Description Versus Experience for Decisions About Discounts

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The description–experience gap in risky choice behavior is the finding that people tend to overweight rare events when making description-based decisions, whereas they tend to underweight rare events when making experience-based decisions. In the present study, the authors investigated whether the gap, which is studied mainly in the context of monetary gambles, generalizes to the context of retail discounts in the consumer domain. In 3 experiments, subjects made description- or experience-based decisions about safe and risky discounts (scratch-and-save promotions). When discounts were expressed as percentages without a reference point, there was no evidence of a gap (Experiment 1). When discounts were expressed in dollars with an explicit reference point, there was evidence of a partial gap, such that experience subjects chose the risky promotion more often than description subjects did but only when the large discount occurred with high probability (Experiments 2 and 3). In all experiments, experience subjects tended to be more rational than description subjects when choosing between promotions with different expected values. Possible reasons for the pattern of results are discussed.

KEYWORDS: description–experience gap, risky choice, retail discounts, price promotions, consumer decision making

People can use information acquired in different ways to make decisions in uncertain situations. For example, a decision about when to schedule an outdoor event can be informed by a description (weather forecast) or by experience (memory of past weather conditions at that time of year). Behavioral decision research has revealed differences in choices based on description versus experience. Decisions from description tend to reflect overweighting of rare events, whereas decisions from experience tend to reflect underweighting of rare events (e.g., Barron & Erev, 2003; Hertwig, Barron, Weber, & Erev, 2004). This difference in risky choice behavior is called the description–experience gap and has motivated considerable research (for reviews, see Hertwig & Erev, 2009; Wulff, Mergenthaler-Canseco, & Hertwig, 2018). In the present study, we investigated whether the description–experience gap generalizes to the context of retail discounts in the consumer domain.

The generality of the description–experience gap is important because the gap is studied mainly in the context of monetary gambles (see Wulff et al., 2018). A typical decision problem in this context involves choosing between a risky option (different amounts of money are won or lost with different probabilities) and a safe option (a fixed amount of money is always won or lost). The desirable outcome for the risky option (e.g., largest gain) can occur with low or high

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probability. For decisions from description, subjects read about the probabilities of winning or losing various amounts for the options, then choose their preferred option. For decisions from experience, subjects sample outcomes from the distributions associated with the options before choosing their preferred option.

These decision paradigms yield differences in behavior (Hertwig & Erev, 2009). Subjects making description-based decisions tend to favor the risky option when the desirable outcome occurs with low probability, whereas they favor the safe option when the desirable outcome occurs with high probability. This choice pattern suggests overweighting of rare events, consistent with cumulative prospect theory (Tversky & Kahneman, 1992). In contrast, subjects making experience-based decisions tend to exhibit the opposite choice pattern, as if they underweight rare events.[1] This divergence in choices represents the description–experience gap, which has been replicated many times (see Wulff et al., 2018).

Researchers have explored potential sources of the description–experience gap, focusing mainly on characteristics of the experience condition. When subjects control when to terminate sampling of options, their sample sizes are small (Wulff et al., 2018). Consequently, their decisions might be influenced by sampling error (a mismatch between experienced and objective probabilities of outcomes; Fox & Hadar, 2006; Hertwig et al., 2004), a possibility supported by evidence that the gap is diminished—but not necessarily eliminated—when sampling error is reduced (e.g., Camilleri & Newell, 2011a; Hau, Pleskac, Kiefer, & Hertwig, 2008; Ungemach, Chater, & Stewart, 2009). Another potential source of the gap is recency, such that decisions might reflect giving more weight to recent samples (Hertwig et al., 2004), but evidence of recency effects is mixed and dependent on sampling constraints (Wulff et al., 2018). Although sampling error and recency have received the most attention in the literature, other possibilities have also been considered (see Hertwig & Erev, 2009; Rakow & Newell, 2010).

Explanations of the description–experience gap might be informed by whether it generalizes beyond monetary gambles to other contexts. There is evidence that it does. For example, the gap has been found for intertemporal choices (Dai, Pachur, Pleskac, & Hertwig, 2019), cooperative choices in social games (Martin, Gonzalez, Juvina, & Lebiere, 2014), medical choices related to side effects (Lejarraga, Pachur, Frey, & Hertwig, 2016), and consumer choices about products (Camilleri, 2017; Wulff, Hills, & Hertwig, 2015). The findings in the consumer domain are particularly relevant for the present study. Camilleri (2017) and Wulff et al. (2015) observed description–experience gaps for product choices based on aggregate (summary) descriptions of consumer ratings or disaggregated experiences of individually sampling ratings, such that subjects made choices as if they underweighted rarely experienced ratings. We also explored the consumer domain in the present study but investigated whether the gap occurs for choices about safe and risky promotional discounts. One of our motivations for studying a discount context was that it represents an interesting contrast to a monetary gambling context; the latter involves winning or losing money, whereas the former involves saving money. Framing is known to be important in decision making (e.g., Tversky & Kahneman, 1981), but it is unknown whether the description–experience gap found when gaining (or not losing) money in a gamble generalizes to retaining money because of a discount.

