relevant

[5] = extremely relevant (This is one of the most important factors when I judge right and wrong)

- \_\_\_\_\_ Whether or not someone suffered emotionally
- \_\_\_\_\_ Whether or not some people were treated differently than others
- \_\_\_\_\_ Whether or not someone's action showed love for his or her country
- \_\_\_\_\_ Whether or not someone showed a lack of respect for authority
- \_\_\_\_\_ Whether or not someone violated standards of purity and decency
- \_\_\_\_\_ Whether or not someone was good at math
- \_\_\_\_\_ Whether or not someone cared for someone weak or vulnerable
- \_\_\_\_\_ Whether or not someone acted unfairly
- \_\_\_\_\_ Whether or not someone did something to betray his or her group
- \_\_\_\_\_ Whether or not someone conformed to the traditions of society
- \_\_\_\_\_ Whether or not someone did something disgusting
- \_\_\_\_\_ Whether or not someone was cruel
- \_\_\_\_\_ Whether or not someone was denied his or her rights
- \_\_\_\_\_ Whether or not someone showed a lack of loyalty
- \_\_\_\_\_ Whether or not an action caused chaos or disorder
- \_\_\_\_\_ Whether or not someone acted in a way that God would approve of

Please read the following sentences and indicate your agreement or disagreement:

	[0]	[1]	[2]	[3]	[4]
	[5]				
Strongly disagree	Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree
Strongly agree					

- \_\_\_\_\_ Compassion for those who are suffering is the most crucial virtue.
- \_\_\_\_\_ When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.
- \_\_\_\_\_ I am proud of my country's history.
- \_\_\_\_\_ Respect for authority is something all children need to learn.
- \_\_\_\_\_ People should not do things that are disgusting, even if no one is harmed.
- \_\_\_\_\_ It is better to do good than to do bad.
- \_\_\_\_\_ One of the worst things a person could do is hurt a defenseless animal.
- \_\_\_\_\_ Justice is the most important requirement for a society.
- \_\_\_\_\_ People should be loyal to their family members, even when they have

- done something wrong.
- \_\_\_\_\_ Men and women each have different roles to play in society.
  - \_\_\_\_\_ I would call some acts wrong on the grounds that they are unnatural.
  - \_\_\_\_\_ It can never be right to kill a human being.
  - \_\_\_\_\_ I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.
  - \_\_\_\_\_ It is more important to be a team player than to express oneself.
  - \_\_\_\_\_ If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.
  - \_\_\_\_\_ Chastity is an important and valuable virtue.

Appendix I, part 5  
Belief in a Dangerous World  
Experiment 1  
(Altemeyer, B., 1988).

For each of the following statements, please indicate how much you agree with the statement.

- \_\_\_\_\_ 1. It seems that every year there are fewer and fewer truly respectable people, and more and more persons with no morals at all who threaten everyone else.
- \_\_\_\_\_ 2. Although it may *appear* that things are constantly getting more dangerous and chaotic, it really is not so. Every era has its problems, and a person's chances of living a safe, untroubled life are better today than ever before.
- \_\_\_\_\_ 3. If our society keeps degenerating the way it has been lately, it's liable to collapse like a rotten log and everything will be in chaos.
- \_\_\_\_\_ 4. Our society is not full of immoral and degenerate people who prey on decent people. News reports of such cases are grossly exaggerating and misleading.
- \_\_\_\_\_ 5. The "end" is not near. People who think that earthquakes, wars and famines mean God might be about to destroy the world are being foolish.
- \_\_\_\_\_ 6. There are many dangerous people in our society who will attack someone out of pure meanness, for no reason at all.
- \_\_\_\_\_ 7. Despite what one hears about "crime in the street," there probably is not any more now than there ever has been.
- \_\_\_\_\_ 8. Any day now, chaos and anarchy could erupt around us. All the signs are pointing to it.
- \_\_\_\_\_ 9. If a person takes a few sensible precautions, nothing bad will happen to him. We do not live in a dangerous world.
- \_\_\_\_\_ 10. Every day, as our society becomes more lawless, a person's chances of being robbed, assaulted, and even murdered go up and up.
- \_\_\_\_\_ 11. Things are getting so bad, even a decent law-abiding person who takes sensible precautions can still become a victim of violence and crime.
- \_\_\_\_\_ 12. Our country is not falling apart or rotting from within.



