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Experience Theory, or How Desserts Are Like Losses

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Although many experiments have explored risk preferences for money, few have systematically assessed risk preferences for everyday experiences. We propose a conceptual model and provide convergent evidence from 7 experiments to suggest that, in contrast to a typical "zero" reference point for choices on money, reference points for choices of experiences are set at more extreme outcomes, leading to concave utility for negative experiences but convex utility for positive experiences. As a result, people are more risk-averse for negative experiences such as disgusting foods—as for monetary gains—but more risk-seeking for positive experiences such as desserts—as for monetary losses. These risk preferences for experiences are robust to different methods of elicitation.

Keywords: experiences, money, risk preferences, prospect theory, experience theory

How can we predict, when people make choices in everyday life, whether they will be risk-seeking or risk-averse? If these choices relate to money, we know the answer fairly confidently; extensive research demonstrates that people are risk-seeking when choosing between monetary losses and risk-averse when choosing between monetary gains (e.g., Kahneman & Tversky, 1979; Rabin & Thaler, 2001; Stewart, Chater, Stott, & Reimers, 2003; Wang & Johnson, 2012). To provide an example, most people will take a 50/50 chance of losing either $1 or $5 over a sure loss of $3, but choose a sure gain of $3 over a 50/50 chance of gaining either $1 or $5. Despite this well-documented research on risk preferences for money, surprisingly little attention has been paid to risk preferences for nonmonetary experiences, either negative (disgusting foods and visits to the dentist) or positive (desserts and visits to the movies). Facing a choice between seeing a "safe" movie that receives many three-star ratings and a "risky" movie that receives many five-star but also many one-star ratings, how do people evaluate the potential risks and rewards? Generally speaking, when and why do people decide to take chances on experiences (or not)?

Given the established contrast between risk preferences for positive and negative gambles on money, valence offers an intuitively appealing prediction about risk preferences for experiences: negative experiences (e.g., dentist visits) might be similar to monetary losses, whereas positive experiences (e.g., movie visits) might be similar to monetary gains, implying risk-seeking for negative experiences and risk-aversion for positive experiences. However, we propose and provide convergent evidence stemming from seven experiments reported below that people are relatively more risk-seeking for positive experiences and more risk-averse for negative experiences, the mirror image of choices for money: people gamble on desserts, but not on dentists. We coin this notion "experience theory" and explain its principles next.

We suggest that one mechanism underlying this pattern relates to the contrasting reference points that are commonly drawn upon for experiences and money. Reference points are critical to understanding risk preferences because they serve as the criterion against which possible outcomes are compared; outcomes are treated as losses whenever they fall below some reference point but as gains when they exceed that reference point (Heath, Larrick, & Wu, 1999; March & Shapira, 1992; Payne, Laughhunn, & Crum, 1980). For monetary prospects, zero change in wealth (i.e., the status quo) serves as a salient reference point, such that monetary choice options with positive values are straightforwardly treated as gains and those with negative values are treated as losses (Kahneman & Tversky, 1979; Rabin & Thaler, 2001; Tversky & Kahneman, 1992). For experiences, on the other hand, research shows that reference points may be determined not by neutral values but rather by extreme values (e.g., the best dessert and the worst dentist visit): people asked to recall *typical* instances of past experiences in positive and negative domains in fact recall the *most extreme* positive and negative experiences they have had in those domains (Gershoff, Mukherjee, & Mukhopadhyay, 2003; Morewedge, Gilbert, & Wilson, 2005), and these readily available memories offer convenient reference points (Koszegi & Rabin, 2006; Novemsky & Dhar, 2005; Thaler & Johnson, 1990). As a result, we suggest that the value assigned to an experiential prospect is determined at least in part by a comparison to the most extreme outcome of past experiences. Should the best dessert one has ever eaten serve as a reference point when choosing between

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desserts, then ironically many of the available positive options will be treated in prospect as comparative losses. Similarly, should the most burdensome chore come to mind when choosing which chore to tackle, many of the available options—despite being negative experiences—will be treated in prospect as comparative gains.

This account suggests several interrelated hypotheses, which we test in seven experiments below. In Experiment 1a, we find support for our first hypothesis that people are relatively more risk-averse for negative categories of experience and risk-seeking for positive categories of experience, in contrast to the relationship between valence and risk preferences observed for money. In Experiment 1b, we provide additional evidence supporting our first hypothesis, employing an incentive-compatible experiment with a real choice. In Experiment 2, we clarify that this reversal in risk preferences is due to a fundamental difference between risk in the *quality* of experiences and risk in *quantity* of money. We observe similar risk preferences for quantities of experiences and quantities of money of the same valence, but again the opposite pattern for experiential quality, a type of experiential risk commonly encountered in everyday life. In Experiment 3, we rule out alternative explanations relating solely to the manner in which people use rating scales for experience quality: when participants list equivalent experiences and monetary outcomes, from which we construct "equivalent" risky choices, they exhibit different risk preferences depending on whether these choices are expressed as experiential outcomes or their monetary equivalents. In Experiment 4, we offer evidence in support of our second hypothesis that subjective utility functions are convex for positive experiences and monetary losses, but concave for negative experiences and monetary gains, consistent with extreme reference points for experiences; these utility curves also predict risky choices across all four domains. In Experiments 5a and 5b, we provide additional support for our second hypothesis, that reference points for experiences are more extreme than reference points for money, measuring the reference points that people utilize when making choices and demonstrating that reference point extremity mediates risk preferences for experiences when compared with money.

Based on the sample sizes and the obtained effects of Experiments 1a/b, we aimed for sample sizes of around 40 participants per condition in Experiment 2 to yield an alpha (Type I error rate) of .05 and power of .80. In Experiments 3–5, we aimed for larger sample sizes of between 100 and 200 participants per condition. We cut off data collection for these experiments after a fixed number of laboratory sessions, after a fixed amount of time had passed for online experiments, or after the requested sample size had been reached by the panel provider—always prior to examining the data—which resulted in more or fewer participants according to the laboratory turnouts or online response rates. Depending on the recruiting method, based on historical turnout rates in the laboratory and response rates of online panels, this usually entailed recruiting about 30% more participants than were actually desired. Finally, all measures collected in our experiments are reported.

Experiment 1a

In Experiment 1a, we tested our first hypothesis that risk-seeking for experiences increases as experiences become more positive—in contrast to risk preferences for money—by presenting participants with choices between monetary prospects as well as a variety of experiences for which they viewed information about others' opinions (see Gershoff et al., 2003).

