When Uncertainty Brings Pleasure: The Role of Prospect Imageability and Mental Imagery

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Consumers generally prefer certainty to uncertainty, which leads them to shun uncertain situations. This research demonstrates, however, that consumers facing uncertainty (rather than certainty) associated with a positive event (e.g., winning a lucky draw but not knowing the exact prize won) can experience greater, longer-lasting positive feelings. The sustainability of this pleasurable uncertainty effect hinges on the (right) level of imagery elaboration that consumers generate about the various possible favorable prospects of the event (e.g., imagining the possible prizes from winning a lucky draw). Findings from two experiments support the proposed imageability-based framework.

As the proverb "curiosity killed the cat" suggests, finding out about and resolving an uncertain issue may not always be in one's best interest. In a similar spirit, this research examines uncertainty from events with positive future prospects (i.e., individuals know that the prospects of the events are of a certain positive nature, yet they do not know which particular prospect will come true) and suggests that people may gain more pleasure from such uncertain situations rather than certain ones.

Consider an example of a "sure-win" lucky draw, in which the consumers are assured of winning a prize from a pool of potential prizes that are equally attractive. Upon drawing a prize, the marketer may immediately tell the consumers what the prize is, or alternatively, reveal the exact prize at a later time so that the consumers are uncertain about the prize for some period of time. Comparing these two approaches, which would bring more pleasure to consumers? Previous research in different areas seems to bear different implications to this research question.

First, given the typical negative affective consequences of uncertainty (e.g., Calvo and Castillo 2001; Loewenstein 1994), would the state of being uncertain, regardless of whether the prospects involve gain or loss, always evoke negative feelings? Alternatively, from the perspective of expected utility framework, since the different prospects of the events are equally favorable regardless of the degree of uncertainty (i.e., equal expected utility), would we observe little difference in consumer feelings between the uncertain and certain situations? A third possibility is suggested by recent research on events with positive uncertain prospects, which demonstrates the positive affective consequence of such uncertainty (Wilson et al. 2005). Our research is more in line with this last perspective than with the previous two. However, unlike Wilson and colleagues' (2005) examination of positive uncertainty where resolution is not expected (e.g., receiving a gift from an anonymous entity; in their study 1a), we focus on positive uncertainty with an anticipated resolution in a relatively short time—a characteristic that is highly applicable to the marketplace. In doing so, we uncover the process underlying the pleasurable uncertainty effect and specify the circumstances under which this effect may emerge.

We compare uncertainty (e.g., winning a lucky draw without knowing immediately what the exact prize is) and certainty (e.g., winning a lucky draw and knowing immediately what the exact prize is) from positive marketing-related events, and we suggest that, when their respective future prospects are equally attractive, uncertainty would not only elicit greater immediate positive feelings but also be more likely to increase the duration of positive feelings beyond a mere pleasant surprise. Moreover, the durability of positive feelings hinges on the *imageability* of the uncertain prospects. Specifically, the duration of positive feelings is likely to increase as the level of imagery processing toward the various possible prospects of the event (e.g., prize possi-

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bilities from a lucky draw) increases. Furthermore, such imagery processing (e.g., visualizing the possible prizes and the situations of using these prizes) would be favorably enhanced when the uncertain prospects are high in imageability in terms of both amount and specificity of mental imagery. When this happens, the imagery elaboration would help sustain the positive feelings over time. In other words, uncertainty prolongs pleasure via imagery elaboration of the possible positive prospects. In contrast, consumers facing a certain positive prospect (vs. uncertainty) are likely to imagine less about the prospect and to experience more transient positive feelings.

In the following sections, we first review relevant previous research to construct our theoretical framework. We then report results from two experiments that lend support to our hypotheses. Finally, we summarize the implications of the present research, present a follow-up study exploring consumer intuition about the pleasurable uncertainty effect, and discuss potential avenues for future research.

THEORETICAL FRAMEWORK

The need to transform uncertainty into certainty and to reduce the associated anxious feelings seems to be integral in many aspects of human behavior (Calvo and Castillo 2001; Loewenstein 1994). Individuals may attempt to do this by collecting information, making inferences, and generating theories (Kahneman, Slovic, and Tversky 1982; Ofir and Lynch 1984; Urbany, Dickson, and Wilkie 1989) to resolve the uncertainty. However, not all forms of uncertainty are necessarily aversive. In particular, uncertainty from events with positive prospects can result in positive feelings (Wilson et al. 2005). This form of uncertainty may manifest in the consumer domain in a variety of ways, such as the possible prizes from a lucky draw, the possible gifts from a friend, or the possible annual rewards provided by a brand club.

Research shows that emotion-eliciting events vary in the degree of pleasure and activation that they produce (Russell and Barrett 1999). In our context, when faced with an event entailing positive prospects (e.g., winning a lucky draw), be it certain (e.g., with a known prize) or uncertain (e.g., with several potential prizes), people may experience positive feelings due to the favorable nature of the impending prospect. However, the activation level may differ because uncertainty would evoke greater physiological arousal than certainty would (Berns et al. 2001; Schultz, Dayan, and Montague 1997), which then intensifies the emotional reactions toward the positive event. This link between arousal and felt emotion has been suggested particularly in the theory of transferred excitation (see Zillmann [1983] for a review) and demonstrated under different domains. For instance, Gorn, Pham, and Sin (2001) found that consumers under higher arousal states would appraise an advertisement more favorably if the tone of the ad was pleasant, and Dibben (2004) showed that arousal increases the intensity level of felt emotions from listening to music. Therefore, consumers may experience greater, immediate positive feelings when they encounter positive events with uncertain prospects (e.g., not knowing the exact lucky draw prize for a period of time) than with certain ones (e.g., knowing the exact prize immediately). Note that, for this pleasurable uncertainty effect to take place, the certain and uncertain prospects (e.g., the prize possibilities) should be equally attractive. Otherwise, the difference in prospect attractiveness may create extraneous feelings to entangle with those from the uncertainty effect we examine. Therefore, we predict:

