YANG YANG, JOACHIM VOSGERAU, and GEORGE LOEWENSTEIN*

The authors show, with real and hypothetical payoffs, that consumers are willing to pay substantially less for a risky prospect when it is called a "lottery ticket," "raffle," "coin flip," or "gamble" than when it is labeled a "gift certificate" or "voucher." Willingness to accept, in contrast, is not affected by these frames. This differential framing effect is the result of an aversion to bad deals, which causes buyers to focus on different aspects than sellers. Buyers' willingness to pay is influenced by the extent to which a risky prospect's frame is associated with risk (Experiment 1) as well as the prospect's lowest (but not highest) possible outcome (Experiment 2). Sellers' willingness to accept, in contrast, is influenced by a prospect's lowest and highest possible outcomes but not by the risk associated with its frame (Experiments 2 and 3). The framing effect on willingness to pay is independent of the objective level of uncertainty (Experiment 4) and can lead to the uncertainty effect. The findings have important implications for research on risk preferences and marketing practice.

Keywords: framing, willingness to pay, willingness to accept, endowment effect, uncertainty effect

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Framing Influences Willingness to Pay but Not Willingness to Accept

Every day, consumers are faced with decisions that entail uncertainty, whether as mundane as purchasing a lottery ticket or as consequential as buying a house. Prior research has shown that the choices consumers make are dramatically influenced by how risky prospects are framed. For example, the same prospect framed as a gain makes consumers risk averse—unless outcomes or probabilities are very small—whereas framing it as a loss leads to risk-seeking behavior (Tversky and Kahneman 1981).

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In addition to gain/loss frames, decision researchers and marketing practitioners use other frames to describe risky prospects, such as "lottery," "raffle," "coin flip," "gamble," "voucher," or "uncertain gift certificate." We investigate how these frames influence consumers' willingness to pay (WTP) and willingness to accept (WTA). The risky prospects we use in our experiments are two-outcome gambles with a 50% chance of a low and a 50% chance of a high outcome. In four experiments, we hypothesize and demonstrate that the more a prospect's frame is associated with risk and the lower a prospect's low (but not high) possible outcome, the lower people's WTP. We hypothesize that WTA, in contrast, will not be affected by how the prospect is framed but will instead depend on a prospect's low and high possible outcomes. These hypotheses are based on previous research showing that buyers and sellers tend to focus on different aspects of a potential transaction (Carmon and Ariely 2000; Isoni 2011; Johnson, Häubl, and Keinan 2007; Weaver and Frederick 2012).

We further show that the differential framing effect can produce—and thus help explain—an important anomaly: calling a certain prospect a "gift certificate" and a risky

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prospect a "lottery ticket" can lead to the uncertainty effect (UE), whereby the risky prospect is valued less than its lowest possible outcome (Gneezy, List, and Wu 2006). We conclude with a discussion of implications for research on risk preferences and marketing practice.

THEORETICAL BACKGROUND

Decision researchers originally used framing to describe a situation in which equivalent choices between prospects were cast in terms of either gains or losses. In the famous "Asian disease problem," participants exhibited risk aversion when outcomes were framed as gains but displayed risk-seeking behavior when the same objective outcomes were framed as losses (Tversky and Kahneman 1981). In general, people respond more favorably to gambles when probabilities are framed as chances of winning than as chances of losing (e.g., Levin, Snyder, and Chapman 1988; Vosgerau 2010).

Moving beyond gain/loss frames, other researchers have investigated framing effects that result from how prospects are labeled. Decision makers are willing to incur a sure loss when it is framed as an insurance premium but are less willing to do so when the sure loss is incurred in a gamble (Hershey, Kunreuther, and Schoemaker 1982; Schoemaker and Kunreuther 1979). Consumers evaluate ground beef more favorably when it is described as 75% lean than 25% fat (Levin and Gaeth 1988). Framing also elicits social norms (e.g., competitive, selfish, or cooperative behavior) in economic games (Eiser and Bhavnani 1974). Research has found cooperation and contribution to be greater when prisoner's dilemma or public goods games are given labels such as "social exchange," "international negotiation," "interpersonal interaction," or "community game" than when they are labeled "business transaction," "economic bargaining," or "Wall Street game" (Eiser and Bhavnani 1974; Liberman, Samuels, and Ross 2004; Rege and Telle 2004).

We investigate the influence of the frames "lottery," "raffle," "gamble," "coin flip," "gift certificate," and "voucher" (frequently used by decision researchers and marketing practitioners) on buying and selling prices for risky (as well as riskless) prospects. Because these frames differ in the extent to which they are associated with risk, we hypothesize that they influence WTP but not WTA. We argue that this differential framing effect is the result of an aversion to bad deals (Monroe 1973; Thaler 1985; Winer 1986), which causes buyers and sellers to focus on different aspects of a potential transaction (Carmon and Ariely 2000; Isoni 2011; Johnson, Häubl, and Keinan 2007; Weaver and Frederick 2012). Specifically, Isoni (2011) and Weaver and Frederick (2012) propose that an aversion to bad deals causes the endowment effect. For buyers, a bad deal would mean purchasing an item at a price higher than the market price. Consequently, buyers are only willing to pay up to the market price or their own valuation of the item, whichever is lower. For sellers, a bad deal would be selling an item at a price lower than the market price. Therefore, sellers are only willing to accept prices that are higher than—or at least equal to—the market price or their own valuation of the item, whichever is higher.

We argue that when evaluating a risky prospect rather than a sure prospect, aversion to bad deals similarly causes buyers and sellers to focus on different aspects of the potential exchange. Consider a prospect that with a 50% chance will yield a $50 gift certificate and with 50% chance a $100 gift certificate. For buyers, a bad deal would be paying more than the prospect's lowest possible outcome and then learning that the lowest outcome was realized. Bad-deal aversion causes buyers to be highly sensitive to the prospect's lowest (but not highest) possible outcome. In general, bad-deal aversion sensitizes buyers to the negative aspects of the risky prospect—a form of extreme risk aversion. This extreme risk aversion may even apply to otherwise irrelevant negative aspects of the prospect, such as its subjective level of risk. A prospect framed as "lottery," "gamble," "raffle," or "coin flip" is more associated with risk than a prospect framed as "gift certificate" or "voucher." Consequently, WTP may be lower the more a prospect's frame is associated with risk, even though a prospect's label clearly has no influence on the prospect's objective level of uncertainty (McGraw, Shafir, and Todorov 2010). This form of extreme risk aversion may be equivalent to what Simonsohn (2009) has called "direct risk aversion."

The situation is very different for sellers, however. For sellers, a bad deal would be selling the prospect at a price lower than its market value. Given that market prices are not readily available—especially for risky prospects—a seller may use the prospect's expected value as a starting point for determining her or his WTA. In this sense, we hypothesize sellers to be less risk averse than buyers in their valuation of the potential transaction.[1]

Our bad-deal aversion account leads to two key predictions: First, the more a prospect's frame is associated with risk and the lower the prospect's lowest possible outcome, the lower WTP will be. The prospect's highest possible outcome, in contrast, should influence WTP to a much lesser extent. Second, WTA should be influenced by both a prospect's lowest and highest possible outcomes, but the prospect's frame should influence WTA to a much lesser extent.

We test our bad-deal aversion account in four experiments. Using real payoffs, Experiment 1 shows that framing a risky prospect as a "lottery ticket" compared with an uncertain "gift certificate" substantially reduces WTP. Experiment 2 tests and finds support for the two predictions of our account: WTP is influenced by both framing and the lowest possible outcome of a risky prospect. The highest possible outcome does not affect WTP. Willingness to accept, in contrast, is influenced by both a prospect's lowest and highest possible outcomes. Framing does not influence WTA. Experiment 3 examines whether the differential framing effect for WTP and WTA extends to other descriptions that emphasize risk ("coin flip," "gamble," and "raffle") or that do not ("voucher"). In Experiment 4, we test whether the framing effect for WTP exists for riskless prospects.

