



ASSOCIATION FOR CONSUMER RESEARCH

Labovitz School of Business & Economics, University of Minnesota Duluth, 11 E. Superior Street, Suite 210, Duluth, MN 55802

Uncertainty Increases Motivation

Ayelet Fishbach, University of Chicago, USA

Christopher Hsee, University of Chicago, USA

Luxi Shen, Chinese University of Hong Kong, China

Contrary to existing research showing uncertainty aversion, we find that uncertainty increases motivation: People invest more time, effort, and money to pursue uncertain rewards (e.g., a 50% chance at \$10) than certain rewards of higher expected values (e.g., \$10 for certain).

[to cite]:

Ayelet Fishbach, Christopher Hsee, and Luxi Shen (2014) , "Uncertainty Increases Motivation", in NA - Advances in Consumer Research Volume 42, eds. June Cotte and Stacy Wood, Duluth, MN : Association for Consumer Research, Pages: 681-682.

[url]:

<http://www.acrwebsite.org/volumes/1017841/volumes/v42/NA-42>

[copyright notice]:

This work is copyrighted by The Association for Consumer Research. For permission to copy or use this work in whole or in part, please contact the Copyright Clearance Center at <http://www.copyright.com/>.

Uncertainty Increases Motivation

Luxi Shen, Chinese University of Hong Kong, China
Ayelet Fishbach, University of Chicago, USA
Christopher K. Hsee, University of Chicago, USA

EXTENDED ABSTRACT

Consumers often invest resources (e.g., effort, time, or money) to pursue an item of an uncertain magnitude. Will uncertainty increase or decrease resource investment (i.e., motivation)? Previous research found that in choice and evaluation, people prefer certain gains over uncertain gains (Bernoulli 1738; Kahneman and Tversky 1979; Gneezy, List, and Wu 2006; von Neumann and Morgenstern 1944). In this research we focus on motivation rather than choice and evaluation, and explore the possibility that while pursuing a reward, people are more motivated by an uncertain reward than by a certain reward, even if the latter entails a higher expected value.

We define a certain reward as a reward of a certain magnitude (e.g., a 100% chance at V ; $V > 0$) and an uncertain reward as a reward of an uncertain magnitude (e.g., a 50% chance at V and a 50% chance at c ; $V > c > 0$). By controlling the best-case scenario of the two rewards, we run a strong test for the motivational impact of uncertainty.

We suggest that uncertainty is exciting and predict that uncertainty increases motivation by generating a positive experience during the pursuit of a reward of an uncertain magnitude. Research has shown that uncertainty about positive outcomes stimulates positive feelings and arousal (i.e., excitement, enjoyment, and suspense; Bar-Anan, Wilson, and Gilbert 2009; Brehm and Self 1989; Lee and Qiu 2009; Wilson et al. 2005; Zillmann 1983). Thus, uncertainty can be a source of positive experience. Moreover, excitement increases motivation because excitement is a positive feeling, and according to motivation theory, positive feelings increase motivation (Czikszentmihalyi 1990; Custers and Aarts 2005; Erez and Isen 2002; Ferguson 2008; Fishbach and Choi 2012; Shah and Kruglanski 2000).

An important moderator of the motivating uncertainty effect is the focus on process (pursing the reward) versus outcome (reward itself) of the reward pursuit. When inside the process of reward pursuit, people spontaneously attend to the process, and affective aspects, such as excitement, are central to their decisions on how much resource to invest to pursue the reward. By contrast, when outside of the process of reward pursuit (e.g., when deciding in prospective), people spontaneously attend to the outcome, and non-affective aspects, such as the value of the outcome, are central to their decisions (Bagozzi and Dholakia 1999; Choi and Fishbach 2011; Gollwitzer 2012; Kivetz 2003; Hsee and Rottenstreich 2004; Millar and Tesser 1986).

We examined the motivating uncertainty effect and its mechanism in four studies, all involving real rewards and resource investment.

Study 1 ($N = 87$) provides an initial demonstration that uncertainty can increase motivation. We found that whereas 70% of participants completed a water-drinking task in pursuit of an uncertain reward (\$2 or \$1 depending on a coin toss), only 43% completed the same task in pursuit of a certain reward (\$2).

Study 2 ($N = 530$) replicates the motivating uncertainty effect across a range of reward probabilities (from 1% to 99%). MTurk participants worked on an ad evaluation task for a bonus, and those who evaluated more ads than the average number across all participants qualified for a bonus. We had two major findings. First, on average, participants incentivized by an uncertain bonus (1%, 40%, 50%, 60%, 99%, an unspecified chance at \$0.50; otherwise, \$0.20)

evaluated more ads than those incentivized by a certain bonus (\$0.50 or \$0.20). Second, each uncertain bonus in this design was more motivating than the certain, economically better bonus (\$0.50).

Studies 3 and 4 investigate the process underlying the motivating uncertainty effect, namely, excitement during the process of reward pursuit. Specifically, Study 3 ($N = 138$) demonstrates that uncertainty increases motivation only during the process of pursuing a reward but not before the process starts. Participants bid against each other for a bag of Godiva truffle chocolates in a multiple-round auction. The bag contained either a certain number of truffle chocolates (5 in an unwrapped bag) or an uncertain number of truffle chocolates (5 or 3 in a wrapped bag); participants either elicited their WTP before the auction (presumably focus on outcome) or throughout the auction (presumably focus on process). We found that when stating WTP in advance participants gave a higher reservation price to the certain bag, but during the actual bidding process, they bid higher for the uncertain bag.

