

Reflexive Positivity: How Uncertainty Can Improve Promotions

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ABSTRACT

When should retailers offer promotions with uncertain rewards? The current research investigates this question and finds there are instances when uncertain incentives may seem more attractive than their expected value. For example, a lottery between small and large rewards may even be as attractive as the large reward for certain. We demonstrate this effect in hypothetical scenarios as well as a field experiment involving actual purchases. We suggest that this effect occurs because consumers exhibit reflexive positivity whereby their intuitive appraisal of the lottery leads to a response beyond what would be justified by an expected value consideration. This underlying psychological mechanism informs research on risk and uncertainty and outlines boundary conditions for this positive effect of uncertainty that have direct practical implications for marketers.

Consumer incentives often project varying degrees of uncertainty. For example, a consumer might be told that she will receive a generous gift with purchase (e.g., “Buy today and receive a box of Godiva truffles!”), or that she will receive a gift with purchase that could be either the same generous gift or a more modest gift (e.g., “Buy today and receive *either* a box of Godiva truffles *or* two Hershey’s kisses!”). The latter incentive would be comparably more uncertain than the former with a lower expected value to the customer. However, with enough positivity on the part of the customer this incentive may be no less effective. The impact of such promotions with uncertain outcomes (uncertain incentives, hereafter), the underlying mechanism, and its boundary conditions are at the center of the current investigation.

Uncertain incentives that achieve the same effect as certain high value rewards benefit retailers as promotions with uncertainty, such as the incentive of either a box of Godiva truffles or the two Hershey’s kisses mentioned above, cost far less than distributing only the high value reward at certainty, if the probability of receiving the high value reward is smaller than 1. For the very same reason, any rational model of choice that assumes risk neutrality or risk aversion would predict that the motivational effect of the uncertain incentive would be smaller than that of the high value reward at certainty.

A preliminary experiment was conducted to assess consumers’ interest in such uncertain incentives. One hundred and thirty five students were assigned to one of three conditions. In parallel to the example above, participants were asked to imagine that a soft drink company running a promotion was offering a prize on the underside of every soda cap. They were then told that the prize under every cap was either a high value reward (“one free iTunes song download”), a low value reward (“one point towards a potential prize”), or a lottery between the two rewards (uncertain incentive). Participants then indicated their likelihood of purchasing the

soft drink on a scale from 0 (not at all likely) to 100 (extremely likely). To control for perceptual contrast, a second group of 112 students completed the same task; however, all participants were exposed to both the high and low value incentives (those in the certain conditions were informed that they entered a store offering the high [low] value incentive only). This time, participants rated how attractive they found the offer (1 – not at all attractive, 7 – very attractive). The results (Table 1) confirm the basic premise of the current investigation: consumers may over-value promotions with an uncertain outcome. In these two preliminary examples, the uncertain incentive was significantly more effective than the low value incentive and performed on par with the high value incentive.

--- Insert Table 1 here ---

The key hypothesis of this paper is that consumers' response to uncertain incentives may exceed the response appropriate for the expected value of the incentive. Specifically, we claim that uncertain incentives can generate appeal beyond their expected value when consumers' reflexive positivity is allowed to operate. This premise relies on the following assumptions about judgments in the domain of gains: 1) Reflexive judgments tend to demonstrate positivity; and 2) This positivity increases the perceived value of uncertain incentives above their rational expected value. In the remainder of the paper, we will elaborate on the theoretical and empirical foundations for these premises and test them in a series of experiments. As suggested by our preliminary examples, we test our proposition by offering certain and uncertain incentives and assessing consumers' judgments of those incentives in both hypothetical purchase scenarios as well as in an actual field experiment involving real purchases.

REFLEXIVE POSITIVITY: A SUBSET OF OPTIMISTIC JUDGMENTS

The notion that people can put a positive “spin” on uncertainty is consistent with the prior work on optimism showing that in setting goals (Armor and Taylor 2002; Newby-Clark et al. 2000), making predictions about future life events (Weinstein 1980), predicting the merits of one’s future behavior (Epley and Dunning 2000), and evaluating ourselves in comparison to others (Kruger 1999; Kruger and Evans 2006; Martz et al. 1988; Taylor and Brown 1998) we often see the world through “rose colored” lenses. One key to the effects of such self-serving optimism is that people may be aware of the population base rate; however, they believe the base rate only applies to *others*. From a normative perspective, exhibiting self-serving optimism often means making a mistake by not applying a known base rate to oneself. In our current work, we focus on *reflexive positivity* as a subset of optimistic judgments. By this we refer to the innate, automatic tendency to see the world through a positive lens (Bar-Hillel and Budescu 1995; Taylor and Brown 1988), a process we suggest to be primary to any base-rate considerations. As prior research has demonstrated that the “rosy glow” generated by positivity does not necessarily influence perceived likelihood judgments (Bar-Hillel and Budescu 1995; Krizan and Windschitl 2007), we use this to draw a distinction between reflexive positivity and optimism: the positive perspective studied here is a reflexive state that may be overridden by considerations of “real” aspects of the forthcoming event, e.g. actual likelihood rates. Importantly, we do not propose a disconnect between value and frequency. Prior research has demonstrated that scarce objects may be viewed as more valuable (Cialdini 2001) and recently in a clever reversal that more valuable objects may be judged more scarce (Dai, Wertenbroch, & Brendl 2008). Note that this relationship between value and frequency would make a prediction consistent with ours, if the uncertainty increased perceptions of scarcity; however, this would rely on an over-valuation of the incentive’s worth inflating the expected value. Our current prediction diverges from this as

we argue that a motivational reaction to uncertainty is what drives the incentive's effectiveness beyond what would be appropriate based on its expected value. Thus, distinct from the predictions this prior research might make, we argue that the intuitive over-valuations studied here are caused by neither inflated perceived likelihoods nor by inflated expected values. Rather, they are caused by a process that precedes likelihood considerations.

To illustrate this distinction, consider a lottery between a high value reward (\$12) and a low value reward (\$2), with an unknown probability distribution. Self-serving optimism dictates that when asked about *their* probability of receiving the high value reward, people would estimate it to be higher than that of the average person, thus they might prefer the lottery to a sure reward that is slightly higher in value than the average of the two possible rewards (e.g., an \$8 reward). While reflexive positivity would also lead to preference for the lottery over the sure \$8 reward, when asked about *their* probability of receiving the higher value incentive, people would not estimate their own likelihood to be higher than that of the average person. Moreover, such likelihood considerations would disengage their positive perspective and thereby negate the effect; people would no longer prefer the lottery. In this way, the scope of this investigation falls outside of some broader uses of the term "optimism," such as in the domain of probability weighting (Prelec 1998; Wakker 2001) where some range of probabilities yields reactions consistent with inflated likelihood levels. Our experiments will test how probability considerations affect over-valuations. We predict that probability weighting is not the explanation for the over-valuation studied here, and argue instead that these effects occur precisely because consumers do not naturally consider probabilities. That is, reflexive positivity can be construed as generating a holistic positive view of uncertain incentives, which may cause

consumers' response to an uncertain incentive to exceed the response appropriate to its expected value.