In combination, the experimental results provide a new account for the UE (Gneezy, List, and Wu 2006), a well-

[1]Our hypothesis that buyers are more risk averse than sellers may seem at odds with Okada's (2010) finding that buyers and sellers do not differ in their aversion to risk. However, Okada assessed general aversion to risk (and found no differences between buyers and sellers), whereas we propose that buyers are more risk averse than sellers in their evaluation of the potential transaction.

documented phenomenon in which a risky prospect is valued less than its lowest possible outcome. We find that the UE occurs only when the frame of the prospect's lowest possible outcome is not associated with risk (e.g., a "gift certificate" or "voucher") and the frame of the strictly dominating risky prospect is highly associated with risk (e.g., a "lottery," "gamble," "coin flip," or "raffle"). In contrast, when the lowest possible outcome and the risky prospect are framed similarly, the UE does not occur. We conclude with a discussion of the implications of our findings for research on risk preferences and marketing practice.

In all our experiments, we follow the methodological guidelines Simmons, Nelson, and Simonsohn (2011) propose: We report all measures used in each experiment. All experiments have at least 20 participants per condition, and we analyzed data only after data collection was finished. To avoid the possibility of deciding *ex post* which data points to include, we adopted the same exclusion criteria for all experiments.

EXPERIMENT 1: FRAMING EFFECT ON WTP WITH REAL PAYOFFS

The purpose of Experiment 1 was to determine whether framing a risky prospect as a lottery ticket versus an uncertain gift certificate would influence WTP. Participants were asked to indicate their WTP for a risky prospect, which was called either a "lottery ticket" or an uncertain "gift certificate." In a pretest, participants rated the extent to which they associated "lottery ticket" and "gift certificate" (between-subjects) with risk and uncertainty on two seven-point scales (1 = "not at all," and 7 = "very much"). Because the two ratings were highly correlated, we created a risk-association measure by averaging them (Cronbach's $\alpha = .81$). Participants rated the lottery frame as being more associated with risk and uncertainty than the gift certificate frame ($M_{lottery} = 5.94$, $M_{gift\ certificate} = 2.44$; $t(50) = 10.32$, $p < .001$). We therefore expected WTP to be lower under the lottery frame than the gift certificate frame.

Method

One hundred nineteen participants (50.4% male; $M_{age} = 32.61$ years, SD = 10.35 years) from Amazon.com's Mechanical Turk (MTurk) participated in this experiment in exchange for $.20. Participants were asked to indicate their WTP for a risky prospect that was framed as either a lottery ticket or an uncertain gift card. We adapted the instructions from Simonsohn (2009) and Gneezy, List, and Wu (2006) (see Appendix A). In the lottery condition, the lottery ticket would for sure yield either a $10 or a $20 Best Buy gift card (both equally likely). In the gift card condition, the gift card would be either a $10 or a $20 Best Buy gift card (both equally likely). Participants were told that we would randomly select five respondents to get a $20 bonus and an opportunity to purchase a lottery ticket or a gift card. If their WTP was above our reservation price (our reservation price was not revealed to participants), they would buy the lottery ticket or gift card at our reservation price. If their WTP was below our reservation price, they would not buy the lottery ticket or gift card (Gneezy, List, and Wu 2006).

To detect participants who did not pay attention to the instructions, we administered an instructional manipulation check (Oppenheimer, Meyvis, and Davidenko 2009) at the beginning of the experiment. Participants could start the experiment only after they had correctly answered the instructional manipulation check. Finally, to check whether participants erroneously believed that $0 was a possible payoff, participants were asked, "What was the lowest possible outcome of the offer?" and chose an answer from the values $0, $5, $10, $15, and $20 (Simonsohn 2009). The experiment concluded with participants answering demographic questions.

Results

Forty-seven participants (75.8%) in the gift card condition and 54 participants (94.7%) in the lottery condition correctly indicated that the $10 gift card was the lowest possible outcome ($\chi^2(1) = 8.86$, $p = .012$). In the subsequent analysis, we only considered responses of those who answered this question correctly. The results do not change when all responses are included.

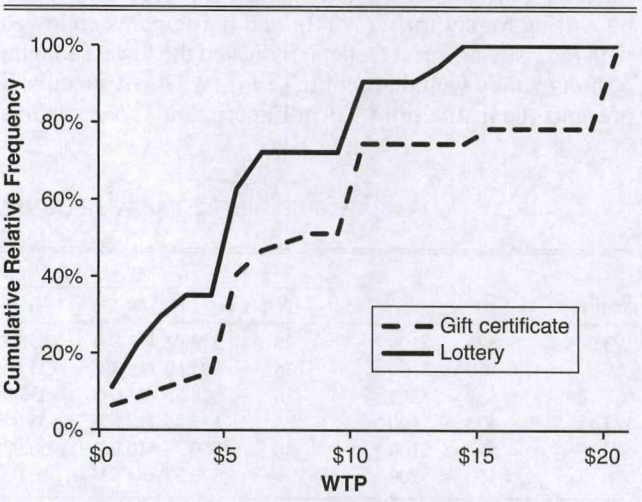
Because distributions of WTP typically deviate from normality, we test our hypotheses parametrically with F- and t-tests and compare distributions nonparametrically. Participants in the lottery condition were willing to pay less (M = $5.68, SD = $6.69, Mdn = $5.00) than participants in the gift card condition (M = $9.52, SD = $4.48, Mdn = $ 7.50; $t(99) = 3.43$, $p < .001$, $\eta_p^2 = .11$; $z = 2.93$, $p = .003$; see Figure 1).

Discussion

Consistent with our hypothesis that buyers are susceptible to the risk associated with a frame, participants were willing to pay less for the risky prospect when it was called a lottery ticket than when it was called an uncertain gift card. The lottery frame reduced WTP by more than 40%, even though WTP was elicited in the same incentive-compatible fashion (five participants were randomly selected and received the $20 bonus payment; however, none of them

Figure 1

EXPERIMENT 1: CUMULATIVE RELATIVE FREQUENCY DISTRIBUTION OF WTP UNDER THE LOTTERY AND GIFT CERTIFICATE FRAME



Notes: Curves toward the upper-left corner represent low valuations, and curves toward the lower-right corner represent high valuations.

ended up buying the risky prospect because their WTPs were all lower than our reservation price of $15).

Figure 1 illustrates that approximately 20% of participants in the gift card (but not the lottery) condition valued the risky prospect above $15, its expected value. It seems that there is considerable heterogeneity in risk attitudes, especially when the frame of the risky prospect is not associated with risk. We observed similar patterns in other experiments.

EXPERIMENT 2: TESTING DIFFERENTIAL EFFECTS ON WTP AND WTA

Experiment 1 tested our bad-deal aversion account (i.e., buyers focus on negative aspects and are risk averse in their valuation of a potential transaction) by showing that a frame associated with risk decreases WTP. Our account also predicts that because buyers are risk averse, they will be sensitive to the low (but not the high) outcome of a risky prospect. Sellers, in contrast, are less risk averse than buyers because they try to sell the risky prospect at or above its market value and use the prospects' expected value as a starting point for determining their WTA. Consequently, WTA should be sensitive to the low and high possible outcomes of a risky prospect, but it should be insensitive to a prospect's label (i.e., how much risk is associated with the prospect's frame). To test these predictions, in Experiment 2, we orthogonally manipulated framing and the low and high outcomes of the risky prospect.

Method

Four hundred eighteen participants (62.7% male, 37.1% female, .2% unknown; M_{age} = 30.30 years, SD = 10.71 years) from MTurk participated in this experiment in exchange for $.20. The experiment used a 2 (frame: gift certificate vs. lottery ticket) × 3 (outcomes: $25 or $100 vs. $50 or $100 vs. $50 or $200) × 2 (endowment status: buyer vs. seller) between-subjects design. Participants were asked to indicate their WTP/WTA for a lottery ticket/gift certificate that would either be a $25 or $100/a $50 or $100/a $50 or $200 Barnes & Noble gift certificate (both equally likely). Participants not endowed with the risky prospect (buyers) indicated the highest amount of money they would be willing to pay for it (WTP), and participants endowed with the risky prospect (sellers) indicated the lowest amount of money they would accept to sell it (WTA). Appendix B presents the instructions. As in Experiment 1, participants answered the instructional manipulation check and comprehension question.

