

The disgust-promotes-disposal effect

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Abstract Individuals tend toward status quo bias: preferring existing options over new ones. There is a countervailing phenomenon: Humans naturally dispose of objects that disgust them, such as foul-smelling food. But what if the source of disgust is independent of the object? We induced disgust via a film clip to see if participants would trade away an item (a box of unidentified office supplies) for a new item (alternative unidentified box). Such “incidental disgust” strongly countered status quo bias. Disgusted people exchanged their present possession 51% of the time compared to 32% for people in a neutral state. Thus, disgust promotes disposal. A second experiment tested whether a warning about this tendency would diminish it. It did not. These results indicate a robust disgust-promotes-disposal effect. Because these studies presented real choices with tangible rewards, their findings have implications for everyday choices and raise caution about the effectiveness of warnings about biases.

Keywords Disgust · Status quo bias · Decision making · Disposal · Emotion

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Disgust satisfies all the modern criteria of a basic emotion, as articulated by Ekman (1992), encompassing distinctive behavioral, physiological, expressive, and experiential components. Rozin and his colleagues have observed that anything that reminds us of our animal origins can elicit disgust, including sexual behaviors, poor hygiene, and certain moral offenses (Haidt et al. 1994; Rozin and Fallon 1987; Rozin et al. 2000). This wide range of elicitors makes disgust a common experience that significantly affects behavior. Nonetheless, the effects of disgust on people's choices, both mundane and consequential, remain unexplored.¹ For example, preparation for a colonoscopy is a disgusting experience, in terms of the taste of the laxative, and the unpleasantness of the process of eliminating waste from one's system. Does this disgust significantly reduce the willingness of individuals to have colonoscopies, which are an important and underused measure for preventing colon cancer?

This paper examines how disgust affects choices between a current possession and an alternative not yet possessed. Such choices are common, involving jobs, significant others, employees hired, physical objects, and political representatives. Typically, decision makers faced with such choices favor sticking with what they have, a phenomenon called status quo bias (SQB), and first written about in this journal (Samuelson and Zeckhauser 1988). A variety of explanations have been offered for this bias, including rational decision making (e.g., transition costs and search costs); cognitive misperceptions such as loss aversion and its cousin the endowment effect, and anchoring; motivational commitment due to sunk costs; errors of commission cost more than those of omission²; a drive for consistency to escape cognitive dissonance; and self-perception processes, for example to view oneself as being in control (Samuelson and Zeckhauser 1988).

Our experiment sought to replicate the experience of a typical decision under severe conditions of uncertainty. Thus we confronted individuals with a choice where they knew the general nature of the goods to be acquired (office supplies), but not their actual identity. This might be the equivalent of choosing between two hotels in a distant town with only brief descriptions available, between two items on a menu where you merely know that both are types of fish, or between two mutual funds knowing merely their names and the names of their sponsors.

¹ In September of 2012, an FDA requirement that cigarette packages carry disgusting pictures—such as heavily stained teeth and cancer-afflicted lips due to smoking—will go into effect. The support for such an approach comes from asking people, e.g., in Canada where such warnings are in effect, whether the warnings motivate them to quit. (See Hammond et al. 2004.) However, other anti-smoking measures had accompanied declining smoking rates, smoking was declining on a long-term basis, and survey responses on what leads one to behavioral change are unreliable. A more reliable indicator of the effects of warnings would be to see how their introduction affected long-term trends. A comparison of four roughly similar nations looked at Australia, Canada, and the UK, which introduced such warnings between 1994 and 2006, and the United States, which did not. It found no significant break in downward trends due to the disgusting warnings. See the written statement for the rulemaking record of W. K. Viscusi (2011) before the FDA. Viscusi's statement preparation, but not his research, was supported by three cigarette companies. Note: our study is of incidental disgust and its effect on disposal, hence unlike the cigarette warnings case.

² Ritov and Baron (1992) provide results that support this explanation. They find that subjects react more strongly to adverse outcomes due to action, and that subjects preferred inaction over action even when inaction led to change. Schweitzer (1994) presents an experiment that disentangles status quo bias and a preference for inaction. He finds effects that are separate and additive.

