

Feelings Not Forgone: Underestimating Affective Reactions to What Does Not Happen

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Abstract

In two experiments, we observed that when given the choice of gambling or not gambling, people who chose not to gamble underestimated the intensity of their affective reactions to the forgone gamble's outcome. Those who would have been winners felt more displeasure than anticipated, and those who would have been losers felt more pleasure than anticipated. We suggest that this underestimation stems partly from people's belief that affective experience is relatively uninfluenced by events they chose not to experience. Consistent with this suggestion, participants' affective forecasts were not influenced by whether the participants or a computer made the choice not to gamble—as though participants did not feel personally responsible for the forgone outcome, whether chosen by themselves or by a computer. In contrast to their affective forecasts, however, participants' affective reactions to forgone outcomes were less intense when the computer chose not to gamble than when the participants themselves made the choice not to gamble. Participants therefore proved to be more accurate in predicting their affective reactions to the results of the computer's decision not to gamble than in predicting their affective reactions to the results of their own decision not to gamble. The theoretical and practical implications of these findings are discussed.

Keywords

affect, judgment, counterfactual thoughts, affective forecasting, choice, decision making

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An intriguing feature of everyday experience is that people react affectively not only to events that happen, but also to those that do not happen. Consider the very different reactions of two individuals who decided many years ago not to invest their entire retirement savings in one of two risky financial ventures. One investment opportunity was later discovered to have been a Ponzi scheme, whereas the other was with an Apple-like computer company that became unimaginably successful. Although the two investors' retirement savings (chosen over the investments) could have been growing steadily over the years, the person who would have lost the investment (but has instead moderate retirement savings) may be more pleased than the person who could have become wealthy, who may be distinctly displeased. Or consider the very different reactions of two individuals who both decide not to bet \$20 at a roulette wheel. One finds out that he or she would have lost the bet, whereas the other finds out that he or she would have won. Although both individuals have kept their \$20 by not gambling, the person who would have lost may feel better than the person who would have won. In cases such as these, how accurately do people forecast their affective reactions to events that do not happen?

When predicting their affective responses to events that do happen, people often overestimate the intensity (Buehler & McFarland, 2001) and duration (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998) of their reactions (Gilbert & Wilson, 2007; Wilson & Gilbert, 2003). For example, people overestimate how much happier they will be living in California than in the Midwest (Schkade & Kahneman, 1998), how distressed they will be if their favored candidate were to lose an election (Gilbert et al., 1998), and how intense their emotional reaction will be after learning they have performed either well or poorly on an important examination (Buehler & McFarland, 2001).

Given the results of affective forecasting research on events that *do* happen, it would seem that people might also overestimate the intensity of their affective reactions to events that *do not* happen. Indeed, there are several examples of studies in which participants overestimate their affective reactions to missing a desired and intended outcome. In one series of

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studies, individuals overestimated how much regret they would experience after not winning an attractive prize in a laboratory game show and after missing their subway train (Gilbert, Morewedge, Risen, & Wilson, 2004). The overestimation of regret was particularly evident when people missed a desired intended outcome by a narrow rather than a wide margin (e.g., just missing a subway train by 1 or 2 min rather than 5 or 6 min).

The degree to which people overestimate (or possibly underestimate) the intensity of their affective reactions depends on two types of factors: factors that exacerbate a person's belief that events will influence them affectively and factors that minimize events' actual affective impact. People overestimate affective impact when the same factors leading them to believe events will have affective impact actually minimize affective impact. In particular, when people feel personally responsible for a negative outcome, their sense of responsibility both exacerbates their affective forecasts and minimizes their affective experience. This often occurs because individuals retrospectively rationalize their actions to minimize their personal responsibility (Gilbert & Ebert, 2002; Wilson & Gilbert, 2003). In the case of regret, when people imagine a desired outcome not occurring by a narrow margin, they feel a heightened sense of personal responsibility, which increases their predicted regret. However, when people actually come close to a desired and intended outcome that does not occur, the same narrow margin leads them to shift responsibility from themselves to an external source, thereby minimizing their experienced regret (Gilbert et al., 2004, Studies 2, 3a, and 3b).