H1: Given equally attractive prospects (e.g., equally attractive prize possibilities from a lucky draw), uncertainty in positive events (e.g., winning a lucky draw without knowing the exact prize immediately) would elicit greater, immediate positive feelings than certainty in positive events would (e.g., winning a lucky draw and knowing the exact prize immediately).

Aside from examining the immediate effect of positive uncertainty, we further investigate how such uncertainty affects feelings over time. The prolonged effect of positive uncertainty was demonstrated by Wilson and colleagues (2005) in a movie plot context. Their participants were shown a movie clip based on a real person's life story. Thereafter, participants assigned to the certain condition read two paragraphs, each describing a possible happy ending of the main character that was beyond the conclusion from the movie clip, and they were then told which version was true. Participants assigned to the uncertain condition read the same two paragraphs without knowing which of the two was true. Results showed that the latter group remained happy for a longer period of time than the former group. This finding can be explained by the emotion adaptation model (Wilson, Gilbert, and Centerbar 2003), which suggests that an uncertain, relevant event is likely to command attention and elicit affective reactions until the uncertainty is resolved via sense-making. The sense-making process involves an attempt to arrive at a subjective resolution of the uncertainty through, for instance, casual attribution, knowledge assimilation, or knowledge accommodation. For the movie plot example cited earlier, a sense-making process may center on the participant rationalizing toward a specific (or most likely) happy ending by piecing up the plot development. Subsequently, participants experienced a reduction of uncertainty, got adapted to the event emotionally, and switched their attention away from the event. Thus, the further the sense-making process is delayed, the later emotion adaptation would occur, and hence the longer the positive feelings triggered by uncertainty would last. While this account helps explain when positive feelings would dissipate, the precise mechanism as to why positive feelings may be sustained before sense-making is not as well understood.

We propose that consumers experiencing uncertainty in a positive event may mentally simulate their consumption of the possible favorable prospects, a process which is akin to prefactual thinking (Sanna 1996; Taylor and Schneider 1989). The inducement of scenario constructions from impending

future events is not new and has been proposed in research domains such as decision making (Levi and Pryor 1987) and emotions (Holmes and Mathews 2005). Furthermore, these areas have commonly suggested that such hypothetical thoughts may potentially generate mental imagery, that is, the concrete sensory or perceptual representations of objects and ideas in working memory (MacInnis and Price 1987). Such mental imagery may take place even in the absence of the real object that produces the genuine sensory or perceptual experiences, and it is capable of eliciting affective reactions. For example, mental imagery constructed during window shopping (a vicarious consumption) has been shown to elicit positive feelings among consumers (Holbrook and Hirschman 1982; MacInnis and Price 1987). Along a similar line, we propose that generating mental imagery about marketing events with positive prospects (e.g., a lucky draw with various possible prizes) may bring about virtual consumption experience that offers a sensory substitute to actual consumption and in turn produces positive feelings. As such, the uncertainty associated with the events should be able to sustain the positive feelings elicited as long as it triggers mental imagery sufficiently. By contrast, inadequate imagery elaboration can potentially impede the generation of affective reactions. Along this vein, we propose that not all events with positive uncertain prospects are able to sustain the immediate positive affective responses they create. In particular, the imageability of the possible prospects of the event would affect the durability of the affective reactions. Imageability refers to the ability of a stimulus to evoke mental imagery, and a higher level of imageability tends to generate more sensory images and greater imagery elaboration (Paivio, Yuille, and Madigan 1968). Thus, to the extent that the sustained pleasurable uncertainty effect is due to the generation of mental imagery, we posit as follows:

H2: Events with positive uncertain prospects (e.g., winning a lucky draw without knowing the exact prize immediately) are more likely to sustain the positive feelings individuals experience when the prospects of the events (the prize possibilities) are of higher imageability than when they are of lower imageability.

As the prospect imageability of the events increases, it should trigger a higher level of imagery elaboration, which then contributes to sustaining the positive feelings experienced during the events. This underlying mechanism would therefore imply the following:

H3: The level of imagery elaboration mediates the effect of positive uncertainty on the durability of the experienced positive feelings.

In the following sections, we report how we tested our framework across two experiments, each with a different operationalization of prospect imageability. In experiment 1, we examined imageability based on the number of potential positive prospects of an event (i.e., the prize possibilities of a lucky draw). In experiment 2, we operationalized imageability by manipulating the imagery-evoking nature of the possible prospects and also collected process measures to further validate our predictions.

EXPERIMENT 1

In experiment 1, we varied the number of possible prospects of a positive event to manipulate prospect imageability. This allows us not only to test hypotheses 1 and 2 but also to examine a curiosity-based alternative explanation for hypothesis 2. In particular, as the state of being curious is closely associated with uncertainty (see Loewenstein [1994] for a review), concerns may arise with regard to whether curiosity, rather than imagery processing, contributes to sustaining positive feelings following uncertainty. We therefore designed this experiment to test the alternative explanation against our mental imagery framework.