We know that individuals, reflecting SQB, will disproportionately go with the first acceptable alternative.

The question addressed here is whether a briefly induced emotion of disgust, coming from a source having nothing to do with the choice itself, might strongly counter this status quo bias. An individual who associates a possession with disgust may be more likely than usual to replace it. Indeed, Lerner et al. (2004) found that disgust induced by a prior irrelevant situation carried over to eliminate the endowment effect, primarily by reducing selling prices. How might incidental disgust affect the appeal of objects currently possessed versus those potentially acquired?

Drawing on the literature, at least four hypotheses could describe the relationship between disgust and SQB:

- Hypothesis 1: Incidental disgust will exert no influence on SQB. Rational decision theory would hold that because incidental disgust is unrelated to the inherent attractiveness of two options, it should not affect the choice between them (Raiffa 1997).
- Hypothesis 2: Following influential theories of affect and judgment (for a review, see Forgas 2003), disgust, as a negatively valenced emotion, will trigger generalized negative judgments and thus devalue both present and potential possessions. If so, when disgusted, decision makers will simply retain their bias for the status quo.

If Hypotheses 1 and 2 are refuted, then Hypotheses 3 and 4 merit attention.

- Hypothesis 3: Incidental disgust will amplify SQB. Research shows that increases in overall arousal cause individuals to display their dominant response to the stimulus situation (see, for example, Foster et al. 1998). Given that disgust is an emotion that intensifies arousal (Gross and Levenson 1993), it will amplify the dominant response of retaining a possession.
- Hypothesis 4: Incidental disgust will counteract SQB. If somehow individuals link a feeling of unpleasantness with the contents of the box currently in their possession, they may have a greater tendency to discard or exchange the contents of their box. Our experimental setup was designed to test for such behavior—to see if even such incidental disgust, despite a situation where objective analysis would show the source of unpleasantness had nothing to do with the box or its contents, motivates decision makers to exchange a current item for a new one.

If Hypothesis 4 is confirmed we will say that a *disgust-promotes-disposal* (DPD) effect is found. If incidental disgust creates emotional carryover in this way, it is likely to be a non-conscious process driven by gut feelings. If so, decision makers will not recognize the emotional influences on their choice (Wilson and Brekke 1994), even if that possibility is raised after the fact. If such obliviousness is found, we will then test whether warning participants prior to their choice about the DPD effect alters their choice of whether or not to stick with the status quo.

1 Study 1

Study 1 took the form of a 2×2 between-subjects factorial in which the emotion induction was crossed with two unlabeled items: a square box and an oblong box of approximately equal weight and volume (see Fig. 1). Each was announced to contain office supplies.

1.1 Method

In exchange for a \$10 show-up payment, 106 individuals (54 males, 50 females, 2 unspecified) from a university community participated. They ranged in age from 16 to 29 ($M=20$).

Participants sat in cubicles and could not see each other. They were given instructions for two separate tasks, which they were told had been combined in one session for convenience. Before the first task, participants randomly received either an unlabeled oblong or square box. They were told their box contained office supplies, and they could keep its contents.

Participants were randomly assigned to either a *disgust induction* or a *neutral induction*. *Disgust-induction* participants watched a video clip portraying a man using a filthy toilet (from the film *Trainspotting*). *Neutral-induction* participants watched a video clip about the Great Barrier Reef (from a *National Geographic* special). Both clips had been previously validated (Lerner et al. 2004). After watching their clip, participants in the *disgust induction* were asked to write about how they would feel if they were in the situation depicted, and participants in the *neutral induction* were asked to write about their daily activities.

To encourage a sense of ownership, participants were invited to shake their box and guess what office supplies it might contain.³ Next, they were given a new box and invited to shake it. They were told the new box contained different kinds of office supplies of equivalent value to those contained in the old box. Participants were then asked to decide whether to keep the old box or exchange it for the new one, where they would ultimately keep the contents. The procedure was slightly modified from the one used by Knetsch (1989) to measure participants' preference between the status quo and the alternative.⁴

Immediately after making the decision whether or not to trade, participants were asked to report how intensely they felt each of 20 emotions. Four negative emotions were of primary interest: anger, sadness, fear, and disgust.