APPENDIX J  
DEMOGRAPHIC INFORMATION, EXPERIMENT 1

Age:

What is your height?

Gender:

Male                  Female  
Decline to Answer

How much do you weigh?

Ethnicity (Check as many as apply)

- American Indian & Alaska Native
- Asian or Asian American
- Black or African American
- Hispanic or Latino
- White
- Native Hawaiian & Other Pacific Islander
- Some Other Race
- Decline to answer

Political affiliation

- Republican
- Democrat
- Independent
- Libertarian
- Green Party
- Tea Party
- Other or unaffiliated
- Decline to answer

How would you describe your family's social class?

Working class  
Lower middle class  
Middle Class  
Upper middle class  
Upper class

How liberal or conservative are you in terms of social issues?

1 = Extremely Conservative  
7 = Extremely Liberal

How liberal or conservative are you in terms of fiscal issues?

1 = Extremely Conservative  
7 = Extremely Liberal

What is your religious orientation?

Catholic or Greek Orthodox  
Christian  
LDS/ Mormon  
Hindu  
Buddhist  
Jewish  
Muslim  
Native American  
Atheist  
Other

How liberal or conservative are you, overall?

1 = Extremely Conservative  
7 = Extremely Liberal

How important are politics to you, personally?

1 =Not at all  
7 = Extremely

How religious are you?

1 – Not at all  
7 = Extremely

APPENDIX K

INDEPENDENT VARIABLE: COMPANY DESCRIPTION, EXPERIMENT 2

We would like to get your opinion about factors that may affect the community you live in. Please read the scenario below and then respond to the questions that follow.

Imagine that a manufacturing plant is going to be built near your neighborhood. The company would bring in 2,000 much-needed jobs for local residents and have a positive impact on the local economy. However, it may affect the community in other ways as well.

#### No mention

Imagine that a manufacturing plant is going to be built near your neighborhood. The company would bring in 2,000 much-needed jobs for local residents and have a positive impact on the local economy. However, it may affect the community in other ways as well.

#### Smokestack Only

The company that will move into your neighborhood would have several smokestacks that emit several tons of pollutants into the air daily.

#### Low Visibility

The company that will move into your neighborhood would have several smokestacks that emit several tons of pollutants into the air daily. If that were to happen, smoke would be visible in the area immediately surrounding the plant, but might not be noticeable in residential areas.

#### Moderate Visibility

The company that will move into your neighborhood would have several smokestacks that emit several tons of pollutants into the air daily. If that were to happen, smoke would be visible in the area immediately surrounding the plant, and might also be noticeable in residential areas.

#### Low Health Risk

The company that will move into your neighborhood would have several smokestacks that emit several tons of pollutants into the air daily. Although there is a small amount of disagreement, most experts agree that, with the expected exposure, the risks of serious health problems are small.

#### Moderate Health Risk

The company that will move into your neighborhood would have several smokestacks that emit several tons of pollutants into the air daily. Although there is a small amount of disagreement, most experts agree that, with the expected exposure, the risks of serious health problems are moderate.

APPENDIX L

DEPENDENT VARIABLE: COMPANY EVALUATIONS, EXPERIMENT 2

Tell us your impressions about the company.

1 = Not At All

7 = Extremely

20. How FAVORABLE is your view of this company?
21. How POSITIVE are the CONSEQUENCES of having this company nearby?
22. How NEGATIVE are the CONSEQUENCES of having this company nearby?
23. How much would you LIKE having this company occupy the site NEARBY?
24. How COMFORTABLE would you feel having this company occupy the site nearby?
25. To what extent should your local government provide MONETARY INCENTIVES to encourage this particular company to move into the site nearby?