The Number of Possible Prospects, Prospect Imageability, and Curiosity

Prospect Imageability and the Number of Possible Prospects. Bone and Ellen (1992) proposed that the extent and the content of elaboration are two broad dimensions of imagery elaboration. From this perspective, we suggest that the extent and content of elaboration may be positively associated with the number of possible prospects in an event. However, this association may be bounded because, when it comes to future prospects, people tend to keep in mind only a few possibilities due to the limit of working memory (Johnson-Laird and Byrne 1991). Hence, having a large number of alternative prospects is unlikely to aid imageability because of the lack of a specified set of identifiable alternatives from which mental imagery can be concretely generated. This, in turn, compromises the potential affective experience from imagery (Frijda 1988) and impedes the virtual consumption process highlighted earlier. Thus, higher prospect imageability of an event should not be simply equated with a larger number of possible prospects. Instead, imageability should be higher when the number of possible prospects is moderate (a condition where positive feelings are more likely to be sustained if our prediction based on mental imagery holds) rather than small or large.

Curiosity and the Number of Possible Prospects. Loewenstein (1994) presented a comprehensive review of curiosity research and essentially theorized curiosity as an undesirable state of being "uncertain" that enhances the desire to know. From this perspective, it is conceivable that curiosity level may vary depending on the number of possible prospects in an event, especially when uncertainty resolution is anticipated (Loewenstein 1994). An ensuing question is whether the curiosity effect can account for the sustainability of feelings under positive uncertainty. If it does, we would expect positive feelings to be better sustained when the event with uncertain prospects triggers a higher rather than a lower curiosity level.

Drive theory (e.g., Berlyne 1954) generally predicts that

curiosity level is heightened when uncertainty level increases. From this perspective, curiosity level would be positively related to the number of possible prospects, and hence positive feelings would be more sustainable as the number of possible prospects increases. However, Loewenstein (1994) proposed the concept of the knowledge gap (i.e., discrepancy between what one knows and what one wants to know) and argued that curiosity may increase as the knowledge gap shrinks. This is based on the argument that people are more motivated to close the knowledge gap as they get closer to their goal of resolving uncertainty. From this perspective, it seems conceivable that, when the number of possible prospects is smaller, the perceived knowledge gap to certainty is also smaller and hence curiosity level is higher. However, implied in the knowledge gap theory is a progressive process toward resolving uncertainty, where the number of possible prospects is reduced until final resolution (much like in a game of Cluedo™). This iterative process of elimination is not present in our research, and hence the applicability of the knowledge gap theory for our predictions is somewhat tentative. Nevertheless, the inverse relationship between curiosity and the number of possible prospects as suggested by the knowledge gap theory is different from the relationship between imageability and the number of possible prospects, which allows us to test a curiosity-based explanation against an imageability-based one.

Method

This experiment had a 4 (number of possible prospects: one certain prospect vs. limited possible prospects vs. moderate possible prospects vs. infinite possible prospects) × 3 (feeling responses were collected three times across different stages of the experiment) mixed-factorial design. We used winning a lucky draw game to represent an event with positive prospects. Uncertainty and prospect imageability were manipulated via the number of possible prospects of the event, that is, the lucky draw prize possibilities. One hundred and twenty-one undergraduate students at the National University of Singapore participated in the experiment in exchange for course credit and were randomly assigned to one of the four prospect conditions.

In the certain prospect condition, participants saw the description of the prize they would receive immediately after winning the lucky draw game. In the limited possible prospects condition, participants saw descriptions of two prize options—a set of stereo speakers or a radio set (each worth $30)—and were informed that they would receive one of them. The two prizes were pretested with 40 participants and found to be of similar perceived value on a 5-point scale anchored from "not a good value" to "an extremely good value" ($M_{\text{speakers}} = 3.6$, $M_{\text{radio}} = 3.45$; NS).

In the moderate possible prospects condition, participants were informed that they would receive a consumer electronics product worth $30 as their prize. The categorical phrase *consumer electronics product* was pretested to elicit relatively high levels of imagery processing. As the number of possible prospects increases (e.g., as the product category becomes broader), there may be more room for consumers to engage in imagery processing but up to a point where the number of possible prospects exceeds the limit of working memory, which eventually impedes the generation of concrete mental imagery. To calibrate an appropriately high imageability level for prospects in the event, we asked 20 undergraduate students to write down the thoughts they can infer from a relatively broad categorical phrase *consumer electronics product* and another 20 students to pen down their thoughts on a relatively narrow categorical phrase *music player*. Our purpose was to choose the descriptor that can elicit higher imagery processing. The results showed that *consumer electronics product* evoked a greater number of imagery thoughts (which took participants about 5 minutes to write down) than *music player* did ($M_{\text{cep}} = 4.80$ vs. $M_{\text{mp}} = 2.35$; $F(1, 38) = 22.87$, $p < .05$). Therefore, we adopted *consumer electronics product* as a cue to the content of the prize, which should stimulate relatively high levels of imagery elaboration about the various possibilities involved.

The fourth treatment was the infinite possible prospects condition. Here participants were simply told that they would receive a prize worth $30, and no further details given.

