When Numbers Are Frightening: Effects of Message Framing on Judgments of Risk and Behavioral Intentions

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We propose that framing may cause consumers to respond differentially to equivalent descriptions of the same information. Specifically, when the information is framed negatively (e.g., require repairs) respondents are more likely to engage in risk-reducing behaviors and buy a product if relative frequency (e.g., 1/20) is used as compared to percentage (e.g., 5%), but when the information is framed positively (e.g., operate without repairs) this effect disappears. We investigate the underlying process and show that when the impact information is presented as negative relative frequency respondents exhibit higher negative affect, resulting in higher perceived risk and lower choice likelihood.

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EXTENDED ABSTRACT

Consumers’ judgments of risks and benefits associated with specific products or issues may be highly susceptible to numerically framing of the “impact” information. For example, people rated cancer as riskier when it was described as killing 1,286 out of 10,000 people than when it was described as killing 24.14 out of 100 people (Yamagishi 1997). Likewise, communicating the possibility that a patient may exhibit violent behavior using a relative frequency (2 out of 10) led to higher perceived risk than did communicating the possibility by means of a comparable probability (20%; Slovic, Monahan and MacGregor 2000). Thus, the numerical framing may cause decision makers to respond differently to objectively equivalent descriptions of the same problem.

Consumers are often exposed to statistics similar to the ones presented above. Imagine that Consumer Reports has listed that 95% of the computers of a manufacturer are expected to operate without repairs, or that 19 out of 20 of the computers of the manufacturer are expected to operate without repairs. Will consumers draw different conclusions about the risks associated with buying a computer because of the numerical framing? What about when the risk communication is framed negatively – a statement indicating that 5% (vs. 1 out of 20) of the computers of a manufacturer are expected to require repairs? In this paper, we examine how attribute framing (positive vs. negative) and numerical framing (probability vs. relative frequency) affect consumers’ perceptions of risk and behavioral intentions. We also investigate the process driving the results, and demonstrate that affect mediates the framing effects on risk perceptions.

Our study investigates framing effects when the impact information is associated with a specific option or event evaluated independently. It is different from previous research on risky choice framing where several options differing in risk level are compared (e.g., the Asian disease problem, Tversky and Kahneman 1981) or when multiple options are evaluated jointly or separately (e.g., Hsee 1996). Although previous studies conclude that people perceive relative frequency expressions of likelihood as suggesting greater risk than equivalent probability expressions (e.g., Slovic et al. 2000), our study brings additional insights by investigating not only the combined effect of numerical and attribute framing on risk perceptions and the process behind the effect, but also by relating the risk perceptions to behaviors relevant to policy makers and marketers.

Building upon the cognitive-experiential self theory (e.g., Epstein et al. 1992; Kirkpatrick and Epstein 1994), affect-as-information (Schwarz and Clore 1988) and attribute framing (Levin et al. 1998), we hypothesize that attribute framing moderates the effect of numerical framing on consumers’ perceptions of risk and behavioral intentions. Also, perceived risk is proposed to mediate the effect of framing on risk-reducing behaviors and purchase intentions. Finally, we expect negative affect to mediate the numeric and attribute framing effects on risk perceptions.

We implement three studies to test the above hypotheses. In study 1 we show that under negative attribute framing respondents report higher perceived risk when the impact information is presented as relative frequency as compared to percentage; there is no difference in risk perceptions when the impact information is framed positively. Study 2 provides empirical support to our hypotheses that under negative attribute framing respondents are more likely to engage in risk-reducing behaviors under relative frequency as compared to numeric framing, and this effect is mediated by perceived risk; there is no difference in risk perceptions and risk-reducing behaviors when the impact information is framed positively. We also rule out potential alternative explanations for the observed effect including numerical ability, expertise, risk aversion, style of processing, and visual imaging. Finally, study 3 provides empirical support to our proposed mechanism that negative affect mediates the effect of numeric and attribute framing on risk perceptions. We also extend the results of study 2 by showing that risk perceptions affect not only the risk-reducing behaviors in which consumers may engage, but also their product purchase likelihood.

Our study contributes to the framing literature by showing the conditions in which relative frequency and percentage framing have a differential effect on consumers’ perceptions and behavioral intentions. We provide evidence that biases associated with numerically framing the impact information can be minimized by framing the risk communication in a positive manner. Further, we relate the risk perceptions to behaviors relevant to policy makers and marketers (e.g., importance of a warranty and likelihood to buy a warranty).

Our study also adds to the growing literature in the area of affect-as-information. We provide evidence that the framing of the impact information per se can be used as a piece of information that affects consumers’ perceptions, attitudes and behaviors. Adding to previous studies that have demonstrated the importance of affective reactions in the context of risky choice framing and risk-benefit analysis (e.g., Rottenstreich and Hsee 2001; Finucane et al. 2000), we suggest that affective reactions can be also triggered by impact information presented in various formats.

From a practical point of view, our study suggests how risk communications can be made more effective and instrumental in promoting positive and reducing negative consumer behaviors and outcomes. Specifically, consumers may be encouraged to engage in risk-reducing behaviors (e.g., breast self-examination, AIDS preventive behaviors) by using negative relative frequency framing in risk communications. Further, consumers may be made aware of framing techniques that marketers use to increase the likelihood of purchasing unnecessary products or services, and be educated on how to avoid access spending (e.g., buying insurance, gambling). Last but not least, companies may try to adopt relative frequency negative framing as a part of their communications in order to encourage consumers to buy options and value-added services (e.g., extended warranty) that will be beneficial for the consumers and improve their overall product experience.

REFERENCES


