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Feelings not Foregone:

Underestimating Affective Reactions to What Does Not Happen

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Abstract

In two experiments, people who chose not to gamble underestimated the intensity of their affective reactions to the foregone gamble's outcome. Would-have-been winners felt more displeasure than anticipated and would-have-been losers felt more pleasure than they anticipated. We suggest that this underestimation stems partly from people's belief that affective experience is relatively uninfluenced by events they chose not to happen. Consistent with this suggestion, learning that a computer rather than themselves would choose not to gamble did not influence people's affective forecasts—as though people were not personally responsible for the foregone outcome whether chosen by themselves or a computer. However, participants' affective reactions to the foregone outcomes were less intense when the computer rather than themselves chose not to gamble. Participants were therefore more accurate when forecasting their affective reactions to the computer's decision not to gamble. Theoretical and practical implications of these findings are discussed.

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## Feelings not Foregone:

## Underestimating Affective Reactions to What Does Not Happen

An intriguing feature of everyday experience is that people react affectively not only to events that happen, but also to events that do *not* happen. Consider the very different reactions of two people who decided many years ago not to invest their retirement savings in one of two risky “opportunities”—one that is later discovered to have been a Ponzi scheme, the other with a Microsoft-like software company that later became unimaginably successful. Although the two investors’ retirement savings might have grown steadily over the years, the investor who almost lost it all may be more pleased with her moderate savings than the investor who was almost wealthy, who may be distinctly displeased. Or consider the very different reactions of two individuals at a roulette wheel who decide not to bet \$20—one of whom finds out that she would have lost, the other who finds out that she would have won. Although both individuals kept their \$20 by not gambling, the person who would have lost may feel better than the person who would have won. In these cases and others like them, how accurately do people forecast their affective reactions to the events that do not happen?

When people make affective forecasts about events that do happen, they often overestimate the intensity (Buehler & McFarland, 2001) and duration (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998) of their affective reactions (Gilbert & Wilson, 2007; Wilson & Gilbert, 2003). For example, people overestimate how much living in California would make them happier than living in the Mid West (Schkade & Kahneman, 1998), how distressed they would be if their favored candidate lost an election (Gilbert, et

al., 1998), and how intense their emotional reactions would be to learning they performed well or poorly on an important exam (Buehler & McFarland, 2001).

A simple extension of affective forecasting research from events that *do* happen would imply that people similarly overestimate the intensity of affective reactions to events that *do not* happen. Indeed, in one series of studies, people overestimated how much they would experience regret when they did not win an attractive prize in a laboratory game show and when they did not make a subway train on time (Gilbert, Morewedge, Risen, & Wilson, 2004). The overestimation of regret was evident particularly when people missed a desired intended outcome by a narrow rather than a wide margin (e.g., just missing a subway by 1 or 2 min rather than 5 or 6 min).

The degree to which people overestimate the intensity of their affective reactions obviously depends on two types of factors: first, factors that exacerbate people's belief that events will affectively impact them; second, factors that minimize events' actual affective impact. People overestimate affective impact when circumstances conspire such that the same factors that lead people to believe events will be affectively impactful actually minimize affective impact. In particular, when people feel personally responsible for negative outcomes, the sense of responsibility both exacerbates affective forecasts and minimizes affective experience, often by retrospectively rationalizing one's actions to minimize personal responsibility (Gilbert & Ebert, 2002; Wilson & Gilbert, 2003). In the case of regret, when people imagine a desired outcome not occurring, the closeness of missing by a narrow margin heightened the sense of personal responsibility, thereby increasing forecasted regret. However, having actually come close to a desired and intended outcome that did not happen, the same closeness that led people to expect

more intense regret also led people to shift responsibility from themselves to an external source, minimizing experienced regret (Gilbert, et al., 2005, Studies 2, 3a, and 3b).