Our focus on discounts was also motivated by the observation that both safe and risky discounts are actually used by retailers. Safe discounts correspond to promotions with guaranteed savings of a fixed percentage (e.g., a 20% off sale). Risky discounts are exemplified by scratch-and-save promotions, where consumers scratch a card to reveal a hidden discount, with different probabilities of attaining various percentage savings (e.g., scratch and save 20–50% off). Research on scratch-and-save and related promotions has used description and experience paradigms to explore how consumer preferences are influenced by factors such as minimum discount levels, per-item versus per-purchase discounts, and product quality cues (Alavi, Bornemann, & Wieseke, 2015; Choi & Kim, 2007; Choi, Park, Qiu, & Stanyer, 2013; Choi, Stanyer, & Kim, 2010; Dhar, González-Vallejo, & Soman, 1995; Kamleitner, Mandel, & Dhami, 2011). However, no study has compared both paradigms for choosing between risky and safe discounts to see whether there is a description–experience gap.

Our goal in the present study was to make an empirical contribution more so than a theoretical contribution to research on the description–experience gap. That is, instead of testing a hypothesis about

a source of the gap, we investigated whether a gap would be found at all in the context of promotional discounts, thereby providing evidence about the generality of the gap that goes beyond previous work in the consumer domain involving product ratings (Camilleri, 2017; Wulff et al., 2015). In three experiments, we asked subjects to make description- or experience-based decisions about pairs of scratch-and-save promotions offered by fictional stores. Each promotion pair consisted of a safe discount (e.g., 17% off with probability of 1) and a risky discount (e.g., 15% off with probability of .9; 35% off with probability of .1). Subjects in the description condition read text describing the probabilities of getting specific discounts when each store's cards were scratched. Subjects in the experience condition sampled virtual scratch-and-save cards from each store, with full feedback about the discounts (Camilleri & Newell, 2011b; Hertwig & Erev, 2009). After the description or experience, subjects chose their preferred promotion. The question of interest was whether a description–experience gap would occur in this retail discount context.[2]

EXPERIMENT 1

METHOD

Subjects

A total of 100 undergraduate students from Purdue University participated for course credit. They were randomly assigned to description and experience conditions with the constraint of equal-sized groups. There were 50 subjects in the description condition (mean age = 18.8 years; 26 female and 24 male) and 50 subjects in the experience condition (mean age = 18.7 years; 30 female and 20 male).[3] The preregistered sample size was based on a power analysis that indicated 100 subjects would provide 95% power to detect an effect size of $w = 0.36$, which was the mean effect size obtained for individual problem analyses of description and full-feedback experience conditions in Camilleri and Newell (2011b).

Materials

Information for all decision problems is provided in Table 1. Each problem consisted of risky and safe scratch-and-save promotions offered by two fictional stores. The risky promotion involved probabilistic discounts (e.g., 15% off with probability of .9; 35% off with probability of .1), whereas the safe promotion involved a guaranteed discount (e.g., 17% off with probability of 1). The range of discounts (10% to 50%) was chosen to be similar to the ranges used in some previous studies of scratch-and-save promotions (e.g., Choi et al., 2010). The range of low probabilities (.1–.2) for the risky promotions was chosen based on numbers typically used for rare outcomes in previous studies of the description–experience gap (Wulff et al., 2018). Problems were constructed to satisfy those constraints and fit a specific problem type (described next). Note that it was not feasible to use existing problems from previous studies of the description–experience gap (e.g., Camilleri & Newell, 2011b; Hertwig et al., 2004) because some of those problems involve negative values (representing

TABLE 1. Problem Information

		Experiments 1 and 2		Experiment 3	
Problem type	**Problem**	**Risky**	**Safe**	**Risky**	**Safe**
Large discount with low probability	1	35 (.1), 15 (.9)	17 (1.0)	48 (.1), 28 (.9)	30 (1.0)
	2	50 (.15), 30 (.85)	33 (1.0)	40 (.15), 20 (.85)	23 (1.0)
	3	45 (.2), 20 (.8)	25 (1.0)	34 (.2), 14 (.8)	18 (1.0)
Large discount with high probability	4	30 (.9), 10 (.1)	28 (1.0)	35 (.9), 15 (.1)	33 (1.0)
	5	39 (.85), 19 (.15)	36 (1.0)	44 (.85), 24 (.15)	41 (1.0)
	6	50 (.8), 15 (.2)	43 (1.0)	32 (.8), 12 (.2)	28 (1.0)
Different expected values	7	30 (.9), 20 (.1)	35 (1.0)	35 (.9), 25 (.1)	40 (1.0)
	8	40 (.2), 35 (.8)	30 (1.0)	45 (.2), 30 (.8)	25 (1.0)

Note. Discounts are indicated as amounts with probabilities in parentheses. Discount amounts were expressed as percentages in Experiment 1 and in dollars in Experiments 2 and 3.

losses, which do not translate clearly to our discount context), small values that would be trivial discounts and not representative of scratch-and-save promotions (e.g., 3%), or extreme probabilities that would not be conducive to eliminating sampling error in the experience condition (e.g., .025).

