

The Out-of-Stock (OOS) Effect on Choice Shares of Available Options[☆]

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Abstract

Prior research on product out-of-stock (OOS) has mainly focused on the consequences of OOS due to consumers not being able to select their target options. The present research explores how OOS noticed by consumers without a specific target option in mind affects their preference among the in-stock options. We find that consumers can draw social inferences from OOS about the desirability of product features. Consequently, in-stock options that share feature with the OOS option enjoys choice advantage. We show that this effect occurs only when the OOS condition is caused by consumer demand (as opposed to by logistical causes), and only for consumers who are not product category experts. Further, consumers' belief on others' expertise and shopping goal determines which specific feature they will identify as the key feature that drives the OOS. These findings provide a more complete picture for how consumers respond to OOS. They also offer insights into making more accurate demand estimation and suggest a potential new tool for in-store marketing.

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Product out-of-stock (OOS) is a universal issue for retailers. On average, at any point of time, about 8 percent of SKUs are OOS in a typical retail store (Gruen, Corsten, and Bharadwaj 2002). Traditionally, OOS is viewed as an operational challenge for retailers. Research has found that consumers who encounter OOS are likely to postpone their purchase, switch to a different store, switch to other options, or simply decide not to purchase anymore (Anderson, Fitzsimons, and Simester 2006; Campo, Gijbrecchts, and Nisol 2000, 2003; Emmelhainz, Emmelhainz, and Stock 1991; Fitzsimons 2000; Sloot, Verhoef, and Franses 2005), all of which contribute to adverse consequences, such as hurting the firm's profitability (Anderson, Fitzsimons, and

Simester 2006; Jing and Lewis 2011) and creating difficulties in demand estimation (Anupindi, Dada, and Gupta 1998).

A common premise of these findings is that the OOS option is what the consumer has initially decided to choose. In other words, the scope of this research is limited to consumers who have planned to buy a certain option but later find it OOS. Industry research, however, indicates that only about 30 percent of purchase decisions are made before consumers enter the store (Advertising Age 2008; POPAI 1995). Thus, more commonly, consumers do not enter a store with a specific target in mind, and their decisions are influenced by what they find in the store (Chandon et al. 2009; Inman, Winer, and Ferraro 2009).

The focus of the present research in understanding the effect that finding an option OOS has on in-store decision making when the consumer does not have an a priori preference. Drawing on the theory of social inference, we propose that OOS conveys information about others' preference for the OOS option, which, under specified conditions, can be attributed to the desirability of certain features of the OOS option. We investigate whether this feature desirability inference systematically affects choice for available options. We refer to the influence of an OOS option on choice shares of available options as the *OOS effect*. Because of its basis in social inference, the OOS effect occurs only when the OOS condition is caused by consumer demand (as opposed

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to by logistical causes), and only for consumers who are not product category experts. In contrast to the traditional view that OOS generally has negative impact on retailers, we propose that retailers can benefit from OOS by using it as a tool of category management to improve sales.

Background and Theoretical Development

The Impact of OOS

A consumer may notice a certain option OOS either *after* s/he has decided to choose that option (e.g., during transaction), or *before* any preference has been formed (e.g., during information search). Previous research has mostly focused on the former situation, and suggested that consumers who find their desired option OOS will defer purchase, cancel the order, or switch stores (Anderson, Fitzsimons, and Simester 2006; Fitzsimons 2000). Further, if consumers decide to choose an in-stock option as a substitute, they are likely to choose options similar to the OOS product, a behavior referred to as “product switching” (Campo, Gijsbrechts, and Nisoli 2000, 2003; Emmelhainz, Emmelhainz, and Stock 1991; Sloot, Verhoef, and Franses 2005).

OOS also affects a consumer’s satisfaction with the retailer. Fitzsimons (2000) finds that OOS lowers customer satisfaction in general, and even more so if the OOS option is in (as opposed to out of) the consumer’s consideration set. Similarly, Pizzi and Scarpi (2013) show that participants are more dissatisfied when they learn about the OOS after, rather than before, deciding. These works suggest that OOS has a greater negative impact when consumers have already formed their preference for a target option than when they do not.

In comparison, relatively little attention has been paid to situations in which consumers encounter OOS without a target option in mind. Of the few exceptions, Ge, Messinger, and Li (2009) and Kramer and Carroll (2009) both find that OOS in this situation creates a sense of urgency and accelerates purchase. No research has studied whether and how OOS affects consumer choice of in-stock options. We believe that such incidentally encountered OOS is likely to importantly affect consumers’ in-store decision-making.

In-store Decision Making

As noted, not all consumers enter a store with a specific purchase target in mind. Many purchase decisions are made or revised in the store (Advertising Age 2008; POPAI 1995). In-store decision making is inevitably affected by the information that consumers receive in the store, and the extent of its impact depends on how concrete the consumer’s shopping goal is (Bucklin and Lattin 1991; Lee and Ariely 2006). As has been extensively shown in prior research, consumers who do not have a concrete shopping goal are susceptible to in-store contextual factors such as promotion and in-store display (Bemmar and Mouchoux 1991; Christenfeld 1995; Drèze, Hoch, and Purk 1994).

Making decisions in these situations sometimes requires consumers to make inferences about competing options. We propose that an option’s being OOS may facilitate this process. Specifically, OOS provides information about the desirability of the features that are present or absent in the OOS option, and consequently affects a consumer’s judgment of the in-stock options. This information can be learned by consumers through social inference, and is usually not available through other in-store contextual factors such as promotion or display.

Social Inference in a Retailing Context

In the absence of information that directly pertains to the target of judgment, people draw inferences from existing information. For example, consumers make inference about products and marketers from all kinds of cues in the decision context, such as price, market offerings, and marketing communication (Broniarczyk and Alba 1994; Chernev and Carpenter 2001; Sanbonmatsu, Kardes, and Sansone 1991; Zhang and Schwarz 2012). In particular, social inference involves observing others’ behavior and interpreting its meaning and implications for one’s own choices. People believe that the behavior of others results from sound reasoning and leads to desirable outcomes (Naylor, Lambertson, and Norton 2011). Therefore, others’ choices can serve as a source of information concerning the value of the options (Burnkrant and Cousineau 1975; Kelley 1967) and provide reasons for consumers to conform (Goldstein, Cialdini, and Griskevicius 2008; Zhang 2010).

Since most others’ choice behavior is not directly observable by each consumer, consumers usually view the stock level of an option as the trace of others’ choice. Specifically, scarcity suggests popularity, and hence better value than what is possessed by more plentiful options. As a result, consumers tend to choose products that are already low in stock (Parker and Lehmann 2011; van Herpen, Pieters, and Zeelenberg 2009). Such social inference saves consumers the effort of processing detailed product information, and therefore should play a prominent role in choice tasks on which consumers are unwilling or unable to spend time and effort to gather and process product information extensively, as in low involvement purchases (Beatty and Smith 1987; Celsi and Olson 1988; Suh and Youjae 2006; Zaichkowsky 1985).

Hypothesis

To introduce our hypotheses, we first describe the common settings of our experiments and the symbols we will use throughout the rest of this paper. We study how the OOS of a certain option impacts consumers’ preferences among other in-stock options. In all of our experiments, each option is defined on two attributes relevant to a consumer’s decision. Each attribute varies between two levels of value, referred to as features. We use A and B to denote the two features on attribute 1, and X and Y to denote the two features on attribute 2, yielding four possible options: AX, AY, BX, and BY. Without losing generality, the OOS option is denoted as AX, and we examine participants’ preference among AY, BX, and BY. Besides, in the rest of this

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