We suggest that similar personal responsibility factors, which can sometimes cause people to overestimate their experienced regret, can at other times cause people to underestimate their affective reactions to events that do not happen. We hypothesize that when people intentionally choose not to experience an uncertain event, they believe that the event's forgone outcome will have relatively little affective impact. Upon discovering the uncertain event's outcome, however, people quite easily make compelling counterfactual comparisons (Roese, 1997), such that they tend to experience more displeasure than they had expected if they find out that the outcome would have been positive and more pleasure than they had expected if they find out that the outcome would have been negative. Thus, the same factor that leads individuals to think they will be relatively unaffected—intentionally choosing not to experience an uncertain event—in fact leads them to experience more intense affect than they had expected.

We suggest that people believe they will be relatively unaffected by uncertain events that they intentionally forgo because they construe decisions as the intentional selection of actions taken rather than the selection of actions *not* taken. This assumption is supported by research indicating that people can process information, learn contingencies, and make inferences about positive occurrences—such as actions that are taken and outcomes that are associated with attributes' presence—more easily than about nonoccurrences—such as actions not taken

and outcomes associated with attributes' absence (Fazio, Sherman, & Herr, 1982; Jenkins & Sainsbury, 1969; Ross, 1977). One implication of the suggestion that people construe decisions as actions they take rather than as actions they do not take is that people may expect to have stronger affective reactions to events that they chose to happen than to events that they chose not to happen. For example, people may expect to have more intense affective reactions to gambles they chose to take than to gambles they chose not to take. Research consistent with this claim indicates that people expect the regret arising from actions they take to be more intense than the regret arising from actions they do not take (Kahneman & Tversky, 1982), at least initially (Gilovich & Medvec, 1994).

The possibility that individuals believe they will be relatively unaffected by the events they choose not to happen may appear to contradict the finding that people overestimate how much regret they will experience when an intended and desired outcome does not happen (Gilbert et al., 2004). In previous research, people overestimated how much regret they would feel when their chosen actions narrowly failed to produce the desired event. The event that did not happen—and for which people overestimated the intensity of their regret—was therefore one that they selected and intentionally pursued, as opposed to one that they did not select and pursue. In contrast, our analysis concerns people's affective forecasts and reactions to actions that they chose not to take.

If people believe that they will be relatively unaffected by the outcomes of actions they chose not to take, there should be some situations in which people underestimate, rather than overestimate, their affective reactions to events that do not happen. Such underestimation should be particularly likely to occur when the salience of events that do not happen amplifies rather than attenuates affective experiences (Mellers, Schwartz, Ho, & Ritov, 1997). Our opening examples concerning gambling choices illustrate this case: People can easily make counterfactual comparisons between their chosen event and forgone events. Consider a risk-averse individual's first visit to a high-stakes roulette game. The potential loss of a large sum of money makes the decision not to gamble the obvious safe choice. It would seem that having wisely avoided gambling, the individual would be relatively unaffected by the forgone gamble's outcome. When the wheel stops spinning, however, and the potential gambler sees vividly and concretely that he or she could have lost (or won) a large sum of money, counterfactual comparisons are rapidly, easily, and compellingly made (Roese, 1997). Facing a now-real forgone loss (or win) may therefore cause the individual to experience more pleasure (or pain) than he or she had expected.

In two experiments, we tested the hypothesis that after choosing not to take an uncertain gamble, people would underestimate both their degree of pleasure following a forgone loss and their degree of displeasure following a forgone gain. We used a gambling paradigm for three reasons: First, individuals experience strong affective reactions to monetary losses and gains (Kahneman & Tversky, 1979; Mellers et al., 1997),

which makes gambling a simple context in which to study affective experience. Second, the clarity of a gamble's expected value makes it easy for people to evaluate the wisdom (or foolishness) of gambling when they are deciding whether or not to take the gamble. Third, having a clear idea of the odds and potential outcome of a gamble makes it difficult for people to reinterpret the event in a way that might minimize their affective reactions to forgone outcomes. Previous research (Gilbert et al., 2004) showed that people could shift responsibility from themselves to an external source (e.g., closed gates in a subway station), which might have contributed to the overestimation of their own future affective reactions. Our study, however, made it relatively difficult for individuals to shift personal responsibility for choosing not to gamble to an external source.

