

CONSUMER RESPONSE TO STOCKOUTS

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This is a preliminary draft. All comments and suggestions are welcome. Please do not quote without the author's permission.

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ABSTRACT

We explore consumer responses to stockouts, both in terms of consumer satisfaction with the decision process, and in terms of subsequent store choice behavior. A series of four laboratory experiments involving stockouts in a consumer choice context are run. The results of these experiments suggest that consumer response to stockouts is driven in large part by two factors: the effect of a stockout on the difficulty of making a choice from the set, and the degree of personal commitment to the out-of-stock alternative. We show that personal commitment to an out-of-stock choice option is a function of preference for the option, whether the option is included in the consumer's consideration set, and the degree to which the stockout announcement is personally directed. We find that as personal commitment to the out-of-stock option increases, consumers react substantially and negatively to the stockout – they report lower satisfaction with the decision process and show a higher likelihood of switching stores on subsequent shopping trips. However, under conditions in which personal commitment to the out-of-stock option is low and the stockout leads to a decrease in the difficulty of making a product selection, we find that consumer response to the stockout can actually be positive.

This paper identifies the conditions in which a stockout provokes a severe response from consumers. Theoretically, we suggest that consumers will react negatively to a stockout in proportion to the consumer's personal commitment to the out-of-stock option. We argue that personal commitment to a choice option is a function of preference for the option, whether it is a considered option, and whether any choice constraint is personally directed. We also suggest that consumer response is effected by changes in the difficulty associated with making a decision that may be caused by a stockout (i.e., a change in the choice set composition due to a stockout makes it more or less difficult to make a choice). When a stockout leads to an increase in decision difficulty consumers will respond more negatively, while if the stockout leads to a decrease in difficulty the response to a stockout can be positive. Our results across a series of studies provide strong evidence that consumer response to stockouts is positively related to the importance of the alternative that is out-of-stock and is inversely related to the change in decision difficulty. We show that consumers respond to stockouts through changing their evaluations of satisfaction with the decision process and through changes in store switching behavior, but not through changing their satisfaction with the consumption of the product ultimately selected.

Practically, the ramifications of consumer response to stockouts are substantial, particularly given the prevalence of stockouts in consumer settings (*Progressive Grocer*, 1968 a&b; Schary and Christopher, 1979; Hess and Gerstner, 1987). Stockout levels of 10-30% in retail settings have proven to be the norm, rather than the exception (Mason and Wilkinson, 1976). In a recent study of national supermarket chains, 8.2% of items were out-of-stock on a typical afternoon (15% if only advertised items are considered; *Andersen Consulting* 1996). This problem was worse in categories such as yogurt (11.1%), bottled water (10.7%) and chilled juice (10.0%), and even ranged nationally from 8-10% for such staple items as milk. This issue is not confined to traditional retail settings, as demonstrated by a 1987 *Consumer Reports* study of mail-order companies which found that mail-order customers reported "out-of-stock items" as their most frequent complaint. More recently, stockouts have become a major problem for online merchants, due to both traditional forecasting problems and poor links between their inventory systems and their Web sites (*Forbes* 1999; *Los*

Angeles Times 1999). An improved understanding of consumer response to stockouts may lead to a more informed managerial decision which, for example, efficiently balances larger product assortments with the increased likelihood of incurring stockouts. The present research seeks to develop estimates of the potential cost of stockouts, both in terms of consumers' decision satisfaction levels and in terms of the impact of a stockout on actual store switching behavior.

The next section briefly reviews two of the factors we suggest are most critical in understanding and predicting consumer response to stockouts. A framework for understanding consumer response to stockouts is discussed and a number of hypotheses are forwarded, after which the results of four experiments are presented. Each of the four studies attempts to both demonstrate varying consumer response to stockouts as well as to identify the conditions under which stockouts might increase versus decrease consumers' evaluations of the decision experience. The first three studies focus their attention on consumers' evaluative response to stockouts, as measured by their satisfaction with the decision experience. The fourth study examines both evaluative and behavioral response to stockouts, by measuring store switching behavior in successive visits to one of two virtual CD retailers. The final section summarizes the overall findings, discusses the implications of these findings for researchers, and identifies opportunities for future research.

RESPONSE TO STOCKOUTS

In his description of a theory of psychological reactance Brehm (1966) posited that when an individual's freedom is restricted through the elimination of (or threat of elimination of) a behavior, that individual will experience a state of psychological reactance (defined as a motivational state directed toward re-attaining the restricted freedom). Brehm found that the result of this reactance was, in many circumstances, an increase in the aggression experienced and demonstrated by the individual toward the source of the restriction. Clee and Wicklund (1980) discuss numerous practical examples of situations in a consumer setting where reactance may occur and where aggression may be manifest as hostility toward the marketer.