The eight problems were classified into three types (see Table 1). Problems 1–3 involved risky promotions in which the large discount occurred with low probability. Problems 4–6 involved risky promotions in which a large discount occurred with high probability. For both of these problem types, the expected value of the risky promotion equaled the value of the safe promotion. In contrast, Problems 7 and 8 involved risky and safe promotions with different expected values to assess the extent to which subjects were paying attention to the information provided to them and making rational decisions when possible. For Problem 7, both probabilistic discounts were smaller than the guaranteed discount. For Problem 8, both probabilistic discounts were larger than the guaranteed discount.

Design

The aforementioned manipulations resulted in a 2 (experimental group: description or experience) × 3 (problem type) mixed factorial design, with experimental group as a between-subject factor and problem type as a within-subject factor. As we elaborate later, given our interest in whether and how choice behavior differed between the description and experience conditions separately for each problem type, we analyzed the data by conducting independent-samples *t* tests rather than an analysis of variance.

Procedure

The study protocol was approved by the Purdue University Institutional Review Board. Subjects provided informed consent and filled out a demographics questionnaire before completing the experiment individually in private rooms. The experiment was run in E-Prime 3 on desktop computers. Text and stimuli were displayed onscreen, and responses were made using the computer mouse.

Instructions tailored to the subject's experimental condition (description or experience) were displayed onscreen and read aloud by the experimenter. The instructions did not include information about the other condition (i.e., the condition to which a subject was not assigned) or the concept of the description–experience gap; that information was provided in the postexperiment debriefing. For both conditions, the instructions introduced the concept of scratch-and-save promotions, then detailed the process by which subjects would be comparing hypothetical promotions for different pairs of fictional stores.[4] Some steps of the comparison process differed between conditions to implement procedures similar to those used for description and experience conditions in previous research (e.g., Hertwig & Erev, 2009).

For subjects in the description condition, each problem began with two virtual scratch-and-save "cards" (different-colored rectangles) presented side by side onscreen and labeled with letters (e.g., Store A and Store B). Below each card was text describing the probabilities of getting specific discounts when that store's cards were "scratched" (Figure 1). Reading of the descriptions was self-paced, and the descriptions remained onscreen until subjects clicked the mouse when ready to continue.[5] After subjects clicked the mouse, the descriptions disappeared and subjects were prompted to make a decision by clicking on the card of the store with the scratch-and-save promotion that they would prefer if they were actually shopping. We omitted the descriptions from the decision display to make it as similar as possible to the final decision display in the experience condition, where no information about either promotion was visible. This comparison process was repeated for subsequent problems involving other pairs of fictional stores (e.g., Stores C and D). All subjects in the description condition saw all eight problems.

For subjects in the experience condition, each problem also began with two virtual scratch-and-save cards presented side by side onscreen and labeled with letters. However, no text descriptions appeared below the cards. Instead, subjects experienced 20 trials of scratch-and-save cards randomly sampled without replacement from discrete distributions associated with the stores.[6] The experienced proportions of specific discounts exactly matched their objective probabilities in Table 1 (e.g., if a specific discount had a probability of .1, then it was shown on two of the 20 trials). Thus, there was no sampling error. On each trial, subjects clicked on either card to scratch both cards and reveal their discounts (full feedback; see Figure 1). After the discounts were displayed for 2 s, they disappeared and the next trial began with two new cards from the same stores. After the 20 trials, subjects were prompted to make a final decision by clicking on the card of the store with the scratch-and-save promotion that they would prefer if they were actually shopping.[7] No information about the preceding samples of cards was visible in the final decision display. This comparison process was repeated for