Participants also typed a response to the question, "Why did you choose to exchange/keep the box you were given?" Then participants answered demographic

³ The particular commodity does not appear to matter. In a pilot study where a sporty water bottle and a highlighter set were used as the status quo and alternative commodities, 39% of disgust-condition participants traded away the status quo commodity as compared to 11% of the neutral-condition participants, $\chi^2(1, N=41)=4.04, p<.05, \Phi=.31$.

⁴ Knetsch employed much more dissimilar objects, a mug and a candy bar, than we did. Note that status quo bias is a cousin of the endowment effect. SQB states that individuals tend to stick with their current possession rather than switch to an alternative. The endowment effect states that individuals value an object more if it is currently their property. SQB focuses on willingness-to-exchange, the endowment effect on willingness-to-pay. Future research should measure how greatly willingness-to-pay is reduced by incidental disgust.



Fig. 1 The square (*left*) and oblong (*right*) boxes used in the studies

questions. Finally, the experimenter exchanged boxes for those who chose to trade. Participants kept the contents of their chosen boxes, which pilot tests revealed to be moderately pleasing.

1.2 Results

1.2.1 Manipulation checks

The desired *emotions* were effectively induced, both in magnitude and specificity. As Table 1 shows, *neutral-induction* participants reported feeling neutral much more often than *disgust-induction* participants did ($\chi^2(1, N=106)=8.689, p<.005$), whereas *disgust-induction* participants reported feeling disgusted much more often than *neutral-induction* participants did, $\chi^2(1, N=106)=84.441, p<.001$. Table 2 shows that other negative emotions were much less likely to be reported in the *disgust induction*.⁵

1.2.2 Replication of status quo bias

In the *neutral induction*, SQB was significant; fewer than one-third of neutral participants traded away their item. Participants were less willing to trade the oblong box than the square box, suggesting an unpredicted preference (see Table 3). Yet the absolute increase in the propensity to trade due to disgust was very close across the two types of boxes.

⁵ These variables were originally scaled by participants on a 0–8 scale where 0 indicates “did not experience the emotion at all” and 8 indicates “experienced the emotion more strongly than ever.” Following *JRU* procedure, we eliminated qualitative scales, and divided our four negative emotions as binary dummy variables with 0–2=0 and 3–8=1. These binary values were also used when anger, fear, and sadness were employed as control variables in subsequent logistic equations. Results were much the same when other break points were used for these binary control variables, since they had little influence. Neutral was also divided 0–2=0 and 3–8=1. Neutral was never employed as a control variable.

Table 1 Frequency of reports of feeling disgusted or neutral by induction

| Emotion induction | Reported emotion | |
|-------------------|------------------|-----------|
| | Neutral | Disgusted |
| Neutral | 71.7% | 0% |
| Disgust | 43.4% | 88.7% |

1.2.3 Main analyses

Regardless of which commodity was randomly chosen to serve as the status quo, *disgust-induction* participants were significantly more likely (50.9%) to trade away their status quo commodity than were *neutral-induction* participants (32.1%).

Our results reject Hypotheses 1, 2, and 3 and support Hypothesis 4. Relative to a neutral state, incidental disgust makes decision makers more likely to exchange a status quo commodity for a new commodity. This effect was confirmed using a linear probability model. See Table 4.

The equation predicts that the probability of trading one's status quo box is 42.2% for a participant who is exposed to Oblong Box and *Disgust Induction* but 21.1% for a participant who is exposed to Oblong Box and *Neutral Induction*. Likewise, the probability of trading one's status quo box is 59.3% for a participant who is exposed to Square Box and *Disgust Induction* but 38.2% for a participant who is exposed to Square Box and *Neutral Induction*.⁶ The box shape effect was significant at the 0.1 level. The *disgust induction*, our primary interest, raised the probability of disposal by 21.1%. This effect was significant at the 0.05 level.