UNCERTAINTY AND POSITIVITY

Well known work in economics and psychology documents consumers' preference for certain benefits over uncertain benefits. By definition, risk aversion stipulates that a "riskless" benefit will always be valued more than the same benefit with any uncertainty (Kimball 1993). Captured by the concavity of the Prospect Theory value function (as well as any other utility function satisfying concavity in the domain of gains) is the notion that, unless the probabilities are very small¹, consumers will tend to be risk averse over gains (Kahneman and Tversky 1979) and prefer a sure good to a lottery of equivalent expected gain (Bernoulli 1954; Dhar, Gonzalez-Vallejo, and Soman 1995). Kahneman and Tversky (1979) further describe the "certainty effect," which specifically addresses how in the domain of gains consumers avoid risk or uncertainty, at times with little normative justification². More recently, Gneezy and colleagues (2006) have identified situations in which people value an uncertain reward even less than its worst possible realization: specifically, participants in their experiments were willing to pay less for a lottery than its lowest possible outcome, exhibiting hyper risk aversion (Gneezy, List, and Wu 2006)

However, in this paper we argue that consumers' innate reflexive positivity might allow for instances when uncertain incentives can be effective. Specifically, we predict that consumers' natural response to a lottery between a high value reward and an inferior one may exceed the expected value of the lottery. Related research in psychology supports this prediction,

¹ The scope of promotions examined in the current work does not fall into the very small probability range, where overweighting has been shown (Prelec 1998), as exhibited by the results of Experiments 1 & 2.

² However, it has been suggested that such "ambiguity aversion" arises at least in part from comparative judgments (Tversky and Fox 1995), while consumer promotions tend to present offers in non-comparable contexts (as our leading example depicts).

showing that there can be benefits to uncertainty. For example, Amir and Ariely (2008) find that some degree of uncertainty about progress on a task can enhance motivation, performance, and task enjoyment. Norton and colleagues find a similar effect in interpersonal attraction, demonstrating that in the domain of on-line dating, the less people know about prospective mates (the more uncertain the outcome), the more they like them (Norton, Frost, and Ariely 2006). Wilson et al. (1995) term such effects of the unforeseen benefits to uncertainty “the pleasure paradox,” as consumers may at times sacrifice the pleasures uncertainty can offer out of a desire for greater information (increased predictability). While this literature only makes indirect predictions for the evaluations of incentives with uncertain outcomes, it suggests that motivational benefits may accrue from some degree of uncertainty.

In response to examples of deviations from expected utility theory, judgments of risky prospects have been modeled by various weighting functions attempting to capture the inverse-S shaped effects exhibited in empirical data (Prelec 1998; Diecidue and Wakker 2001). Generally, such models point to people’s sensitivity to changes in probability levels (impossible, possible, and certain), but suggest a lack of the ability to distinguish between finer levels of likelihood. The context of our investigation, however, lies in a domain where very little probability weighting is expected, as we deal with middling probability levels.. We argue that individuals react to uncertain promotions, such as the incentive in the preliminary example, reflexively: neither demonstrating a great deal of elaboration nor making probability considerations.

Thus while the standard risk aversion or risk neutrality assumptions may predict otherwise, recent research on uncertainty provides evidence of instances when a lack of information can lead to a more positive response than is justified by an expected value consideration. Coupling this with the notion of positivity, we make the following predictions

about the manner in which reflexive positivity could bolster the effectiveness of uncertain incentives:

H1: Uncertain incentives may be effective beyond what would be justified by an expected value consideration (an implied over-valuation).

H2: The over-valuation of uncertain incentives is caused by reflexive positivity.

We will test these hypotheses in a series of experiments. Each experiment will demonstrate that consumers can over-value uncertain incentives. In Experiments 1a and 1b we will elicit the perceived probability distribution and the perceived expected value to shed light on this assumption. Experiments 2 – 4 will test for reflexive positivity as the process behind this effect and outline boundary conditions for when uncertain incentives may *not* lead to positive outcomes (i.e., when elaboration is encouraged or among pessimists). Experiment 5 will rule out two potential alternate accounts for our proposed effect. Additionally, several robustness checks will be included throughout the experiments test for replications of this effect across a variety of standard consumer incentive designs. Finally, a field experiment will test for the ecological validity of our claims. The paper concludes with a discussion of the theoretical and practical implications for this work and a summary analysis of the robustness and boundary conditions uncovered.

In our preliminary studies, we assumed that those receiving the uncertain incentive perceived their probability of receiving the high value reward as significantly less than 1, taking the comparable effect of the uncertain incentive and the certain high value incentive as support for the proposed over-valuation of the uncertain incentive (H1). Experiment 1 will test this assumption more directly, in addition to testing for a conceptual replication of this effect in a different consumer context.

EXPERIMENT 1a: CANDY WITH PURCHASE

Method

One hundred and seventeen participants from an online participant pool took part in an experiment on consumer behavior. For this experiment, participants were placed into one of three conditions at random in exchange for entry into a lottery for a \$40 Amazon.com gift certificate.

Design

This experiment had a between participants design with three conditions. Participants in two conditions read instructions asking them to imagine that their favorite soft drink company was currently running a promotion: anyone purchasing a six-pack of soft drinks would receive a free gift with purchase. Participants in the two certain conditions were offered either a package of Godiva Truffles (high value) or two Hershey's Kisses (low value) as their gift. Participants in the third condition were told that their gift was "*either* a package of Godiva Truffles *or* two Hershey's Kisses" (uncertain incentive). Participants then indicated their likelihood of purchasing a six-pack of soft drinks (0-100 scale), and how attractive they found the offer (1 – not at all attractive, 7 – very attractive). On the next page participants were asked to indicate whether the promotion had any effect on their decision to purchase, and to elaborate on how the promotion influenced their decision in an open response. They were then asked for their estimate of the value of the promotion (in Dollars). Finally, participants in the uncertain incentive condition were asked to estimate the probability that they would receive the package of Godiva Truffles (high value incentive).

Results

In H1, we predicted that uncertain incentives may be effective beyond what would be justified by an expected value consideration. The results supported this hypothesis. Participants were significantly more likely to purchase the six-pack of soft drinks and found the incentive more attractive when the incentive was a package of Godiva Truffles (high value) as opposed to two Hershey's Kisses (low value) (Likelihood of purchase: $M_{\text{high value}} = 73.5\%$; $M_{\text{low value}} = 44.6\%$, $t(75) = 3.62$; Attractiveness: $M_{\text{high value}} = 5.5$; $M_{\text{low value}} = 2.6$, $t(75) = 7.33$; p 's < .001). More important for our current account, participants' reactions to the uncertain incentive exceeded what one would expect based on the expected value they indicated: there was no significant difference in purchase likelihood between when a package of Godiva Truffles was offered for certain and when the same prize was part of the uncertain incentive ($M_{\text{high value}} = 73.5\%$; $M_{\text{uncertain}} = 67.8\%$, $t(77) = .76$, $p = .45$). This time, however, the uncertain incentive was judged less attractive than the certain high value reward ($M_{\text{high value}} = 5.5$; $M_{\text{uncertain}} = 4.6$, $t(77) = 2.08$, $p = .04$). In line with our prediction, participants were significantly more likely to purchase the six-pack of soft drinks and found the incentive more attractive when the incentive was the uncertain incentive as opposed to when it was the low value incentive ($t(76) = 2.99$, $p < .01$, and $t(76) = 4.66$, $p < .001$, respectively).

To test more precisely for over-valuation, we asked participants to estimate the value of the promotion. Participants in the certain high and low value incentive conditions estimated the incentive to be worth \$5.33 and \$1.34³, respectively ($t(68) = 4.37$, $p < .001$). Those in the uncertain incentive condition estimated the promotion value at \$2.96, which was significantly lower than the certain high value incentive estimate ($t(62) = 2.38$, $p = .02$), but only marginally higher than the certain low value estimate ($t(62) = 1.68$, $p = .099$). We also asked those in the

³ While the retail value of two standard Hershey's kisses almost certainly would fall below \$1.34, participants may have reported the amount that they imagined the incentive / promotion would cost the company, or might have referred to a pack of Hershey's Kisses.

uncertain incentive condition to estimate the probability of receiving the high reward (mean = .486). This leads to an implied expected value of \$3.35. If we use \$5.33 and \$1.34 as estimates of the value of the certain high and low value incentives respectively, participants' actual purchase likelihood responses (behavior) imply a risk-neutral expected value on the order of \$4.91, and the attractiveness results imply it to be \$4.47, both of which significantly exceed the expected values expressed by participants ($t(29) = 2.61, p = .014$ and $t(28) = 2.02, p = .052$, respectively). If we use a concave utility transformation as opposed to a risk neutral one this finding would be exaggerated.