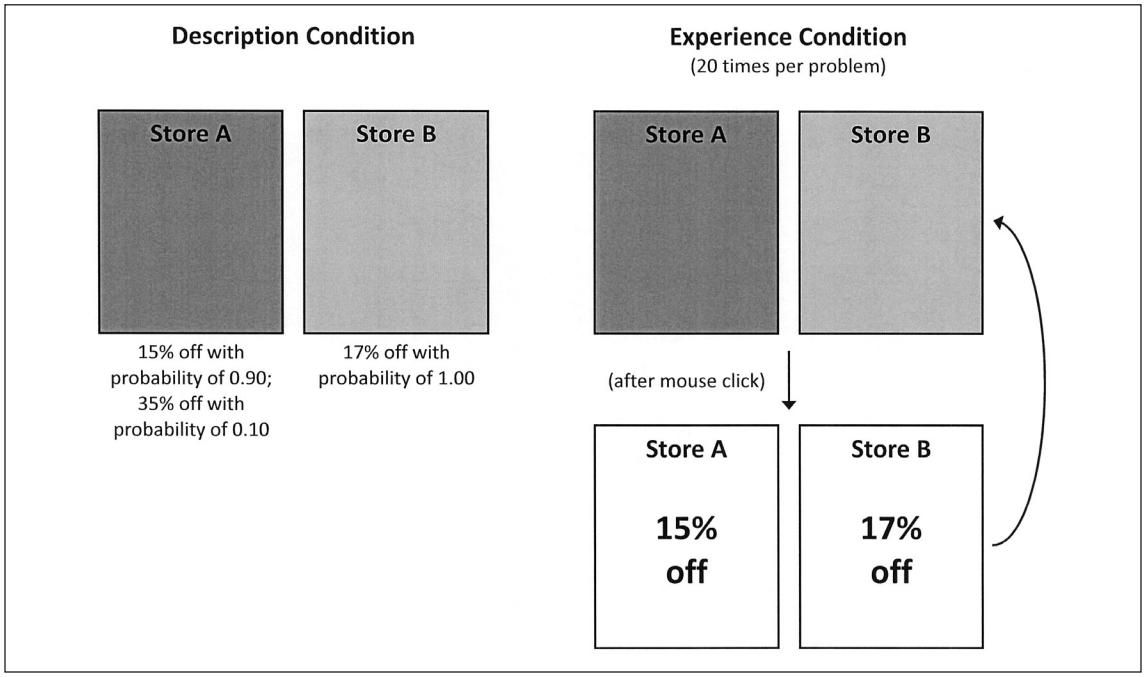

FIGURE 1. Description and experience conditions for Problem 1, Experiment 1

subsequent problems. All subjects in the experience condition saw all eight problems.

In both conditions, subjects were instructed that there were no right or wrong answers but that we wanted them to think carefully about either the information they read (description condition) or the cards they saw (experience condition) before making their decision for each comparison. They were also informed that there was no time pressure on their decisions. There was no mention of distinct problem types in the instructions. After giving the instructions, the experimenter left the testing room, and the subject completed the experiment alone.

The order of the eight problems was randomized for each subject, which meant that the problem types were randomly intermixed. There was no labeling of any given problem to indicate its problem type. The left–right order in which the cards associated with risky and safe promotions were displayed onscreen was randomized, with the constraint that each type of promotion occurred equally often on the left and on the right for each subject.

RESULTS

The dependent variable of interest was the percentage of risky (or rational) choices made by subjects in each condition when they were asked to choose their preferred promotion. If the description–experience gap in previous research fully generalizes to the discount context of the present study, then choice patterns should differ between the description and experience conditions as a function of problem type. For Problems 1–3, which involved risky promotions in which the large discount occurred with low probability, the gap would be manifested as a higher percentage of risky choices in the description condition than in the experience condition. For Problems 4–6, which involved risky promotions in which the large discount occurred with high probability, the gap would be manifested as a higher percentage of risky choices in the experience condition than in the description condition.

No gap was necessarily expected for Problems 7 and 8, which involved risky and safe promotions with different expected values. As noted earlier, these problems were included to assess the extent to which subjects were paying attention to the information provided to them and making rational decisions when possible. If acting rationally is defined as choosing the promotion with the larger expected value, then the rational choice is the safe promotion for Problem 7 and the risky promotion for Problem 8 (see Table 1).

We analyzed the choice data by conducting independent-samples *t* tests on the mean percentages of risky (Problems 1–6) or rational (Problems 7 and 8) choices for each problem type to determine whether choice patterns for problems of the same type differed between the description and experience conditions.[8] For Problems 1–6, we also report statistics based on data only from the subset of subjects in each condition who responded rationally to both Problems 7 and 8 because these "rational" subjects might have paid closer attention to the problem information than did the subjects who sometimes made irrational choices. Alpha was set at .05 for all analyses in the present study.

Mean percentages of risky or rational choices by problem type appear in the top row of Figure 2. The