Procedure

Participants were told that the aim of the experiment was to understand consumer responses in lucky draws. They played a computer-simulated lucky draw game called "spin the wheel." All participants were predetermined to win (but they were not aware of this) so that they would experience positive feelings. Participants then received relevant information on the prize (certain condition) or the possible prizes (uncertain conditions) and were requested to indicate their feelings immediately thereafter (T1). The positive feeling scales were adapted from Edell and Burke (1987) with five items—cheerful, delighted, happy, interested, and good (1 = not at all to 5 = very much). We also checked for negative feelings, in which participants further rated the extent to which they felt anxious, nervous, restless, bored, irritated, and sad (Edell and Burke 1987). Participants in the three uncertain conditions also indicated how curious and uncertain they were about the prizes (1 = not at all to 5 = very much). Next, participants were told that they would have a short break while waiting for the prizes to be brought to the lab. After 10 minutes, participants rated their feelings again (T2). Participants in the three uncertain conditions also rated their curiosity and perceived uncertainty, and they were then informed verbally what exact prize they would receive. Thereafter, all participants' feelings were measured for the third time (T3). Finally, to check for the preference similarity between the two possible prizes (speakers and radio set), participants in the limited possible prospects condition were asked additional questions concerning their evaluations of the two prizes using three 5-point scales (1 = not at all appealing/desirable/of good value to 5 = very appealing/desirable/of good value). Thereafter, all participants were debriefed and given $30 instead of the real prize.

Results

Confound Checks. The three items measuring prize evaluations in the limited possible prospects condition (the only uncertain condition where participants were given information about the two prizes) were averaged to form evaluation indices (Cronbach's $\alpha = .83$ and .92 for the speakers and the radio set, respectively). An ANOVA with the two indices as repeated measures confirmed equal attractiveness of the two possible prizes ($M = 3.39$ and $M = 3.17$; $F < 1$).

Feelings. Factor analysis of the feeling measures indicated the five positive feelings items loaded on the same factor (with 75%, 60%, and 60% average variance extracted at T1, T2, and T3, respectively), and they were averaged to form positive feelings indices (Cronbach's $\alpha = .92$, .81, and .83 for T1, T2, and T3, respectively). An ANOVA involving number of possible prospects as a between-subjects factor and the three positive feeling indices as within-subjects measures revealed a significant interaction effect ($F(6, 234) = 3.59$, $p < .05$). Table 1 presents the descriptive statistics. A similar analysis conducted on negative feelings reveals no significant effects and will not be discussed further.

To test hypothesis 1, we focused on positive feelings at T1 (i.e., immediately after participants won the lucky draw and received information on the possible prize) and conducted planned comparisons between the certain and the uncertain conditions. As predicted, participants in the uncertain conditions experienced greater positive feelings than those in the certain condition ($M_{\text{limited}} = 3.51$ vs. $M_{\text{certain}} = 3.17$; $F(1, 117) = 5.77$, $p < .05$; $M_{\text{moderate}} = 3.55$ vs. $M_{\text{certain}} = 3.17$; $F(1, 117) = 7.24$, $p < .05$; $M_{\text{infinite}} = 3.59$ vs. $M_{\text{certain}} = 3.17$; $F(1, 117) = 8.57$, $p < .05$; the three uncertain conditions did not differ from one another, $F < 1$).

Next, to test hypothesis 2, we compared the positive feelings at T1 and T2. As predicted, participants in the moderate possible prospects (i.e., high prospect imageability) condition experienced sustained positive feelings from T1 to T2 ($M_{\text{T1}} = 3.55$, $M_{\text{T2}} = 3.57$; $F < 1$). In contrast, when prospect imageability was low, participants' positive feelings dissipated significantly from T1 to T2 (limited possible prospects condition: $M_{\text{T1}} = 3.51$, $M_{\text{T2}} = 3.15$; $F(1, 117) = 10.45$, $p < .05$; infinite possible prospects condition: $M_{\text{T1}} = 3.59$, $M_{\text{T2}} = 3.20$; $F(1, 117) = 12.01$, $p < .05$). For the certain condition, participants experienced similar, relatively low levels of positive feelings at T1 and T2 ($M_{\text{T1}} = 3.17$, $M_{\text{T2}} = 3.03$; $F(1, 117) = 1.57$, NS). Moreover, comparing positive feelings at T2 across the four prospect conditions, we found participants in the moderate possible prospects condition experienced greater positive feelings ($M_{\text{moderate}} = 3.57$) than those in the certain ($M_{\text{certain}} = 3.03$; $F(1, 117) = 37.5$, $p < .05$), limited possible prospects (vs. $M_{\text{limited}} = 3.15$; $F(1, 117) = 22.9$, $p < .05$), and infinite possible prospects conditions ($M_{\text{infinite}} = 3.20$; $F(1, 117) = 17.93$, $p < .05$). Finally, the levels of positive feelings at T3 were similar across the four prospect conditions ($M_{\text{certain}} = 2.63$, $M_{\text{limited}} = 2.57$, $M_{\text{moderate}} = 2.69$, $M_{\text{infinite}} = 2.70$; $F(3, 117) < 1$).

