

**Making Probability Judgments of Future Product Failures: Packing versus  
Unpacking the Problem**

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### Extended Abstract

While making product use or purchase decisions, consumers often make explicit or implicit judgments regarding potential product failures in the future. In a related vein, through advertisements and other actions, managers often have the flexibility to influence what types of information are presented to consumers. For instance, in their magazine advertisements and package inserts, the birth control pill ORTHO TRI-CYCLEN<sup>®</sup> outlines the frequent adverse reactions in the form of headache, nausea, and abdominal pain.

Prior research has found that people often do not follow the extensional logic of probability theory while making probability judgments and are frequently influenced by the information format (Kahneman et al. 1982). Specifically, in the context of the ORTHO TRI-CYCLEN<sup>®</sup> example outlined above, would consumers have differential judgments for “packed” versus “unpacked” information? Prior research (e.g., Fiedler and Armbruster 1994; Rottenstreich and Tversky 1997; Tversky and Koehler 1994) would suggest that people would have a higher probability judgment for the unpacked (“adverse reaction in the form of headache, nausea, abdominal pain”) than for the equivalent packed (“some form of adverse reaction”) condition. This is because people tend to assign probabilities to descriptions of events, called *hypotheses*, rather than to actual events (Tversky and Koehler 1994). As a result, consumers’ probability judgments for the focal hypothesis relative to the alternative hypothesis are influenced by how events are described. In this context, Support theory “predicts that the judged probability of an event increases by unpacking the focal hypothesis and decreases by unpacking the alternative hypothesis” (Rottenstreich and Tversky 1997, p 406). Support theory also predicts that the judged probability assigned to an unpacked description of an event is greater than the packed description (Tversky and Koehler 1994). Hence, when the description of an event is unpacked into its individual components, people are likely to assign an overall higher probability judgment for the event’s occurrence. This phenomenon has been termed as “subadditivity” in probability judgments. Many other research streams (e.g., Fiedler and Armbruster 1994; Fischhoff, Slovic and Lichtenstein 1978; Teigen 1974, 1983) have found similar patterns of results.

We extend the basic premise of information packing/unpacking, and examined scenarios where participants themselves generated the unpacking variables, unlike as in prior studies where participants were given explicit unpacking questions. We also examined how prior general negative experiences with the product can influence the evaluation outcomes.

When a consumer is asked to make probability judgments about future product performances, in light of past experiences, in essence it translates into making a conditional prediction. Conditional predictions conform to the format of asking participants the probability of an outcome  $y$ , given condition  $x$  has occurred (Koriat,

Fiedler, and Bjork 2006). In the context of the present research,  $y$  can be conceptualized as the probability judgment regarding future product failure, while  $x$  can represent past experiences with the product (e.g., negative experience in the form of product failures). Koriat, Fiedler, and Bjork (2006) found that “in making conditional predictions, people are subject to a prediction inflation bias, overestimating the likelihood of occurrence of the stated outcome given the stated envisioned condition” (p. 430). This implies that if people have had prior negative experiences with a product class, they are more likely to have unfavorable predictions regarding future product failures. However, more interestingly, people are likely to have a greater level of prediction inflation bias, when they can build “a causal scenario leading from the condition to the outcome” (Koriat, Fiedler, and Bjork 2006, p. 443).

We are proposing that a general negative experience with the product in the past, would lead to a stronger causal mapping in the “packed” data condition, since a general experience can be more directly mapped with a general (than specific) problem in the future. In contrast, when the questions are unpacked, consumers are less likely to form a direct causal mapping between the past experience and making the conditional prediction regarding the future, for more specific problems.

Hence, we hypothesized that a general negative product experience in the past would unfavorably impact judgments to a greater degree when the problem is packed (than unpacked). In contrast, prior general positive experiences with a product would lead to lower probability judgments regarding future product failures, to a greater extent for unpacked (than packed) conditions. The results of a 2 (packed vs. unpacked) X 3 (negative prior experience vs. positive prior experience vs. no prior experience) between-subjects experiment supported our hypotheses.

Study 2 attempted to examine if participants have increased probability judgments for unpacked versus packed conditions, in an increasing linear fashion? That is, if 5 levels of mental unpacking lead to greater probability judgments than a packed scenario, will a 12-level unpacking lead to an even greater probability judgment? We hypothesized that when the generation of unpacking variables is easy, consumers would have a higher probability judgment of future product failure for the mentally “unpacked” than “packed” conditions; when the generation of unpacking variables is difficult, consumers would have similar probability judgments of future product failure for the “unpacked” and the “packed” conditions. Moreover, these hypothesized relations will become stronger for high (vs. low) need for cognitive closure participants. The results of 3 (packed condition vs. unpacked with 4 variables generated vs. unpacked with 12 variables generated) X 2 (Need for Cognitive Closure: High vs. Low) between-subjects experiment supported our hypotheses.

Combined, the two experiments showed that a general prior negative experience had a stronger impact on participant judgments, for future product failures, in the packed (than the unpacked) condition, with the pattern of results getting reversed for prior positive experience with the product. Also, when asked to generate the unpacking variables,

participants had higher probability judgments of future product failures only when they were able to generate the variables with relative ease.

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