Experiment I

We crafted a gamble with an unfavorable expected value, so that people would choose to avoid taking the gamble. They were subsequently told the gamble's outcome. As the participants freely chose to avoid the gamble, we predicted that they would underestimate how pleased they would be to learn that had they gambled, they would have lost. We also predicted that they would underestimate how displeased they would be to learn that had they gambled, they would have won.

Method

University students ($N = 49$; 34 females, 15 males) participated in exchange for \$15. Upon arriving at the lab, participants were told that they could choose to gamble \$10 of the \$15, which allowed them to make a risky decision about their money, while earning at least \$5 in the experiment.

Participants were told they could either bet \$10 or choose not to bet and that they would observe the gamble and its outcome regardless of their choice. The expected value of the gamble was designed so that participants would choose not to gamble: There was a 47.50% chance of winning the \$10 bet (to win \$20 in total) and a 52.50% chance of losing the \$10 (for \$0 in total). Given the gamble's negative expected value (of $-\$0.50$), and people's tendency to be risk averse, particularly when weighing a guaranteed gain against a potential loss (Kahneman & Tversky, 1979), we predicted (and later confirmed) that the overwhelming majority of participants would choose not to gamble.

To highlight the chance nature of the gamble's outcome, we displayed a board of 21 red and 19 blue squares on a screen; red squares represented losing outcomes, and blue squares represented winning outcomes. An "X" was flashed at a random location on the board every 0.5 s for 15 s. The color of the square that the "X" landed on at the end of 15 s determined the outcome. Participants viewed a trial gamble before choosing whether or not to bet in the target gamble. We included a trial gamble to prevent any ambiguity about what would happen

during the gambling procedure, so that it would be difficult for participants to later reinterpret the situation in a way that minimized its affective impact.

To measure participants' baseline affect, we asked them at the beginning of the experiment to report how they felt "right now," using a 101-point scale ($-50 = \textit{very bad}$, $0 = \textit{neutral}$, $+50 = \textit{very good}$). To measure the affective reactions that participants predicted they would have when they learned the outcome of the gamble they had chosen not to take, we asked them, right after they chose not to gamble, to predict on the same 101-point scale how they would feel upon learning that they would have won and how they would feel upon learning that they would have lost. Immediately after observing the gamble's outcome, participants were asked to report how they felt "right now," using the same scale as before. Participants thus reported their experienced or predicted affect three times during the experiment: prior to making the gambling choice (baseline affect), after choosing not to gamble (predicted post-outcome affect), and after learning the outcome (experienced postoutcome affect).

Results and discussion

The vast majority of participants (43 out of 49) chose not to gamble. The gamblers, whose baseline affect ($M = -2.00$, $SD = 7.48$) did not significantly differ from that of the rest of the sample ($M = 0.00$, $SD = 21.11$), $F < 1$, n.s., were excluded from all analyses. Among participants who chose not to gamble, there was no significant difference in baseline affect between those who would have won ($M = 2.5$, $SD = 15.9$) and those who would have lost ($M = -2.2$, $SD = 24.9$), $F < 1$, n.s.

As predicted, participants underestimated the magnitude of their emotional reactions to forgone wins and losses (see Table 1). A 2 (forgone win vs. forgone loss) \times 2 (forecasted vs. experienced affect) analysis of variance (ANOVA) with repeated measures on the second factor revealed (not surprisingly) a significant effect of forgone outcome, $F(1, 41) = 35.39$, $p < .001$, $\eta_p^2 = .46$, reflecting that participants predicted they would feel worse following a forgone win ($M = -8.25$, $SD = 15.01$) than following a forgone loss ($M = 20.50$, $SD = 20.04$). More important, the analysis also revealed the expected significant interaction, $F(1, 41) = 9.62$, $p < .01$, $\eta_p^2 = .19$. When considering forgone losses, participants underestimated how positively they would feel on learning that they would have lost \$10 had they gambled ($M_{\text{predicted}} = 16.30$, $SD = 19.78$; $M_{\text{experienced}} = 24.70$, $SD = 20.30$), $F(1, 41) = 5.76$, $p < .05$, $\eta_p^2 = .12$. When considering forgone wins, participants underestimated how negatively they would feel on learning that they would have won an additional \$10 had they gambled ($M_{\text{predicted}} = -4.50$, $SD = 15.21$; $M_{\text{experienced}} = -12.00$, $SD = 14.81$), $F(1, 41) = 4.01$, $p = .05$, $\eta_p^2 = .09$.¹