Method

Forty participants (29 females, M_{age} = 20.1, SD_{age} = 1.3) completed an online survey after being recruited through email LISTSERVs at undergraduate dorms. Participants were asked to choose between a risky and a safe option in each of 18 experience categories of varying valence, as well as to choose between a safe and risky winning gamble, and between a safe and risky losing gamble (see Appendix A). The 18 domains of experience were: comedy movies, dentists, desserts, disgusting foods, documentary films, haircuts, magazines, museums, music CDs, novels, restaurants, sandwiches, surgeons, textbooks, television shows, vacations, video games, and washing machines.

We selected a method that allowed us to present choices between experiences and choices between gambles in a comparable format. For experiences, participants were shown purported ratings that 10 previous participants had given two experiences on a 10-point scale (from 1 = *worst* to 10 = *best*); for gambles, participants were shown purported monetary outcomes that 10 previous participants had received for playing two gambles, which ranged from $1 minimum to $10 maximum.

Although the mean value of the distribution of each option within each choice was the same (5.5 out of 10), we varied the risk of the two options. Outcomes for each safe option were uniformly distributed from 4 to 7 (and then rounded to the nearest whole number); outcomes for each risky option were uniformly distributed from 1 to 10 (and then rounded to the nearest whole number), such that participants had a greater chance of receiving extremely good or extremely bad outcomes. For each choice by each participant, the safe and risky options were constructed by randomly drawing 10 numbers from these two distributions. The 20 choices were presented in random order, counterbalancing for each whether the risky or safe option appeared on the left (as option A) or the right (as option B).

After having made all choices, participants rated the valence of each category on a 7-point scale (1 = *very negative* to 7 = *very positive*). For each category, we computed the average valence rating, and the proportion of participants choosing the risky option (see Table 1).

Results

As predicted, we observed a highly significant correlation between choice of the risky option and category valence among the 18 experiences, Pearson's $r(16) = .81$, $p < .001$, 95% confidence interval [.56, .93]); as the average valence of the options became more positive, the percentage of participants choosing the risky option increased from 27.5%–35% for the most negative experiences to 55%–62.5% for the most positive experiences. As seen in Figure 1, however, gambles stood in clear contradiction to this trend, with 60.0% of participants choosing the risky option for losing gambles but just 37.5% choosing it for winning gambles. These results support our first hypothesis that people become increasingly risk-seeking as experiences become more positive.

Table 1
Valence Ratings and Percentage Choice of Risky Option for Each of the 20 Choice Categories, Ordered by Average Valence Rating (Experiment 1)

Category	Average valence rating	% choosing risky option
Disgusting foods	1.40	35.0
Losing gambles	1.55	60.0
Surgeons	1.58	27.5
Dentists	3.15	27.5
Textbooks	3.50	30.0
Washing machines	3.68	22.5
Haircuts	4.55	30.0
Documentary films	4.58	52.5
Video games	5.00	55.0
Magazines	5.03	52.5
Sandwiches	5.15	42.5
Television shows	5.23	50.0
Museums	5.58	57.5
Novels	5.70	57.5
Music CDs	5.85	62.5
Comedy movies	5.90	60.0
Restaurants	6.18	55.0
Winning gambles	6.20	37.5
Desserts	6.43	62.5
Vacations	6.73	57.5

Experiment 1b

Experiment 1b offered an incentive-compatible test of risk preferences for experiences, as it included a consequential choice.

Method

Pretest. We asked 58 participants to sample 20 jellybeans in random order and rate their enjoyment of each bean on a 10-point scale (1 = *horrible* to 10 = *fantastic*). After deleting results for the five participants who gave incomplete responses, we tabulated the mean and variance of the remaining 53 ratings for each of the jellybeans. We selected two flavors with identical mean ratings (M = 5.6), but one having lower variance (SD = 2.5) and one having higher variance (SD = 2.8). We refer to these as the "safe" and "risky" options, respectively.

Main experiment. Thirty-eight participants (25 females, M_{age} = 21.8, SD_{age} = 3.2) were recruited to the lab to take part in this experiment, along with several unrelated other studies, in exchange for $20. Participants were informed in advance that they would be asked to eat something as part of the experiment. We gave participants an example to illustrate how to interpret histograms of ratings, similar to the ones that are shown on many websites to display ratings of previous consumers. Once participants understood the example, they were instructed to choose between the "safe" and "risky" jellybeans from the pretest based solely on histograms of the (actual) ratings received. Participants were reminded that it was a real choice, meaning that they would signal the experimenter after their choice to get their chosen jellybean, which they would be required to eat. The order of the low and high variance options was counterbalanced (see Appendix B for detailed instructions given to participants).

Results

Twenty-seven participants (71.1%) selected and ate the "risky" jellybean. This was significantly more than 50% in a proportion test, $\chi^2(1) = 5.92$, $p = .01$.

Experiment 2

In Experiment 2, we tested whether the above pattern of choice is specific to risk in experiential quality. Importantly, whereas money is most often evaluated by quantity, experiences are most often evaluated by quality (e.g., trying to choose a *good* movie to watch some evening rather than trying to choose *how many* movies you will watch). We hypothesized that risk preferences for experience *quantities* would in fact be similar to those for monetary *quantities*, because both choosing between a voucher for three

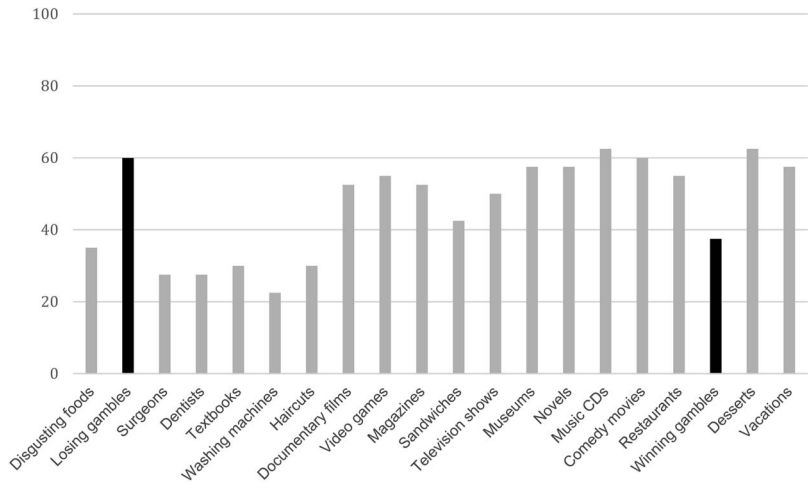

Figure 1. Percentage choosing risky option in Experiment 1. As experiences (grey bars) become more positive, the percentage of participants choosing the risky option increases; in contrast, losing gambles (leftmost black bar) elicit risk-seeking, whereas winning gambles (rightmost black bar) elicit risk-aversion.

desserts or a 50/50 chance of either one or five desserts and choosing between a sure gain of $3 or a 50/50 chance of gaining either $1 or $5 have as their reference point the middle quantity of three. In contrast, and consistent with the results of Experiments 1a and 1b, we predicted that when choosing between experiences that varied in quality (as opposed to quantity), we would observe risk-seeking choices for positive experiences and risk-averse choices for negative experiences.