This statistically significant effect persisted at the 0.05 level when self-reported anger, fear, and sadness, or all three together were entered as controls.⁷ None of the emotions was close to significant. Including them hardly affected the coefficient on Disgust.⁸ This indicates that the locus of the effect is from disgust and not generalized negativity. Disgust greatly counteracted SQB, almost doubling the propensity to exchange for the oblong box and raising it by more than half for the square box. Thus, disgust promotes disposal (DPD).

Research assistants coded participants' explanations for choosing their preferred box. The explanations conveyed no awareness of emotional carryover. Apart from "random choice," the most common rationales for choosing a box were: "feels more useful" (28%), "makes a more interesting noise" (21%), and "feels heavier" (21%).

1.3 Discussion

Using two virtually generic commodities, Study 1 found that disgust can drive choice even when decision makers have no good reason to prefer one item over another. This result is as predicted by the appraisal-tendency framework (ATF)(Lerner and Keltner 2001), which posits that specific emotions give rise to specific cognitive and

⁶ A chi-square test yielded similar results, also significant at the 0.05 level.

⁷ We also conducted a dprobit analysis, which computes effects on variables assuming mean values for all other variables. This made little difference to the results in Table 4.

⁸ That coefficient increased from 21.1 to 21.6, and remained significant at the 0.05 level.

Table 2 Frequency of reports of feeling sadness, anger or fear by induction

| Emotion induction | Reported emotion | | |
|-------------------|------------------|-------|-------|
| | Sadness | Anger | Fear |
| Neutral | 11.3% | 1.9% | 9.4% |
| Disgust | 17.0% | 9.4% | 26.4% |

motivational characteristics that can determine the effect of each emotion on individuals’ decisions (Lerner et al. 2004). According to this framework, such cognitive and motivational characteristics, although tailored to help individuals respond to the event that evoked the emotion, persist beyond the eliciting situations and function as an implicit lens for interpreting subsequent situations. The ATF posits that disgust, which revolves around the appraisal theme of being too close to an indigestible object or an idea (for elaboration, see Lazarus 1991), will evoke an implicit tendency to dispose of potentially harmful objects (Frijda 1986; Rozin et al. 2000). Thus, the ATF predicts that decision makers will dispose of the status quo object, which came to be associated more closely with their disgust-inducing experience, much more often than if they did not have that experience (e.g., were in *neutral induction*).

2 Study 2

Carryover effects of disgust were solidly established in the Study 1 finding of DPD. Interestingly, participants reported no influence of disgust on their choices. This led to Study 2, which examined whether alerting participants to this bias and providing motivation to correct for it reduces its effects. If the disgust effect is driven by subconscious feelings, then calling attention to it is unlikely to decouple the disgust prime from the object and correct the bias. Thus, we propose:

Hypothesis 5: An otherwise effective warning will not negate the disgust-promotes-disposal effect.

2.1 Method

Study 2 took the form of a 2×2 between-subjects factorial crossing the emotion induction with a warning. We made the oblong box the status quo, thus removing a further experimental factor.

Table 3 Propensities to trade away status quo object in study 1

| Status quo object | Neutral induction | Disgust induction | Difference |
|----------------------|-------------------|-------------------|------------|
| Oblong box | 21.1% | 42.3% | 21.2% |
| Square box | 38.2% | 59.3% | 21.1% |
| Across the two boxes | 32.1% | 50.9% | 18.8% |

In exchange for class credit, 120 university students (74 males, 45 females, 1 unspecified) participated, ranging in age from 18 to 25 ($M=20$). Procedures matched those of Study 1, except as noted.

Warning After the emotion induction but before making their choices, half the participants received the following written warning regarding emotional carryover from the film clip they had just seen:

Watching film clips in the first part of the study can bias choices in the second part. Specifically, having just seen an unpleasant film can increase your desire to get rid of things you have in your possession. Likewise, having just seen a pleasant film clip can increase your desire to keep things you have in your possession. Because we are interested in studying how people can avoid being biased, please try your absolute best to avoid having any influence of the film clip on your decisions about the box! Give us your honest choice, reflecting your own feelings about the box, regardless of the film clip you viewed.