Participants who chose not to gamble thus underestimated how intensely they would feel upon learning about what did not happen (but could have happened). Moreover, people underestimated the magnitude of their affective reactions to forgone

Table 1. Participants' Mean Baseline, Predicted, and Experienced Affect in Experiments 1 and 2

Experiment and measure	Forgone outcome	
	Win	Loss
Experiment 1: free choice		
Baseline affect	2.5 _a (15.9)	-2.2 _a (24.9)
Predicted postoutcome affect	-4.5 _a (15.2)	16.3 _b (19.8)
Experienced postoutcome affect	-12.0 _b (14.8)	24.7 _c (20.3)
Experiment 2: free choice		
Baseline affect	-1.7 _a (20.6)	-5.4 _a (16.0)
Predicted postoutcome affect	-3.0 _a (21.4)	18.1 _b (22.4)
Experienced postoutcome affect	-13.5 _b (23.1)	30.7 _c (19.6)
Experiment 2: forced choice		
Baseline affect	-3.3 _a (18.3)	-5.0 _a (17.9)
Predicted postoutcome affect	-5.4 _a (21.2)	19.1 _b (28.6)
Experienced postoutcome affect	-7.5 _a (17.5)	22.6 _b (25.0)

Note: Standard deviations are given in parentheses. In Experiment 1, means with different subscripts within each row and column are significantly different ($p < .05$). Within each of the free-choice and forced-choice conditions of Experiment 2, means with different subscripts within each row and column are significantly different ($p < .05$).

outcomes despite having predicted these affective reactions less than 1 min earlier. The short time lapse between the measurement of affective forecasts and affective reactions, coupled with people's tendency to express consistent responses and have affective reactions that confirm their affective expectations (Klaaren, Hodges, & Wilson, 1994) thus make this paradigm a somewhat conservative test of the underestimation of affect.

Experiment 2

In our second experiment, we tested whether the tendency to underestimate affective reactions to the outcome of forgone gambles would vary when the decision not to gamble was imposed rather than freely and intentionally chosen. Our hypothesis was that people construe their decisions as intentionally taken actions and selected events, more than as actions not taken and events not selected. This hypothesis implies that when forecasting affective reactions to forgone outcomes, individuals should not take responsibility for—and should not expect strong affective reactions to—either freely chosen or imposed forgone outcomes. When experiencing affective reactions to forgone outcomes, however, freely chosen forgone outcomes have greater affective impact than imposed forgone outcomes (Pieters & Zeelenberg, 2005; Zeelenberg & Pieters, 2007). Thus, whether a forgone outcome is freely chosen or imposed may influence participants' affective experiences more than their affective forecasts. People's affective predictions should therefore correspond with their affective experience when the forgone outcomes are not freely chosen but imposed, in which case personal responsibility is minimized in both expectation and experience.

We tested this hypothesis in our second experiment by replicating the first experiment's procedure, but with a twist. Whereas participants in one condition freely chose not to gamble, participants in another condition had the choice not to gamble imposed by a computer. We predicted that accuracy would be higher in the latter condition, primarily because affective reactions to forgone outcomes would be attenuated when those outcomes were forced rather than freely chosen.

It is important to note that this procedure controlled for two alternative interpretations of the findings in our previous experiment. One interpretation is that individuals tend to underestimate the magnitude of their affective experience because they underestimate the perceptual contrast between obtained and forgone outcomes. Another interpretation is that participants underestimate how much the hindsight bias—the tendency, after the fact, to think that an observed outcome was more obvious than it was (Fischhoff, 1975, 1982)—exacerbates counterfactual comparisons between obtained and forgone outcomes. Experiment 2 ruled out both interpretations because in both the free-choice and the forced-choice conditions, participants observed both the obtained and forgone outcomes. Neither the perceptual contrast nor the hindsight bias interpretations imply a difference between the free-choice and forced-choice conditions. Our hypothesis, in contrast, was that although people do not distinguish between freely chosen and imposed forgone outcomes when forecasting affect, freely chosen forgone outcomes exert greater influence on affective experience than imposed forgone outcomes.