Finally, we analyzed the open responses provided by participants (as coded by two independent coders blind to the purpose of the experiment, $\alpha = .78$). First, while 56.5% and 46.2% of participants indicated that the promotion influenced their decision in the certain high value and uncertain incentive conditions, respectively, only 15.8% did so in the certain low value condition. Of those remarks that were made, only 2-3 per condition made any specific reference to the actual prizes offered, and none discussed probability or risk. In line with the purchase intent and interest measures, 54% of the comments made in the certain high value condition and 52% in the uncertain incentive conditions were judged as strictly positive, as compared to 14% in the certain low value condition.

Discussion

The current experiment adds to our preliminary findings in several important ways. First, we replicate our preliminary findings using different products and promotion offerings. Second, our results substantiate our claim regarding consumers' over-valuation of the uncertain incentive relative to the expected value (H1) with more direct measures. While our previous results support this claim with the assumption that people in the uncertain condition do not imagine

receiving the high value reward with certainty, the current results suggest that the uncertain incentive generates a more positive consumer reaction than is justified by the value that consumers themselves place on the promotion or by the implied value based on their perceived probability of receiving the high value incentive. Finally, the finding that no participants mentioned probability and very few discussed specific rewards in their open-ended remarks further suggests that the reaction to the uncertain incentive may be reflexive and primary to probability considerations. While the results thus far demonstrate our proposed effect, one could argue that these effects might only be bounded to highly stylized conditions. For example, would these effects replicate if participants in the uncertain incentive condition were provided with their probability of receiving the high value incentive? Would it matter if the probability was provided as a range as opposed to a fixed value?

Experiment 1b tests the robustness of this effect, assessing how a variety of subtle contextual manipulations affect interest in the uncertain incentive relative to the certain high and low value incentives. Specifically, Experiment 1b tests how directly providing probabilities (within the uncertain incentive condition) affects interest in uncertain incentives, as well as how manipulating attention (by drawing focus to one incentive vs. the other within the uncertain incentive) affects our pattern of results. If the pattern of results thus far was driven by consumers in the uncertain incentive condition selectively focusing their attention on the high value incentive within the set, drawing their focus to the low value incentive should decrease interest in the uncertain incentive. As we predict that reflexive positivity is an intuitive, “gut” consumer response, we argue that the pattern of results demonstrated thus far will be robust to these subtle interventions and will not be explained by a selective attention account.

EXPERIMENT 1b: REPLICATION AND ROBUSTNESS CHECK

Method

Two hundred and sixty nine participants from an online participant pool took part in an experiment on consumer behavior. For this experiment, participants were placed into one of seven conditions at random and were offered a chance to win a \$40 a gift certificate to Amazon.com.

Design

This experiment had a between participants design with seven conditions. The first three conditions identically replicated Experiment 1a: a certain high value and low value condition, and an uncertain incentive condition. To this basic design, we added two additional uncertain incentive conditions including an explicit probability statement: participants were provided with either their exact probability of receiving the high value incentive (50%) or a range of probabilities (40-60%). In two final uncertain incentive conditions, we manipulated the salience of each incentive within the uncertain incentive condition using a font manipulation (see Table 2). After reviewing the available incentive, all participants indicated how likely they would be to purchase the focal product (0-100 scale), and how attractive they found the offer (1 – not at all attractive, 7 – very attractive). On the next page, all participants were asked to indicate the perceived value of the incentive to which they were assigned. Participants in the uncertain incentive conditions were asked to indicate how receiving the lower value incentive would influence their subsequent purchases of the focal product (in the certain high [low] value incentive conditions participants were asked about the influence of the high [low] value reward). Finally, all participants were asked to estimate the value of the promotion (in Dollars).

Results

The results from conditions 1-3 replicated our prior findings (Table 2). Our analysis revealed that participants were significantly more likely to purchase the focal product ($t(77) = 4.72, p < .001$) and found the incentive more attractive ($t(77) = 8.66, p < .001$) when the incentive was high value as opposed to low value. More important for our current account, participants' reactions to the uncertain incentive exceeded what one would expect based on the expected value they indicated: there was no significant difference in purchase likelihood between the high value and uncertain incentive conditions ($t(77) = 1.38, p = .17$). This time, however, the uncertain incentive was judged less attractive than the high value incentive ($t(77) = 2.39, p = .02$). In line with our prediction, participants were significantly more likely to purchase the focal product ($t(78) = 3.31, p = .001$) and found the incentive more attractive ($t(78) = 5.82, p < .001$) when the incentive was uncertain as opposed to low value. Moreover, all four of the additional uncertain incentive conditions yielded results statistically indistinguishable from our standard uncertain incentive condition. The only marginal difference that emerged was when comparing across the salience manipulation (large font = Godiva large vs. two Hershey's Kisses) (Likelihood of purchase: $t(72) = 1.75, p = .085$; Attractiveness: $t(72) = 1.46, p = .147$); however, neither of these conditions yielded results that were significantly different from the standard uncertain incentive condition ($p > .22$): all uncertain incentive conditions were significantly more motivating and attractive than the low value incentive condition and statistically indistinguishable from the high value incentive condition.

--- Insert Table 2 here ---

Participants in the high and low value incentive conditions estimated the incentive to be worth \$6.31 and \$1.19, respectively ($t(66) = 5.34, p < .001$), while those in the uncertain incentive condition estimated the promotion value at \$1.92. This was significantly lower than

the certain high value incentive estimate ($t(59) = 4.34, p < .001$), but no higher than the certain low value incentive estimate ($t(67) = 1.52, p = .132$). This monetary valuation of the uncertain incentive was significantly lower than the expected value of the promotion of \$3.75 (using the above certain values and the probability participants indicated in Experiment 1a; $t(30) = 5.19, p < .001$). Replicating Experiment 1a, we find over-valuation of the incentive in behavior, as the indications of purchase intent and attractiveness in the uncertain incentive conditions correspond to much higher incentive values (Table 2).

Finally, we asked participants to predict how receiving the low value incentive would impact their future purchase of the focal product (in all but the certain high value condition, where participants predicted the implications of receiving the high value incentive). Responses were provided on a scale anchored at 1 = negative impact, 4 = no impact, and 7 = positive impact. Comparing responses to the scale's midpoint, while receiving the high value incentive with certainty generated a positive impact ($t(38) = 6.08, p < .001$), and receiving the low value reward in the condition when the high value reward was made salient generated a negative response ($t(36) = 2.23, p = .03$), in all other conditions the impact was neutral (not significantly different from the mid-point of the scale, see Table 2 for means).

Discussion

The current experiment builds on our previous findings in several important ways. We replicate the results of Experiment 1a and demonstrate that our findings are relatively robust to simple presentation manipulations (e.g., providing probability estimates), and further that an account in which the reflexive reaction is driven by a simple focus on the more positive outcome (i.e., selective attention) alone cannot account for our results. Moreover, we find consumers receiving the uncertain incentive do not predict that being given the low value option in the set

would generate a negative impact on their subsequent purchase intentions towards the focal product.