To what extent would having this company near your neighborhood make you feel:

1 = Not At All

7 = Extremely

1. PHYSICALLY DISGUSTED?
2. MORALLY DISGUSTED?
3. ANGRY or RESENTFUL?
4. FEARFUL?

How detrimental would this company be for:

1 = Not at all detrimental

7 = Extremely detrimental

1. The quality of your neighborhood, in general
2. The local ecology, in general
3. The local air quality, in general
4. The global ecology
5. The global air quality
6. The global water quality

APPENDIX M

DEMOGRAPHIC INFORMATION, EXPERIMENTS 2, 3 AND 4

Gender:  
Male                      Female

- Ethnicity (Check all that apply)
- American Indian & Alaska Native
  - Asian or Asian American
  - Black or African American
  - Hispanic or Latino
  - White
  - Native Hawaiian & Other Pacific Islander
  - Some Other Race
  - Decline to Respond

- Some high school
- High school completed or GED
- Some college
- Associate's (2-year) degree
- Bachelor's (4-year) degree
- Some graduate or professional training
- Graduate or professional degree

What is your occupational status?

- Working full time
- Working part time
- Unemployed, looking for work
- Unemployed, not looking for work (includes retired, disables, stay-at-home spouse)
- Student
- Other
- Prefer not to answer

What is your age, in years? \_\_\_\_\_

Which socioeconomic status do you most identify with?

- Working class
- Lower middle class
- Middle Class
- Upper middle class
- Upper class

How liberal or conservative are you in terms of social issues?

- 1 = Very Conservative
- 7 = Very Liberal

How liberal or conservative are you in terms of fiscal issues?

- 1 = Very Conservative
- 7 = Very Liberal

What is your approximate household income (before tax)?

- Under \$20,000
- \$20,000-\$29,999
- \$30,000-\$39,999
- \$40,000-\$49,999
- \$50,000-\$59,999
- \$60,000-\$79,999
- \$80,000-\$99,999
- \$100,000-\$149,999
- \$150,000 or greater
- Decline to answer

How liberal or conservative are you, overall?

- 1 = Very Conservative
- 7 = Very Liberal

What is your political affiliation?

- Republican
- Democrat
- Independent
- Libertarian
- Green Party
- Tea Party
- Other or Unaffiliated
- Decline to Respond

What is the highest education level you have received?

- No high school

What is your religious affiliation?

- Protestant Christian
- Catholic



- Evangelical Christian
- Jewish
- Muslim
- Hindu
- Atheist
- Other
- Prefer not to answer

In what state do you currently reside?

What is your zip code?

APPENDIX N  
BETWEEN-PARTICIPANTS MANIPULATION: GOAL PRIMING,  
EXPERIMENTS 3 AND 4

Now you will read three separate statements. Please form a mental image, picturing yourself in that situation.

*After reading each scenario, participants were presented with a text box and the following instructions:*

Please describe the situation you imagined. Write 2 or 3 sentences.

#### Control

1. Imagine yourself seeing a dog running through the park.
2. Imagine yourself seeing a ball roll across the floor.
3. Imagine yourself fitting an extra book into a full bookshelf.

#### Interpersonal Disgust

1. Imagine yourself sitting next to someone who has red sores on their arm.
2. Imagine yourself shaking hands with a stranger who has sweaty palms.
3. Imagine yourself standing close to a person who has body odor.

#### Impersonal Disgust

1. Imagine yourself stepping on dog poop.
2. Imagine yourself seeing some mold on old leftovers in your refrigerator.
3. Imagine yourself seeing a cockroach run across the floor.

#### Financial Concern (Experiment 3)

1. Imagine a man hanging an "Out of Business" sign on a door.
2. Imagine a young person holding a "Will Work for Food" sign.
3. Imagine seeing a coworker getting a pink-slip (lay-off notice).

#### Financial Concern (Experiment 4)

1. Imagine a man hanging an "Out of Business" sign on a door.
2. Imagine a young person holding a "Will Work for Food" sign.
3. Imagine watching a coworker packing up belongings after getting laid off.