TABLE 1

RESULTS OF EXPERIMENT 1

	T1	T2	T3
Positive feelings:			
Certain (one certain prospect)	3.17	3.03	2.63
Uncertain:			
Limited possible prospects	3.51	3.15	2.57
Moderate possible prospects	3.55	3.57	2.69
Infinite possible prospects	3.59	3.20	2.70
Curiosity:			
Uncertain:			
Limited possible prospects	1.84	2.13	
Moderate possible prospects	2.10	2.67	
Infinite possible prospects	2.47	2.90	

Curiosity and Perceived Uncertainty. As expected, the impact of the number of possible prospects manipulation on curiosity and perceived uncertainty (measured in the uncertain conditions only) was different from those on the feeling responses. An ANOVA involving number of possible prospects as a between-subjects factor and curiosity responses at T1 and T2 as repeated measures yielded a main effect of number of possible prospects ($F(2, 88) = 15.16$, $p < .05$) and a main effect of time ($F(1, 88) = 31.43$, $p < .05$). At T1, curiosity increased as the number of possible prospects increased ($M_{\text{limited}} = 1.84$ vs. $M_{\text{moderate}} = 2.10$ vs. $M_{\text{infinite}} = 2.47$; $F(2, 88) = 7.33$, $p < .05$). A similar pattern was found at T2 as well ($M_{\text{limited}} = 2.13$ vs. $M_{\text{moderate}} = 2.67$ vs. $M_{\text{infinite}} = 2.90$; $F(2, 88) = 13.65$, $p < .05$). Comparing T1 and T2 responses, curiosity increased over time in all three uncertain conditions (limited possible prospects condition: $M_{\text{T1}} = 1.84$ vs. $M_{\text{T2}} = 2.13$; $F(1, 88) = 4.88$, $p < .05$; moderate possible prospects condition: $M_{\text{T1}} = 2.10$ vs. $M_{\text{T2}} = 2.67$; $F(1, 88) = 17.99$, $p < .05$; infinite possible prospects condition: $M_{\text{T1}} = 2.47$ vs. $M_{\text{T2}} = 2.90$; $F(1, 88) = 10.52$, $p < .05$). An ANOVA conducted on perceived uncertainty revealed a similar pattern.

Discussion

Consistent with hypothesis 1, participants experienced greater immediate positive feelings if they were uncertain about what exact prize they would receive. Consistent with hypothesis 2, when our participants were presented with only two possible prizes or no clue to the possible prizes (i.e., low prospect imageability), they experienced more fleeting positive feelings than those in the moderate possible prospects condition (i.e., high prospect imageability). Together, these results suggest that consumer pleasure derived from positive uncertainty is better sustained when the prospect imageability of the event is higher. Furthermore, the similar levels of feelings reported at T3 across the number of possible prospects conditions suggest that consumers adapted emotionally after uncertainty resolution.

Note that to examine the hypothesized pleasurable uncertainly effect, equal prospect attractiveness between the certain and uncertain conditions needed to be ensured. Thus, we specified the price of the prizes to be the same across all number of possible prospects conditions. Moreover, the pretest and confound check for prize likeability confirmed the equal attractiveness of the two prizes adopted in the certain prospect and limited possible prospects conditions.

Findings on curiosity and perceived uncertainty suggest that curiosity is unlikely to be the mechanism underlying the pleasurable uncertainty effect. In line with the drive theory, curiosity tends to increase with the level of uncertainty (as represented by the number of possible prospects and confirmed by the perceived uncertainty measure). If curiosity is the critical mechanism underlying the pleasurable uncertainty effect, we would expect positive feelings to be most well sustained when curiosity level is at its highest (i.e., in the infinite possible prospects condition). However, we found positive feelings to be best maintained when curiosity level is only moderate but prospect imageability is at its highest (i.e., in the moderate possible prospects condition). These findings support our conceptualization of the pleasurable uncertainty effect based on imageability and mental imagery.

Another competing account may be suggested, in which participants in the uncertain conditions (vs. certain condition) were happier (H1) and maintained the happiness longer (H2) because they may have anticipated receiving a prize they preferred. Such "optimistic" anticipatory effect may then drive the differences observed between the uncertain and certain conditions. From this perspective, the chance of getting a preferred prize may be a positive function of the number of possible prospects (or the level of uncertainty) because a larger number of possible prospects would allow more room for participants to imagine the most preferred prize than would a smaller number of possible prospects. If so, the intensity and durability of positive feelings generated in the three uncertain conditions should follow a similar upward pattern. However, our findings exhibit a different pattern. We found no difference in immediate positive feelings (at T1) among the three uncertain conditions, and positive feelings were best sustained (from T1 to T2) in the moderate possible prospects condition.

Note that we could not confidently ascertain a priori whether the category cue chosen for the moderate possible prospects condition had sufficient imageability, and we are basing the success of the calibration from the findings. Likewise, although the two possible electronics product prizes in the limited possible prospects condition (stereo speakers and radio set) were found to be low in imageability, this does not imply that prospect imageability is low whenever there are two possible prospects. In experiment 2, we kept the number of possible prospects at two and manipulated imageability via the imagery-evoking nature of the possible prospects. This manipulation reduces the reliance on participants' product category knowledge for the generation of mental imagery. It also allows us to disassociate prospect imageability from the number of possible prospects, which in turn helps to further reduce the likelihood of competing accounts from curiosity as well as optimistic anticipation.

EXPERIMENT 2

In addition to adopting a different manipulation of prospect imageability, experiment 2 included process baseline conditions, where participants received instructions to imagine the prizes. Comparing these process baseline conditions with the no-instruction conditions would allow us to ascertain whether participants may generate imagery about the prizes spontaneously. Moreover, we collected thought protocols to test hypothesis 3 regarding the mediating role of imagery elaboration in the pleasurable uncertainty effect.

We employed a 2 (uncertainty: present vs. absent) × 2 (prospect imageability: low-imagery product vs. high-imagery product) × 2 (instruction to imagine: present vs. absent) × 2 (feeling measurement: T1—immediately following the event vs. T2—10 minutes after T1) mixed-factorial design. Uncertainty, prospect imageability, and instruction to imagine were manipulated between subjects, whereas the two feeling measurements were within subjects. One hundred and thirty-six undergraduate students at the National University of Singapore participated in the experiment in exchange for course credit and were randomly assigned to one of the eight between-subjects conditions.