Though we have shown that the over-valuation of these uncertain incentives is a relatively robust phenomenon, our proposed rationale for this effect does not imply it is without bounds. On the contrary, we propose that when consumers react to uncertainty in a thoughtful and non-reflexive manner, this positive influence will cease. Consistent with this argument, prior work has shown that feelings of risk can cause an uncertain outcome to be valued even lower than its worst possible outcome (Gneezy, List, and Wu 2006) and that affective reactions to risk can dominate cognitive assessments of risk (Loewenstein et al. 2001). These prior findings, unlike ours, illustrate instances when uncertainty can generate a comparatively negative response. A factor common to these works, however, is that participants carefully and thoughtfully formed their reactions. Unlike decisions about higher-stakes financial lotteries made in a lab setting, we argue consumer promotions may many times be processed rather reflexively, through a peripheral route. We use this distinction between reflexive and careful processing as a first step in identifying the underlying process behind the positive effect of uncertainty on promotions.

To demonstrate the effects of careful versus reflexive processing on our effect, Experiment 2 employs a simple elaboration manipulation: we asked participants to estimate *their* probability of receiving the high value reward either prior to responding to the behavioral measures or after responding to them. If the underlying process is a thoughtful albeit biased application of base rates or self-serving optimism, we should observe all participants indicating high probability estimates that have no effect on the behavioral measures; however, if the underlying process is indeed reflexive positivity, then when probability estimates are elicited

prior to the behavioral measures, any positive effect should be negated and we should observe a non-rosy view of the uncertain incentive. Our current thesis suggests the latter will hold: if probability estimates are made prior to the measures of consumer interest, reflexive positivity will no longer operate and consumers should not respond as if value of the uncertain incentive exceeds its expected value. In line with prior research, we predict that the desirability of the outcome will not influence predicted likelihood rates and that these rates will not vary dependent on if they are elicited prior to or post the behavioral intention measures (Bar-Hillel and Budescu 1995; Krizan and Windschitl 2007).

EXPERIMENT 2: WHAT'S UNDER YOUR CAP?

Method

One hundred and fifty four students at a southwestern university were asked to participate in an experiment on consumer behavior. For this experiment, participants were placed into one of four conditions at random, and were not compensated for their participation.

Design

The design of this experiment was identical to the design of our first preliminary experiment, with one critical change. While both the high and the low value incentive conditions remained the same, an additional question was added to create the two uncertain incentive conditions. The question asked participants in the uncertain incentive conditions to indicate what they believed their percentage likelihood of receiving the high value incentive would be, if they purchased the soft drink (scale: 0 – 100%). This question was either asked on a second page, after all the intention and judgment measures had been completed or asked directly following the description of the incentive, prior to the other measures. We predicted that asking participants to

write their perceived percentage likelihood of receiving the high value incentive should override any natural reflexive positivity and shed light on the process underlying the effect we have observed in the experiments thus far.

Results

The results of this experiment replicated our previous findings (Table 3). Comparing the certain incentive conditions to the uncertain incentive condition where the perceived percentage likelihood question was asked following the behavioral measures, participants reported a significantly greater intention to purchase soft drinks accompanied by either a high value incentive or an uncertain incentive over a low value incentive (p 's $< .01$). They also found both the high value and uncertain incentives to be more interesting than the low value incentive ($p < .05$; $p = .063$ respectively). Across all dependent measures the difference between the high value incentive and the uncertain incentive was not significant (p 's $> .5$).

--- Insert Table 3 about here ---

In H2, we claim that the over-valuation of uncertain incentives is caused by reflexive positivity. The results of this experiment provide support this hypothesis. Manipulating the elicitation order of the likelihood question had a significant effect on how motivating and interesting participants found the uncertain incentive. When they were initially asked to indicate their perceived likelihood of receiving the high value incentive, participants' interest level in the incentive dropped significantly, as compared to when the question was asked after the interest measures (all p 's $< .05$). This occurred despite the fact that there were no significant differences in how participants in the two uncertain incentive conditions rated their likelihood of receiving the high value incentive ($M_{\text{question before}} = 32.4\%$; $M_{\text{question after}} = 34.1\%$, $p > .7$).

Discussion

The results of Experiment 2 support the proposed process underlying the benefit accrued to a promotion by having an uncertain outcome. The uncertain incentive was as effective at driving purchase intent as the more costly alternative of providing the high value reward with certainty; however, this effect disappeared when participants receiving the uncertain incentive were asked to consider *their* probability of receiving the high value incentive prior to stating their intentions and judgments. In line with prior research demonstrating that outcome desirability may not always lead to a motivated effect on likelihood perceptions (Bar-Hillel and Budescu 1995; Krizan and Windschitl 2007; for an exception see Dai, Wertenbroch, & Brendl 2008), participants ratings of their probability of receiving the high value incentive did not increase when they were elicited after the measures of purchase intent. Demonstrating this asymmetry in the effect of probability elaboration is an important first step in understanding the process underlying the over-valuation of uncertain incentives: while ex-ante elaboration negated the reflexive positivity that benefited the uncertain incentive, ex-post elaboration yielded the same prediction, supporting the notion that the positive reaction to this uncertainty involves reflexive, low level processing as opposed to a bias in probability estimates. In other words, participants in the uncertain incentive condition do not naturally consider the probability that they would actually receive the high value incentive when indicating their level of interest. That the process of evaluating probability and the natural process of reacting to the uncertain incentive are fundamentally different is one key to understanding this effect.

But is there something special about estimating probability? Our proposed account makes a slightly stronger claim regarding the cause of the phenomenon. We claim that it is the naïve gut reaction that causes consumers to perceive the uncertain incentive with a rosy glow. If this is indeed the case, we should find that *any* form of elaboration negates this effect. We test

this stronger claim in Experiment 3, in which we simply compare reactions to an uncertain incentive with reactions to an uncertain incentive made after people have been asked to consider their answer carefully (Amir and Ariely 2007). We predict that while “gut reaction” responses will replicate our previous results, careful consideration will negate reflexive positivity and thus diminish the attractiveness of the uncertain incentive.

EXPERIMENT 3: ELABORATION VS. “GUT” REACTION

Method

One hundred and twenty three students at a southwestern university were asked to participate in an experiment on consumer behavior. For this experiment, participants were placed into one of four conditions at random, and were not compensated for their participation.

Design

This experiment had a between participants design with four conditions. The design was identical to the design used in our first preliminary experiment with the addition of a second uncertain incentive condition asking participants to “Please think carefully before you answer the following questions” prior to indicating their interest in the incentive. After reading the incentive description, all participants indicated how interesting they found the offer on a scale from 1 (not very interesting) to 7 (very interesting).

Results and Discussion

The results support our prediction that encouraging elaboration will decrease interest in uncertain incentives. We find that encouraging elaboration makes the uncertain incentive less appealing: Whereas the standard uncertain incentive condition was again more effective than the low value incentive (interest ratings: $M_{\text{uncertain}} = 4.4$; $M_{\text{low}} = 3.12$; $p = .01$) and indistinguishable

from the high value incentive ($M_{\text{high}} = 4.4$; $M_{\text{uncertain}} = 4.4$; $p > .9$), the elaboration manipulation yielded different results. When participants were given an uncertain incentive and asked to “think carefully” about their responses, the uncertain incentive was much less attractive than the standard uncertain incentive condition ($M_{\text{elaborate}} = 3.16$; $p < .05$). Moreover, participants encouraged to elaborate rated the uncertain incentive as being significantly less interesting than the high value incentive ($p < .05$), and no better than the low value incentive (p 's $> .9$). Thus we find that even simple elaboration negates the pattern of results observed in our previous experiments.

Experiments 2 and 3 thus demonstrate that when reflexive positivity is inhibited by encouraging participants to either predict the likelihood that they will receive the high value incentive or by asking them to think carefully about their responses before indicating their interest, the uncertain incentive becomes significantly less motivating. This suggests that the positive effects of uncertainty studied here are bounded to scenarios that do not encourage consumer elaboration, when consumers can intuitively respond.