In the warning, the neutral and disgust films were respectively referred to as “pleasant” and “unpleasant.”⁹

Trading decision Following Study 1’s methods, subjects next were given the second box, allowed to handle it, and asked whether they wished to trade.¹⁰

2.2 Results

Emotion inductions were effective in magnitude and specificity. *Neutral-induction* participants reported feeling neutral much more often than *disgust-induction* participants did (63.9% versus 45.8%), $\chi^2(1, N=120)=4.001, p<.05$, whereas *disgust-induction* participants reported feeling disgusted much more often than *neutral-induction* participants did (66.1% versus 4.9%), $\chi^2(1, N=120)=49.350, p<.001$. *Disgust-induction* participants also reported feeling significantly more disgust than any other measured negative emotion, including anger, fear, and sadness. Participants noted the warning: 91.7% said they remembered the warning about the possible biasing effects of the film, and 87.2% said the warning was believable.

In the *no-warning (control) conditions*, Study 1’s pattern was replicated. Consistent with the main hypothesis, *disgust-induction* participants were much (2.5 times)

⁹ These particular terms were used for two reasons: (1) withholding a label for the target emotion (disgust) reduced demand characteristics, and (2) pilot testing for the warning revealed that although participants experienced the coral reef film as neutral, they verbally referred to it as a “pleasant” rather than “neutral” film because they were not accustomed to thinking of a film as “neutral.”

¹⁰ There was one difference. In Study 1, participants hung up a card reading “Trade” if they wished to do so. Study 2 made this format more balanced by giving participants a second card reading “Keep” to hang if that was their preferred action. Individuals in Study 2 in both the *disgust* and *neutral inductions* kept their oblong box more often than did individuals in Study 1. The availability of the “Keep” sign may have contributed to this outcome.

Table 4 Regression of the propensity to trade on disgust induction in study 1

| Explanatory variable | (1) Trade | (2) Trade | (3) Trade |
|----------------------|------------------|------------------|------------------|
| Disgust induction | 0.189* (0.095) | 0.211** (0.095) | 0.216** (0.099) |
| Oblong | | -0.171* (0.096) | -0.172* (0.097) |
| Angry | | | -0.153 (0.208) |
| Fearful | | | 0.003 (0.13) |
| Sad | | | 0.122 (0.14) |
| Constant | 0.321*** (0.067) | 0.382*** (0.075) | 0.371*** (0.077) |
| Observations | 106 | 106 | 106 |
| R-squared | 0.04 | 0.07 | 0.08 |

Standard errors in parentheses

* significant at 10%; **significant at 5%; *** significant at 1%

more likely (33.3%) to trade away their status quo commodity than were *neutral-induction* participants (13.8%).

In the *warning condition*, the predicted asymmetric pattern emerged. *Neutral-induction* participants heeded the warning and adjusted their choices, trading much (2.7 times) more frequently than in the *warning condition* ($M_n^{warning}=37.5\%$, $M_n^{no-warning}=13.8\%$). $\chi^2(1, N=61)=4.419, p<.05$. Our prime interest was whether the warning would influence *disgust-induction* participants toward trading away their commodity. Consistent with our negative prediction, participants traded at the same rate independent of the warning manipulation ($M_d^{no-warning}=33.3\%$, $M_d^{warning}=31.0\%$). $\chi^2(1, N=59)=0.36$, an insignificant value. See results in Table 5. This result supports Hypothesis 5; namely, even warnings that are effective elsewhere fail to negate the disgust-promotes-disposal effect.¹¹

This result was replicated using a linear probability model. Table 6 shows that the warning significantly increased the propensity to trade given the *neutral induction*. Table 7 reveals, however, that the warning had no influence on the likelihood of trade given the *disgust induction*. These results applied whether or not the other emotions were included.