Method

Two hundred and 40 participants (137 females, M_{age} = 22.6, SD_{age} = 4.7, after removing an outlier entered as 225 years old) completed this and several unrelated surveys in the laboratory for $20. Participants were randomized into one of six conditions in a 3 (domain: monetary *quantity*, experience *quantity*, experience *quality*) × 2 (valence: positive, negative) between-subjects design. Within their assigned conditions, participants made a hypothetical choice between a risky and a safe option (see Appendix C).

In the monetary quantity conditions, each participant chose between two monetary choice options, one offering a sure gain (or in the negative valence condition, a sure loss) of $3 and the other offering a 50/50 chance of gaining (losing) either $1 or $5. Participants in the experience quantity conditions chose between a voucher for three desserts (or in the negative valence condition, gross foods from the TV program *Fear Factor*) for sure and a 50/50 chance of either 1 or 5 desserts (*Fear Factor* foods). Participants in the experience quality conditions chose between two food options, one rated "3" in deliciousness (disgustingness) by other raters, and the other rated "1" by half of others but "5" by half of others on deliciousness (disgustingness), on a scale from 1 to 5. The order of the two options was counterbalanced. Across all conditions, we refer to the option providing a definite outcome of 3 as the "safe" option and the option with outcomes of 1 or 5 as the "risky" option.

Results

Replicating previous research, participants were more likely to choose the risky option for monetary losses (64.5%) than for monetary gains (32.7%), $\chi^2(1) = 10.20$, $p = .001$; in addition, we observed a similar difference in risk preferences for *quantity* of negative experiences (53.8%) and positive experiences (21.2%), $\chi^2(1) = 6.70$, $p = .01$. However, as predicted, the pattern in risk preferences reversed for *quality* of negative experiences—with just 41.9% choosing the risky option—and *quality* of positive experiences—where 73.9% chose the risky option, $\chi^2(1) = 4.25$, $p = .04$. These results replicate the findings of Experiments 1a/b and additionally highlight a discrepancy in the way that people respond to risk over experiential quality as compared with risk over quantities of either money or experiences.

Experiment 3

To test the robustness of preferences for experience quality to different operationalizations, Experiment 3 examined choices between experience prospects that were not expressed in ratings. In particular, we elicited three preferred vacation destinations or three disliked chores, and gave participants the choice between their second-ranked experience for sure or a 50/50 chance at receiving their first- or third-ranked experience. We also elicited participants' monetary equivalents for the three experiences they listed, and gave them the choice between receiving the monetary equivalent of their second-ranked experience or a 50/50 chance of the monetary equivalent of their first- and third-ranked experience. We expected to observe greater risk-seeking for positive experiences than for their monetary equivalents, and greater risk-aversion for negative experiences than for their monetary equivalents.

Method

Three hundred and 32 participants (210 females, M_{age} = 35.9, SD_{age} = 13.3) were part of a university online panel who completed the survey for a $5 Amazon.com gift card. Participants were randomly assigned to either a negative valence condition or a positive valence condition in two rounds of online data collection. In the negative valence condition, participants listed three chores they disliked, and then specified the monetary loss they considered equivalent to performing each chore; in the positive valence condition, participants listed three desired vacation destinations, and then specified the monetary gain they considered equivalent to each vacation. Participants then made two choices: between a 50/50 chance of their least and most favorite experiences versus certainty of the middle experience, and between a 50/50 chance of the monetary equivalents to the least and most favored experiences versus certainty of the monetary equivalent to the middle experience. For example, if a participant in the negative valence condition said that he disliked ironing (equal to a $10 loss), doing the dishes ($5 loss), and vacuuming ($2 loss), he was given two choices, one between a 50/50 chance of ironing and vacuuming versus doing the dishes for sure, and another between a 50/50 chance of losing $10 and losing $2 versus losing $5 for sure.

The order of the two choices (between money and between experiences) and the order in which the safe and risky options were presented (on the left or the right of the screen) were randomized.

Results

As predicted, participants exhibited greater *risk-aversion* for negative experiences (45.9% choosing the risky option) than for the equivalent monetary losses (56.8% choosing the risky option), $\chi^2(1) = 3.04$, $p = .08$, but greater *risk-seeking* for positive experiences (51.6% choosing the risky option) than for the equivalent monetary gains (39.1% choosing the risky option), $\chi^2(1) = 5.31$, $p = .02$. Comparing within domain, risk-seeking was less likely for winning gambles (39.1%) than losing gambles (56.8%), $\chi^2(1) = 9.54$, $p = .002$, but more likely for positive experiences (51.6%) than negative experiences (45.9%), albeit nonsignificantly, $\chi^2(1) = 0.85$, $p = .4$. We note that Experiment 3 offers a conservative test of a reversal in preferences across domains, given that participants' own rank-ordering of options would more often lead them to the same choices for experiences and money (whenever the middle option was closer to the first or third option) than in prior experiments where we constructed the options to have equal expected value.

In Experiments 1a, 1b, and 2, the distribution of ratings for experiences was derived from the ratings of others who had, for example, viewed that movie. As a result, participants in these

earlier experiments may have drawn inferences from a wide variety of ratings (e.g., that the movie might be liked by women but disliked by men), which may have influenced their choices. Results from the within-participant design in Experiment 3—in which the quality of experiences and the monetary values placed on those experiences are derived from the participants themselves—suggest that the pattern of risk-seeking we observe across our experiments is not limited to an artifact of the design of the earlier experiments.