We suggest that similar factors concerning personal responsibility that can sometimes conspire such that people overestimate their regret can other times conspire such that people underestimate their affective reactions to events that did not happen. We hypothesize, in particular, that when people intentionally choose not to experience an uncertain event, they believe that foregone outcome will have relatively little affective impact. Upon discovering the uncertain event's outcome, however, counterfactual comparisons are quite easily and potently made (Roese, 1997) such that people experience more displeasure than they expected at a foregone positive event and more pleasure than they expected at a foregone negative event. Thus, the same factor that leads people to think they will be relatively unaffected—intentionally choosing not to experience an uncertain event—leads people to experience more intense affect than they expected.

People's belief that they are relatively unaffected by uncertain events that they intentionally select not to happen, we suspect, reflects a tendency to construe decisions as the actions people intentionally take and the outcomes intentionally sought more than the actions *not* taken. Such an intuition is consistent with research indicating that people more easily process information about, learn contingencies, and make inferences about positive occurrences such as actions taken that are associated with the presence of attributes than about non-occurrences such as actions not taken (Fazio, Sherman, & Herr, 1982; Jenkins & Sainsbury, 1969; Ross, 1977). One implication of the suggestion that people construe decisions as the actions they take more than the actions they do not take

is that people should expect stronger affective reactions to events that happen than to events that do not happen. Consistent with this claim, previous research indicates that people expect regret arising from actions they take to be more intense than regret arising from actions they do not take (Tversky & Kahneman, 1982), at least initially (Gilovich & Medvec, 1994).

The possibility that people believe they will be relatively unaffected by the events they choose not to happen is the flipside of previous research's implication that people overestimate how much they will experience regret when an intended and desired outcome does not happen by a narrow rather than a wide margin (Gilbert, et al., 2004). In that 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 to which people overestimate the intensity of their regret—is thus one that people selected and intentionally pursued, not one that people did not select and pursue. Moreover, the possibility that people believe they are relatively unaffected by events they intentionally choose not to happen implies both that people would underestimate their displeasure following foregone positive outcomes pleasure following negative outcomes they chose to forgo.

If people do believe that they should be relatively unaffected by the outcomes of actions they chose not to take, then there should be some situations where people underestimate, rather than overestimate, their affective reactions to events that did not happen. Such underestimation should be particularly likely in situations where the salience of events that did not happen amplifies rather than attenuates affective experiences (Mellers, et al., 1997). One such situation, as illustrated in the opening

examples, is when people can easily make counterfactual comparisons between their chosen event and the foregone events. Consider a risk-averse individual's first time visit to a high stakes roulette wheel. The potential loss of a large sum of money makes the decision not to gamble an obvious, "safe" choice, and it would seem that having wisely avoided gambling, the individual would be relatively unaffected by the foregone gamble's outcome. When the wheel stops spinning, however, and the potential gambler sees vividly and concretely that she could have lost (or won) a large sum of money if she had chosen to gamble, the counterfactual comparisons come fast, easily, and potently (Roese, 1997). Facing a now real loss (or win) that did not happen may therefore cause the individual to experience more pleasure (or pain) than she expected.

We tested in two experiments the hypothesis that after choosing not to take an uncertain gamble, people would underestimate their pleasure following a foregone loss and would underestimate their displeasure following a foregone gain. We used a gambling paradigm for three reasons. First, people experience strong affective reactions to monetary gains and losses (Kahneman & Tversky, 1979; Mellers, et al., 1997), which makes gambles and monetary outcomes a simple context in which to study affective experience. Second, the clarity of gamble's expected value makes it easy for people to evaluate the wisdom (or foolishness) of gambling when deciding whether to gamble or not. Finally, and importantly, the clarity of gambles' odds and outcomes, makes it difficult to people to reinterpret the event in a way that might minimize affective reactions to foregone outcomes. That is, unlike previous research where people could shift responsibility from themselves to an external source (e.g., an unfair game or closed gates in the subway station), which might contribute to overestimating future affective

reactions, it is relatively difficult for people to shift to an external source responsibility for choosing not to gamble.

### Experiment 1

We crafted a gamble with an unfavorable expected value that people would choose to avoid, but of which they would learn the outcome. Because people freely chose to avoid the gamble, we predicted that they would underestimate how pleased they would be upon learning they would have lost had they gambled, and that they would underestimate how displeased they would be upon learning they would have won had they gambled.