Method

University students ($N = 119$; 63 females, 56 males) participated in the experiment in exchange for \$15. Participants learned about the rules of the gamble, practiced it, and then were told that they would be randomly assigned either to a situation in which “you make your betting decision” (free-choice condition) or to one in which “the computer will make your betting decision” (forced-choice condition). As in Experiment 1, participants in the free-choice condition reported their baseline affect (“right now”) on a 101-point scale ($-50 = \text{very bad}$, $0 = \text{neutral}$, $+50 = \text{very good}$); chose whether or not to gamble \$10; predicted their affective reactions to a forgone win and a forgone loss; learned the forgone gamble's outcome; and then reported their experienced affect, having learned the forgone gamble's outcome. For participants in the forced-choice condition, the procedure differed in that they were told a computer would choose whether or not they would gamble; unbeknownst to them, the computer always chose that they would not gamble.

The gamble that participants faced was similar to that in Experiment 1, with two minor changes. First, the probability of winning was decreased to 45% (18 blue squares, 22 red squares), to more strongly discourage participants from choosing to gamble. Second, the duration for which the “X” flashed on the 40 squares was reduced from 15 to 10 s.

Results and discussion

The vast majority of participants (61 out of the 68) in the free-choice condition chose not to gamble their \$10; those who chose to gamble were excluded from analyses, as in Experiment 1. The baseline affect for the gamblers in the free-choice condition ($M = 0.14$, $SD = 18.93$) did not differ from that for the nongamblers in the free-choice condition ($M = -3.49$, $SD = 18.93$), $F < 1$, n.s., nor from that for participants in the forced-choice condition ($M = -6.15$, $SD = 17.95$), $F < 1$, n.s. Also, among nongamblers, there were no significant differences in baseline affect between the free-choice and forced-choice conditions $F < 1$, n.s. (see Table 1).

As expected, individuals in the free-choice condition underestimated the magnitude of their affective reactions to forgone outcomes, replicating the results of Experiment 1, whereas those in the forced-choice condition did not (see Table 1). This pattern was reflected in a significant three-way interaction in a 2 (free choice vs. forced choice) \times 2 (forgone win vs. loss) \times 2 (predicted vs. experienced affect) ANOVA, $F(1, 108) = 4.24$, $p < .05$, $\eta_p^2 = .04$. In the free-choice condition, a 2 (forgone win vs. loss) \times 2 (predicted vs. experienced affect) ANOVA with repeated measures on the second factor revealed a main effect of the forgone outcome, $F(1, 59) = 45.79$, $p < .001$, $\eta_p^2 = .44$, and, more important, the predicted significant interaction, $F(1, 59) = 17.38$, $p < .001$, $\eta_p^2 = .23$. When considering forgone losses, participants underestimated how positively they would feel ($M_{\text{predicted}} = 18.06$, $SD = 22.42$; $M_{\text{experienced}} = 30.72$, $SD = 19.61$), $F(1, 59) = 9.90$, $p < .005$, $\eta_p^2 = .14$. When considering forgone wins, participants underestimated how negatively they would feel ($M_{\text{predicted}} = -2.96$, $SD = 21.40$; $M_{\text{experienced}} = -13.46$, $SD = 23.07$), $F(1, 59) = 7.52$, $p < .01$, $\eta_p^2 = .11$.

Participants in the forced-choice condition, in contrast, did not underestimate the magnitude of their affective reactions to the forgone outcomes. A 2 (forgone win vs. loss) \times 2 (forecasted vs. experienced affect) ANOVA with repeated measures on the second factor revealed a main effect of forgone outcome, $F(1, 49) = 22.31$, $p < .001$, $\eta_p^2 = .31$, but the interaction was not significant, $F < 1$, n.s., $\eta_p^2 = .02$ (see Table 1). When considering forgone losses, participants did not significantly underestimate how positively they would feel compared with how positively they actually felt on learning that they would have lost ($M_{\text{predicted}} = 19.07$, $SD = 28.59$; $M_{\text{experienced}} = 22.63$, $SD = 24.98$), $F < 1$, n.s., $\eta_p^2 = .01$. When considering forgone gains, participants did not significantly underestimate how negatively they would feel compared with how negatively they actually felt after learning that they would have won ($M_{\text{predicted}} = -5.42$, $SD = 21.20$; $M_{\text{experienced}} = -7.50$, $SD = 17.51$), $F < 1$, n.s., $\eta_p^2 = .00$.

