The Power of Uncertainty

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Do people repeat an action more if the outcome of the action is certain than if it is uncertain? We find that consumers, for example, repeat the purchase more for an uncertain discount than a certain discount, because the desire to resolve uncertainty has extra motivational power.

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EXTENDED ABSTRACT
Suppose that from time to time you would get a coffee from a local café. Consider two alternative scenarios. In one scenario (certain), every time you buy a coffee, you receive a $1 discount. In the other scenario (uncertain), every time you buy a coffee, you receive a $1 discount or a $0.50 discount, and you won’t know which discount you will receive until you make the purchase. In which scenario will you buy more coffees from this café?

There are good reasons to predict that you will be more likely to keep buying coffees from this café if it offers the certain discount than if it offers the uncertain discount. For one, you would save more money under the certain discount than under the uncertain discount. For another, if you are like most normal consumers, you would prefer certainty to uncertainty, and the certain discount will allow you to enjoy more certainty than the uncertain discount.

Yet we predict the opposite. We predict that you will repeat the purchase more if the discount you enjoy is uncertain than if it is certain. We propose that outcome uncertainty can increase rather than decrease activity persistence and we attribute this effect to uncertainty resolution. Uncertainty resolution is a positive experience and reinforces the corresponding behavior. We tested this uncertainty effect and its mechanism in diverse contexts, and found that uncertainty in payment (Study 1) increases willingness to repeat in work, uncertainty in discount (Study 2) and uncertainty in price (Study 3) increase willingness to repeat in purchase, and uncertainty in prize (Study 4) increases willingness to repeat in study. These studies all involved real consequences to participants.

Take Study 3 as an example. The study ran a sales program for Reese’s Peanut Butter Cups Miniatures. The sales program had three versions of pricing: certain low price (10 cents each), certain high price (15 cents each), and uncertain price (either 10 or 15 cents with equal chances). Each buyer encountered one version of the sales program, and decided whether to purchase the Reese’s Cups one by one. In either certain price program, if the buyer decided to purchase, (s)he drew a Reese’s Cup from a bag and paid its price. In the uncertain price program, if the buyer decided to purchase, (s)he drew a Reese’s Cup from a bag and paid the price indicated by the cup. We found that in general, the uncertain price induced a larger demand than the certain low price, and the certain low price induced a larger demand than the certain high price. Among those who decided to make purchases, the participants in the uncertain-price condition made more purchases than both those in the certain-low-price condition and those in the certain-high-price condition, and the purchases in the latter two conditions did not differ. These findings suggest that (a) adding uncertainty into a price can generate a larger demand than lowering the price, and that (b) price magnitude may influence the initial purchase, but price uncertainty drives purchase along the way.

In other studies, we found that (a) people are willing to repeat an activity when they have the opportunity to resolve uncertainty after each outcome but not when they don’t have such an opportunity, (b) they do not decide to repeat because the outcomes they receive are varied, and (c) in prospect, they do not expect they would enjoy uncertain outcomes.

For another example, in Study 2 we introduced a second certain control condition, varied-but-certain outcomes, to assess the possible explanations based on outcome variety (e.g., the good outcome in the uncertain prospect may appear even better due to the contrast effect; varied outcomes may be more resistant to hedonic adaptation than fixed outcomes). Participants purchased Band-Aids piece by piece to earn coupons and decided whether to make the purchase again. Some received a 10-cent coupon for sure (certain-fixed) for each purchase; some received either a 10-cent or 5-cent coupon with equal chances (uncertain) for each purchase; and some also received either a 10-cent or 5-cent coupon with equal chances for each purchase but knew which coupon they would receive in advance (yoked to uncertain; certain-varied). We found that participants in both certain-varied and certain-fixed conditions made about the same number of purchases, but those in the uncertain condition made many more purchases. These findings suggest that the uncertainty effect we observed is caused by outcome unknown-ness, rather than outcome variety. In another study, Study 4, we manipulated whether participants had the opportunity to find out the unknown (uncertainty with vs. without resolution after each task) and found direct evidence for our proposed account: uncertainty resolution reinforces behavioral repetition.

In summary, contrary to what decision theories would expect and what lay people would predict, we document the neglected reinforcing power of uncertainty: people are more likely to repeat an activity if the size of its outcome is uncertain than if it is certain. Our findings provide insights for designing incentive schedules in managerial and marketing domains.