#### *Method*

Forty-nine university students (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 participants to face a risky decision with their own 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 constructed such that participants would choose not to gamble: There was a 47.50% chance of winning \$10 bet (for \$20 total), and a 52.50% chance of losing \$10 (for \$0 total). Given the gamble's negative expected value (of  $-\$0.50$ ), and that people tend to be risk-averse, particularly when weighing a guaranteed gain against a potential loss (Kahneman & Tversky, 1979), we expected (and later confirmed) that the overwhelming majority of participants would chose not to gamble.

To highlight the chance nature of the outcomes, a 40-square board of 21 red and 19 blue squares appeared on a screen, with red squares representing losing outcomes and blue squares representing winning outcomes (see Figure 1). An X flashed at a random location on the board every  $\frac{1}{2}$  s for 15 s. The color of the square the X landed on at the end of 15 s would determine whether the participant won or lost. Participants viewed a trial gamble before choosing whether to bet in the target gamble, which removed any ambiguity about what would happen during the gambling procedure—making it difficult later to reinterpret the situation in a way that minimized its affective impact.

To measure participants' baseline affect, they were asked at the beginning of the experiment to report how they felt "right now" on a 101-point scale ( $-50 =$  very bad,  $0 =$  neutral,  $+50 =$  very good). To measure participants' forecasted affective reactions to learning the outcome of the gamble they chose not to take, participants were asked, right after they chose not gamble, to predict on the same 101-point scale how they would feel upon learning that they would have won, and upon learning that they would have lost. Right after observing the gamble's outcome, participants reported on the same 101-point scale how they felt "right now." Participants thus reported their experienced affect at the beginning of the experiment, forecasted their affective reactions to each outcome, and reported their experienced affect after learning the outcome.

### *Results and Discussion*

The vast majority of participants (43 out of 49) chose not to gamble. The six gamblers, whose baseline affect ( $M = -2.00$ ,  $SD = 7.48$ ) did not significantly differ from the rest of the sample ( $M = 0.00$ ,  $SD = 21.11$ ),  $F < 1$ ,  $ns$ , were excluded from all analyses. Among those who chose not to gamble, there was no significant difference in baseline

affect among those would have won ( $M = 2.5$ ,  $SD = 15.9$ ) versus lost ( $M = -2.2$ ,  $SD = 24.9$ ),  $F < 1$ , *ns*.

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

Participants who chose not to gamble thus underestimated how intensely they would feel upon learning what did not happen (but could have). Moreover, people underestimated the magnitude of their affective reactions to foregone outcomes even though they had forecasted their affective reactions less than 1 min previously. Expectation confirmation (Klaaren, Hodges, & Wilson, 1994) and consistency pressures thus make this paradigm a somewhat conservative test of the underestimation of affect.

## Experiment 2

In Experiment 2, we tested whether the tendency to underestimate affective reactions to events that did not happen would be moderated when the decision not to gamble was imposed rather than freely and intentionally chosen. Our hypothesis is that people construe their decisions as the actions taken and events selected more than the actions not taken and the events not selected. This argument implies that, when forecasting affect, people should not distinguish between freely chosen and imposed foregone outcomes—they are unlikely to take responsibility for forgone outcomes in either case. In affective experience, however, events that do not happen by choice influence people more than events that do not happen by imposition (Pieters & Zeelenberg, 2005; Zeelenberg & Pieters, 2007). Thus, whether a foregone outcome is freely chosen or imposed may influence affective experience more than affective forecasts. People's affective forecasts should therefore correspond with their affective experience when the foregone outcomes are not freely chosen but imposed, in which case personal responsibility is minimized in both expectation and experience.

We tested this prediction in Experiment 2 by replicating Experiment 1'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 having the decision to forego outcomes imposed rather than freely chosen would increase the accuracy of affective forecasts primarily by attenuating affective reactions to foregone outcomes that were imposed rather than freely chosen.