Results

One hundred ninety-seven participants (97.0%) in the gift certificate conditions and 198 (92.1%) in the lottery conditions correctly indicated the worst possible outcome ($\chi^2(1) = 4.92, p = .04$). In the subsequent analysis, we only considered those who answered this question correctly. The results do not change when all responses are included.

A 2 (frame: gift certificate vs. lottery ticket) × 3 (outcomes of risky prospect: $25 or $100 vs. $50 or $100 vs. $50 or $200) × 2 (endowment status: buyer vs. seller) analysis of variance (ANOVA) on WTP/WTA revealed a main effect for frame ($F(1, 383) = 6.88, p = .009, \eta_p^2 = .02$; $z = 2.72, p = .007$), a main effect for outcome ($F(2, 383) = 34.52, p < .001, \eta_p^2 = .15$; $H(2) = 54.91, p < .001$), and a main effect for status ($F(1, 383) = 76.87, p < .001, \eta_p^2 = .17$; $z = 7.37, p < .001$).

More importantly, the interaction of status and frame was significant ($F(1, 383) = 6.33, p = .012, \eta_p^2 = .02$), indicating that the lottery frame reduced WTP but not WTA for each level of the prospects' outcomes (for means, medians, and pairwise comparisons, see Table 1). Furthermore, the interaction of status and outcome was significant ($F(2, 383) = 7.52, p = .001, \eta_p^2 = .04$), indicating that the prospects' outcome levels affected WTP and WTA differently (see Figure 2). No other effects were significant (all $Fs < 1$).

To determine whether WTA (but not WTP) is sensitive to the high outcome of a risky prospect, we held the low outcome constant at $50 and conducted a 2 (outcomes: $50 or $100 vs. $50 or $200) × 2 (endowment status: buyer vs. seller) ANOVA on WTP/WTA. The analysis yielded a main effect of outcome ($F(1, 292) = 15.94, p < .001, \eta_p^2 = .05$), a main effect of status ($F(1\ 292) = 61.71, p < .001, \eta_p^2 = .17$), and an interaction of outcome and status ($F(1, 292) = 9.91, p = .002, \eta_p^2 = .03$). In support of our hypothesis, WTA was higher when the high outcome was $200 than $100 ($74.45 vs. $50.21, respectively; $t(147) = 4.07, p < .001, \eta_p^2 = .10$; $z = 2.77, p = .006$). Participants' WTP did not differ ($37.11 vs. $34.24, respectively; $t(145) = .90, p = .37, \eta_p^2 = .01$; $z = 1.32, p = .19$).

To determine whether both WTA and WTP are sensitive to the low outcome of a risky prospect, we held the high outcome constant at $100 and conducted a 2 (outcomes: $25 or $100 vs. $50 or $100) × 2 (endowment status: buyer vs. seller) ANOVA on WTP/WTA. The analysis yielded a main

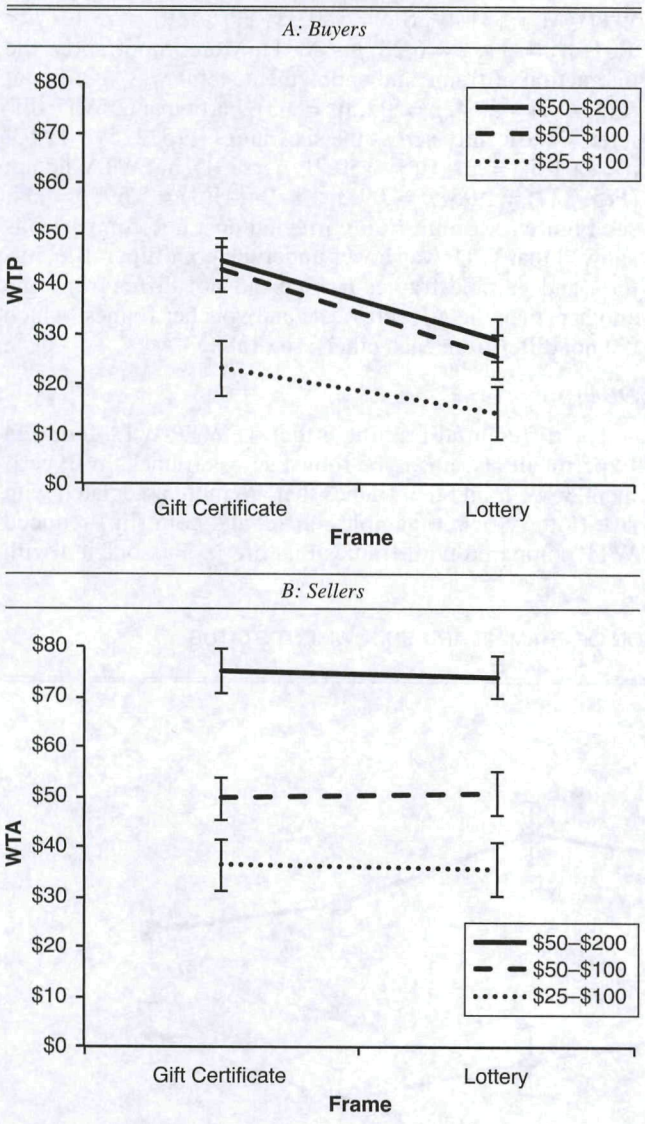
Table 1

EXPERIMENT 2: PAIRWISE COMPARISONS OF WTP/WTA ACROSS FRAMES

		Lottery			*Gift Certificate*				
Status	*Outcome*	*N*	*M (SD)*	*Mdn*	*N*	*M (SD)*	*Mdn*	*t-Test*	*Mann-Whitney*
WTP	$25 vs. $100	26	$14.25 (11.84)	$13.75	23	$23.04 (12.59)	$25.00	2.52*	2.25*
	$50 vs. $100	35	$25.60 (18.30)	$25.00	36	$42.64 (17.46)	$50.00	4.01***	3.71***
	$50 vs. $200	36	$28.75 (21.07)	$25.00	40	$44.62 (13.46)	$50.00	3.95***	3.23**
WTA	$25 vs. $100	24	$35.46 (17.60)	$35.00	26	$36.40 (23.35)	$25.00	.16	.32
	$50 vs. $100	38	$50.74 (20.95)	$50.00	37	$49.68 (21.51)	$50.00	.22	.67
	$50 vs. $200	39	$73.97 (44.13)	$60.00	35	$74.97 (50.62)	$50.00	.09	.56

*$p < .05$.
**$p < .01$.
***$p < .001$ (two-tailed).

Figure 2
EXPERIMENT 2: AVERAGE WTA/WTP AS A FUNCTION OF FRAMING AND OUTCOMES



Notes: Error bars represent ±1 standard errors.

effect of outcome ($F(1, 241) = 36.30, p < .001, \eta_p^2 = .13$) and a main effect of status ($F(1, 241) = 45.01, p < .001, \eta_p^2 = .16$). We found no interaction ($F(1, 241) = .10, p = .75, \eta_p^2 = 0$). Participants' WTP was reduced when the low outcome was $25 compared with $50 ($18.38 vs. $34.24, respectively; $t(118) = 4.95, p < .001, \eta_p^2 = .17$; $z = 4.69, p < .001$), as was WTA ($35.95 vs. $50.21, respectively; $t(123) = 3.74, p < .001, \eta_p^2 = .10$; $z = 3.53, p < .001$).

Discussion

Experiment 2 tested our hypothesis that buyers are more risk averse than sellers in their evaluation of a potential transaction. Replicating findings from Experiment 1, buyers were willing to pay less when the risky prospect was framed as a lottery than a gift certificate. Furthermore, WTP was reduced when the low outcome of the risky prospect was a $25 rather than $50 gift certificate. However, the high outcome of the risky prospect did not influence WTP. Sellers valued prospects more when the value of either the high or the low outcome was greater. The prospect's frame, in contrast, had no influence on WTA. Together, the results of Experiment 2 lend strong support for our hypothesis that bad-deal aversion causes buyers to be sensitive to negative aspects of a risky prospect (its lowest possible outcome and the subjective risk associated with it), whereas sellers are sensitive to the aspects that determine the prospects' objective value (the prospect's lowest and highest outcomes).