Method

Similar to experiment 1, the event with positive prospects involved winning a computer-simulated lottery game. Again, unbeknownst to the participants, all were predetermined to win.

Manipulation of Uncertainty. In the certain condition, participants immediately received information on the specific prize they had won. In the uncertain condition, participants were told that they would receive one of two possible prizes, and they read the respective descriptions. The imagery-evoking nature of the prizes was varied to stimulate different levels of imagery processing, as discussed in the following section.

Manipulation of Prospect Imageability. Previous research suggests that sensory-stimulating products would elicit higher levels of imagery processing than products featuring functional benefits (MacInnis and Price 1987; Unnava and Burnkrant 1991). Based on a pretest, we selected a box of chocolate including milk, white, and dark chocolate with assorted flavors and fillings and a box of aromatherapy candles coming with lavender, chamomile, and many other scents as high-imagery products and a cutlery set and a digital clock as low-imagery products. Eighty participants in the pretest were asked to rate one of the four products, each worth $10, regarding the level of imagery processing elicited—"I imagined what it would be like to use the product (1 = strongly disagree to 7 = strongly agree)," "While

thinking about the product, to what extent did images come to mind (1 = to a very small extent to 7 = to a very large extent)," "While thinking about the product, I experienced (1 = lots of images to 7 = few or no images)," as well as how vivid, concrete, easy to imagine, easy to relate to, and easy to picture the images were on 7-point semantic differential scales (Bone and Ellen 1992; Keller and Block 1997). These items were then averaged to form an index of imageability (Cronbach's $\alpha = .83$). As expected, the chocolate and the candles were rated significantly higher in imageability than the digital clock and the cutlery set ($M_{\text{chocolate}} = 4.50$, $M_{\text{candle}} = 4.92$ vs. $M_{\text{cutlery}} = 3.94$, $M_{\text{clock}} = 3.81$; $F(1, 76)$'s > 9.76, p-values $< .05$). Moreover, another test was conducted among 28 undergraduate students who provided their product preferences toward either the two low-imagery products or the two high-imagery products. The products were evaluated on four 5-point scales (1 = not at all like/appealing/desirable/of good value to 5 = like very much/very appealing/desirable/of good value), which were later averaged to form an evaluation index (Cronbach's α's $> .90$). An ANOVA with imageability as a between-subjects variable and the two possible prizes as a within-subjects variable was conducted on the evaluation index. None of the effects were significant, suggesting equal attractiveness of the different prizes ($M_{\text{chocolate}} = 3.11$, $M_{\text{candle}} = 3.04$, $M_{\text{cutlery}} = 3.04$, $M_{\text{clock}} = 3.13$; NS). Hence, participants' feelings after winning the lottery game were unlikely to be confounded by the likeability of the different prizes.

Procedure and Measures

Participants were told that the aim of the study was to understand consumer attitudes toward a lottery. They then played the lottery game and were notified that they had won a prize worth $10. Participants assigned to the uncertain condition were informed that they would receive one of two possible prizes (chocolate or aromatherapy candles for the high-imagery product condition; cutlery set or digital clock for the low-imagery product condition). Participants assigned to the certain condition only knew the specific prize they had won (either of the two prizes from the high-imagery or the low-imagery product set; counterbalanced). After seeing the prize description, participants indicated their feelings at that moment (T1) via the same set of scales that were used in experiment 1. Next, participants in the instructed to imagine condition were asked to imagine about the prizes they may get and to write down the thoughts that came to them. Upon completion, they performed a 5-minute filler task relating to their attitudes toward the lottery. Participants in the no-instruction condition did not receive the instruction to imagine; they completed a 10-minute filler task relating to their attitudes toward the lottery. After the filler task, all participants' feelings were measured again (T2). The participants then provided their responses for the imageability manipulation check. At the end of the experiment, each participant received a prize from the lottery game and was then debriefed.

Results

Manipulation Check. The manipulation check items (7-point scales regarding how vivid, concrete, easy to imagine, easy to relate to, and easy to picture the prize images were) were averaged to form an index of the imagery-evoking quality of the prizes (Cronbach's $\alpha = .88$). As expected, the high-imagery prizes were rated higher in imageability than the low-imagery prizes ($M_{\text{high}} = 5.08$ vs. $M_{\text{low}} = 4.56$; $F(1, 128) = 6.15$, $p < .05$). This main effect was not qualified by interaction with other factors.

Feelings. The items measuring positive feelings were averaged to form indices of positive feelings (Cronbach's $\alpha = .82$ and .90 for T1 and T2, respectively). Preliminary analysis confirmed that the instruction to imagine factor did not produce any significant effects ($F(1, 128)$'s < 2.03, NS). We therefore collapsed the instruction and no-instruction conditions in subsequent analyses. An ANOVA (see descriptive statistics in table 2) involving uncertainty and prospect imageability as between-subjects factors and positive feelings at two points of time as repeated measures revealed a significant three-way interaction between uncertainty, prospect imageability, and feeling measurement ($F(1, 132) = 10.54$, $p < .05$). All effects for negative feelings were not significant and will not be discussed further.