APPENDIX O

DEPENDENT VARIABLE: EVALUATIONS, EXPERIMENT 3

Ratings

You will read a list of things that many people think of as bad. Please indicate how bad they are to you. Please try to use full range of the scale reserving the highest end of the scale only for the worst of the worst.

- 1 = Not at all bad
- 7 = The Worst

*Items were presented in a randomized order.*

- |                                |  |
|--------------------------------|--|
| 1. Water Pollution             | 11. Poverty  |
| 2. Air Pollution               | 12. Homelessness                                     |
| 3. Climate Change              | 13. Racial Discrimination                            |
| 4. Global Warming              | 14. Child Abuse                                      |
| 5. Toxic Waste Dumping         | 15. Income Tax Evasion                               |
| 6. Expanding Landfills         | 16. Identity Theft                                   |
| 7. Overpopulation (Crowding)   | 17. Shoplifting                                      |
| 8. Genocide / Ethnic Cleansing | 18. Insider Trading (illegal stock market exchanges) |
| 9. War                         |  |
| 10. Famine                     |  |

Rankings

Please rank these 10 things from very worst (1) to the best (or least bad; 10).

*Items were presented in a randomized order. List A always preceded List B.*

List A

- |                    |                     |              |
|--------------------|---------------------|--------------|
| Shoplifting        | Toxic Waste Dumping | Cleansing    |
| Income Tax Evasion | Overpopulation      | Famine       |
| Water Pollution    | (Crowding)          | Homelessness |
| Climate Change     | Genocide / Ethnic   |              |

This is a new list. Please rank these 10 things from worst (1) to best (10).

List B

- |                     |                       |  |
|---------------------|-----------------------|--|
| Air Pollution       | War                   | Child Abuse                                      |
| Global Warming      | Poverty               | Identity Theft                                   |
| Expanding Landfills | Racial Discrimination | Insider Trading (illegal stock market exchanges) |

APPENDIX P

DEPENDENT VARIABLE: MUNICIPAL BUDGET, EXPERIMENT 4

Initial Budget Instructions

Below are several issues that local governments attend to. We are interested in how you would prioritize each of the municipal concerns below. Please indicate how much money, if any, you believe should be allocated to each concern.

For the purpose of this exercise, assume that your local government has a \$10 million annual budget. You will allocate the budget in terms of whole percentage points (each 1 percent represents \$100,000). Your job is to allocate 100 percent of the budget across the six categories below, in a way that reflects your personal preferences. You must spend 100 percent of the budget (the total line will add up as you go, and must equal 100 before you can move on).

Surplus Budget Instructions

Now please imagine that your local government had a budget surplus and could afford to allocate an additional million dollars above and beyond what you allocated in the last page. Again, each 1 percent that you allocate would be worth \$100,000. Because this is surplus, you may also choose not to spend the money and put it into the “keep surplus” category.

Budget Options

Economic Development and Jobs Development and Jobs  
(Encouraging business to locate/remain in the area and hire local workers)

\_\_\_\_\_

Clean Air and Water  
(Policies that limit air and water pollution) \_\_\_\_\_

Transportation  
(Maintaining roads and bridges) \_\_\_\_\_

Public Safety  
(Police, fire, and ambulance services) \_\_\_\_\_

Public Services  
(Parks and recreation, libraries) \_\_\_\_\_

Civic Justice  
(Court Systems, protection of civil rights, and community outreach) \_\_\_\_\_

---

Total \_\_\_\_\_

APPENDIX Q:  
HUMAN SUBJECTS APPROVAL



**To:** Steven Neuberg  
PSY

**From:** *for* Mark Roosa, Chair *SR*  
Soc Beh IRB

**Date:** 04/21/2011

**Committee Action:** **Exemption Granted**

**IRB Action Date:** 04/21/2011

**IRB Protocol #:** 1104006335

**Study Title:** Disgust and Emotional Behaviors

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(2) .

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.