The results of Experiment 2 also help rule out an alternative explanation for the observed framing effect: anchoring. According to this explanation, the lottery frame may make the usual price paid for lottery tickets more accessible, which may then serve as an anchor for valuations (Frederick and Mochon 2012; Tversky and Kahneman 1974). Because lottery tickets tend to be inexpensive, anchoring on their usual price would shift WTP—and WTA—downward. In Experiment 2, however, we observed the framing effect only for WTP and not for WTA, which makes it unlikely that anchoring underlies the framing effect.

Is the differential framing effect on WTP and WTA specific to the frames "lottery" and "gift certificate"? We investigate this possibility in Experiment 3.

EXPERIMENT 3: TESTING THE DIFFERENTIAL FRAMING EFFECT ON WTP/WTA WITH OTHER FRAMES

Experiment 3 determines whether the differential framing effect on WTP and WTA can be generalized to other frames. We picked four additional frames that decision researchers and marketers frequently use to describe risky prospects: "voucher," "coin flip," "raffle," and "gamble." To examine how much each frame is associated with risk, we conducted a pretest in which 157 participants (64.3% male; $M_{age} = 29.70$ years, $SD = 10.01$ years) rated the extent to which each of the six frames (between-subjects) is associated with risk and uncertainty on two seven-point scales (1 = "not at all," and 7 = "very much"; this is the same pretest used in Experiment 1). Bonferroni-corrected post hoc comparisons revealed no difference in risk associations between the gift certificate and the voucher frame ($p = 1.0$). The four remaining frames (coin flip, raffle, lottery ticket, and gamble) were all more associated with risk ($ps < .001$; see Table 2). From these comparisons, we predicted that WTP would be lower under the coin flip, raffle, lottery ticket, and gamble frames than under the gift certificate and

Table 2
EXPERIMENT 3: COMPARISON OF RISK ASSOCIATIONS BETWEEN THE SIX FRAMES

	Risk Association	
Frame	*N*	*M (SD)*
Gift certificate	26	2.44^{a} (1.20)
Voucher	26	2.92^{a} (1.57)
Raffle	27	4.80^{b} (1.20)
Coin flip	26	5.02^{bc} (1.34)
Lottery ticket	26	5.94^{c} (1.20)
Gamble	26	6.00^{c} (.85)

Notes: Means with different superscripts are significantly different at $p < .05$ (Bonferroni-corrected post hoc tests).

voucher frames. We predicted that WTA would not differ under the various frames.

Method

Five hundred thirty-three participants (59.5% male, 39.4% female, 1.1% unknown; M_{age} = 27.77 years, SD = 9.29 years) from MTurk participated in this experiment in exchange for $.20. In addition to manipulating endowment status (buyers vs. sellers), the experiment used six frames: gift certificate, voucher, coin flip, raffle, lottery ticket, and gamble (i.e., a 2 × 6 between-subjects design). Appendix C displays the instructions. As in the previous experiments, we also included the instructional manipulation check and comprehension question.

Results

Four hundred seventy-one participants (88.4%) correctly indicated that the $50 gift certificate was the lowest possible outcome. This rate did not differ across the six framing conditions ($\chi^2(5) = 6.01, p = .26$). In the subsequent analysis, we only considered these responses.

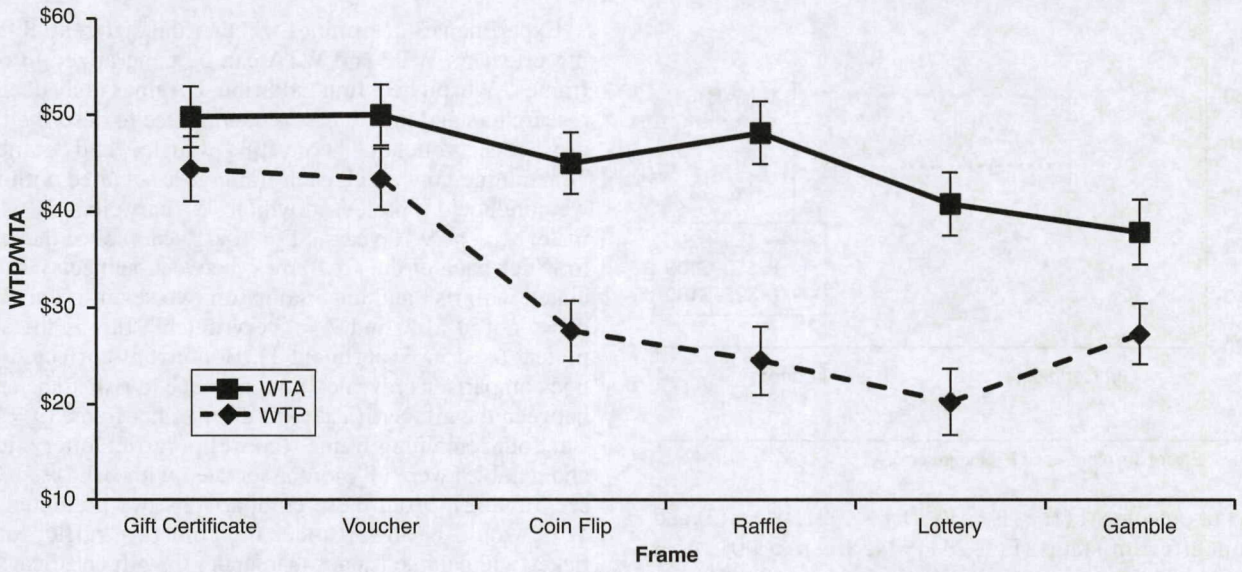
A 6 (frame: gift certificate vs. voucher vs. coin flip vs. raffle vs. lottery ticket vs. gamble) × 2 (endowment status: buyer vs. seller) ANOVA on WTP/WTA revealed a main effect for frame ($F(5, 459) = 9.34, p < .001, \eta_p^2 = .09$; $H(5) = 35.27, p < .001$). The main effect of endowment status indicated that WTA (M = $45.52, SD = $22.62) was higher than WTP (M = $31.47, SD = $20.31; $F(1, 459) = 55.12, p < .001, \eta_p^2 = .11$; $z = 6.28, p < .001$). More importantly, the interaction of frame and endowment status was significant ($F(5, 459) = 2.64, p = .02, \eta_p^2 = .03$). Participants' WTP differed significantly across the six frames ($F(5, 225) = 11.63, p < .001, \eta_p^2 = .21$; $H(5) = 50.71, p < .001$), but WTA did not ($F(5, 234) = 1.95, p = .09, \eta_p^2 = .04$; $H(5) = 5.69, p = .34$; see Figure 3). Bonferroni-corrected post hoc comparisons showed that WTP was lower under the coin flip, raffle, lottery, and gamble frames (which did not differ from one another) than the gift certificate and voucher frames (which did not differ from each other); see Table 3.

Discussion

The differential framing effect on WTP/WTA found in Experiment 2 seems to be robust across frames. In Experiment 3, we found that frames that are more associated with risk (lottery ticket, gamble, raffle, and coin flip) reduced WTP compared with frames that are less associated with

Figure 3

EXPERIMENT 3: AVERAGE WTP/WTA AS A FUNCTION OF FRAMING AND ENDOWMENT STATUS



Notes: Error bars represent ±1 standard errors.

Table 3

EXPERIMENT 3: POST HOC COMPARISONS OF WTP AND WTA

	WTP			*WTA*		
Frame	*N*	*M (SD)*	*Mdn*	*N*	*M (SD)*	*Mdn*
Gift certificate	37	$44.43[a] ($14.12)	$50.00	42	$49.83[a] ($18.26)	$50.00
Voucher	41	$43.39[a] ($13.61)	$50.00	42	$50.02[a] ($18.88)	$50.00
Raffle	33	$24.48[bc] ($22.08)	$20.00	40	$48.18[a] ($23.32)	$50.00
Coin flip	43	$27.59[bd] ($20.96)	$25.00	41	$45.05[a] ($24.74)	$50.00
Lottery ticket	35	$20.20[b] ($20.51)	$10.00	39	$40.82[acde] ($23.21)	$49.00
Gamble	42	$27.26[be] ($20.51)	$25.00	36	$37.89[ace] ($25.62)	$39.50

Notes: Means with different superscripts are significantly different at $p < .05$ (Bonferroni-corrected tests).

risk (gift certificate and voucher). Participants' WTA was not affected by framing, lending support to our bad-deal aversion account whereby buyers are more sensitive to negative aspects of a potential transaction than sellers.