As prior research has shown that positive affect and “good moods” are positively correlated with a more optimistic perspective, while negative affect can negate a rosy view of the world (Isen, Nygren, and Ashby 1988; Johnson and Tversky 1983; Marshall et al. 1992), a more direct way to test a reflexive positivity account for this effect is to manipulate mood. In Experiment 4 we manipulate mood and measure the subsequent effect on interest in uncertain incentives. If our proposed mechanism is indeed driving the over-valuation of the uncertain incentive, manipulating affect should moderate this effect: when reflexive positivity is dampened by negative affect, interest in uncertain incentives will wane; however, affect should have no influence on interest in certain incentives.

EXPERIMENT 4: AFFECT AND UNCERTAINTY

Method

Three hundred and six students from both a southwestern university and a northeastern university were asked to participate in a experiment on consumer behavior. For this experiment, participants were placed into one of four conditions at random. Participants were not compensated for their participation.

Design

This experiment had a 2 (positive affect vs. negative affect) by 2 (uncertain incentive vs. high value incentive) between participants design. The experiment was presented to participants as two separate and unrelated experiments. The first portion of the experiment was the affect manipulation. In both the positive and negative affect conditions, the formatting of the survey was identical. Participants randomly assigned to the positive affect conditions received a survey entitled “What has made you laugh lately?” They were then encouraged to spend a few moments considering something which they had recently experienced or viewed which struck them as “very funny and amusing.” To strengthen the effects of this manipulation, participants were asked to write about this event, listing both specific and general details. Participants randomly assigned to the negative affect conditions received a survey entitled “What has brought you down lately?” They were then asked to spend a few moments considering an event which they had recently experienced or viewed which struck them as “very unfortunate or negative.” These participants were then asked to write about this event, listing both specific and general details.

After completing the first portion of the experiment, participants then moved on to the second portion, which was presented as a separate experiment entitled “Consumer Behavior

Study.” They were then randomly given either the high value incentive condition or the uncertain incentive condition used in our first preliminary experiment.⁴

Results and Discussion

This experiment was designed to test for the effect of affect (positive vs. negative) on interest in incentives of varying certainty. In line with our predictions, negative affect reduced participants’ likelihood of purchase when in the incentive was uncertain ($M_{\text{uncertain-positive}} = 51.4\%$; $M_{\text{uncertain-negative}} = 39.9\%$; $p = .01$). As purchasing the focal product should not offer a means for mood repair, we did not predict that affect would have any effect on purchase likelihoods for participants receiving the certain high value incentive. Indeed, among participants receiving this incentive, the affect manipulation had no impact on purchase likelihood ($M_{\text{high value - positive}} = 47.6\%$; $M_{\text{high value - negative}} = 48.4\%$; $p > .8$). These results were replicated on the interest measure ($M_{\text{uncertain-positive}} = 4.5$; $M_{\text{uncertain-negative}} = 3.6$; $p = .001$; and $M_{\text{high value - positive}} = 4.2$; $M_{\text{high value - negative}} = 3.9$; $p > .4$). There was a marginally significant interaction between affect and uncertainty for both purchase likelihood and interest level respectively ($p = .076$ and $p = .091$). Neither the type of affect nor the type of incentive had a main effect on likelihood of purchase (p 's $> .12$). For interest level, the type of incentive did not have a main effect ($p > .9$); however, there was a significant main effect for affect, indicating that the positive affect manipulation generally raised interest in incentives ($p < .01$).

By manipulating affect, we were able to moderate the positive impact of uncertainty on participants’ reactions to a consumer promotion. These results show that when affect is positive an uncertain incentive may be over-valued, but when affect is negative this no longer holds. This

⁴ As across three studies we have demonstrated that both the uncertain incentive and high value incentive rate consistently higher in interest and motivation than the low value incentive, for simplicity we omitted the low value incentive condition in the current experiment.

result enhances our understanding of the process at work behind the positive effect of uncertainty because of the relationship between affect and positivity (Johnson and Tversky 1983; Marshall et al. 1992). However, one might wisely suggest that while negative affect can dampen positivity, it can also increase elaboration; thus the effects observed here might be analogous to the effects observed in Experiments 2 and 3. As such, to examine the role of reflexive positivity more directly, we turn to individual differences in optimism. If our account is correct, we should find that individuals pre-disposed towards optimism, who are more likely to demonstrate reflexive positivity, will be more likely to over-value the uncertain incentive. We tested this proposition in Experiment 5.

EXPERIMENT 5: OPTIMISM AS A MODERATOR

Method

Two hundred and eleven participants from an online participant pool participated in an experiment on consumer behavior. For this experiment, participants were placed into one of five conditions at random and were offered the chance to win a \$20 a gift certificate to Amazon.com.

Design

This experiment had a between participants design with five conditions: three conditions replicated Experiment 2a and for an added robustness check, two additional uncertain incentive conditions were included in which either the monetary value of the rewards (\$6 and \$1) was mentioned in the description (Reward + Price), or a monetary prize of either a \$6 coupon or a \$1 coupon was offered instead of the goods used in prior experiments (Coupons). After reviewing the available incentive, participants indicated how likely they would be to purchase the focal product (0-100 scale). On a final page, participants were asked to rate their own optimism

relative to their friends and peers on a 7-point scale anchored at 1 (not at all optimistic) and 7 (incredibly optimistic).

Results and Discussion

Robustness check. The design of this experiment allowed us to assess the effect of including monetary sums either in addition to the reward description or as standalone (equal value) substitutes for the high and low value incentives. Our results show that neither manipulation affected interest in the uncertain incentive, as compared to the standard uncertain incentive condition. In terms of purchase intent, the two modified uncertain incentive conditions (Reward + Price = 69.56%; Coupons = 81.95%) performed comparably or better to the standard uncertain condition (mean 62.67%, $t(81) = .84$, $p = .41$, and $t(81) = 2.83$, $p = .006$, respectively). Thus here adding prices did not seem to increase elaboration⁵.

The main results replicated our prior findings, but more importantly, we were able to assess the role of individual differences in optimism. To do so, participants were segregated into “optimists” and “non-optimists” using a median split on the self-reported optimism measure (median = 5). Within these groups, we then compared the impact of the uncertain incentive to those of the certain high and certain low value rewards (Figure 1). Our analysis revealed that only self-professed optimists over-valued the uncertain incentive: purchase likelihood was significantly greater in the uncertain incentive condition than in the certain low value condition ($t(77) = 8.06$, $p < .001$), on par with the certain high value condition ($F(1, 77) = 1.7$, $p = .19$). Conversely, non-optimists in the uncertain incentive condition were no more likely to purchase than in the certain low value condition ($t(38) = .32$, $p > .75$) and were significantly less likely to purchase than those in the certain high value condition ($F(1, 38) = 4.66$, $p = .037$). The

⁵ A very course measure, time spend on the task, confirms this: the time participants spent on the task in the Uncertain, Reward +Price and Coupon conditions did not significantly differ between conditions (78.09s, 43.58s, 28.71s, respectively, all p 's > .2).

interaction between self reported optimism and incentive was significant ($t(122) = 2.32, p = .022$).

--- Insert Figure 1 here ---

We thus find over-valuation of the uncertain incentive among self-reported optimists, and no such over-valuation among individuals who report being less optimistic. This individual difference result supports our proposed process: positivity is required for the intuitive over-valuation of the uncertain incentive. It is important to note that, on average, we find people to be reflexive positivists, and in the same way that elaboration negating this effect because judgments are no longer reflexive, natural pessimism might negate the effect of positivity. Both of these findings help better understand the process underlying the average over-valuation we observe.