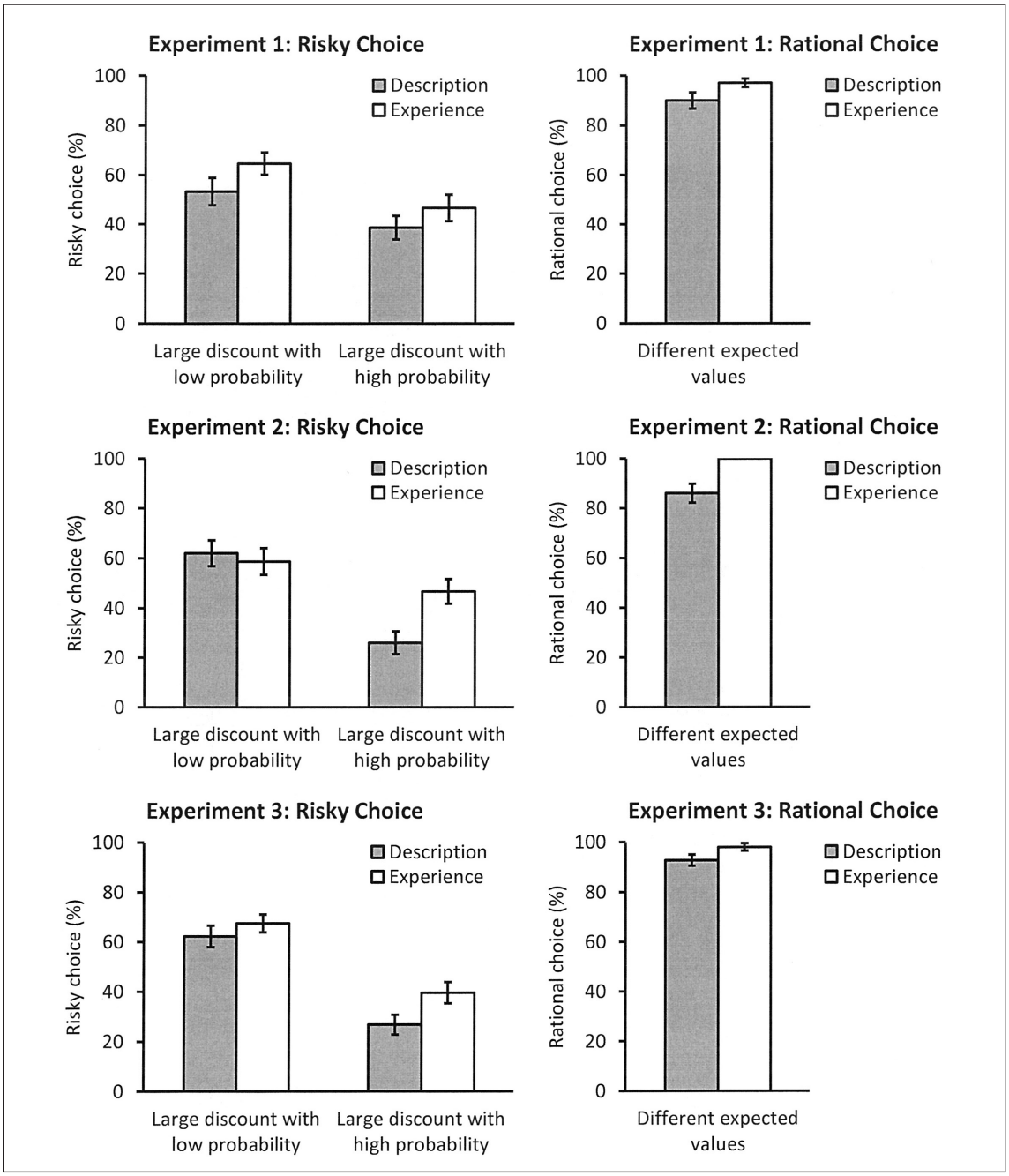

FIGURE 2. Experiment results by choice and problem type. Error bars represent standard errors of the means

difference in risky choices between conditions was nonsignificant for Problems 1–3 (large discount with low probability), $t(98) = 1.584$, $p = .116$, $d = .317$; rational subjects only, $t(86) = 0.797$, $p = .428$, $d = .169$. The difference was also nonsignificant for Problems 4–6 (large discount with high probability), $t(98) = 1.109$, $p = .270$, $d = .222$; rational subjects only, $t(86) = 1.312$, $p = .193$, $d = .282$. The difference in rational choices between conditions was nearly significant for Problems 7 and 8 (different expected values), $t(98) = 1.935$, $p = .056$, $d = .387$, such that experience subjects tended to choose more rationally than description subjects did.

DISCUSSION

There was no evidence of a typical description–experience gap in Experiment 1. Description and experience subjects made similar choices, except the latter group had a greater tendency toward rational decisions for problems with different expected values (a point we discuss later). It is possible that the description–experience gap found in other contexts simply does not occur in a retail discount context. Alternatively, methodological features of Experiment 1 might have impeded detection of a gap.

One feature was that discounts were expressed as percentages, which meant there was no explicit reference point for gauging the amount of monetary savings. For example, 20% off could correspond to a large amount of money ($200 off a $1,000 item) or a trivial amount ($0.20 off a $1 item). This raises the possibility that different subjects—even those in the same condition—in Experiment 1 might have had vastly different perceptions of the same discount amounts, potentially increasing the variability in choice behavior. Research on framing effects indicates that decisions about discounts depend on reference points (Tversky & Kahneman, 1981), possibly reflecting psychophysical judgments of prices (Thaler, 1980). Pricing research shows that interpretation of percentage price differences is influenced by reference points (Darke, Freedman, & Chaiken, 1995; Kruger & Vargas, 2008), and judgments of price changes are affected by relative (percentage) versus absolute (dollar) framing (Chatterjee, Heath, Milberg, & France, 2000; Heath, Chatterjee, & France, 1995). Thus, it is possible that no gap occurred in Experiment 1 because percentage framing was too abstract and lacked a clear reference point.

We addressed this issue in Experiment 2 by expressing discounts in dollars rather than percentages (e.g., 20% off became $20 off) and introducing an explicit reference point (subjects were asked to imagine purchasing a $100 item). The question of interest was whether a description–experience gap would emerge for discounts framed less abstractly.

EXPERIMENT 2

METHOD

Subjects

A total of 100 undergraduate students from Purdue University participated for course credit. They were randomly assigned to conditions, with 50 subjects in the description condition (mean age = 18.8 years; 24 female and 26 male) and 50 subjects in the experience condition (mean age = 18.6 years; 30 female and 20 male). None of them had participated in Experiment 1.