Experiment 4

In Experiment 4, we investigated our second hypothesis that utility for positive experiences and losing gambles is convex whereas utility for negative experiences and winning gambles is concave, consistent with reference points at zero (i.e., current wealth state) for money but at extremes for experiences (i.e., the worst outcome in negative categories and the best outcome in positive categories). In other words, we proposed that subjective utility functions would be steepest—indicating greater marginal utility—near these reference points, and flatter—indicating smaller marginal utility—with distance from these reference points because people are generally more sensitive to changes in objective outcomes near a reference point (Kahneman & Tversky, 1979). We also tested whether choices between risky options were predicted by an individual's utility curve.

Method

Three hundred and 64 participants (277 females, $M_{age} = 36.2$, $SD_{age} = 11.5$) completed this and several unrelated surveys in the laboratory for $20. Participants were randomly assigned to one of four categories: winning gambles, losing gambles, desserts, or disgusting foods. Within their assigned category, participants reported both choice and subjective utility over all possible outcomes.

Choices between safe and risky prospects were presented similarly to Experiment 1a. In the domain of money, participants were shown dollar amounts that 10 previous participants had won or lost playing each gamble. In the domain of experiences, participants were told that 10 previous participants had eaten each of the foods and rated it on a 10-point scale; for desserts, these ratings ranged from 1 = *not at all delicious* to 10 = *extremely delicious*, and for *Fear Factor* foods these ratings ranged from 1 = *not at all disgusting* (recoded as an objective outcome of −1) to 10 = *extremely disgusting* (recoded as an objective outcome of −10). The outcome values shown for risky and safe options were drawn randomly using the same distributions as in Experiment 1a.

To elicit utility curves for money and experiences, participants rated how they would feel if they received each of the 10 possible outcomes using a 10-point scale (see Hsee & Zhang, 2004 for a similar elicitation methodology). For winning gambles and positive experiences, the subjective utility scale ranged from 1 = *not at all happy* to 10 = *extremely happy*. For losing gambles and negative experiences, the scale ranged from 1 = *not at all unhappy* to 10 = *extremely unhappy*. We created a continuous measure of subjective utility from the most negative experiences to the most positive experiences by rescaling each participant's responses from 0 to 1 for positive experiences and winning gambles, and from 0 to −1 for negative experiences and losing gambles, with proportional values for intermediate responses. For each participant, the 10 scaled responses were used to fit a regression model for the dependence of subjective utility on objective outcome: $\beta_0 + \beta_1{}^{*}outcome + \beta_2{}^{*}outcome^2 + error$. We included both outcome and outcome-squared terms as independent variables to assess both the linear trend and second-order curvature of utility. Coefficient β_1 represents the linear effect of objective outcome on subjective utility with a higher value indicating a steeper increase. Coefficient β_2 measures whether there is second-order curvature of utility; that is, if the coefficient is positive, the utility function is convex; if the coefficient is negative, the utility function is concave. We excluded data for 25 participants for whom preferences were inconsistent or arbitrary in that they reported strictly lower subjective utility for an outcome other than the one that was objectively the worst, or they reported strictly greater subjective utility for another outcome than for the one that was objectively the best.

Results

In Experiment 4, as in Experiments 1a through 3, we again observed risk-aversion for monetary gains (39.2% choosing the risky option) and negative experiences (37.8% choosing the risky option), but risk-seeking for monetary losses (61.3% choosing the risky option) and positive experiences (60.2% choosing the risky option). In a logistic regression using domain (experience or money), valence (positive or negative), and their interaction as predictors of risky choice, the interaction between domain and valence was significant, $\beta = 1.81$ (95% confidence interval [.94, 2.70]), Wald's $z = 4.03$, $p < .001$.

The mean coefficient on outcome was positive for participants for all four categories (β_1s > 0.09, ts > 7.37, ps $< .001$), meaning simply that objectively more favorable outcomes provided greater utility; more interestingly, the sign of the squared term was reversed for gambles versus experiences. In accordance with Prospect Theory (Kahneman & Tversky, 1979), utility was concave for monetary gains, $\beta_2 = -.0024$ (95% confidence interval [−.0044, −.0005]), $t(96) = -2.53$, $p = .01$, and convex for monetary losses, $\beta_2 = .0040$ (95% confidence interval [.0016, .0063]), $t(74) = 3.36$, $p = .001$. In contrast, utility was convex for positive experiences and concave (with marginal significance) for negative experiences: for desserts, $\beta_2 = .0027$ (95% confidence interval [.0009, .0046]), $t(92) = 2.98$, $p = .004$; for disgusting foods, $\beta_2 = -.0020$ (95% confidence interval [−.0042, .0003]), $t(73) = -1.72$, $p = .09$. Unlike the typical pattern of decreasing marginal utility for each additional unit change in wealth with distance from a zero reference point, participants report *increasing* marginal utility for increasingly delicious desserts, and *increasing* marginal *dis*utility for increasingly disgusting foods, consistent with our account that these extremes serve as reference points in experience domains.

Finally, as we would expect if decisions are driven by underlying utilities, participants' individual utility curves predicted whether they chose the risky option; in all four domains, choice of the risky option was positively correlated with β_2 (a measure of convexity, indicating increasing marginal utility for more favorable outcomes): for monetary gains, Pearson's $r(95) = .34$, $p < .001$, 95% confidence interval [.15, .51]; for monetary losses,

Pearson's $r(73) = .22$, $p = .05$, 95% confidence interval [−.002, .43]; for desserts, Pearson's $r(91) = .27$, $p = .009$, 95% confidence interval [.07, .45]; for disgusting foods, Pearson's $r(72) = .29$, $p = .01$, 95% confidence interval [.06, .48]. These correlations demonstrate that the mirror-image utility curves for money and experiences undergird the preference reversals for choice that we observe between the two domains.

Experiments 5a and 5b

Experiments 5a and 5b aimed to provide additional support for our second hypothesis that reference points for monetary choices are closer to zero, and reference points for choices on experiences fall further toward the extreme of a category (i.e., the worst outcome in negative categories and the best outcome in positive categories). We asked participants to make several choices between safe risky prospects, as in Experiments 1a through 4, and also assessed their reference points. All participants read a standard definition from the Oxford Dictionary describing reference points as a "*basis or standard for evaluation, assessment, or comparison; a criterion*." We predicted that reference points would be more extreme for both positively- and negatively-valenced experiences, and less extreme for both positively- and negatively-valenced gambles. We conducted two experiments, one for positively-valenced domains (Experiment 5a) and one for negatively-valenced domains (Experiment 5b).