Note that the increased accuracy of affective predictions in the forced-choice condition can be attributed more to changes in participants' experienced affect than to changes in participants' forecasted affect. We conducted a 2 (free choice vs. forced choice) \times 2 (forgone win vs. loss) ANOVA on participants' affective experience after learning the forgone outcome. This

analysis revealed a marginally significant interaction, $F(1, 108) = 2.93$, $p = .09$, $\eta_p^2 = .03$. For participants' forecasted affect, in contrast, the interaction in an analogous model did not approach significance, $F < 1$, n.s. Participants thus made similar affective forecasts whether the forgone outcomes were freely chosen or imposed—a finding consistent with our suggestion that participants would not anticipate feeling personally responsible for choosing to avoid the forgone outcome in either the free-choice or the forced-choice condition. In reality, however, whether the outcomes were freely chosen or computer imposed did substantially influence affective experience, a finding consistent with previous reports indicating that personal responsibility amplifies affective reactions to forgone outcomes.

General Discussion

In two experiments, we demonstrated that when people intentionally choose to forgo an uncertain outcome, they underestimate their affective reactions to finding out what the outcome would have been. We suggest that this underestimation occurs because individuals construe their decisions as actions they chose to take and as outcomes they have selected, more than as actions they chose not to take and as forgone outcomes, and hence do not project personal responsibility for forgone outcomes. Thus, whereas previous research has shown that situations highlighting personal responsibility—for example, missing an intended desired outcome by a narrow margin—can lead people to overestimate their regret about positive events that did not occur, our results suggest that when people intentionally forgo uncertain outcomes, they underestimate the intensity of their displeasure about forgone wins and underestimate the intensity of their pleasure about forgone losses. We suggest that when predicting their feelings, people tend to eschew responsibility for choosing to forgo uncertain outcomes. This suggestion is bolstered by our finding that individuals make similar affective forecasts when they make the “choice” to avoid a risky gamble themselves and when a computer imposes the choice on them.

These results highlight the importance not only of understanding why people often overestimate the intensity of their affective reactions, which has been the focus of most affective-forecasting research, but also of understanding when individuals underestimate the intensity of their affective reactions. We suspect that an important starting point is to determine whether pre- and postevent psychological processes attenuate or accentuate affective predictions and reactions. Research in this field has focused on circumstances in which counterintuitive post-decisional factors attenuate affective experience (e.g., rationalization: Gilbert et al., 1998; normalization: Wilson & Gilbert, 2003; and attention shifts: Schkade & Kahneman, 1998; Wilson, Wheatley, Meyers, Gilbert, & Axsom, 2000). Conversely, our results imply that counterintuitive post-decisional factors can sometimes exacerbate (rather than attenuate) affective experience, resulting in the underestimation (rather than overestimation) of affective experience.

Recent scientific studies on the accuracy of affective forecasting imply a human tendency to overestimate the intensity of affective reactions to emotional events. Our findings indicate that the accuracy of affective forecasting is somewhat more complex, and that when individuals make a “safe bet” by opting out of a risky gamble, they actually underestimate (rather than overestimate) their affective reactions. Forecasting the accuracy of affective predictions is thus more complex than it may first appear and deserves careful and continued scientific inquiry.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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Note

1. Along with underestimating the affective impact of both forgone wins and forgone losses, participants in both Experiments 1 and 2 predicted (incorrectly) that they would be affected by a forgone loss, but not by a forgone gain. As can be seen in Table 1, participants predicted (correctly) that they would experience significantly more pleasure than their baseline affect following a forgone loss, whereas they (incorrectly) did not expect to experience significantly more displeasure following a forgone gain. We suspect that the tendency to predict more extreme reactions to forgone losses than to forgone gains reflects people’s heightened sensitivity to negative outcomes (Rozin & Royzman, 2001), and their anticipated relief at avoiding such outcomes.

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