Materials

The materials were identical to those of Experiment 1 (see Table 1), except that discount amounts were changed from percentages to dollars (e.g., 15% off became $15 off). Given the instructed reference price of $100, the dollar-based discounts could be translated into the same percentage-based discounts used in Experiment 1.

Design

The design was identical to that of Experiment 1.

Procedure

The procedure was identical to that of Experiment 1, except for the addition of a reference price to the instructions. For each problem, subjects were asked to imagine that they were purchasing an item originally priced at $100. They then compared hypothetical promotions offered by fictional stores, as in Experiment 1, with periodic reminders of the reference price.

RESULTS

Mean percentages of risky or rational choices by problem type appear in the middle row of Figure 2. The difference in risky choices between conditions was nonsignificant for Problems 1–3 (large discount with low probability), $t(98) = -0.450$, $p = .654$, d

= –.090; rational subjects only, $t(86) = -0.557$, $p = .579$, $d = -.120$. In contrast, the difference was significant for Problems 4–6 (large discount with high probability), $t(98) = 3.060$, $p = .003$, $d = .612$; rational subjects only, $t(86) = 3.207$, $p = .002$, $d = .696$. As shown in Figure 2, experience subjects made risky choices more often than description subjects did for those problems. The difference in rational choices between conditions was significant for Problems 7 and 8 (different expected values), $t(98) = 3.694$, $p < .001$, $d = .739$, such that experience subjects chose more rationally than description subjects did.

DISCUSSION

There was evidence of a partial description–experience gap in Experiment 2. When the risky promotion involved a large discount with high probability (Problems 4–6), it was chosen more often by experience subjects than by description subjects, consistent with the direction of the gap in past research (Hertwig & Erev, 2009). This gap held even for the subset of subjects who chose rationally for both Problems 7 and 8. However, choice patterns did not differ between conditions when the risky promotion involved a large discount with low probability (Problems 1–3), as in Experiment 1. Finally, experience subjects chose more rationally than description subjects did when problems involved promotions with different expected values (Problems 7 and 8), replicating the trend in Experiment 1.

The finding of a partial gap in Experiment 2 suggests that it might indeed depend on the framing and reference points used for discounts. However, we deemed it important to assess the replicability of the partial gap and its generality across problem sets. We conducted Experiment 3 as a replication of Experiment 2 but with a new problem set and a larger sample size.

EXPERIMENT 3

METHOD

Subjects

A total of 151 undergraduate students from Purdue University participated for course credit. They were randomly assigned to conditions, with 76 subjects in the description condition (mean age = 19.6 years; 44 female and 32 male) and 75 subjects in the experience condition (mean age = 19.3 years; 41 female and 34 male). None of them had participated in Experiments 1 or 2. The preregistered sample size of 150 subjects was based on a power analysis that indicated 149 subjects would provide 80% power to detect an effect size of $w = 0.23$, which was the approximate mean effect size from individual problem analyses of Problems 4–6 in Experiment 2. The preregistered sample size was slightly exceeded because one more subject than anticipated signed up for the experiment during the final week of data collection. Data from two additional subjects were excluded before any analysis. One of those subjects did not complete the experiment because of a power outage, and the other did not receive full instructions from the experimenter.

Materials

We created eight new decision problems (see Table 1) that satisfied the same constraints as the original problems. The probabilities associated with the problems remained the same as in Experiments 1 and 2, but the discount amounts changed. For example, Problem 1 in Experiment 3 involved the same probabilities but different discount amounts than Problem 1 in Experiments 1 and 2 (see Table 1). Discount amounts were expressed in dollars, as in Experiment 2.

Design

The design was identical to that of Experiments 1 and 2.

Procedure

The procedure was identical to that of Experiment 2 and included the $100 reference price.

RESULTS

Mean percentages of risky or rational choices by problem type appear in the bottom row of Figure 2. The difference in risky choices between conditions was nonsignificant for Problems 1–3 (large discount with low probability), $t(149) = 0.931$, $p = .354$, $d = .151$; rational subjects only, $t(137) = 0.668$, $p = .505$, $d = .113$. In contrast, the difference was significant for Problems 4–6 (large discount with high probability), $t(149) = 2.200$, $p = .029$, $d = .358$; rational subjects only, $t(137) = 2.173$, $p = .032$, $d = .370$. As shown in Figure 2, experience subjects made risky choices

more often than description subjects did for those problems. The difference in rational choices between conditions was nearly significant for Problems 7 and 8 (different expected values), $t(149) = 1.946$, $p = .054$, $d = .317$, such that experience subjects tended to choose more rationally than description subjects did.