As in Study 1, 90% of the participants in the *disgust induction*, warned or unwarned, reported that viewing the unpleasant movie clip could *not* have influenced their preferences. Yet the *disgust* clip induced both the warned and unwarned groups to trade substantially more often.

Descriptive analyses compared trading levels in Study 1 and Study 2. For a clean comparison, we only employed an oblong box as the initial possession. As expected, no significant differences emerged in the trading level for the *disgust induction* across studies (42.3% versus 33.3%), nor did they for the trading level for the *neutral induction* (21.1% versus 13.8%).

¹¹ An alternative explanation is that disgusted decision makers ignored the warning because they were angry at the experimenter for making them watch the unpleasant film clip. This idea received no support; in neither condition did many decision makers experience anger, consistent with the results in Table 2.

Table 5 Propensities to trade away status quo object (Oblong Box) in study 2

| Emotion induction | De-Bias condition | Choice | |
|-------------------|-------------------|--------|-------|
| | | Keep | Trade |
| Neutral | No Warning | 86.2% | 13.8% |
| | Warning | 62.5% | 37.5% |
| Disgust | No Warning | 66.7% | 33.3% |
| | Warning | 69.0% | 31.0% |

2.3 Discussion

Neutral-induction decision makers heeded the warning and engaged in substantially more trades when warned.¹² By contrast, *disgust-induction* decision makers traded away their status quo commodity at the same rate whether or not they were warned against carryover effects. As we conjectured, the disgust-promotes-disposal effect persisted despite interventions that might be expected to diminish it.

3 General discussion

Incidental feelings of disgust carry over to promote the disposal of owned objects and thereby counteract SQB. This disgust-promotes-disposal effect is substantial. Across studies and inductions, disgusted people disposed of a present possession 50.9% of the time, as opposed to 32.1% of people in a neutral state. A second study involved a warning about bias. The warning effectively changed behavior for those in the neutral state, but it did not diminish the DPD effect. This finding supports the ATF hypothesis that disgust subconsciously triggers the implicit goal to dispose of current possessions and thus counteracts SQB.

The results add empirical evidence to the growing body of work demonstrating that incidental emotions strongly affect choices. (For reviews see Loewenstein et al. 2001, and Weber and Johnson 2009.) Indeed, in an array of real-world situations, people's propensity to stick with the status quo may be powerfully counteracted by feelings of incidental disgust.

These are the first experiments to examine the effects of emotion on the otherwise robust SQB. Readers may wonder if other emotions will influence SQB. The present data suggest that disgust has uniquely strong effects on SQB. Specifically, the self-reported emotions of participants (except disgust) showed no significant effects on choice. This held across experiments. But systematic evaluation of manipulated (rather than measured) emotion should take place. The ATF, as an overarching framework, may provide guidance for this endeavor. The ATF predicts that the influence of an emotion is limited to spheres of judgment related to the emotion's

¹² The effectiveness of the warning is notable, as there is no reason to believe pleasant films promote SQB.

Table 6 Regression of the propensity to trade on warning for neutral induction in study 2

Standard errors in parentheses* significant at 10%; **significant at 5%; *** significant at 1%

| | (1) Trade | (2) Trade |
|--------------|-----------------|-----------------|
| Warning | 0.237** (0.110) | 0.243** (0.115) |
| Angry | | -0.121 (0.244) |
| Fearful | | -0.221 (0.282) |
| Sad | | -0.098 (0.199) |
| Constant | 0.138* (0.08) | 0.165* (0.084) |
| Observations | 61 | 61 |
| R-squared | 0.07 | 0.11 |

appraisals. For example, research has shown that appraisals of predictability/certainty and perceptions of control drive people’s risk perceptions (Slovic 1987). Accordingly, an emotion such as anger—defined by the appraisals of certainty and individual control—has been found to influence judgments of risk. Anger, however, should not influence choices regarding the status quo, which is not associated with appraisals of certainty or control. The methodological implications of this matching principle are clear. Research should compare emotions that are highly differentiated in their appraisals on judgments/choices that relate to those feelings. In terms of SQB, the ATF predicts that incidental sadness would have a similar effect to disgust, causing decision makers to get rid of what they possess. (For a full theoretical rationale, see Cryder et al. 2008.) By contrast, incidental anger should have no significant effects on SQB.