Importantly, this procedure controls for two alternative interpretations of Experiment 1's findings. One is that people underestimate the magnitude of their

affective experience because they underestimate the perceptual contrast between the obtained and foregone outcomes. Another is that participants underestimate how much the hindsight bias, the tendency to think that an observed outcome was more obvious than it was (Fischhoff, 1975, 1982), would lead them to compare their obtained and foregone outcomes. Experiment 2 controls for these possibilities because in both conditions, participants observe both the “chosen” and foregone outcomes, the only difference being whether those outcomes were freely chosen by or imposed.

### *Method*

One hundred nineteen university students (63 females, 56 males) participated 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 a situation 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 = very bad, 0 = neutral, +50 = very good), which did not differ by condition; chose not to gamble \$10; forecasted their affective reactions to a foregone win and a foregone loss; learned the foregone gamble’s outcome; and then reported their experienced affect having learned the foregone gamble’s outcome. For participants in the Forced Choice condition, the procedure differed in that their decision to gamble or not was made by the computer that, unbeknown to participants, always chose not to gamble.

The gamble 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 encourage participants not to gamble. Second, the duration for which the X flashed on the 40 squares was 10 rather than 15 seconds.

### *Results and Discussion*

Only 7 out of the 68 participants in the Free Choice condition chose to gamble the \$10 and were excluded from analyses. The baseline affect for gamblers ( $M = .14$ ,  $SD = 18.93$ ) did not differ from the non-gamblers in the Free Choice condition ( $M = -3.49$ ,  $SD = 18.93$ ),  $F < 1$ , *ns*, nor from participants in the Forced Choice condition ( $M = -6.15$ ,  $SD = 17.95$ ),  $F < 1$ , *ns*. There were no significant differences in baseline affect among the gamblers and those in the Forced Choice condition who would have won and would have lost,  $F < 1$ , *ns* (see Table 1).

As expected, those in the Free Choice condition underestimated the magnitude of their affective reactions to foregone outcomes whereas those in the Forced Choice condition did not (see Table 1). This pattern was reflected in a significant 3-way interaction in a 2 (Free Choice vs. Forced Choice)  $\times$  2 (foregone win vs. loss)  $\times$  2 (forecasted vs. experienced affect) ANOVA,  $F(1, 108) = 4.24$ ,  $p < .05$ ,  $\eta_p^2 = .04$ . In the Free Choice condition, a 2 (foregone win vs. loss)  $\times$  2 (forecasted vs. experienced affect) ANOVA with repeated measures on the second factor, revealed a main effect of foregone outcome,  $F(1, 59) = 45.79$ ,  $p < .001$ ,  $\eta_p^2 = .44$ , and, more importantly, the predicted interaction,  $F(1, 59) = 17.38$ ,  $p < .001$ ,  $\eta_p^2 = .23$ . Considering foregone losses, participants underestimated how positively they would feel ( $M = 18.06$ ,  $SD = 22.42$ ) compared with how positively they felt after actually learning they would have lost ( $M = 30.72$ ,  $SD = 19.61$ ),  $F(1, 59) = 9.90$ ,  $p < .005$ ,  $\eta_p^2 = .14$ . Considering foregone wins, participants underestimated how negatively they would feel ( $M = -2.96$ ,  $SD = 21.40$ ),

compared with how negatively they felt after actually learning that they would have won ( $M = -13.46$ ,  $SD = 23.07$ ),  $F(1, 59) = 7.52$ ,  $p < .01$ ,  $\eta_p^2 = .11$ .

Participants in the Forced Choice condition, in contrast, did not underestimate the magnitude of their affective reactions to the foregone outcomes. A  $2$  (foregone win vs. loss)  $\times$   $2$  (forecasted vs. experienced affect) ANOVA revealed a main effect of foregone outcome,  $F(1, 49) = 22.31$ ,  $p < .001$ ,  $\eta_p^2 = .31$ , but the interaction was not significant,  $F < 1$ ,  $ns$ ,  $\eta_p^2 = .02$  (see Table 1). Considering foregone losses, participants did not significantly underestimate how positively they would feel ( $M = 19.07$ ,  $SD = 28.59$ ) compared with how positively they felt after actually learning that they would have lost ( $M = 22.63$ ,  $SD = 24.98$ ),  $F < 1$ ,  $ns$ ,  $\eta_p^2 = .01$ . Considering foregone gains, participants did not significantly underestimate how negatively they would feel ( $M = -5.42$ ,  $SD = 21.20$ ) compared with how negatively they felt after actually learning that they would have won ( $M = -7.50$ ,  $SD = 17.51$ ),  $F < 1$ ,  $ns$ ,  $\eta_p^2 = .00$ .