To assess the consistency of the choice patterns across all three experiments, we conducted combined experiment analyses involving 3 (experiment: 1, 2, or 3) × 2 (group: description or experience) between-subject analyses of variance on the choice data by problem type. There were no significant effects for Problems 1–3 (smallest $p = .256$). The only significant effect for Problems 4–6 was a main effect of group, $F(1, 345) = 12.965$, $p < .001$, $\eta_p^2 = .036$, reflecting the consistently higher percentages of risky choices for experience subjects than for description subjects when the large discount occurred with high probability for the risky promotion (see Figure 2). The only significant effect for Problems 7 and 8 was also a main effect of group, $F(1, 345) = 20.655$, $p < .001$, $\eta_p^2 = .056$, reflecting the consistently higher percentages of rational choices for experience subjects than for description subjects when the promotions had different expected values (see Figure 2).

DISCUSSION

There was evidence of a description–experience gap in Experiment 3 for the same problem type (large discount with high probability; Problems 4–6) for which a gap was found in Experiment 2, even though the discount amounts for individual problems differed between experiments (see Table 1). As before, this gap held even for the subset of subjects who chose rationally for both Problems 7 and 8. There was still no evidence of a gap when the risky promotion involved a large discount with low probability (Problems 1–3). These results indicate that the partial gap found in Experiment 2 is replicable. Moreover, experience subjects tended to choose more rationally than description subjects did for problems involving promotions with different expected values (Problems 7 and 8), replicating Experiments 1 and 2. Combined experiment analyses revealed that the gap in risky choice for Problems 4–6 and the difference in rational choice for Problems 7 and 8 were both highly significant effects and consistent across experiments.

GENERAL DISCUSSION

To determine whether the description–experience gap in risky choice behavior (Hertwig & Erev, 2009; Wulff et al., 2018) generalizes to promotional discounts in the consumer domain, we conducted three experiments in which subjects made description- or experience-based decisions about safe and risky retail discounts (scratch-and-save promotions). When discounts were expressed as percentages without a reference point, there was no evidence of a gap (Experiment 1). When discounts were expressed in dollars with an explicit reference point, there was evidence of a partial gap, such that experience subjects chose the risky promotion more often than description subjects did, but only when the large discount occurred with high probability (Experiments 2 and 3). In all experiments, regardless of framing, experience subjects tended to be more rational than description subjects when choosing between promotions with different expected values.

Why did we not obtain a description–experience gap when the risky promotion involved a large discount with low probability (Problems 1–3)? One possible reason is suggested by consumer research on different discounting strategies—specifically, frequency discounting (offering frequent small discounts) and depth discounting (offering infrequent large discounts; Alba, Broniarczyk, Shimp, & Urbany, 1994; Alba, Mela, Shimp, & Urbany, 1999; Danziger, Hadar, & Morwitz, 2014; Jedidi, Mela, & Gupta, 1999). Frequency and depth discounting correspond to some extent to the safe and risky promotions, respectively, used for Problems 1–3.[9] Using an experience paradigm in which average prices were equated across discounting strategies, Alba et al. (1999) found that subjects estimated lower prices under depth discounting than under frequency discounting, particularly for dichotomous price distributions (see also Lalwani & Monroe, 2005). If an analogous depth bias occurred for Problems 1–3 for some of the experience subjects in our experiments, then it would have increased the percentage of risky choices, counteracting any description–experience gap arising from underweighting of the infrequent large discount by other experience subjects. The net effect of a depth bias opposing a gap could be little or no difference in risky choices between the description

and experience conditions, consistent with what we found for Problems 1–3 across our experiments.[10]

A less likely reason for the absence of a gap for Problems 1–3, but one that warrants consideration, is that our discount context was abstract: Stores were labeled with arbitrary letters, and no product was specified. Past studies on scratch-and-save and related promotions usually involved specific products (e.g., coffee, candy bar, iPod; Alavi et al., 2015; Choi et al., 2010; Dhar et al., 1995), and previous findings of description–experience gaps in the consumer domain involved decisions based on reviews of products (e.g., audiobooks, laptops, shoes; Camilleri, 2017; Wulff et al., 2015). It is possible that making the discount context more concrete by using store names and identifiable products might alter decisions in a way that would produce a gap. However, this possibility seems unlikely for two reasons. First, we found a description–experience gap for Problems 4–6 in the same discount context used for Problems 1–3, and it is not obvious why contextual abstractness would affect the occurrence of the gap for one problem type but not for the other. Second, the monetary gambling context in which the description–experience gap is often observed also tends to be abstract. For example, the different options are sometimes unlabeled (Barron & Erev, 2003; Camilleri & Newell, 2011a) or mapped arbitrarily to letters (Ungemach et al., 2009) or colors (Hau et al., 2008). Thus, contextual abstractness does not seem to be a key determinant of the gap, although our results suggest that informational abstractness (e.g., expressing discount information in percentages vs. dollars) might be an important dimension.

Why did we obtain a description–experience gap when the risky promotion involved a large discount with high probability (Problems 4–6)? In research on scratch-and-save promotions, Kamleitner et al. (2011) found that subjects preferred per-item over per-purchase discounts, partly because of differences in perceived discount superiority. For Problems 4–6, experience subjects frequently saw a risky discount that was larger than the safe discount, which might have led them to think that the risky promotion offered greater overall savings (even though expected values were matched between promotions). In addition, the higher frequency of experiencing the large discount versus the small discount for the risky promotion might have increased the perceived salience of the large discount, leading to underweighting of the infrequent small discount and making the risky choice more attractive to experience subjects (for work on relative salience and discount magnitude, see Krishna & Johar, 1996; Lalwani & Monroe, 2005). The size of the description–experience gap we found for Problems 4–6 in Experiments 2 and 3 suggests that this perception, if it occurred, had a modest effect on choice behavior.