EXPERIMENT 4: CAN FRAMING CAUSE THE UE?

In Experiments 1–3, we investigated the framing effect on WTP for risky prospects with a 50% chance of a low outcome and a 50% chance of a high outcome. Our account that buyers are sensitive to the negative aspects of a potential transaction to avoid bad deals, however, should apply equally to riskless prospects. Imagine that we asked participants how much they would be willing to pay for a lottery ticket guaranteed to yield a $50 gift certificate (however, such a prospect would be quite unusual because a lottery typically implies that there is uncertainty involved). If buyers are sensitive to the negative aspects of the prospect—as our bad-deal aversion account states—they may be sensitive to the risk associated with the prospect's frame even though the prospect itself does not entail any uncertainty. As a result, WTP for the lottery that guarantees a $50 gift certificate may be lower than WTP for a $50 gift certificate.

An even more noteworthy case consists of a risky and a certain prospect framed in different ways. For example, if the risky prospect of receiving either a $50 or a $100 gift certificate with equal probability was framed as a lottery, and the certain prospect of getting a $50 gift certificate was framed simply as a gift certificate, consumers may be willing to pay less for the risky than the certain prospect. In other words, consumers in this case would value the risky prospect less than its guaranteed worst possible outcome. This is the so-called UE (Gneezy, List, and Wu 2006). In their study, Gneezy, List, and Wu (2006) demonstrate that participants were willing to pay an average of $16 for a lottery that would pay either a $50 or a $100 gift certificate with equal probability, but they were willing to pay an average of $26 for a certain $50 gift certificate. It is difficult to understand why anyone who is willing to pay $26 for a $50 gift certificate would not be willing to pay at least $26 for a lottery that promises at least a $50 gift certificate. The UE violates monotonicity, one of the most fundamental axioms of choice, and presents a major challenge to most normative and descriptive theories of decision making, as virtually all formal models of decision making assume and/or imply dominance/monotonicity. Even the original prospect theory (Kahneman and Tversky 1979) includes an editing operation that specifies that dominance violations are avoided when detected. Whereas some researchers have argued that the UE is an experimental artifact caused by misinterpretation or task ambiguity (Keren and Willemsen 2009; Rydval et al. 2009), others have shown the UE to be a remarkably robust phenomenon and have demonstrated it with hypothetical and real payoffs, in between-subjects and within-subject designs, with WTP, with choices, and in auctions (Gneezy, List, and Wu 2006; Markle, Rottenstreich, and Galak 2008; Newman and Mochon 2012; Simonsohn 2009; Sonsino 2008; Wang, Feng, and Keller 2013).

We propose that the UE occurs—at least partially—because the risky prospect and its lowest outcome are framed in different ways. In studies that demonstrate the UE, the risky prospect is usually framed as a lottery ticket (a frame associated with risk), and its lowest outcome is framed as a gift certificate (a frame not associated with risk). In Experiments 1–3, we have demonstrated that consumers are willing to pay less for prospects when their frames are associated with risk than when they are not, because buyers are sensitive to the negative aspects of a potential transaction to avoid bad deals. Consequently, the UE may be more likely to occur when the risky prospect's frame is associated with risk (e.g., lottery, gamble, coin flip, raffle) and its lowest outcome's frame is not associated with risk (e.g., gift certificate, voucher) than when both or neither frames are associated with risk. Experiment 4 tests this hypothesis by orthogonally manipulating objective uncertainty (certain low outcome vs. risky prospect) and the six frames used in Experiment 3.

Method

Six hundred five participants (63.4% male; M_{age} = 26.99 years, SD = 9.28 years) from MTurk participated in this experiment in exchange for $.20. The experiment employed a 6 (frame: gift certificate vs. voucher vs. coin flip vs. raffle vs. lottery ticket vs. gamble) × 2 (objective uncertainty: certain low outcome vs. risky prospect) between-subjects design. Appendix D shows the instructions. Participants indicated the highest amount they would be willing to pay for either a risky prospect or its guaranteed low outcome under one of the six frames. For example, the instructions for the lottery frame in the risky prospect condition read, "We are interested in how much you would be willing to pay for a lottery ticket. The lottery ticket will for sure give you either a $50 gift certificate for Barnes & Noble bookstore or a $100 gift certificate for Barnes & Noble bookstore (both are equally likely)." The instructions for the same frame in the certain low outcome condition read, "We are interested in how much you would be willing to pay for a lottery ticket. The lottery ticket will for sure give you a $50 gift certificate for Barnes & Noble bookstore."

Because framing a certain prospect as the outcome of a lottery ticket, coin flip, raffle, or gamble is unusual (typically, these frames imply that there is risk involved), we were concerned that participants might not understand the frames or at least would have difficulties doing so. If so, it is possible that any observed differences in WTP would be caused by differences in the ease of processing the instructions. Therefore, we included two questions that measured processing disfluency (e.g., "How complicated/difficult was it for you to understand this offer?" 1 = "not at all complicated/difficult," and 9 = "very complicated/difficult"). We also included a few other measures, reported in Web Appendix A. Finally, we administered the instructional manipulation check and comprehension question. Unlike previous experiments, all participants were allowed to commence with this experiment regardless of whether they had passed the instructional manipulation check.

Results

Among those who had passed the instructional manipulation check (81.8%), 211 (85.4%) participants in the certain low outcome conditions and 230 (89.8%) participants in the risky prospect conditions correctly indicated that the $50 gift certificate was the lowest possible outcome ($\chi^2(1) = 2.27, p = .13$). In the following analyses, we only included

participants who passed both checks. The results do not change when all responses are included.

Processing disfluency (Cronbach's α = .89) differed across the 12 experimental conditions ($F(11, 429) = 4.52$, $p < .001$, $\eta_p^2 = .10$). All of the 12 cell means were significantly lower than 4 (all ts > 2.27, all ps < .03; the scale ranged from 1 = "not at all complicated/difficult" to 9 = "very complicated/difficult"), indicating that participants overall experienced little difficulty in understanding the offers. Including processing disfluency as a covariate in the subsequent analysis did not change the results, nor was the covariate significant ($F(1, 427) = 1.05$, $p = .31$). We report the following analyses without the covariate.

A 6 (frame: gift certificate vs. voucher vs. coin flip vs. raffle vs. lottery ticket vs. gamble) × 2 (objective uncertainty: certain low outcome vs. risky prospect) ANOVA on WTP revealed a main effect for objective uncertainty, indicating that overall, participants were willing to pay slightly more for the risky prospect (M = \$33.64, SD = \$21.33) than for its guaranteed low outcome (M = \$29.60, SD = \$17.16; $F(1, 428) = 5.09$, $p = .025$; $z = 2.36$, $p = .018$; see Figure 4). Participants' WTP differed significantly across frames ($F(5, 428) = 14.73$, $p < .001$; $H(5) = 63.81$, $p < .001$). The interaction of framing and objective uncertainty was not significant ($F(5, 428) = 1.22$, $p = .30$).