Experiment 5a

Method. Four hundred participants (160 females, $M_{age} = 32.4$, $SD_{age} = 9.4$) were recruited through Amazon Mechanical Turk, provided informed consent, and completed a choice task for monetary compensation. We excluded 49 duplicate responses based on participants' worker identification number, while retaining their first responses. The experiment employed a single-factor (domain: money, experiences) between-subjects design: participants were randomly assigned to one of two positively-valenced domains: either winning monetary choice options or desserts.

Participants were offered different choices between safe and risky prospects based on the ratings of 10 other people (ranging from 1 to 10). As in Experiment 1a, outcomes for each safe option were uniformly distributed from 4 to 7 (and then rounded to the nearest whole number), whereas outcomes for each risky option were uniformly distributed from 1 to 10 (and then rounded to the nearest whole number). For each choice, the safe and risky options were constructed by randomly drawing 10 numbers from these two distributions. Note that the ratings for money and experiences were identical in Experiments 5a/b: each prospect was represented by 10 ratings of other participants. Participants made a total of four choices presented in random order. Because in a binary choice, one choice option may serve as a reference point to the other, we included a direct measure of reference point extremity. After each choice, participants indicated the reference point to which they were comparing the two prospects on a 9-point scale for experiential prospects (−4: *consuming the worst food* to 4: *consuming the best food*) or, respectively, for monetary prospects (−4: *losing a huge amount of money* to 4: *winning a huge amount of money*). We calculated the mean choice of risky prospects across participants' four choices. We also calculated the absolute value for each reference point rating and averaged them to create a measure of reference point extremity.

Results. Participants assigned to positive experiences were significantly more likely to choose the risky prospect on average ($M = .61$, $SD = .26$) than participants assigned to winning gambles ($M = .54$, $SD = .30$), $t(349) = 2.05$, $p = .04$, Cohen's $d = .22$, 95% confidence interval of the difference [.003, .12]. Further, the mean (absolute) value of reference point extremity was significantly closer to zero for participants assigned to the gambles domain ($M = 1.88$, $SD = 1.12$) compared with participants assigned to the experiences domain ($M = 2.39$, $SD = 1.12$), $t(349) = -4.24$, $p < .001$, Cohen's $d = .45$, 95% confidence interval of the difference [−.74, −.27].

We used a mediational analysis approach that allows the independent variable to be multicategorical (Hayes & Preacher, 2014). As shown in Panel A of Figure 2, D_1 codes the positive experience as 1, with the winning gamble serving as the reference group coded as 0. The mediation analysis revealed that reference point extremity explains the link between positive experience and choice of the risky prospect, $F(2, 348) = 7.37$, $p < .001$, with 1,000 bootstrap samples and at a confidence level of 95%. Specifically, results revealed significant effects of positive experience (D_1) on reference point extremity (path a: $b = .506$, $SE = .12$, $t = 4.24$, $p < .001$) and on choice of the *risky* prospect (path c: $b = .061$, $SE = .03$, $t = 2.05$, $p = .04$). The full model with both D_1 and reference point extremity as independent variables revealed a significant effect of reference point extremity on the choice of the *risky* prospect (path b: $b = .043$, $SE = .01$, $t = 3.23$, $p = .001$). In this model, results also showed a nonsignificant effect of the positive experience (D_1) on the choice of the *risky* prospect (path c': $b = .040$, $SE = .03$, $t = 1.32$, $p = .19$). In support of statistically significant mediation by reference point extremity, the indirect effect of positive experience (D_1) through reference point extremity on choice of the *risky* prospect was significant at a 95% confidence level ($b = .022$, $SE = .01$, 95% confidence interval of [.01, .04] with zero being outside of the confidence interval; Hayes, 2014).

Experiment 5b

Method. Four hundred and five participants (181 females, $M_{age} = 34.5$, $SD_{age} = 10.8$) were recruited through Amazon Mechanical Turk, provided informed consent, and completed a choice task for monetary compensation. We excluded 14 duplicate responses based on participants' worker identification number, while retaining their first responses. Experiment 5b was identical to Experiment 5a, except that participants were randomly assigned to one of two negatively-valenced domains: either losing monetary choice options or disgusting foods.

Results. Participants assigned to the negative experiences were significantly less likely to choose the risky prospect on average ($M = .46$, $SD = .32$) than participants assigned to losing gambles ($M = .53$, $SD = .30$), $t(389) = -2.08$, $p = .04$, Cohen's $d = .21$, 95% confidence interval of the difference [−.13, −.004]. Further, providing additional support for our second hypothesis, the mean (absolute) value of reference point extremity was again significantly closer to zero for participants assigned to the gambles domain ($M = 1.98$, $SD = 1.10$) compared with participants as-