However, one may question whether participants in Experiments 1 - 5 who are evaluating the uncertain incentive are actually engaging in reflexive positivity or are they simply focusing their attention on the more extreme of the two outcomes? Experiment 6 was designed to rule out this alternate account. Focus on extremes and reflexive positivity make convergent predictions in the domain of gains, but not in the domain of losses. When considering a lottery between two losses, a focus on the extreme would highlight the greater loss, whereas positivity would draw focus to the less negative option. We use this important point of divergence to tease these two potential explanations apart. While consumer promotions offer gains and benefits, there are other decisions that consumers may face where the decision to purchase is accompanied by a negative consequence, such as any potential side effects to an elective medical treatment. We use this example to test if consumers are using reflexive positivity or whether they are focusing on the most extreme outcome by assessing their interest in receiving a flu shot when the side effect is either negative (extreme option), moderately negative (preferred option), or a lottery between the

two. If consumers receiving the lottery are focusing on the more extreme of the two options then their interest in the flu shot should resemble the case where the side effect is the negative (extreme) option. However, if consumers are being reflexive positivists then those receiving the lottery will treat it as better than the expected value of the lottery.

EXPERIMENT 6: FOCUS ON EXTREME VS. REFLEXIVE POSITIVITY

Method

Ninety students were approached at a southwestern university and were asked to participate in an experiment on consumer behavior. For this experiment, participants were placed into one of three conditions at random, and were not compensated for their participation.

Design

This experiment had a between participants design with three conditions. Participants in all conditions read instructions that asked them to imagine that on a routine visit to their doctor, their doctor recommended that they receive a flu shot. The doctor then said that patients experienced one side effect as the result of the flu shot. Participants were told that the side effect would be either a moderately negative side effect (a headache), a negative side effect (severe fatigue), or one the two side effects (either a headache or severe fatigue, but never both). Participants then indicated their likelihood of getting this flu shot on a scale from 0 (not at all likely) to 100 (extremely likely) as well as how attractive the idea of the flu shot was to them (1 – not at all attractive, 7 – very attractive). They also reported their gender, age and any additional comments which they might have.

Results and Discussion

The results demonstrate that a focus on the extreme is not a plausible alternative account for our effect. Participants indicated they were significantly more likely to get the flu shot and found the idea of the flu shot more attractive when the side effect was the moderately negative (headache) rather than the more negative (severe fatigue) option (Likelihood of getting shot: $M_{\text{moderate}} = 62\%$, $M_{\text{negative}} = 38\%$; Attractiveness: $M_{\text{moderate}} = 4.7$, $M_{\text{negative}} = 2.9$, p 's $< .01$). More importantly, the uncertain side effect did not differ from the moderate side effect across all dependent measures (Likelihood of getting shot: $M_{\text{lottery}} = 56\%$; Attractiveness: $M_{\text{lottery}} = 4.4$, p 's $> .34$), and was significantly more motivating than the extreme side effect (p 's $< .01$).

In our previous experiments, the preferred option in the set (e.g., the package of Godiva truffles) was the more extreme of the two, thus our effect might have been driven by consumers' reflexive focus on the more extreme option within the choice set. This alternate account is far less likely in face of the results of Experiment 6 where the more extreme option and the more preferred option differed. By demonstrating that consumers' response to the lottery is still more positive than its expected value and significantly more positive than the extreme option, we find additional support for our theory that reflexive positivity engenders a "rosy glow" in response to uncertainty.

Thus far we have demonstrated that consumers can over-value uncertain incentives. Further we have shown that this effect cannot be explained by perceptual contrast (preliminary experiment) or a focus on the extreme option (Experiment 6). This effect is robust to a variety of subtle contextual manipulations and, in line with our theory, is pronounced among individuals in non-negative moods or who identify themselves as optimists. However, as Experiments 2 and 3 demonstrate that this effect is reflexive and fleeting. Thus it is important to determine whether

this effect is capable of influencing consequential behavior outside the lab involving actual purchases. Our field experiment tests this directly.

UNCERTAIN INCENTIVES: A FIELD EXPERIMENT

Having repeatedly demonstrated the effect of uncertainty on consumer interest in hypothetical scenarios, this field experiment was designed to extend these findings and test their ecological validity by assessing the relative effectiveness of uncertain incentives in an actual retail location where consumers were making real purchase decisions.

Method

Initial pre-testing was done to test how attractive consumers found a variety of possible incentives which could be offered as a gift with purchase at an on-campus snack shop. Based on the results of this initial pre-test, we identified a high value incentive (a can of soda of one's choice) and a comparatively low value incentive (a bag of microwavable popcorn, un-popped). Finally, a comparative pre-test was conducted where participants were asked to indicate which of these two incentives they would prefer to receive as a gift with purchase on a 1 to 9 Likert scale, with 1 corresponding to the bag of microwavable popcorn, 9 corresponding to the can of soda of one's choice, and 5 corresponding to indifference. Participants in this pre-test indicated that they would prefer to receive a can of soda of their choosing (Mean = 6.31; $p < .001$).

One hundred customers at an on-campus snack shop took part in this experiment. For this experiment, participants were placed into one of three conditions at random. We varied the promotion conditions across time within a day, and the order of promotion conditions between days. The experiment lasted 3 days. Participants who chose to purchase the promoted item (a candy bar) received the incentive which corresponded to their condition.

Design

This experiment had a between participants design with three conditions. Customers at an on-campus snack shop would approach the cashier with the item(s) that they had selected for purchase⁶. Prior to paying for the items that they selected, all customers were informed by the cashier that the store was currently running a promotion: All customers would receive a gift with purchase if they purchased a candy bar from a given set of candy bar options. Participants were then told that the gift with purchase was either a high value incentive (a can of soda of their choosing), a low value incentive (a bag of microwave popcorn, un-popped), or a lottery between the two rewards (uncertain incentive). Participants then verbally indicated whether or not they would like to buy a candy bar from the set of options. The cashier recorded all responses. Finally, participants paid for the items that they had chosen for purchase. Those who had chosen to additionally purchase a candy bar paid for the candy bar and were given the incentive corresponding to the condition to which they were assigned. For participants in the uncertain incentive condition, the cashier determined which incentive they would receive (the soda vs. the bag of microwavable popcorn) by flipping a coin under the service counter, where it could not be seen by the customer. This was done to keep the probability distribution confidential.

Results

The results replicated our previous findings. Consistent with the pre-test, our analysis revealed that participants were significantly more likely to purchase the candy bar when the incentive was of high value as opposed to low value (Purchase rates: High value: 38.7%, Low value: 13.4%, $\chi^2(1) = 5.71, p < .05$). More importantly, there was no significant difference between the purchase rates for the high value incentive and for the uncertain incentive (uncertain

⁶ Customers who approached the register already intending to purchase one of the candy bars which was on promotion or a can of soda were excluded from our sample (n = 2). No one approached intending to buy a bag of un-popped microwave popcorn.

incentive: 34.4%, $\chi^2(1) = .13, p > .7$). In line with our prediction, participants were significantly more likely to purchase the candy bar when the incentive was of uncertain value than of low value ($\chi^2(1) = 4.19, p < .05$).

Discussion

This field experiment demonstrates that uncertain incentives can promote actual purchase behavior beyond that implied by incentive's expected value⁷. Further, uncertain incentives can increase purchase rates significantly above a low value reward at certainty. Thus this experiment extends our previous findings by demonstrating this effect is ecologically valid and holds in a consumer context where participants are required to make actual purchases.

GENERAL DISCUSSION

How to attract consumers with incentives that are appealing yet are cost effective is a question that many marketers must face. The literature on common risk attitudes would predict that adding uncertainty to an incentive, e.g. offering a lottery between a high value and a low value incentive as opposed to a high value incentive with certainty, would decrease its effectiveness, parallel to the decrease in expected value. Further, previous research has shown that when in the domain of gains, consumers tend to be risk averse (Kahneman and Tversky 1979; Gneezy, List, and Wu 2006) and that generally, adding uncertainty to a benefit makes it comparatively less attractive (Kimball 1993). However, work on uncertainty demonstrates that it is possible for consumers to generate more optimistic value interpretations when benefits are uncertain (Hsee 1995). Our research helps bridge the gap between these seemingly disparate

⁷ Strictly speaking, in this experiment we do not know what the perceived expected value might have been. Nevertheless, the average probability implied from the purchase rates is on the order of 0.8 to win the free soda and 0.2 to win the popcorn. In all of our previous studies we never observed any perceived prior probability of receiving the high value incentive to approximate 0.8.

view points. We demonstrate across a series of experiments that when our own reflexive positivity operates uninhibited, the uncertain incentive can be more motivating and effective than its expected value. These findings offer compelling insights for marketers, as adding uncertainty to an incentive may be one way to reduce promotion costs while at the same time maintaining consumer interest.