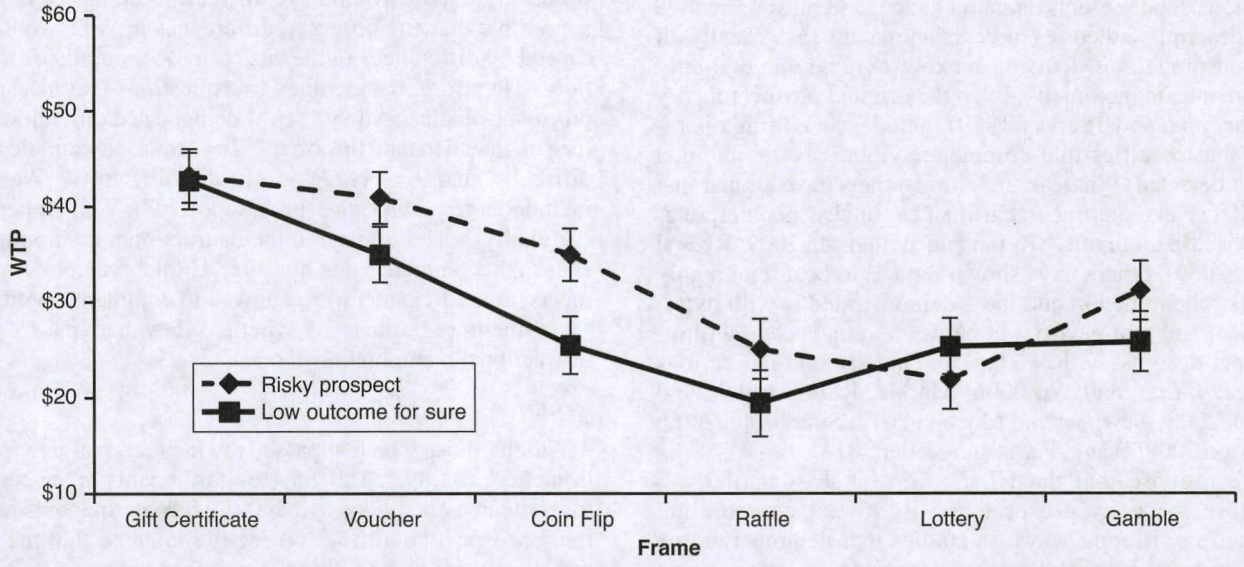
Willingness to pay differed significantly across the six frames for both the risky prospect ($F(5, 224) = 6.71$, $p < .001$; $H(5) = 27.17$, $p < .001$) and its certain low outcome ($F(5, 204) = 10.02$, $p < .001$; $H(5) = 44.64$, $p < .001$). To test our hypothesis that frames that are highly associated with risk (coin flip, raffle, lottery ticket, and gamble) reduce WTP compared with frames not associated with risk (gift certificate and voucher), we conducted planned contrasts and found that WTP was indeed lower under the coin flip, raffle, lottery, and gamble frames than under the gift certificate and voucher frames for both the risky prospect ($F(1, 224) = 25.15$, $p < .001$, $\eta_p^2 = .10$) and its certain low outcome ($F(1, 204) = 43.53$, $p < .001$, $\eta_p^2 = .18$). The results provide strong evidence for our hypothesis that even when a prospect entails no objective uncertainty, buyers are sensitive to its negative aspects, such as the risk associated with its frame.

Table 4 displays the means, medians, a series of pairwise comparisons, and the sharp lower bounds of the proportion of participants who exhibited the UE effect as well as those who showed the opposite effect. The sharp lower bounds, proposed by Simonsohn (2010), provide a conservative estimate of how many participants showed an effect in a between-subjects design, a value that can be computed precisely in a within-subject design. The "Frames Match" column shows pairwise comparisons of the risky prospect and its certain low outcome when both were framed in the same way. Willingness to pay for the risky prospect and for its low outcome did not differ (except for the coin flip frame), and we observed no UE (i.e., the sharp lower bounds suggest that only 1.03%–16.3% of participants showed the UE). However, note that participants were still risk averse in these cases: only 14.6%–37.2% were willing to pay more for the strictly dominating risky prospect than the certain low outcome.

Next, the "Frames Mismatch" column shows pairwise comparisons of the risky prospect under different frames and the certain low outcome framed as a gift certificate. Willingness to pay was lower for the risky prospect when its frame was highly associated with risk (lottery, raffle, coin flip, and gamble) than for the certain low outcome framed as a gift certificate (low risk association). In all these cases, we observed the UE (i.e., the sharp lower bounds suggest that 34.0%–57.8% of participants showed the UE); in other words, participants were willing to pay less for the risky prospect than for its certain worst possible outcome.

Figure 4

EXPERIMENT 4: AVERAGE WTP AS A FUNCTION OF FRAMING AND CERTAINTY



Notes: Error bars represent ±1 standard errors.

Table 4

EXPERIMENT 4: PAIRWISE COMPARISONS OF WTP FOR THE RISKY PROSPECT AND ITS LOW OUTCOME WHEN FRAMES MATCHED AND MISMATCHED

	Certain Low Outcome: $50 Gift Certificate			*Risky Prospect: $50 or $100 Gift Certificate*			*Frames Match*[a]				*Frames Mismatch*[b]			
Frames	*N*	*M*	*Mdn*	*N*	*M*	*Mdn*	*t-Test*	*Mann–Whitney Test*	*Sharp Lower Bound (a < b)*	*Sharp Lower Bound (a > b)*	*t-Test*	*Mann–Whitney Test*	*Sharp Lower Bound (b < c)*	*Sharp Lower Bound (b > c)*
Gift certificate	38	42.71	49.50	41	43.27	40.00	.17	.60	14.6%	14.4%	.17	.60	14.6%	14.4%
Voucher	38	35.00	40.00	44	40.95	47.00	1.70	2.21*	37.2%	4.5%	.52	.65	17.6%	9.1%
Coin Flip	36	25.51	25.00	43	34.99	40.00	2.23*	2.27*	27.1%	1.03%	2.02*	1.61	34.0%	14.0%
Raffle	27	19.44	20.00	33	25.12	25.00	1.12	.88	20.5%	2.7%	4.29***	3.72***	52.7%	6.9%
Lottery	38	25.39	25.00	35	21.89	10.00	.79	.60	14.5%	16.3%	5.56***	4.54***	57.8%	2.9%
Gamble	33	25.88	25.00	34	31.24	25.00	1.06	.45	23.0%	14.3%	2.66**	2.05*	45.0%	11.8%

*$p < .05$.
**$p < .01$.
***$p < .001$.
[a]Comparison between the risky prospect and its certain low outcome (a is the low outcome, b is the risky prospect).
[b]Comparison between the risky prospect and its certain low outcome framed as a gift certificate (b is the risky prospect, c is the low outcome framed as a gift certificate).
Notes: Two-tailed tests. Sharp lower bounds, proposed by Simonsohn (2010), provide a conservative estimate of how many subjects showed an effect in a between-subjects design, a value that can be computed precisely in a within-subjects design.

Finally, Figure 4 and Table 4 also show that when the risky prospect is framed as low risk (gift certificate or voucher) and its certain low outcome is framed as high risk (lottery, raffle, coin flip, and gamble), participants were willing to pay more for the risky prospect than its certain worst possible outcome, in line with dominance/monotonicity.

Discussion

Experiment 4 tested the framing effect on WTP with the six frames used in Experiment 3. We found that frames highly associated with risk (coin flip, raffle, lottery ticket, and gamble) reduced WTP compared with frames little associated with risk (gift certificate and voucher). Importantly, these framing effects occurred independently of the objective level of uncertainty.

The framing effect on WTP may help explain why some researchers found the UE whereas others did not. As Table 5 shows, in most studies that have found the UE, the risky prospect's frame was highly associated with risk (e.g., lottery, coin flip), and the lowest outcome's frame was little associated with risk (e.g., gift, gift certificate, voucher). In contrast, most studies that did not replicate the UE framed both the risky prospect and its certain lowest outcome in the same way.

An exception, however, is Study 2 in Newman and Mochon (2012). In this study, participants were asked how much they would be willing to pay for an airline voucher for a round-trip coach ticket to anywhere in the continental United States. In the risky prospect condition, participants were told that the airline was running a promotion in which half the customers would be upgraded to first class. Consistent with the UE, WTP was lower in the promotion than in the certain condition (however, the effect was much smaller than in the authors' first study, which used the word "lottery"). Because neither of the frames (voucher and promotion) seems highly associated with risk, our framing effect cannot explain the UE in this case. The UE seems to be multiply determined; mismatching high- and a low-risk-associated frames is only one way to produce the UE. In the same vein, it is an open question whether the framing effect—which we have thus far only demonstrated for WTP—would also lead to the UE in choices or auctions (Gneezy, List, and Wu 2006; Sonsino 2008). We discuss this point in greater detail in the "General Discussion" section.