Consistent with hypothesis 1, after participants were notified of the prize(s) at T1, those in the uncertain conditions experienced greater positive feelings than those in the certain conditions ($M_{\text{uncertain}} = 3.01$ vs. $M_{\text{certain}} = 2.74$; $F(1, 132) = 12.51$, $p < .05$), regardless of the imagery-evoking nature of the prize ($F < 1$). Moreover, positive feelings declined significantly from T1 to T2 among participants in the certain conditions (high-imagery product: $M_{\text{T1}} = 2.82$ vs. $M_{\text{T2}} = 2.24$; $F(1, 132) = 30.19$; low-imagery product: $M_{\text{T1}} = 2.66$ vs. $M_{\text{T2}} = 2.21$; $F(1, 132) = 19.27$, both p-values $< .05$), as well as among participants in the uncertain, low-imagery product condition ($M_{\text{T1}} = 3.02$ vs. $M_{T2} = 2.34$; $F(1, 132) = 42.04$, $p < .05$). In contrast, participants who were uncertain about the two possible high-imagery prizes remained as happy after 10 minutes ($M_{\text{T1}} = 3.01$ and $M_{\text{T2}} = 2.88$; $F(1, 132) = 1.54$, NS), supporting hypothesis 2.

Level of Imagery Elaboration as Mediator. The listed thoughts were coded by two independent judges as either

TABLE 2

RESULTS OF EXPERIMENT 2, POSITIVE FEELINGS

	Positive feelings	
	T1	T2
Certain:		
Low-imagery product	2.66	2.21
High-imagery product	2.82	2.24
Uncertain:		
Low-imagery product	3.02	2.34
High-imagery product	3.01	2.88

an imagery or nonimagery thought. We considered imagery thoughts to be those that clearly relate to vicarious consumption, such as about the sensory aspect of the prizes or the situation for using the prizes (e.g., "I wonder how it would feel like if I lit the candle during my study time"). Thoughts that did not fit this criterion were classified as nonimagery in nature (e.g., "I wonder how long the candle will last"). Interrater reliability was .89, and the inconsistencies were resolved after discussion. We then divided the number of imagery thoughts by the total number of thoughts to create an imagery elaboration index.

We predicted that the level of imagery elaboration would mediate the effect of positive uncertainty on the durability of positive feelings. To test this hypothesis, we created a feeling durability variable by subtracting the level of positive feelings at T2 from those at T1. A smaller value of this variable represents higher feeling durability. When feeling durability was regressed on uncertainty, prospect imageability, and uncertainty by prospect imageability, the uncertainty by prospect imageability interaction was significant ($\beta = -.49$, $t = -2.41$, $p < .05$). When the mediator, imagery elaboration index, was regressed on uncertainty, prospect imageability, and uncertainty by prospect imageability, there was also a significant uncertainty by prospect imageability interaction effect ($\beta = .54$, $t = 2.65$, $p < .05$). Finally, when feeling durability was regressed on uncertainty, prospect imageability, uncertainty by prospect imageability, and the imagery elaboration index, the imagery elaboration index remains a significant predictor ($\beta = -.62$, $t = -6.09$, $p < .05$) while the effects of the other independent variables became insignificant. The reduction in the significance level of the uncertainty by prospect imageability interaction was further confirmed by a Sobel (1982) test ($z = -2.44$, $p = .01$). In support of hypothesis 3, the level of imagery elaboration fully mediated the effect of uncertainty and prospect imageability on the durability of positive feelings. Two additional analyses with the total number of thoughts and the number of imagery thoughts separately regressed on uncertainty, prospect imageability, and uncertainty by prospect imageability showed insignificant interaction between uncertainty and imageability.

Discussion

Consistent with hypotheses 1–3, our findings suggest that events with positive uncertain prospects that are higher (vs. lower) in imagery-evoking qualities elicit greater immediate positive feelings that are also more sustainable. Furthermore, the uncertainty effect on the sustainability of the elicited positive feelings is mediated by the relative amount of imagery elaboration. In sum, this experiment offers further proof that uncertainty from possible favorable prospects that are high in imageability would enhance the durability of positive feelings. Moreover, this experiment included process baseline conditions where participants were prompted to imagine about the possible prizes. The fact that this treatment produced no differences in effects suggests that consumers may spontaneously generate mental imagery that helps sustain the pleasurable uncertainty effect.

The earlier highlighted competing explanation based on optimistic anticipatory effect under uncertainty also has limited applicability to our findings here. The (four) prizes we used were pretested to be equally attractive, and furthermore the specific prize that was won had no bearing on the pattern of findings (all effects involving the specific prize won as an explanatory variable had a significance level greater than .12). Moreover, while the possibility of anticipating a preferred prize was the same (i.e., one out of two possible prizes) in the low-imageability and the high-imageability conditions, positive feelings were more transient under the low-imageability condition than under the high-imageability condition.

GENERAL DISCUSSION

Our research suggests that individuals can indeed experience greater pleasure from uncertainty than from certainty. Uncertainty from events with positive prospects (e.g., winning a lucky draw but not knowing the exact prize for a period of time) would not only elicit greater immediate positive feelings than certainty, but it would also increase the duration of the positive feelings when the prospects are sufficiently high in imageability. With two different manipulations of prospect imageability across two experiments—one varying the number of possible prizes and the other varying the imagery evoking nature of the possible prizes, we obtain converging evidence that confirms our imageability-based framework.