Past work, in both the lab and field studies, demonstrates that status quo bias strongly affects important choices. Our study alone cannot determine whether it is a surface bias that can be easily counterbalanced by even the brief induction of a mild countervailing emotion, or conversely whether SQB is a deep bias, yet still one capable of being counterbalanced by the potent emotion of disgust. However, the fact that we know of no prior study where SQB was overcome tilts our suspicion towards the deep-bias-with-counterbalance hypothesis. But this hypothesis, obviously, merits future testing, for example by assessing willingness-to-pay to trade the object.

The finding that warning about the disgust-promotes-disposal effect had no influence on choice suggests a realm for future study. Under what circumstances, more generally, can warning about biases reduce or eliminate them? For example, would

Table 7 Regression of propensity to trade on warning for disgust induction in study 2

Standard errors in parentheses* significant at 10%; **significant at 5%; *** significant at 1%

| | (1) Trade | (2) Trade |
|--------------|------------------|-----------------|
| Warning | -0.023 (0.124) | -0.014 (0.136) |
| Angry | | 0.053 (0.25) |
| Fearful | | -0.006 (0.197) |
| Sad | | -0.188 (0.225) |
| Constant | 0.333*** (0.087) | 0.35*** (0.098) |
| Observations | 59 | 58 |
| R-squared | 0 | 0.02 |

warning about the effects of anchoring make individuals less likely to be influenced by a strategically provided statistic in a legal proceeding, or a starting price in a negotiation? And even if warnings had little or no effect in experiments, would semester long courses in decision theory help? And if the answer to these questions is also negative, should this lead us to change our normative decision theory? After all, those who preach the religion of Ramsey and de Finetti—see Raiffa 1997, for an accessible explication—often argue that if individuals could be thoroughly exposed to that religion, the individuals would come around to their point of view.

Transcending theoretical models, the implications of these findings apply to many of life's choices. As public health expert Valerie Curtis (2011) argues, “disgust is a hidden cost of many occupations such as caring for the sick and dealing with wastes,” making it a crucial area of study. It may be, for example, that sick patients who have bowel-related problems may be systematically avoided by medical practitioners without awareness of such by the practitioners. In addition, based on the present findings, it may be that interventions to avoid such a bias may fail.

Relatedly, a cancer patient who is nauseated by chemotherapy drugs might decide to switch to alternative treatments, to her detriment. One possible remedy is that doctors might show their obese patients images of diseased hearts to motivate them to lose weight, or perhaps a revealing image of their body would be more successful.

Also within the domain of health, research by Rozin and colleagues (1997) reveals that disgust can serve as a “moralizing emotion,” serving to reinforce a commitment to vegetarianism even if meat were not originally considered disgusting by the individual who has now chosen to become a vegetarian. Thus, a disgust-promotes-disposal effect can have a self-perpetuating effect on food decisions, leading to an ever-widening domain of foods that are avoided. Given that providing health information to patients often yields paltry effects, healthcare practitioners may want to deploy an improved knowledge of how to invoke human emotion to bolster outcomes.

Examples in legal decision making abound. In the courtroom, where the status quo is a finding of innocence, moral disgust—say toward an alleged pedophile—might make conviction more likely than it would be with equivalent evidence for an equally serious but less disgust-inducing crime.¹³

As the above examples in health and legal decision making reveal, a better understanding of disgust and its effects on decision bias should hopefully yield useful insights into improving public policies. It is now time to embark on systematic research involving what has been an understudied domain: disgust and decision making.

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¹³ See Nussbaum (2006) for a broad ranging discussion on how the law treats, indeed often criminalizes, activities that induce disgust.

