Shake Hard Play Hard: the Impact of Risk on Consumer Behavior in the Aftermath of Disaster

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EXTENDED ABSTRACT

Danger is an inescapable part of human existence; understanding how consumers naturally respond to and behaviorally cope with risk is theoretically important not only for marketing but for fields ranging from psychology to finance to public health. We use geo-physical and mobile phone data of 157,358 victims of the 2013 Ya’an earthquake (Ms 7.0) in China to diagnose the effects of the disaster and test the hypothesis that hedonic activities have an important role in promoting psychological recovery. Combining mobile phone app usage data, field surveys, and the naturally occurring instrument of an earthquake, we investigate how experiencing different levels of real disaster risk changes human behavior. Contrary to the intuition that solemnity dominates society’s response to tragedy, we find that hedonic activity (i.e., having fun) has a special role in alleviating the negative psychological impact of disaster. Furthermore, we document and model the temporal patterns of post-disaster recovery to advance a dynamic understanding of behavioral processes that are often studied from a static perspective.

We investigate how experiencing real risk (different levels of earthquake intensity) changes post-disaster behavior captured by daily individual-level usage of mobile applications, telecommunications, and internet, and whether these behavioral responses ameliorate perceived risk, the negative psychological state inflicted by the disaster. In this research, the earthquake is conceptually a multi-leveled experiential treatment of risk (that is difficult to replicate in the lab). The population scale data about each individual’s daily app usage patterns reflects changes in daily life patterns after the shock of the earthquake. For example, one might infer that informational app usage corresponds to greater information seeking (i.e., greater uncertainty or greater desire for information).

We find that rather than reduce the scope of human activity, higher earthquake intensity yielded graded increases in communications (e.g., social networking, messaging), functional (e.g., informational tools), and hedonic (e.g., music, videos, games) app usage. Formally, we used a fixed effects model to show that higher levels of experienced earthquake intensity caused graded increases in app usage in each category. However, only increased hedonic behavior reduced perceived risk during recovery.

We measured perceived risk a week after the earthquake in a large scale field survey conducted by phone (N = 2000) that was linked to the mobile data (we only surveyed earthquake victims who we had mobile data for). Prior literature has used perceived risk to capture the negative psychological feeling induced by risk, which in our research reflects the negative psychological impact of experiencing earthquake risk). An instrumental variable analysis using a two-stage Tobit model (with censored dependent variables to account for the heavily right-censored perceived risk measures), showed that only increased hedonic behavior reduced perceived risk after the earthquake. Increased communications behavior, which one might have thought brought greater emotional support, predicted an increase in perceived risk, possibly as a result of more exposure to risk-related information. Functional behaviors were not significant predictors of change in perceived risk, possibly because functional behaviors (like checking one’s finances) occurred independently of risk perception.

We also map the temporal patterns of post-disaster behavioral recovery, which are not linear, but typically follow exponential-decay functions, i.e., initial behavioral spikes quickly decline and then persist for a long time at a low level. Overall, the characteristics and relative efficacy of each facet of the population’s behavioral response intuit their shifting roles over time, and suggest that hedonics are an effective population-scale coping strategy that is often missing in society’s response to disaster.

This research makes several conceptual, applied, and methodological contributions. Conceptually, the paper focuses on risk, which is a classic topic in marketing and the behavioral sciences. From a theoretical standpoint, we investigate the potential of utilizing hedonic consumer behavior as a means of promoting psychological recovery from negative psychological states. Despite the existence of an established literature on the power of hedonics, fun is traditionally perceived to be divorced from risk and governments often enforce anti-hedonic policies, such as compulsory national mourning and bans on leisure activities such as fun television programming. However, our results suggest that pleasure should be allowed to mix with tragedy, and that hedonics (particularly hedonic consumer behavior) play an important role in promoting population-scale psychological recovery. This finding is not only of interest to marketers, governments, and NGO’s alike.

In addition to our conceptual findings related to risk and experiential psychology, we make numerous methodological contributions to consumer behavior research. We use new mobile big-data methods to explore several empirical questions in consumer psychology that have only become possible after the mobile and big data revolutions (e.g., the relationship between real risk experiences and changes in consumer behavior over time; it would have been difficult to replicate the psychological effect of the earthquake in a lab setting, or to measure its impact over time.). Our use of a mobile data in a rare natural experiment setting also explores the meaning of ‘big data’ (e.g., individual-level population-scale app usage) from a consumer behavior perspective. Our methodology is applicable to many domains of consumer behavior and social psychology, which have traditionally been criticized for small sample sizes, biased selection, and other methodological flaws, and stands to benefit from new advances of the big-data revolution. Both academia and industry are both increasingly affected by ‘big-data’ insights; finding new ways in which behavioral sciences can contribute to this growing conversation is existentially important for our field. We believe many such opportunities exist: statistics-oriented data sciences are often theory-light in human behavior and do not rigorously explore the psychological meaning of many behaviors that are observable in big-data. For example, what can mobile meta-data such as app usage reflect about what a person is thinking or feeling? In exploring such questions, we hope to demonstrate the value of consumer behavior research and psychological theory in ‘big data’.