The current set of experiments achieves several goals. Our studies demonstrate that an uncertain incentive may be more effective than its expected value (H1 – Exp. 1), and that this is not caused by perceptual contrast (preliminary experiment and Exp.5) or by focus on the extreme (Exp. 6). In support of our proposed mechanism (H2) we find that the over-valuation relative to an expected value is reflexive and may be negated by elaboration (Exp. 3) or by probability considerations (Exp. 2). When elaboration was encouraged, interest in the uncertain incentive dropped significantly and was on par with interest in the low value reward, as opposed to the high value reward. Importantly, in Experiment 2 ratings of one's likelihood of receiving the high value incentive made ex-post were statistically indistinguishable from those made ex-ante, supporting the claim that this effect is not driven by a biased understanding or application of base rates (see also Bar-Hillel and Budescu 1995; Krizan and Windschitl 2007). Further, self-serving optimism or a bias caused by desirability would predict that interest in the uncertain incentive would not be influenced by manipulating when the probability question was asked. Moreover, expressing a higher level of interest in the uncertain incentive did not influence the ex-ante likelihood estimation, suggesting that these are two separate processes. Consistent with this and further supporting our proposed process, we find that negative affect negates the over-valuation of the uncertain incentive (Exp. 4) but that general self-reported optimism moderates it (Exp. 5).

Finally the field experiment shows that this effect holds in an actual retail context involving real purchases.

There are potentially other effects that may be caused by uncertainty and could contribute to the effectiveness of these uncertain incentives. One candidate is increased excitement caused by the prospect of “winning”. For example, prior research has shown that under certain circumstances, consumers may prefer probabilistic discounts (e.g., 10% of getting your purchase for free) to fixed discounts (10% off of your purchase) (Mazar and Ariely 2007), or prefer a live TV broadcast to a recorded one (Vosgerau, Wertenbroch, and Carmon 2006). While this effect may explain some of the increase in motivation and interest observed throughout our experiments it cannot account for all of our results. In particular, the over-valuation of the uncertain incentive should be robust to manipulations such as the probability elicitation order (e.g., the prospect of winning should be at least as exciting after considering the probability), to an instruction to “think carefully before responding”, and it further cannot explain our findings in the domain of losses (Exp. 6).

The same set of experiments weakens a related story about valence priming that might provide an alternate explanation for our effect. As participants may view receiving the high value incentive as a positive outcome of purchasing a product, positively valenced associations with the product might form (in the high value and uncertain incentive conditions). These in turn might cause a non-conscious, motivated bias in their likelihood perceptions. However, such a bias should persist regardless of the probability elicitation order. Moreover, this account should lead to inflated valuation of the promotion, which we do not observe in Experiment 1. As such, much like a utility for gambling, valence priming may contribute to our effect but cannot explain our current set of results.

Robustness and Boundary Conditions

The experiments in the current article were designed to both test for our proposed effect and support the conceptual account with evidence for the process and boundary conditions. In each experiment, the ultimate dependent measure of interest was the magnitude of the over-valuation of the uncertain incentive. To gain perspective on these results across our experiments, we calculated the relative effectiveness of the uncertain incentive as its relative location between the certain low value incentive and certain high value incentive. Thus if the uncertain incentive performed identically to the low value incentive it would receive 0%; if it performed identically to the high incentive it would receive 100% (similarly, if it were less effective than the low value incentive it would be negative and if it were more effective than the high value incentive it would be greater than 100%). For this analysis, we averaged across dependent measures (purchase likelihood and promotion attractiveness) where appropriate and excluded Experiment 5 as it did not include the certain low value incentive condition. Overall, in 11 experiments with over 1,700 participants we find consistent over-valuation of the uncertain incentive (Figure 2). This effect was found to be robust to perceptual contrast, inclusion of the relevant probabilities (either in a range or fixed value), inclusion of the monetary values of the rewards, and could not be explained by selective attention or a focus on the extreme (Figure 2).

--- Insert Figure 2 here ---

One important boundary condition we have not yet investigated is the extent to which, in certain contexts, the nature of the incentive itself might increase elaboration and thus inhibit over-valuation. One might argue that when one of the options in the uncertain incentive was far better than the other (i.e., the variance between the two options was large) elaboration might

naturally increase as consumers could be prompted to carefully consider their odds of receiving the far better incentive. To test for this important distinction, we ran an additional experiment with the three conditions common to the experiments run previously (certain high value, certain low value, uncertain incentive) with one important difference: we increased the difference in value between the high and low value incentives (high value incentive = 100 free iTunes downloads; low value incentive = 1 free iTunes download). Seventy six participants from an online pool were randomly assigned to one of the three incentive conditions and asked to report how likely they would be to purchase the focal product. Our results suggest that when there is a large disparity between the high and low value incentives, the uncertain incentive is no longer over-valued (Figure 3). Reactions to the uncertain incentive were on par with low value incentive and significantly less favorable than the high value incentive. We add this finding as another important boundary condition: elaboration, negative affect, self-reported optimism and the magnitude or variance of the incentives moderates the over-valuation of uncertain incentives (Figure 3).

--- Insert Figure 3 here ---

Our results contribute to a growing body of literature on how and when uncertainty can be motivating. Demonstrating such instances enriches our understanding of how consumers react to retailer promotions and has clear practical implications for marketers. On a theoretical level, our results might be taken as an initial step in understanding the psychology behind general risk aversion: construed differently, our findings might imply that risk aversion is the result of deliberative non-reflexive processes. We hope this paper encourages further research in this line.

PRACTICAL IMPLICATIONS

Our research implies that marketers looking to employ cost effective promotions should consider adding uncertainty to their incentives. Understanding the underlying drivers of this phenomenon is crucial however, as our studies outline important boundary conditions. The reflexive positivity we find is reflexive and can be mitigated by elaboration. This fact suggests that promotions with uncertain components may be most effective for impulse purchase products or low involvement purchases. Purchases that involve extensive elaboration may not be suitable for the types of promotions studied here. We also suspect that factors that inhibit positivity, such as skepticism or negative affect set important boundary conditions for this effect. Importantly, though our participants did not predict any negative effects of receiving the lower value incentive in the uncertain incentive condition, in reality this may be a function of what that outcome is.

Finally, it is worth mentioning that there are other types of retailer promotions that have uncertain components to them. Prior research on promotions and pricing has investigated the effects of specific types of promotions which vary in their certainty (e.g., “Save up to X%” vs. “Save X%”) (Mobley, Bearden and Teel 1998; Tan and Hwang Chua 2004). These researchers have found that under certain conditions ambiguity about discount size may not generate negative effects. For example, promoting “Save up to X%” vs. “Save X%” has little effect on the perceived value of the discount when the percentage discount is low (e.g., 25%) (Mobley, Bearden, and Teel 1998). Further research demonstrates that effects of vague price discounts are sensitive to the sizes of the discounts and rewards: for example, consumers over-value large rewards when told the probability of receiving the reward was low (Dhar, Gonzalez-Vallejo and Soman 1995). Our current work extends this body of knowledge and identifies reflexive positivity as one potential mechanism that may help explain these effects.