References

- Cryder, C. E., Lerner, J. S., Gross, J. J., & Dhal, R. E. (2008). Misery is not miserly. *Psychological Science*, *19*, 525–530.
- Curtis, V. (2011). Why disgust matters. *Philosophical Transactions of the Royal Society B*, *366*, 3478–3490.
- Ekman, P. (1992). An argument for basic emotions. *Cognition and Emotion*, *6*, 169–200.
- Forgas, J. P. (2003). Affective influences on attitudes and judgments. In R. J. Davidson, K. R. Scherer, & H. H. Goldsmith (Eds.), *Handbook of affective science* (pp. 596–618). New York: Oxford University Press.
- Foster, C. A., Witcher, B. S., Campbell, W. K., & Green, J. D. (1998). Arousal and attraction: Evidence for automatic and controlled processes. *Journal of Personality and Social Psychology*, *74*, 86–101.
- Frijda, N. H. (1986). *The emotions*. New York: Cambridge University Press.
- Gross, J. J., & Levenson, R. W. (1993). Emotional suppression: Physiology, self-report, and expressive behavior. *Journal of Personality and Social Psychology*, *64*(6), 970–986.
- Haidt, J., McCauley, C. R., & Rozin, P. (1994). Individual differences in sensitivity to disgust: A scale sampling seven domains of disgust elicitors. *Personality and Individual Differences*, *16*, 701–713.
- Hammond, D., Fong, G. T., McDonald, P. W., Brown, S., & Cameron, R. (2004). Graphic Canadian cigarette warning labels and adverse outcomes: Evidence from Canadian smokers. *American Journal of Public Health*, *94*(8), 1442–1445.
- Knetsch, J. L. (1989). The endowment effect and evidence of nonreversible indifference curves. *American Economic Review*, *79*(5), 1277–1284.
- Lazarus, R. S. (1991). *Emotion and adaptation*. New York: Oxford University Press.
- Lerner, J. S., & Keltner, D. (2001). Fear, anger, and risk. *Journal of Personality and Social Psychology*, *81*(1), 146–159.
- Lerner, J. S., Small, D. A., & Loewenstein, G. F. (2004). Heart strings and purse strings: Carryover effects of emotions on economic decisions. *Psychological Science*, *15*(5), 337–341.
- Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin*, *127*(2), 267–286.
- Nussbaum, M. (2006). *Hiding from humanity: Disgust, shame, and the law*. Princeton: Princeton University Press.
- Raiffa, H. (1997). *Decision analysis: Introductory lectures on choices under uncertainty*. McGraw-Hill College Custom Series.
- Ritov, I., & Baron, J. (1992). Status-quo and omission biases. *Journal of Risk and Uncertainty*, *5*, 49–51.
- Rozin, P., & Fallon, A. (1987). A perspective on disgust. *Psychological Review*, *94*, 23–41.
- Rozin, P., Markwith, M., & Stoess, C. (1997). Moralization and becoming a vegetarian: The transformation of preferences into values and the recruitment of disgust. *Psychological Science*, *8*, 67–73.
- Rozin, P., Haidt, J., & McCauley, C. (2000). Disgust. In M. Lewis & J. Haviland (Eds.), *Handbook of emotions* (2nd ed., pp. 637–653). New York: Guilford Press.
- Samuelson, W., & Zeckhauser, R. (1988). Status-quo bias in decision making. *Journal of Risk and Uncertainty*, *1*, 7–59.
- Schweitzer, M. (1994). Disentangling status quo and omission effects: An experimental analysis. *Organizational Behavior and Human Decision Processes*, *58*, 457–476.
- Slovic, P. (1987). Perception of risk. *Science*, *236*, 280–285.
- Viscusi, W. K. (2011). Written statement for the rulemaking record of the FDA. <http://law.vanderbilt.edu/faculty/faculty-personal-sites/w-kip-viscusi/publications/other-documents-and-reports/download.aspx?id=7469>
- Weber, E. U., & Johnson, E. J. (2009). Mindful judgment and decision making. *Annual Review of Psychology*, *60*, 53–85.
- Wilson, T. D., & Brekke, N. (1994). Mental contamination and mental correction: Unwanted influences on judgments and evaluations. *Psychological Bulletin*, *116*(1), 117–142.