Notice that the increased accuracy of affective forecasts in the Forced Choice condition was more attributable to changes in experienced affect than in forecasted affect. Considering participants' affective experience after learning the foregone outcome, a  $2$ (Free Choice vs. Forced Choice)  $\times$   $2$ (foregone win vs. loss) ANOVA revealed a marginally significant interaction,  $F(1, 108) = 2.93$ ,  $p = .09$ ,  $\eta_p^2 = .03$ . Considering participants' affective forecast, in contrast, the interaction in an analogous model did not approach significance,  $F < 1$ ,  $ns$ . Participants thus made similar affective forecasts whether the foregone outcomes were freely chosen or imposed—consistent with our suggestion that in neither the Free Choice nor the Force Choice condition did participants anticipate feeling personally responsible for choosing to avoid the foregone outcome. In

reality, however, whether outcomes were freely chosen or computer-imposed substantially influenced affective experience, consistent with previous research indicating that personal responsibility amplifies affective reactions to foregone outcomes.

### General Discussion

Two experiments demonstrate that when people intentionally choose to avoid an uncertain foregone outcome, they underestimate their affective reactions to what did not happen. We suggest this underestimation occurs because people construe their decisions as the actions taken and outcomes selected more than the actions not taken, and hence do not take personal responsibility for foregone outcomes. Thus, whereas previous research has shown that highlighting personal responsibility—for example, by missing an intended desired outcome by a narrow margin—can lead people to overestimate their regret about positive events that did not happen, our results suggest that when people intentionally avoid uncertain foregone outcomes, they underestimate the intensity of their displeasure about foregone wins and underestimate the intensity of their pleasure about foregone losses. Our suggestion that, when forecasting feelings, people eschew responsibility for choosing to avoid uncertain foregone outcomes is bolstered by the finding that people make similar affective forecasts when the “choice” to avoid a risky gamble is made by themselves personally and imposed by a computer.

These results highlight the importance of understanding not just why people often overestimate the intensity of affective reactions, which has been the focus of most affective forecasting research, but also of understanding when people underestimate the intensity of affective reactions. We suspect that an important starting point is whether pre- and post-event psychological processes attenuate or accentuate affective predictions

and reactions. Previous research focused on circumstances where 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, et al., 2000). Our results imply, on the flip side, that counter intuitive post-decisional factors can sometimes exacerbate (rather than attenuate) affective experience, yielding underestimation (rather than overestimation) of affective experience.

The recent scientific interest in the accuracy of affective forecasting has implied a tendency to overestimate the intensity of affective reactions to emotional events. The present findings indicate that the accuracy of affective forecasting is somewhat more complex, that when people make a “safe bet,” opting out of a risky gamble, they underestimate (rather than overestimate) their affective reactions. Forecasting the accuracy of affective forecasting is thus more complex than it might have seemed, and deserving of careful and continued scientific inquiry.

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## Footnotes

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

Figure 1. A screen shot of the red and blue checkerboard that participants viewed while the win (blue) or loss (red) outcome was randomly selected.