Lastly, vague promotions (e.g., “an amazing gift bag”) as opposed to specific promotions (e.g., “a gift bag containing products X, Y, and Z”) may generate similar levels of reflexive positivity. We tested this final notion in the context of an organic grocery store offering a gift bag to those who visit. We found that when offered a vague promotion, reported likelihood of visiting the store was significantly higher than when a more specific incentive was offered ($M_{\text{uncertain}} = 75\%$; $M_{\text{specific}} = 64\%$; $p < .05$), even though subsequent measures indicated that the participants receiving the vague promotion did not believe their gift bag would contain more items or that the items would be of higher value. More research is needed to investigate the similarities and differences between lack of information about the content of rewards and the uncertainty of receiving them.

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TABLE 1

Preliminary Experiments:
 Results of two preliminary experiments demonstrate that an
 incentive with an uncertain outcome can be over-valued

| | Under the cap (purchase likelihood) | Under the cap without perceptual contrast (promotion attractiveness) |
|----------------------|--|---|
| High value incentive | 56.5%, | 4.0 |
| Low value incentive | 36.0%;* | 2.88* |
| Uncertain incentive | 53.8%; | 3.99 |

* Differences between the low value incentive and both the high value and uncertain incentive conditions significant at $p < .01$; no reliable differences between the high value incentive and the uncertain incentive.

Table 2

Results of Experiment 1b demonstrate robust over-valuation of the promotion with an uncertain outcome relative to its expected value

| | Certain reward | | Uncertain reward | | | | |
|-------------------------|---------------------------------------|--|--------------------------------|-----------------------------------|---|---|--|
| | High Value (Godiva Truffle) | Low Value (Hershey's Kisses) | Standard (either/or) | 50% (known probability) | 40-60% (known probability, range) | High emphasized (either Godiva or Hershey's Kisses) | Low emphasized (either Godiva or Hershey's Kisses) |
| Purchase likelihood (%) | 74.8 | 39.8* | 64.9 | 59 | 66.2 | 68 | 56 |
| Attractiveness | 5.3 | 2.3* | 4.4 | 4.3 | 4 | 4.5 | 3.9 |
| Future impact | 5.3 | 3.8 | 3.9 | 4.1 | 4 | 3.7 | 3.8 |
| Promotion valuation | 6.3* | 1.2 | 1.9 | 2 | 2.1 | 1.5 | 1.7 |
| Imputed promotion value | NA | NA | 5.5 | 5 | 5.6 | 5.7 | 4.7 |

* Significantly different from everything else in the same row at $p < .001$

TABLE 3

Results of Experiment 2 demonstrate that considering probabilities negates the over-valuation of the incentive with an uncertain outcome.

| | Certain | | Uncertain | |
|---------------------------|-----------|------------|----------------------------------|--------|
| | Low Value | High value | Probability elicitation After | Before |
| Likelihood of Purchase | 33.9% | 56.0% | 53.0% | 33.8% |
| Interest Level | 3.3 | 4.2 | 4.1 | 3.1 |

Figure 1

Results of Experiment 5 demonstrate the moderating role of optimism in the over-valuation of the incentive with an uncertain outcome.

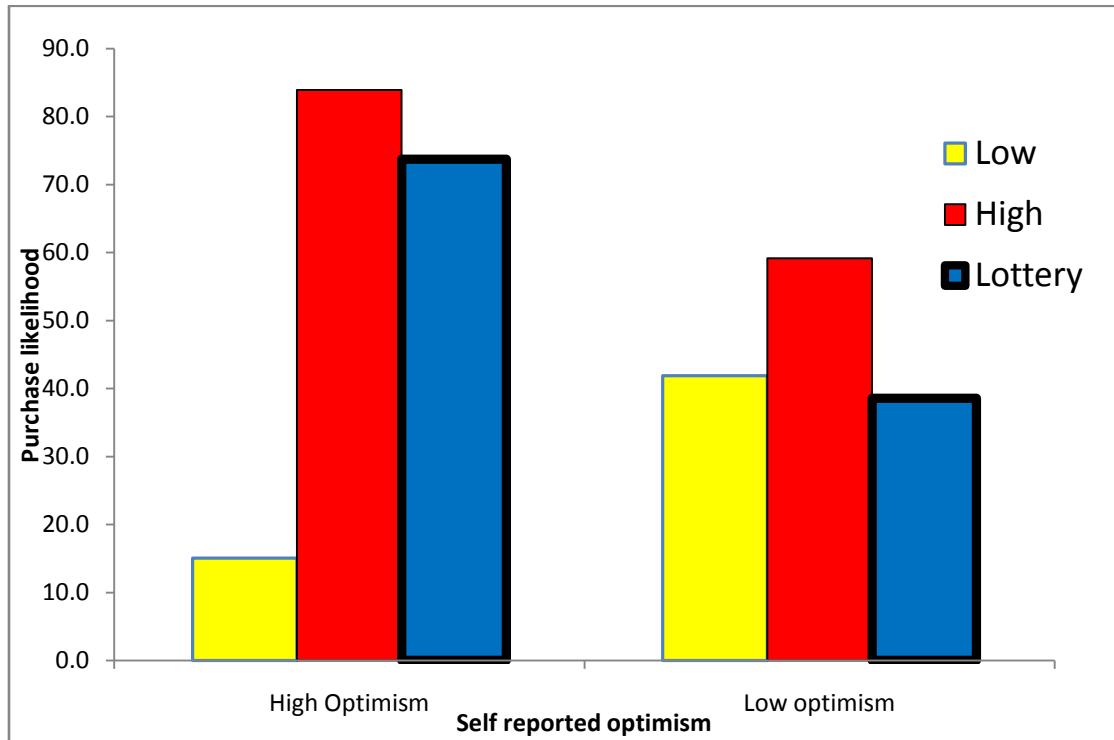


Figure 2

Robustness of the over-valuation findings, standardized across experiments.

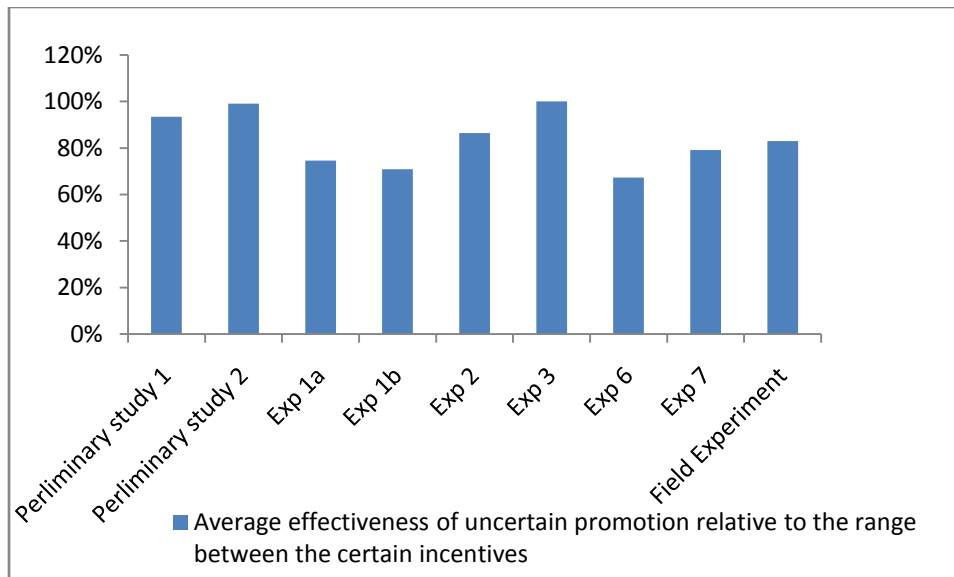


Figure 3

Boundary conditions for the over-valuation of the incentive with an uncertain outcome, standardized across experiments.