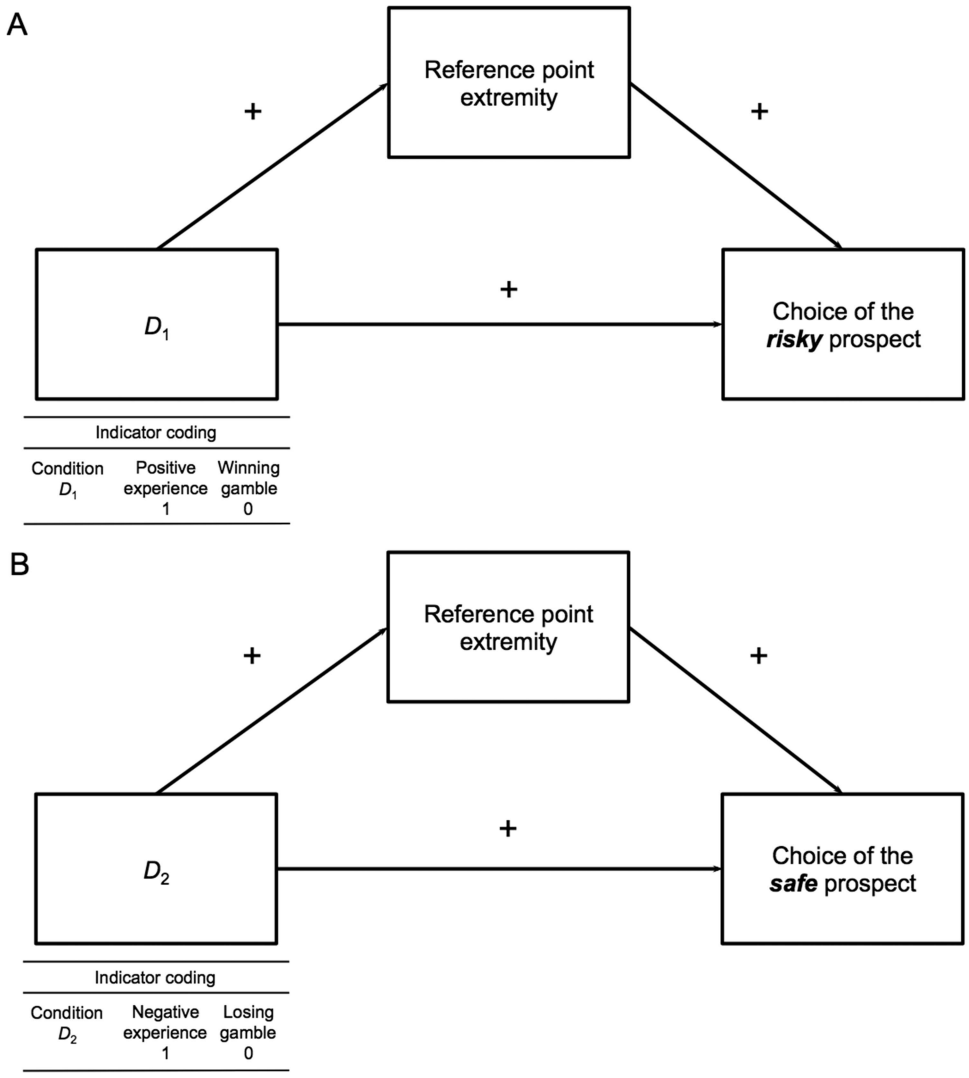

Figure 2. Conceptual model for Experiments 5a and 5b. Reference points for experiences are more extreme than reference points for money.

signed to the experiences domain ($M = 2.56$, $SD = 1.23$), $t(389) = -4.90$, $p < .001$, Cohen's $d = .50$, 95% confidence interval of the difference [–.81, –.35].

We used the same mediational approach as in Experiment 5a. As shown in Panel B of Figure 2, D_2 codes the negative experience as 1, with the losing gamble serving as the reference group coded as 0. Reference point extremity explains the link between negative experience and choice of the safe prospect, $F(2, 388) = 6.17$, $p = .002$, with 1,000 bootstrap samples and at a confidence level of 95%. Results showed significant effects of negative experience (D_2) on reference point extremity (path a: $b = .578$, $SE = .12$, $t = 4.90$, $p < .001$) and on choice of the *safe* prospect (path c: $b = .065$, $SE = .03$, $t = 2.08$, $p = .04$). The full model with both D_2 and reference point extremity as independent variables revealed a significant effect of reference point extremity on the choice of the *safe* prospect (path b: $b = .038$, $SE = .01$, $t = 2.82$, $p = .005$). In this model, results also showed a significant effect of the negative experience on the choice of the *safe* prospect (path c': $b = .087$, $SE = .03$, $t = 2.72$, $p = .01$). In support of statistically significant mediation by reference point extremity, the indirect effect of negative experience (D_2) through reference point extremity on choice of the *safe* prospect was significant at a 95% confidence level ($b = .022$, $SE = .01$, 95% confidence interval [.01, .05], with zero being outside of the confidence interval; Hayes, 2014).

General Discussion

Seven experiments offer evidence that people's choices between experiences become riskier as experiences become more positive in valence: people are relatively risk-seeking for desserts compared with dentists. Indeed, patterns of preferences for experiences are distinct from those for money, with relative risk-seeking for both losing gambles and positive experiences but risk-aversion for both winning gambles and negative experiences. These differences between experiences and money cannot be ascribed to an anomalous result within a single

experience category, as the results of Experiment 1a reveals a general pattern of increased risk-seeking with experience valence across a diverse set of everyday experience categories. Previous research investigating the effect of valence on people's preferences for multiple positive and negative events (Linville & Fischer, 1991; Thaler & Johnson, 1990) demonstrates that people prefer to segregate both gains and losses (Linville & Fischer, 1991), the latter because people do not want to suffer such a large negative event. We extend this research by showing that people prefer lower risk even for single negative experiences, again driven by thoughts of large negative events—in our case, extremely negative experiential reference points.

The results of Experiment 2 highlight that the contrasting risk preferences for experiences and gambles of the same valence are related to the typical representation of the former as outcome quality levels (e.g., ratings of various movie options) rather than quantities (e.g., number of movies to watch). In fact, risky choices between quantities of experiences are much more similar to risky choices on money. It is important to note that there is a body of research on framing effects and risky choice that compares monetary to nonmonetary outcomes, showing that people make riskier choices when outcomes involve human lives rather than either money (Fagley & Miller, 1997) or property (Jou, Shanteau, & Harris, 1996). However, even in this stream of research, the outcomes are quantities, which we have shown elicit risk preferences more similar to those for monetary outcomes than for experience quality.

Experiment 3 reveals that our results are not specific to the way that people understand ratings scales, but rather offer a comprehensive conceptual account for when and why we can expect risk-seeking or risk-aversion when choosing experiences in everyday life. Our results advance previous research on risk and experiences, which has focused primarily on preference reversals between affect-rich and affect-poor stimuli at very extreme probabilities (e.g., a 1% chance or a 95% chance of some outcome; McGraw, Shafir, & Todorov, 2010). Although these earlier results inform theory, probabilities are often not so extreme in the real world, such that these results may be less relevant to building a model that describes (and allows us to predict) risk preferences for everyday experiences. Relatedly, although these earlier experiments use a variety of interesting stimuli (e.g., kisses, electric shocks), we offer a model for understanding what types of everyday experiences people choose or forgo, thereby offering guidance in predicting risk preferences for all experience categories (including "boring" experiences like haircuts and sandwiches). For instance, a shopper on Amazon.com is more apt to accept a recommendation for a book with high variance in its ratings if she is looking for a book in the comedy genre than for a textbook, because experiences in the former category tend to be more positively valenced.