Table 5
OVERVIEW OF THE UE LITERATURE WITH RESPECT TO FRAME (MIS)MATCHES AND UE REPLICATION

	Framing of Outcomes		
Article	*Certain Low Outcome*	*Risky Prospect*	*UE Observed?*
Gneezy, List, and Wu (2006)	Gift certificate	Lottery	Yes
Markle, Rottenstreich, and Galak (2008)	Gift certificate	Coin flip	Yes
Simonsohn (2009)	Gift certificate	Lottery	Yes
Newman and Mochon (2012)	Gift certificate	Lottery	Yes
	Airline voucher	Promotion	Yes
Goldsmith and Amir (2010)	Free gift	Free gift	No
Rydval et al. (2009)	Gift certificate	Gift certificate	No
Experiment 4 in the current research	Gift certificate, voucher	Gift certificate, voucher	No
	Gift certificate	Lottery, raffle, coin flip, gamble	Yes
	Lottery, raffle, coin flip, gamble	Lottery, raffle, coin flip, gamble	No
	Lottery, raffle, coin flip, gamble	Gift certificate, voucher	No

Willingness to pay decreases when a prospect is framed as risky. This reduction in attractiveness also seems to be at odds with Goldsmith and Amir's (2010) findings that consumer promotions involving a risky prospect can be as attractive as the prospect's *best* certain outcome. In one study, participants were told that the purchase of a six-pack of soft drinks would come with a free gift. Participants were equally likely to buy the soft drinks whether they would receive either Godiva chocolates (best outcome) or Hershey's Kisses (inferior outcome) with unknown probabilities or receive Godiva chocolates for sure. The authors argue that consumers engage in "reflexive positivity," simply assuming the best case scenario. When participants were encouraged to think about probabilities, however, the reflexive positivity effect vanished.

It is difficult to compare these results directly with ours and the UE, because the dependent variable was willingness to buy, not WTP. A notable feature of Goldsmith and Amir's (2010) studies, however, is that they used an "add-on" frame: the risky prospect of receiving either Hershey's Kisses or Godiva chocolate was added on to a sure option, the six-pack of soft drinks. Newman and Mochon (2012) also used such an add-on frame in their aforementioned study; participants were asked how much they would be willing to pay for an airline coach ticket (the sure option), with the risky prospect of receiving an upgrade to first class added on to the sure option.

To determine whether such an add-on frame (e.g., a $50 gift certificate plus a 50% chance of the gift certificate being upgraded to a $100 gift certificate) would interact with our framing effect, we ran an experiment in which we orthogonally manipulated add-on frame (add-on vs. original) and the lottery/gift certificate frames. We replicated the lottery/gift certificate framing effect; the add-on framing had almost no effect on WTP. Web Appendix B describes the experiment and its results.

GENERAL DISCUSSION

The present research advances our understanding of how framing of a risky prospect influences consumers' WTP and WTA. Buyers and sellers are sensitive to different aspects of a potential exchange. To avoid bad deals, buyers are risk averse and focus on a prospect's negative aspects: its lowest possible outcome and how much its frame is associated with risk. Sellers, in contrast, want to avoid selling a prospect below its market value and thus take the prospect's expected value as a starting point. Therefore, they are sensitive to a prospect's lowest and highest outcomes but do not take into account the risk associated with a prospect's frame. In support of our aversion to bad deals account, we found WTP to be higher when a risky prospect was framed as a gift certificate or a voucher (frames weakly associated with risk) than when it was framed as a lottery ticket, a raffle, a coin flip,

or a gamble (frames strongly associated with risk). We demonstrated this framing effect with real and hypothetical payoffs (Experiment 1–4) and showed that this effect is independent of the objective level of uncertainty (Experiment 4). Furthermore, we showed that WTP is sensitive to a risky prospect's low outcome but not to its high outcome. In contrast, we found that WTA is influenced by both a risky prospect's low and high outcomes but not by the extent to which its frame was associated with risk (Experiment 2).

Theoretical Implications

Different frames elicit differences in WTP. The experiments presented in this article are the first to show that an offer's label can dramatically influence how much people are willing to pay for it. Frames such as lottery, coin flip, raffle, or gamble elicit much lower WTP than frames such as gift certificate and voucher, irrespective of the amount of uncertainty involved in the offer. The framing effect is robust and substantial, reducing WTP by approximately one-third on average. Moreover, in another experiment not reported here, we manipulated the framing of the risky prospect within subject (the order of the frames was counterbalanced) and again observed a reduction in WTP.

Framing influences WTP but not WTA. Our work shows not only when framing matters but also when it does not matter. Previous work on the endowment effect has shown that the market price and the valuation of an object can have different influences on WTP and WTA (Carmon and Ariely 2000; Isoni 2011; Johnson, Häubl, and Keinan 2007; Weaver and Frederick 2012). The present research contributes to this line of study by showing that a prospect's label also influences WTP and WTA differently. We demonstrate that when the objective uncertainty of the risky prospect is held constant, the uncertainty associated with its frame is considered a value-decreasing factor. Buyers tend to focus on the negative aspects of the prospect and thus are sensitive to framing. Sellers tend to be less risk averse and are thus insensitive to framing.

Online marketers have long realized the effect of framing on consumers' willingness to participate in surveys. Web-based consumer surveys are typically advertised by offering consumers an opportunity to win an attractive item (e.g., "Answer a short survey and win an iPod"), not by offering to enter them in a lottery to win the item. Notably, this is not the case for state-run lotteries (e.g., the Pennsylvania State Lottery, the China Welfare Lottery, Spain's El Gordo). These lotteries still use the label "lottery" or "lotto" in their names and offerings (e.g., "lottery tickets," "lotto numbers"). Our research suggests that participation could potentially be increased by refraining from using frames that are highly associated with risk such as "lottery." For example, "Powerball" is an American lottery game offered by the Multi-State Lottery Association that does not use the words "lottery" or "gamble" in any of its offerings. Needless to say, changing the name of a brand and its offerings may result in a loss of brand equity that may well offset the beneficial effect of omitting the word "lottery." Start-up lotteries, however, are likely to benefit from not using the word "lottery," "gamble," or other frames highly associated with risk.

Framing effects can lead to decision anomalies. As a consequence of the framing effect, violations of dominance/monotonicity can arise when prospects are framed differently. Because framing can influence WTP for both certain and uncertain prospects, framing a risky prospect as a lottery, coin flip, raffle, or gamble and framing its lowest outcome as a gift certificate will lead to the UE; that is, consumers are willing to pay less for the risky prospect than for its lowest outcome (Experiment 4). Consistent with this finding, most studies that have found the UE used frames highly associated with risk to describe the risky prospect and frames weakly associated with risk to describe the certain prospect; most research that did not find the UE used the same frame to describe both the risky and certain prospects (see Table 4).

Note that frame mismatching is common in other research fields as well. Most studies investigating decision making under uncertainty use different frames to describe risky and certain prospects. Risky prospects are typically described as lotteries or gambles, whereas certain outcomes or certainty equivalents are not framed in any way. Consequently, decision anomalies and levels of risk aversion inferred from choices or WTP may be caused not only by objective levels of uncertainty but also by the extent to which a frame is associated with risk.

It should be noted, however, that we have demonstrated the framing effect only on WTP, whereas others have found the UE in WTP and choices (Gneezy, List, and Wu 2006). Will framing lead to similar preference inconsistencies in choices as it does in WTP? Previous work has demonstrated that under some conditions, consumers may choose a risky prospect A over another risky prospect B but are willing to pay more for the latter than the former (Grether and Plott 1979; Lichtenstein and Slovic 1971, 1973; Lindman 1971). Willingness to pay and choice are measures of preferences that are influenced differentially by situational/contextual factors. It is thus a question for further research to determine whether framing influences choices in the same way as it influences WTP, and—more generally—to what extent framing effects influence our understanding of risk aversion and decision anomalies.