In experiment 1, while imageability is presumably highest with moderate possible prospects and curiosity is highest with infinite possible prospects, we find positive feelings to be better sustained in the high-imageability situation rather than that of high curiosity. In experiment 2, with the number of possible prospects held constant, we find positive feelings to be better sustained when the prospects are more imagery eliciting, again supporting our conceptualization. Moreover, findings from the thought-listing protocol provide process evidence that imagery elaboration is critical in sustaining positive feelings.

Note that our findings on the immediate affective consequence of uncertainty may appear inconsistent with those from Wilson et al. (2005). Their participants in the certain and uncertain conditions experienced a similar level of positive feelings immediately following the positive event, whereas our participants experienced greater positive feelings in the uncertain than in the certain condition. This may be due to the way that certainty was differently operationalized. In Wilson and colleagues' study, participants in the certain condition learned about all possible prospects and were then immediately told which specific prospect was applicable. In our study, however, participants in the certain condition only learned about the specific prospect applicable to them. We deliberately employed this experimental procedure for two reasons. First, we aimed to follow marketplace situations in which consumers are typically informed of a specific winning prize if the promotion event is designed

without an uncertain prize structure. Second, we tried to minimize a potential "psychological endowment effect" that may be introduced if we were to show all possible prizes in the certain condition. Although participants were then notified of the specific prospect, they might have continued to think about the other "forgone" possible prospects, making it potentially difficult for us to clearly discern the effects under the certain condition.

Aside from confirming the immediate pleasurable effect of uncertainty, the temporal aspect of the effect arguably bears richer theoretical implications. In this respect, our main contribution lies in identifying the role of prospect imageability and the ensuing imagery elaboration as the mechanism responsible for the sustainability of the pleasurable effect. In a related vein, we examined imageability from the perspective of the number of possible prospects (experiment 1) as well as the imagery-evoking nature of each possible prospect (experiment 2). Apart from these prospect-related characteristics, future research may consider both situational (e.g., retail environment; MacInnis and Price 1987) and individual influences (e.g., dispositional imagery vividness; Pham, Meyvis, and Zhou 2001) as additional determinants of imageability.

Future research may also consider the contextual effects that pleasure under uncertainty brings. Consumers in a positive mood (vs. in a neutral or a negative mood) have been documented to form more favorable product evaluations, weigh positive product attributes more heavily, and judge brand extensions more positively (Adaval 2001; Barone, Miniard, and Romeo 2000; Pham 1998). As such, it is not surprising that investigations into ways to enhance consumers' positive moods bear both theoretical interest and practical implications. Along this line, our research suggests that promotions incorporating positive uncertainty may place consumers in a positive mood. Furthermore, since this positive mood originates from prospect-specific imagery elaboration and the increased accessibility of consumption imagery has been shown to enhance product preference (Petrova and Cialdini 2005), it is probable that the mood effects may be more prominent when consumers subsequently evaluate products that relate closer to the possible prospects (e.g., forming a judgment about an electronics product after winning a prize in the same product category). This issue may be of particular interest to practitioners who are concerned with the creation of positive uncertainty not only as an end (delighted consumers) but also as a means to an end (favorable responses to subsequent marketing stimuli).

On a separate issue, we suspect that consumers may not be able to correctly forecast the pleasure they would derive from events with positive uncertain prospects and that they may have a hardwired inclination to reduce uncertainty whenever they have a choice. Individuals' failure to predict the intensity and duration of their future feelings has been documented in the literature (Hsee and Hastie 2006). As consumers tend to reduce uncertainty during their purchase process (Urbany et al. 1989; Weinberg 2001), they may overgeneralize this tendency to positive events and hence still prefer certainty to uncertainty. To provide a preliminary test of the potential misalignment between intuition (or forecast) and actual experiences, we conducted a follow-up study with 90 undergraduate students to investigate consumer intuition about the pleasurable uncertainty effect. Three sets of scenarios (each set with a certain and an uncertain prospect) were created by modeling after the stimulus design in experiments 1 and 2. Each participant was shown one of the three sets (making 30 participants per scenario set) and was requested to choose between the certain and uncertain situations.

The three choice sets from the scenarios were (1) between knowing they have won a digital clock or knowing they have won a consumer electronics product, (2) between knowing they have won a box of chocolate or knowing they have won either a box of chocolate or aromatherapy candles, and (3) between knowing they have won a cutlery set or knowing they have won either a cutlery set or a digital clock. Prizes in each choice set were specified to be of the same price. All uncertain scenarios had a cover story in which participants would know of the exact prize won after 10 minutes because the staff needed to check "stock availability."

Chi-square tests revealed that the choice share of the certain situation was significantly higher than that of the uncertain situation in all three scenario sets (all p-values $<$ .05). Given that the eventual prospect is positive in nature, 83.3%/90%/80% of the participants chose to be certain of the exact lucky draw prize in the digital clock/chocolate/cutlery scenarios rather than being uncertain about the prize for some period of time.

Uncertainty, whether involving positive or negative prospects, is a common occurrence in the marketplace. An equally common tendency seems to be for consumers to avoid uncertainty even if it entails positive prospects. Extending research on uncertainty yet contrasting past emphasis on its negative implications (e.g., Chandrashekaran et al. 2007; Urbany et al. 1989; Weinberg 2001), our research shows that there is a pleasurable side to positive uncertainty and further uncovers the underpinning imagery elaboration process. Why then are consumers such poor predictors in this regard? It seems probable that the requisite mental elaboration process is ill forecasted and underestimated with regard to its pleasurable effects and as such not salient enough in compensating for general uncertainty-reduction behavior. The plausibility of this account and its underlying reasons await further research.

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