In addition, these results help to illuminate the psychological mechanisms underlying two well-known but insufficiently explained aspects of marketplace behavior: price sensitivity and customer satisfaction. First, our findings offer insight into why consumers are relatively insensitive to price when buying hedonic goods (Babin, Darden, & Griffin, 1994; Hirschman & Holbrook, 1982; Wakefield & Inman, 2003); although utility for monetary losses is concave, meaning that each additional dollar lost is decreasingly painful, we show in Experiment 4 that utility for hedonic experiences is convex, meaning that each additional increment in experiential quality is increasingly valuable: the relative change in utility from improving the experience outweighs the relative loss of utility for spending (i.e., losing) more money. Similarly, price-consciousness for utilitarian goods may be linked to the fact that changes in experiential utility for upgrading are quite small, making each incremental loss of money relatively more impactful. Second, our results inform research demonstrating that the monetary return to the firm of increasing customer satisfaction is convex (Gupta & Zeithaml, 2006; Mittal & Kamakura, 2001), such that the benefit of moving customers from "somewhat satisfied" to "very satisfied" is less than the benefit of moving them from "very satisfied" to "extremely satisfied." Because customer service is by its very nature an experience, it is not surprising that increasing the quality of the service experience at the top end of the spectrum reduces customer focus on the disutility of spending more money.

Our results on preferences for experiences also inform the literature distinguishing the psychological impact of material goods versus experiences. Previous research suggests that, on average, experiential purchases make people happier than do material purchases (Van Boven, 2005; Van Boven & Gilovich, 2003). Although this research examines hedonic outcomes at the level of consumption utility, our research offers insight into what prompts choice of experiences in prospect. We show that people are likely to choose riskier experiences as those experiences become more positive in valence, but we do not measure the hedonic outcomes of those choices. Future research should explore the interrelationships between choosing experiences and actually experiencing them, in order to determine the optimal set of choices for maximizing well-being across the entire decision process—from prospect to consumption.

Results from Experiments 5a and 5b reveal that reference point extremity mediates the link between experiences (compared with gambles) and risky choice. People rely upon extreme reference points for experiences, as opposed to the common zero reference point for money. Our experiments involved experiences for which most participants had some knowledge (dentists, desserts etc.). Further research is needed to explore risky choice for experiences that are likely to lack any prior encounters—such as *Virgin Galactic*'s trips to space. It is possible that in such cases, people may have no point of reference, causing them to revert to a neutral reference point as with money; on the other hand, people may draw on similar experiences (the best or worst airplane flight they have taken) to use as a reference point. In addition, whereas Experiments 5a and 5b measured reference points, future research could manipulate people's reference points by, for example, randomly assigning participants to either a condition in which extreme reference points are invoked or a condition in which more moderate reference points are invoked before participants make their choices.

We have argued and provided empirical evidence that risk preferences for experiences (compared with money) are driven at least in part by more extreme reference points. Given the range of experiences in everyday life, however, it is likely that additional mechanisms also play a role, offering promising areas for future research into risk preferences for experiences. First, in many of our studies, possible outcomes for gambles were presented in dollars

whereas possible outcomes for experiences were presented as ratings by others. Whereas the objective difference between $1 and $2 is the same as between $4 and $5, it is possible that participants do not perceive the difference between hotels that receive a one-star and two-star rating as the same as between hotels that receive a four-star and five-star rating: the money is on an interval scale, whereas participants may believe that others use the 5-point rating scale in a nonlinear fashion. We note that our Experiments 5a and 5b utilized the same rating scales for both monetary and experiential categories, replicating the effect shown in our other studies, some of which used different types of scales (e.g., dollar-based scales for money vs. points-based scales for experiences). However, given the prevalence of consumer ratings—now ubiquitous for products and services ranging from restaurants to doctors to daycares—further research is needed to assess the manner in which people interpret such scales, and how such interpretations may drive choice.

Second, it is possible that people set systematically different goals for experiences than for money. For example, people's goals for experiences may be driven predominantly by a desire to get the best experience or avoid the worst experience, whereas gambles may involve dual goals of winning some money while avoiding big losses. Given the many forms that goals can take (e.g., Austin & Vancouver, 1996; Locke & Latham, 2006), a better understanding of people's goals for monetary and experiential gambles is needed. One possibility is that people have a goal to avoid counterfactual regret (Kahneman & Tversky, 1982): anticipation of being bothered by thoughts of a foregone extremely positive outcome—due to a decision to play it safe and obtain a moderately positive outcome—might further drive risk-seeking for positive experiences. Of course, goals themselves can serve as reference points (Heath et al., 1999), necessitating a methodology where goals can be elicited dependently of reference points, in order to test whether extreme reference points and goals may serve complementary roles in driving risk preferences.

Conclusions

Finally, we note that although our results suggest that choices between most desserts are treated as relative losses, this does not imply that people do not derive positive decision utility from contemplating which dessert to choose, or positive consumption utility upon actually eating that dessert. As with most experiments on risky choices for monetary prospects, our results relate to people's anticipated utility about future experiences, rather than their decision utility or their experienced consumption utility. Although a less preferred dessert is treated as a relative loss in prospect, it still likely offers greater decision utility (who doesn't enjoy deciding which dessert to consume?) and greater consumption utility (who doesn't enjoy eating desserts?) than even the very best *Fear Factor* food. Integrating anticipated utility, decision utility, and consumption utility offers an important future avenue for understanding the differences and similarities between risk preferences for experiences and money. We hope that future investigations will expand our understanding of experience theory.

