Gleaning Signals From Sold-Out Products

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This article models preference construction using Bayesian updating triggered by a particular market signal: namely, when a product is observed to have sold out in a store. We demonstrate how soldout-products change consumer preference for the remaining options with two Bayesian models and test the effects in three experiments.

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EXTENDED ABSTRACT
This article examines one type of market signal — a soldout product — and the inferences that purchasers make when they observe a soldout product. The notion that preferences of some consumers can shape those of others has been studied in the literature on social influence involving word of mouth, opinion leaders, reference groups, and herd behavior (Godes and Mayzlin 2004; Summers 1970). But inter-personal influence can emerge even without explicit communication or direct observation of other people’s behavior. We argue that a soldout condition (when a certain product is sold out) is a market signal that accompanies an indirect mechanism of interpersonal influence on consumer choice.

We consider consumers who are initially uncertain about their preferences for a product, perhaps because they have never tried the product before. A soldout condition is interpreted as a signal that other consumers find the soldout product desirable. We develop and test a model whereby consumers (positively) update their expected preferences for the remaining products that are similar to the soldout product. We call the inference arising from a soldout product, the “preference signaling” effect.

The change in perceived desirability of a product, arising from observed market factors, is consistent with the concept of constructive preferences (Bettman, Luce and Payne 1998; Lichtenstein and Slovic 2006; Tversky and Thaler 1990). According to this view, preference is an evolving, context-dependent process. In the current article, the mechanism of preference construction is modeled as Bayesian updating; and a soldout condition constitutes a signal upon which an update is formed. The current research, thus, demonstrates how Bayesian thinking can underlie preference construction.

To motivate our hypotheses, we develop two Bayesian models: an attribute-free benchmark model and an attribute-based model. Both models require assumptions about consumer beliefs about previous store inventory levels and traffic/visits of other consumers to the store. In the former model, we derive the basic “preference signaling effect” and a boundary condition (whereby the market segment that gave rise to the soldout condition is unrepresentative of the focal consumer’s preferences). In the attribute-based model, we demonstrate that soldout alternatives can give rise to the well-known attraction effect (Huber, Payne and Puto 1982; Huber and Puto 1983), which we distinguish from the preference signaling effect. We further demonstrate that a soldout condition can induce attribute weight shifts along the key attribute dimensions of products. We derived four hypotheses from these models.

Hypothesis 1: A soldout condition will cause increased consumer preference for an available option similar to the soldout product.

Hypothesis 2: The soldout condition increase consumer preference for an available option (similar to the soldout product) only when the decision maker perceives him/herself to be similar to those who have purchased the soldout product. When a decision maker perceives him/herself to be different from those who purchased the soldout product, the soldout condition will not influence the decision maker’s choice.

Hypothesis 3: The soldout condition will lead consumers to accord more importance to the attribute dimension on which the soldout product (and the target product) has a high value relative to the rival.

Hypothesis 4: The combined influence of a preference signaling effect and an attraction effect for a similar available option in a soldout condition will be the strongest when the soldout product is inferior to the available option, followed by the case when the soldout product is equal to the available option, and the weakest when the soldout product is superior to the available option.

These hypotheses were substantiated by with three experiments involving children’s toys, exercise classes, and hotels for Hawaii beach vacations. Experiment 1 demonstrated a preference signaling effect, whereby the presence of a soldout product induced a greater choice share for a similar remaining option (H1). Experiment 2 supported a boundary condition whereby, if the soldout condition is attributable to consumers in a segment very different from the focal consumer, then the preference signaling effect does not occur (H2). Experiment 3 provided support for an attribute weight-shift effect (H3) and also showed that an inferior soldout product adds to the preference signaling effect whereas a superior soldout product lessens the preference signaling effect, consistent with H4 concerning the positive and negative attraction effects triggered by soldout products.

To the best of our knowledge, this research is the first to illustrate how Bayesian thinking can constitute a behavioral theory that explains “preference construction” in the face of market signals. This article illustrates an example of preference construction — where consumer preferences are formed or reformed, on the fly, by factors in the purchase environment. We show that a preference signaling effect is an outcome of Bayesian inference-making from soldout product signals. It would be desirable for future research to examine whether other forms of preference construction can be supported with models of Bayesian inference-making.

In particular, Lichtenstein and Slovic (2006, p. 1) argued that preference construction may arise when (1) some of the decision elements are unfamiliar; (2) preferences are unclear and it is difficult to make tradeoffs; or (3) positive and negative feelings are difficult to translate into a numerical response. Lichtenstein and Slovic (2006) also argued that the first situation (unfamiliarity) is rarely studied. This article implicitly restricts attention to such situations where consumers are considering unfamiliar decision options. It would be desirable to extend Bayesian models of thinking to other types of situations where preference construction is commonly employed — involving either tradeoffs between conflicting attributes or numerical quantification of preferences or probabilities. The literature has framed preference construction as a criticism of classical utility theory. From a conceptual perspective, we look forward to application of Bayesian thinking, along the lines illustrated in this article, to help begin to reconcile classical utility theory with the idea of preference construction.
REFERENCES