Study 4 ($N = 185$) further examines our account that uncertainty adds excitement to the process and reveals that uncertainty brings excitement and excitement boosts motivation. We manipulated participants' focus by experimentally instructing them to focus on process or outcome (or control, no instruction). We also measured their excitement experience. The findings are that participants who focused on process (or control) priced the uncertain item higher than the certain item, whereas participants who focused on outcome priced the certain item higher, and that the excitement experience mediated the motivating uncertainty effect.

In sum, we document a robust positive effect of uncertainty on motivation: uncertain rewards increase motivation. We further demonstrate that this effect occurs when people focus on process (pursing the reward) rather than when they focus on outcome (the reward itself) and that uncertainty in reward magnitude creates excitement, thereby increasing motivation. Our research yields theoretical contributions about when people react positively or negatively towards uncertainty and practical implications about how to devise cost-efficient incentive systems, including consumer loyalty programs.

REFERENCES

- Bagozzi, Richard P. and Utpal Dholakia (1999), "Goal Setting and Goal Striving in Consumer Behavior," *Journal of Marketing*, 63, 19-32.
- Bar-Anan, Yoav., Timothy D. Wilson, and Daniel T. Gilbert (2009), "The Feeling of Uncertainty Intensifies Affective Reactions," *Emotion*, 9(1), 123-27.
- Bernoulli, Daniel (1738), "Specimen Theoriae Novae de Mensura Sortis," *Comentarii Academiae Scientiarum Imperialis Petropolitanae*, 5, 175-92 (translated by L. Sommer in *Econometrica*, 1954, 22(1), 23-36).
- Brehm, Jack W. and Elizabeth A. Self (1989), "The Intensity of Motivation," *Annual Review of Psychology*, 40(1), 109-31.
- Choi, Jinhee and Ayelet Fishbach (2011), "Choice Is an End versus a Means," *Journal of Marketing Research*, 48(3), 544-54.
- Custers, Ruud and Henk Aarts (2005), "Positive Affect as Implicit Motivator: On the Nonconscious Operation of Behavioral Goals," *Journal of Personality and Social Psychology*, 89(2), 129-42.

- Czikszentmihalyi, Mihalyi (1990), *Beyond Boredom and Anxiety: The Experience of Flow in Work and Games*, San Francisco, CA: Jossey-Bass.
- Erez, Amir and Alice M. Isen (2002), "The Influence of Positive Affect on the Components of Expectancy Motivation," *Journal of Applied Psychology*, 87(6), 1055-67.
- Ferguson, Melissa J. (2008), "On Becoming Ready to Pursue a Goal You Don't Know You Have: Effects of Nonconscious Goals on Evaluative Readiness," *Journal of Personality and Social Psychology*, 95(6), 1268-94.
- Fishbach, Ayelet and Jinchee Choi (2012), "When Thinking about Goals Undermines Goal Pursuit," *Organizational Behavior and Human Decision Processes*, 118, 99-107.
- Gneezy, Uri, John A. List, and George Wu (2006), "The Uncertainty Effect: When A Risky Prospect Is Valued Less Than Its Worst Possible Outcome," *Quarterly Journal of Economics*, 121(4), 1283-1309.
- Gollwitzer, Peter M. (2012), "Mindset Theory of Action Phases," in *Handbook of Theories of Social Psychology Vol. 1*, ed. Paul A. M. Van Lange, Arie W. Kruglanski, and E. Tory Higgins, London: Sage Publications, 526-45.
- Hsee, Christopher K. and Yuval Rottenstreich (2004), "Music, Pandas, and Muggers: On the Affective Psychology of Value," *Journal of Experimental Psychology: General*, 133, 23-30.
- Kahneman, Daniel and Amos Tversky (1979), "Prospect Theory: An Analysis of Decision under Risk," *Econometrica*, 47(2), 263-92.
- Kivetz, Ran (2003), "The Effects of Effort and Intrinsic Motivation on Risky Choice," *Marketing Science*, 22(4), 477-502.
- Lee, Yih Hwai and Cheng Qiu (2009), "When Uncertainty Brings Pleasure: The Role of Prospect Imageability and Mental Imagery," *Journal of Consumer Research*, 36(4), 624-33.
- Millar, Murray G. and Abraham Tesser (1986), "Effects of Affective and Cognitive Focus on the Attitude-Behavior Relation," *Journal of Personality and Social Psychology*, 51(2), 270-76.
- Shah, James Y., and Arie W. Kruglanski (2000), "The Structure and Substance of Intrinsic Motivation," in *Intrinsic and Extrinsic Motivation: The Search of Optimal Motivation and Performance*, Vol. xix, ed. Carol Sansone and Judith M. Harackiewicz, San Diego, CA: Academic Press, 105-27.
- Von Neumann, John and Oskar Morgenstern (1944), *Theory of Games and Economic Behavior*, Princeton, NJ: Princeton University Press.
- Wilson, Timothy D., David B. Centerbar, Deborah A. Kermer, and Daniel T. Gilbert (2005), "The Pleasures of Uncertainty: Prolonging Positive Moods in Ways People Do Not Anticipate," *Journal of Personality and Social Psychology*, 88(1), 5-21.
- Zillmann, Dolf (1983), "Transfer of Excitation in Emotional Behavior," in *Social Psychophysiology: A Sourcebook*, ed. John T. Cacioppo and Richard E. Petty, New York: Guilford, 215-40.