Why did experience subjects tend to choose more rationally than description subjects did when promotions had different expected values (Problems 7 and 8)? When one option has attributes that are superior to those of another option, the dominance principle of expected utility theory (von Neumann & Morgenstern, 1944) indicates that people should choose the dominant option, provided that the dominance is transparent (Tversky & Kahneman, 1986). Most subjects in both conditions chose rationally (see Figure 2), but the greater tendency for experience subjects to do so might have arisen because the dominance relation was particularly salient when encountered repeatedly for 20 trials of a problem. The tendency for experience-based choice to be more rational than description-based choice has been noted by others (Hertwig, Hogarth, & Lejarraga, 2018; Hogarth & Soyer, 2011; Wulff et al., 2018).

In conclusion, the present study indicates that a partial description–experience gap occurs for decisions about retail discounts, providing insight about description-based versus experience-based choices in the consumer domain (see also Camilleri, 2017; Wulff et al., 2015). Our results point to the potential importance of the framing (percentages vs. dollars) and reference points used for discounts, suggesting that a gap might be more likely to emerge when information is expressed less abstractly. Exploring variations of our discount context could be a productive direction for future research on how consumer decision making differs for promotions that are described versus experienced.

NOTES

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1. Representative examples of these patterns can be found in a study by Hertwig et al. (2004) in which description and experience groups chose between risky and safe options for several decision problems. Problem 5 involved the risky option of winning $32 with probability of .1 or $0 with probability of .9 and the safe option of always winning $3. The risky option (for which the desirable outcome was rare) was chosen by more than twice as many subjects in the description group than in the experience group. Problem 1 involved the risky option of winning $4 with probability of .8 or $0 with probability of .2 and the safe option of always winning $3. The risky option (for which the desirable outcome was frequent) was chosen by more than twice as many subjects in the experience group than in the description group.

2. Each experiment was preregistered separately: Experiment 1, https://aspredicted.org/9xt8r.pdf; Experiment 2, https://aspredicted.org/gm2jf.pdf; Experiment 3, https://aspredicted.org/av43n.pdf. The data for all experiments are publicly available (https://osf.io/t4z5x/).

3. Our subject population was chosen primarily because it was easily accessible. However, their demographic group (Generation Z) has been labeled "the most coveted retail demographic" (Kaplan, 2019), making it important to study what influences their preferences for different kinds of retail discounts.

4. We opted for fictional stores (labeled with letters) and did not mention any specific products to avoid any influence of subjects' preexisting preferences on their choice behavior. In addition, some scratch-and-save promotions offered by retailers do not mention specific products (e.g., the discount can be applied to any item).

5. To address the possibility that some subjects in the description group might accidentally click through or skip the descriptions, we preregistered the exclusion criterion that subjects who spent less than 1 s (on average) reading the descriptions would be replaced. No subjects in the present study met that criterion. Mean description reading time was 16.3 s (SD = 11.5 s) in Experiment 1, 12.7 s (SD = 6.9 s) in Experiment 2, and 12.1 s (SD = 6.1 s) in Experiment 3.

6. We chose 20 trials because the meta-analysis of studies on the description–experience gap by Wulff et al. (2018) indicated that subjects take a median of 20 samples when they are free to terminate sampling at any time.

7. The procedure used in the experience condition was a variant of the "sampling paradigm" used in previous research (Hertwig & Erev, 2009), in that the samples were nonconsequential (i.e., discounts were not accumulated across trials), and the final choice was what mattered. However, instead of showing the discount only for the card that was clicked, we showed the discounts for both cards on each trial, a feature of the "full-feedback paradigm."

8. Our preregistered protocols indicate that our original analysis approach was to conduct chi-square tests for individual problems. However, it was subsequently pointed out to us that that approach inflates the type I error rate, does not take into account the classification of problems into different problem types, and does not allow one to assess whether subjects responded consistently to problems of the same type. For those reasons, we report alternative analyses (not preregistered) that seem more appropriate.

9. The correspondence is not perfect because the safe promotion for each problem gave the same discount with 100% frequency, so it could also be considered a variation of a discounting strategy referred to as everyday low pricing (Danziger et al., 2014; Hoch, Drèze, & Purk, 1994). However, note that the scratch-and-save promotion concept is incompatible with the everyday low pricing strategy.

10. Some researchers have found that subjects' perceptions or choices in experience paradigms favor frequency discounting or everyday low pricing over depth discounting (e.g., Alba et al., 1994; Danziger et al., 2014), which would yield an effect in the same direction as a description–experience gap in the present context. The absence of a reliable gap in our data for Problems 1–3 suggests that a similar effect did not occur in our experiments, possibly because the small risky discount was close in magnitude to the safe discount for those problems (see Table 1).

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