APPENDIX A: INSTRUCTIONS USED IN EXPERIMENT 1

Gift Certificate (WTP)

We will randomly select five participants of this survey. If you are selected, we will give you $20 (in form of a bonus payment for completing this HIT [Human Intelligence Task]) and an opportunity to purchase a gift card.

We are interested in how much you are willing to pay for the gift card. The gift card will be either a $10 Best Buy gift card or a $20 Best Buy gift card (both are equally likely). If the price you are willing to pay is equal to or above our reservation price for this gift card, you will buy the gift card at the reservation price (in this case, we will send you the outcome of the gift card, either a $10 Best Buy gift card or a $20 Best Buy gift card). If the price you are willing to pay is below our reservation price, you will not buy the gift card.

What is the highest price you are willing to pay for the gift card?

Lottery (WTP)

We will randomly select five participants of this survey. If you are selected, we will give you $20 (in form of a bonus

payment for completing this HIT) and an opportunity to purchase a lottery ticket.

We are interested in how much you are willing to pay for the lottery ticket. The lottery ticket will for sure give you either a $10 Best Buy gift card or a $20 Best Buy gift card (both are equally likely). If the price you are willing to pay is equal to or above our reservation price for the lottery ticket, you will buy the lottery ticket at the reservation price (in this case, we will send you the outcome of the lottery ticket, either a $10 Best Buy gift card or a $20 Best Buy gift card). If the price you are willing to pay is below our reservation price, you will not buy the lottery ticket.

What is the highest price you are willing to pay for the lottery ticket?

APPENDIX B: INSTRUCTIONS USED IN EXPERIMENT 2

Gift Certificate (WTP)

Suppose you have the option to buy an uncertain gift certificate. The gift certificate will be either a $50 [$50] [$25] gift certificate for Barnes & Noble bookstore or a $100 [$200] [$100] gift certificate for Barnes & Noble bookstore (both are equally likely). What is the highest amount of money (in dollars) you would pay to buy this gift certificate?

Gift Certificate (WTA)

Suppose you were given a gift certificate which is yours to keep. The gift certificate will be either a $50 [$50] [$25] gift certificate for Barnes & Noble bookstore or a $100 [$200] [$100] gift certificate for Barnes & Noble bookstore (both are equally likely). What is the lowest amount of money (in dollars) you would accept to sell this gift certificate?

Lottery (WTP)

Suppose you have the option to buy a lottery ticket. The lottery ticket will for sure give you either a $50 [$50] [$25] gift certificate for Barnes & Noble bookstore or a $100 [$200] [$100] gift certificate for Barnes & Noble bookstore (both are equally likely). What is the highest amount of money (in dollars) you would pay to buy this lottery ticket?

Lottery (WTA)

Suppose you were given a lottery ticket which is yours to keep. The lottery ticket will for sure give you either a $50 [$50] [$25] gift certificate for Barnes & Noble bookstore or a $100 [$200] [$100] gift certificate for Barnes & Noble bookstore (both are equally likely). What is the lowest amount of money (in dollars) you would accept to sell this lottery ticket?

APPENDIX C: INSTRUCTIONS USED IN EXPERIMENT 3

Voucher (WTP)

Suppose you have the option to buy a voucher. This voucher will be either a $50 gift certificate for Barnes & Noble bookstore or a $100 gift certificate for Barnes & Noble bookstore (both are equally likely). What is the highest amount of money (in dollars) you would pay to buy this voucher?

Voucher (WTA)

Suppose you were given a voucher which is yours to keep. This voucher will be either a $50 gift certificate for Barnes & Noble bookstore or a $100 gift certificate for Barnes & Noble bookstore (both are equally likely). What is the lowest amount of money (in dollars) you would accept to sell this voucher?

Raffle (WTP)

Suppose you have the option to buy a raffle ticket. The raffle ticket will for sure give you either a $50 gift certificate for Barnes & Noble bookstore or a $100 gift certificate for Barnes & Noble bookstore (both are equally likely). What is the highest amount of money (in dollars) you would pay to buy this raffle ticket?

Raffle (WTA)

Suppose you were given a raffle ticket which is yours to keep. The raffle ticket will for sure give you either a $50 gift certificate for Barnes & Noble bookstore or a $100 gift certificate for Barnes & Noble bookstore (both are equally likely). What is the lowest amount of money (in dollars) you would accept to sell this raffle ticket?

Gamble (WTP)

Suppose you have the option to pay for playing a gamble. The gamble will for sure give you either a $50 gift certificate for Barnes & Noble bookstore or a $100 gift certificate for Barnes & Noble bookstore (both are equally likely). What is the highest amount of money (in dollars) you would pay to play this gamble?

Gamble (WTA)

Suppose you were given a chance to play a gamble. The gamble will for sure give you either a $50 gift certificate for Barnes & Noble bookstore or a $100 gift certificate for Barnes & Noble bookstore (both are equally likely). What is the lowest amount of money (in dollars) you would accept to give up the chance to play this gamble?

Coin Flip (WTP)

Suppose you have the option to pay for participating in a coin flip. If heads comes up, you will get a $50 gift certificate for Barnes & Noble bookstore. If tails comes up, you will get a $100 gift certificate for Barnes & Noble bookstore. What is the highest amount of money (in dollars) you would pay to participate in this coin flip?

Coin Flip (WTA)

Suppose you were given a chance to participate in a coin flip. If heads comes up, you will get a $50 gift certificate for Barnes & Noble bookstore. If tails comes up, you will get a $100 gift certificate for Barnes & Noble bookstore. What is the lowest amount of money (in dollars) you would accept to give up the chance to participate in this coin flip?

APPENDIX D: INSTRUCTIONS USED IN EXPERIMENT 4

Uncertain Gift Certificate

We are interested in how much you would be willing to pay for a gift certificate. The gift certificate will be either a $50 gift certificate for Barnes & Noble bookstore or a $100 gift certificate for Barnes & Noble bookstore (both are equally likely).

Uncertain Voucher

We are interested in how much you would be willing to pay for a voucher. This voucher will be either a $50 gift certificate for Barnes & Noble bookstore or a $100 gift certificate for Barnes & Noble bookstore (both are equally likely).

Uncertain Coin Flip

We are interested in how much you would be willing to pay for participating in a coin flip. If heads comes up, you will get a $50 gift certificate for Barnes & Noble bookstore. If tails comes up, you will get a $100 gift certificate for Barnes & Noble bookstore.

Uncertain Raffle

We are interested in how much you would be willing to pay for a raffle ticket. The raffle ticket will for sure give you either a $50 gift certificate for Barnes & Noble bookstore or a $100 gift certificate for Barnes & Noble bookstore (both are equally likely).

Uncertain Lottery

We are interested in how much you would be willing to pay for a lottery ticket. The lottery ticket will for sure give you either a $50 gift certificate for Barnes & Noble bookstore or a $100 gift certificate for Barnes & Noble bookstore (both are equally likely).

Uncertain Gamble

We are interested in how much you would be willing to pay for playing a gamble. The gamble will for sure give you either a $50 gift certificate for Barnes & Noble bookstore or a $100 gift certificate for Barnes & Noble bookstore (both are equally likely).

Certain Gift Certificate

We are interested in how much you would be willing to pay for a gift certificate. The gift certificate is a $50 gift certificate for Barnes & Noble bookstore.

Certain Voucher

We are interested in how much you would be willing to pay for a voucher. The voucher is a $50 gift certificate for Barnes & Noble bookstore.

Certain Coin Flip

We are interested in how much you would be willing to pay for participating in a coin flip. If heads comes up, you will get a $50 gift certificate for Barnes & Noble bookstore. If tails comes up, you will get a $50 gift certificate for Barnes & Noble bookstore.

Certain Raffle

We are interested in how much you would be willing to pay for a raffle ticket. The raffle ticket will for sure give you a $50 gift certificate for Barnes & Noble bookstore.

Certain Lottery

We are interested in how much you would be willing to pay for a lottery ticket. The lottery ticket will for sure give you a $50 gift certificate for Barnes & Noble bookstore.

Certain Gamble

We are interested in how much you would be willing to pay for playing a gamble. The gamble will for sure give you a $50 gift certificate for Barnes & Noble bookstore.

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