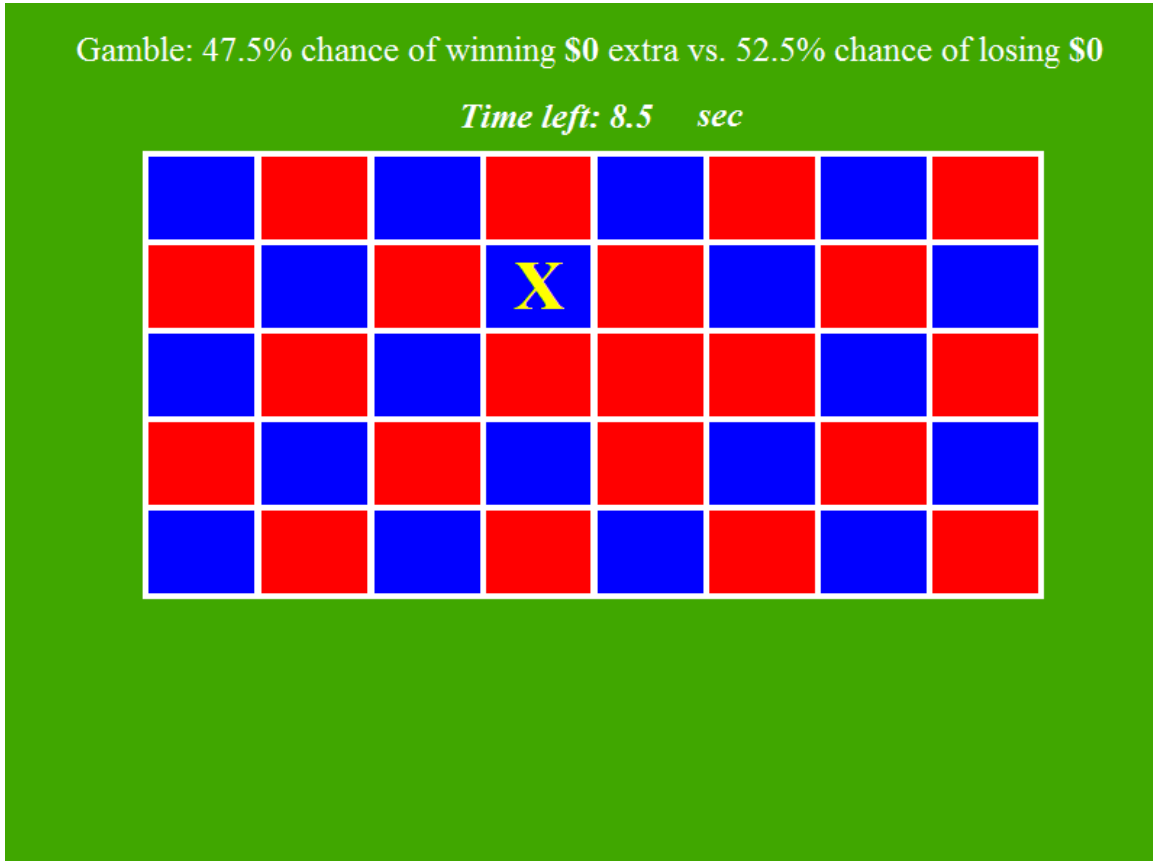


Table 1

*Participants' baseline, forecasted, and experienced affect following a foregone win and foregone loss in Experiments 1 and 2, and within each choice condition in Experiment 2.*

Experiment and Measure	Foregone Outcome	
	Win	Loss
<i>Experiment 1: Free Choice</i>		
Baseline affect	2.5 <sub>a</sub> (15.9)	-2.2 <sub>a</sub> (24.9)
Forecasted affect	-4.5 <sub>a</sub> (15.2)	16.3 <sub>b</sub> (19.8)
Experienced affect	-12.0 <sub>b</sub> (14.8)	24.7 <sub>c</sub> (20.3)
<i>Experiment 2: Free Choice</i>		
Baseline affect	-1.7 <sub>a</sub> (20.6)	-5.4 <sub>a</sub> (16.0)
Forecasted affect	-3.0 <sub>a</sub> (21.4)	18.1 <sub>b</sub> (22.4)
Experienced affect	-13.5 <sub>b</sub> (23.1)	30.7 <sub>c</sub> (19.6)
<i>Experiment 2: Forced Choice</i>		
Baseline affect	-3.3 <sub>a</sub> (18.3)	-5.0 <sub>a</sub> (17.9)
Forecasted affect	-5.4 <sub>a</sub> (21.2)	19.1 <sub>b</sub> (28.6)
Experienced affect	-7.5 <sub>a</sub> (17.5)	22.6 <sub>b</sub> (24.9)

Note. Standard deviations are in parentheses. Within each condition of each experiment, different subscripts indicate significantly different means ( $p < .05$ ) within rows or columns.