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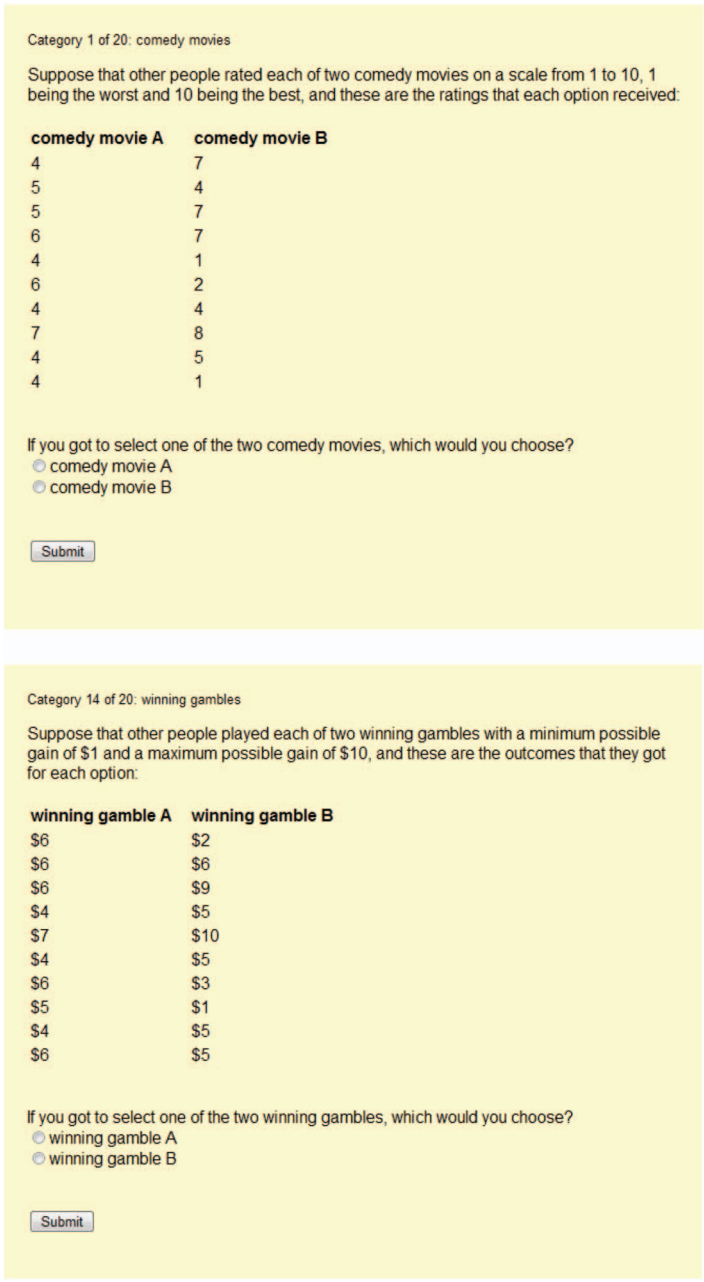
(*Appendices follow*)

Appendix A

Experiment 1a: Sample Screenshots Seen by Participants Choosing Between Risky and Safe Experiences and Gambles



Category 1 of 20: comedy movies

Suppose that other people rated each of two comedy movies on a scale from 1 to 10, 1 being the worst and 10 being the best, and these are the ratings that each option received:

comedy movie A	comedy movie B
4	7
5	4
5	7
6	7
4	1
6	2
4	4
7	8
4	5
4	1

If you got to select one of the two comedy movies, which would you choose?
- comedy movie A
- comedy movie B

Submit

Category 14 of 20: winning gambles

Suppose that other people played each of two winning gambles with a minimum possible gain of $1 and a maximum possible gain of $10, and these are the outcomes that they got for each option:

winning gamble A	winning gamble B
$6	$2
$6	$6
$6	$9
$4	$5
$7	$10
$4	$5
$6	$3
$5	$1
$4	$5
$6	$5

If you got to select one of the two winning gambles, which would you choose?
- winning gamble A
- winning gamble B

Submit

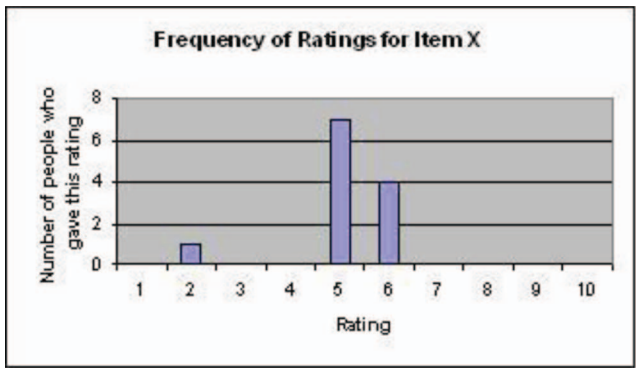
(*Appendices continue*)

Appendix B

Experiment 1b: Instructions to Participants

Page 1

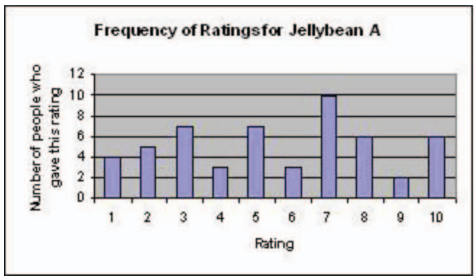
This survey is designed to find out how you make choices between different options based on the ratings other people have given. For each item, we will show you a chart where the heights of the bars above a number indicate the number of people who gave the item that rating. Please read the following example carefully. Suppose 12 people rated Item *X* on a scale from 1 to 10. If one person rated it a "2," seven people rated it a "5," and four people rated it a "6," the chart would look like this:

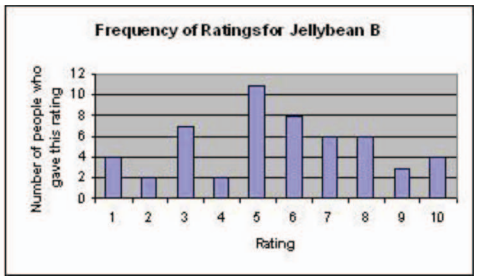


Please Click to Begin.

Page 2

53 people rated two different jellybean flavors (A and B) on a scale from 1 to 10, 10 being the best, and the following charts show the number of people who gave each rating:





You may select one of the two jellybeans to eat. Once you make your choice, the experimenter will come around and bring the jellybean to you. You must eat the jellybean that you choose, and you will not get to eat the one that you do not choose. Based on the ratings they received from other people, which jellybean would you like to eat?

o Jellybean A

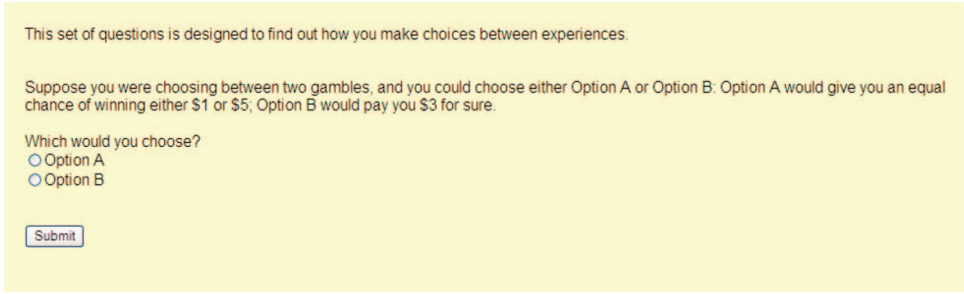
o Jellybean B

Please raise your hand so the experimenter can provide you with the jellybean you selected.

(*Appendices continue*)

Appendix C

Experiment 2: Sample Screenshot Seen by Participants Choosing Between Positive Monetary Quantities



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