From Strong Uncertainty-Loathing to Strong Uncertainty-Loving

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We propose a theoretical framework and present empirical evidence to reconcile two starkly contradictory findings in the literature: extreme uncertainty-loathing by Gneezy et al. (2006) and extreme uncertainty-loving by Shen et al. (2015).

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EXTENDED ABSTRACT

In the last decade, two lines of research on uncertainty have found their places in the literature: one by Gneezy, List, and Wu (2006) documenting a strong uncertainty-aversion effect, and one by Shen, Fishbach, and Hsee (2015) documenting a strong uncertainty-loving effect. Each line is surprising by itself, and more surprising is the contrast between the two. This research aims to reconcile these two striking (and strikingly opposite) effects and build up a theoretical framework to understand responses to uncertainty in general.

Consumers have different responses to exogenous uncertainty, that is, the out-of-personal-control kind of uncertainty. It appears that most of the times, they are uncertainty averse (e.g., Arrow 1965; Holt and Laury 2002; Kahneman and Tversky 1979) and sometimes uncertainty loving (e.g., Dhar, Gonzalez-Vallejo, and Soman 1995; Goldsmith and Amir 2010; Mazar, Shampanier, and Ariely 2016). It is important to note that as long as the response to the uncertainty outcome is still bounded by the responses to its worst and best outcomes for certain, both uncertainty aversion and loving here are still congruent to the dominance principle, that is, the certain incentive of a high value should dominate the uncertain incentive of the expected value, and in turn, the uncertain discount should dominate the certain incentive of a low value.

Anomalies do exist. As a violation of dominance against the lower bound, Gneezy et al. (2006) demonstrated a strong uncertainty-aversion effect. Research participants were willing to work even less to earn a lottery ticket of an uncertain payment than its worst possible payment. As a violation of dominance against the upper bound, Shen et al. (2015) demonstrated a strong uncertainty-loving effect. Research participants worked even harder to earn a bonus of an uncertain magnitude than a bonus of a certain, larger magnitude. We describe both above effects as “strong,” because each is a violation of the dominance principle.

In this research, we suggest that they actually do not happen at the same time. Strong uncertainty-aversion occurs before one engages in the activity, or “in-prospect,” while strong uncertainty-loving occurs when one engages in the activity, or “in-process.” Thus, the mode in which decisions are made, in-prospect versus in-process, moderates the effect of this incentive uncertainty. Specifically, we hypothesize that strong uncertainty aversion occurs in prospect, while strong uncertainty loving occurs in process.

The in-prospect and in-process decisions vary on many psychological aspects (see Figure 1 for a summary of the literature review). However, all psychological differences have their root in one physical feature: continuity. The in-prospect decision is often made on a single time point and hence can be seen as a static decision in a temporal isolation. By contrast, the in-process decision is often made over time and hence can be seen as a dynamic decision in a temporal continuum. Therefore, we propose a “continuity hypothesis”: that the effect from a single decision with continuity (in-process decisions) differs from the combined effects from multiple decisions in isolation (in-prospect decisions). Continuity adds extra utility into the process, and this process utility is usually in the form of high arousal and emotion. In the case of exogenous uncertainty, the extra utility can be in the form of excitement and engagement (Goldsmith and Amir 2010; Lee and Qiu 2009; Shen et al. 2015; Vosgerau, Wertenbroch, and Carmon 2006; Wilson et al. 2005).

We test this framework in a series of four experiments. All experiments entail real consequences for the participants and hence are incentive-comparable. In a typical experiment, participants were assigned to one of six conditions, which constitute a 3 (outcome: certain high (HI) vs. certain low (LO) vs. uncertain (UN)) x 2 (decision mode: in-prospect vs. in-process) between-participants design. In one study, participants were given the opportunity to repeatedly guess the meaning of a foreign word, and were promised to earn $0.25 (LO), $0.50 (HI), or either $0.25 or $0.50 (UN) if they made the correct guess. The word was designed to be so difficult that no one could guess it correctly, so the DV was persistence. As for an in-prospect decision, the participants, before starting the task, indicated how long they would persist. As for an in-process decision, the participants worked on the task and we observed how long they actually persisted. We found that for in-prospect decisions, the persistance pattern followed: HI > UN = LO, indicating not so strong uncertainty aversion and failing to replicate Gneezy et al. (2006), whereas for in-process decisions the persistance pattern followed: UN > HI > LO, indicating strong uncertainty loving and succeeding in replicating Shen et al. (2015). In another study, we found the strong uncertainty aversion did occur in in prospect, but as documented by Yang, Vosgerau, and Lowenstein (2013), the uncertain outcome had to be framed as a lottery.

In other studies, we further replicated this in-prospect/ in-process discrepancy on (a) ambiguity (when UN does not specify the probability of each outcome), (b) choices (when the behavioral measurement was a discrete variable), and (c) pricing measurement (when the behavioral measurement has sensible financial consequences). In the last study, we directly tested the continuity hypothesis by breaking an in-process decision into several in-prospect decisions and gathered supportive evidence.

To the best of our knowledge, we are the first to reconcile the Gneezy effect and the Shen effect, and we are also the first to demonstrate both effects by manipulating a single factor in a single experiment with the same decision context and on the same magnitude level. This research does not only resolve a “conflict” in the literature but also greatly advances our understanding of how people behave under uncertainty in prospect and in process.

REFERENCES


Yang, Yang, Joachim Vosgerau, and George Loewenstein (2013), “Framing Influences Willingness to Pay but Not Willingness to Accept,” Journal of Marketing Research, 50(6), 725-38.