A number of researchers have dealt indirectly with consumer response to stockouts. Farquhar and Pratkanis (1987), for example, investigated the impact of “phantom” alternatives (unavailable options) on consumer choice probabilities and proposed a context-dependent model of choice. Whereas most traditional models of individual consumer choice have assumed that the addition of an unavailable alternative to a choice set will have no impact on the ratios of choice probabilities amongst the original alternatives (Luce, 1959), Farquhar and Pratkanis demonstrate cases in which this assumption is violated. Through an examination of the phantom’s potential contrast and attribute importance effects, they are able to systematically predict how the ratios of choice probabilities will change upon addition of a phantom to a choice set. Pratkanis and Farquhar (1992), in a review of research on phantom alternatives, suggest that future research take a broader perspective and examine the conditions under which the potential effects of unavailable alternatives manifest themselves.

Research on deferred decision making presents an interesting counter to studies investigating response to the removal of an option to choose. Rather, work by both Tversky and Shafir (1992) and Dhar (1997) describe situations in which people may wish to add an alternative to a choice set. For example, Tversky and Shafir argue and demonstrate that as the conflict between items in a choice set increases, people become more likely to defer making a decision, and in some cases explicitly request that additional options be added to the set. Similarly, Dhar found that consumers were more likely to defer choice, or select a “no-choice” option under conditions of increased conflict between choice alternatives. Whereas research on deferred decision making examines the choice consequences of decision conflict, the current research will examine the moderating impact of decision conflict on consumer response to stockouts.

As long as a consumer attaches some value or utility to the “option to choose” an alternative, it is intuitively appealing that he or she will respond when that “option” is taken away in the form of a stockout. As the value of the option to choose a particular choice alternative increases, consumers are more likely to respond, and to magnify their response, if this alternative is temporarily taken away or out-of-stock. We argue that consumers become personally committed to individual choice

alternatives as they proceed through the decision making process, and that as this commitment increases, the value of the option to choose those individual alternatives also increases. A stockout of an alternative that has a high option value, and that the decision maker is therefore more personally committed to, becomes much more likely to elicit a response from the consumer. This concept is similar to the well documented endowment effect (Hoch and Loewenstein 1991; Strahilevitz and Loewenstein 1998; Thaler 1985), - the fact that consumers overvalue items that they possess relative to the value of the item had they not possessed it. Mere possession (or analogously, commitment) leads to a larger loss should the option be taken away. We will show that the consumer's commitment to a particular choice alternative is affected by at least three factors: overall preference for the good, whether the alternative is actively considered (or included in the decision maker's consideration set), and the degree to which the announcement of a stockout of the alternative is personally directed toward the decision maker (i.e., a stockout that a consumer feels is targeted directly towards him or her, and implicitly not toward others, will lead to increased personal commitment to the alternative).

Assuming a simple probabilistic model of consumer choice (e.g., Guadagni and Little 1983), the value associated with the "option to choose" should be a function of both the utility associated with the choice category (i.e., how important choosing a new vacuum cleaner is to a particular consumer) and the conditional choice probability of the particular alternative within the category (e.g., a consumer has a 70% probability of choosing a Hoover vacuum versus a 30% probability of choosing an Oreck vacuum). As both the importance of the choice category and the preference for an alternative (i.e., conditional probability of choice within the category) increase, so too should the value associated with the "option to choose" a particular alternative. With the endowment effect, as preference toward or value for an option increases, the magnitude of the endowment effect increases. It follows then, that personal commitment to a choice alternative will increase as the value of the alternative increases, which in turn should lead to greater consumer response to a stockout of that alternative.

As discussed above, we suggest that stockouts that remove an alternative that consumers are highly committed to are likely to elicit a negative response. Further, we predict that the magnitude of this negative response will be proportional to the value of an option to select the out-of-stock alternative. The value associated with a particular option in a category should be roughly proportional to preference for the alternative. Thus, we expect the following:

H1: Consumers presented with a stockout of an attractive alternative will be less satisfied and will have higher store switching rates than similar consumers with no stockouts, all else held equal.

In addition to threatening or removing the option to choose an alternative that a consumer is personally committed to, a stockout may also affect the difficulty of making a decision. While considerable research has been performed on difficulty in decision making, Shugan (1980) presents a general model which is broadly applicable. He argues that there were a number of factors which could be predicted to contribute systematically to the difficulty of making a choice from a product set. The first, and most intuitively appealing, is the size of the choice set. Shugan argued that as the size of the choice set grows, so too does the number of pair-wise comparisons which must be made, resulting in increased decision difficulty. Shugan also argued that the attribute rating covariance between two alternatives leads to differences in the difficulty of the choice. When the covariance between alternatives is positive (e.g., in the extreme, when one alternative dominates another) the choice is relatively easy. However, when the covariance between alternatives is negative (e.g., one alternative is high on one attribute and low on another while the second alternative has exactly the opposite pattern) the choice between alternatives becomes relatively more difficult. We suggest that all else being held equal, consumers will prefer less difficult decision environments to difficult ones. Thus, as the decision difficulty increases due to a stockout, a more negative response to the stockout is expected, independent of any reaction to losing the option to choose the alternative. However, if the decision difficulty decreases as a result of a stockout one might expect a relatively positive response to the stockout, again independent of any reaction to losing the option to choose the alternative. Thus,

H2: Consumers who receive a stockout which decreases (increases) the difficulty of making a product selection will have higher (lower) levels of satisfaction than will consumers who do not receive a stockout, all else held equal.

It is fairly intuitive that as the attractiveness of a choice option increases, negative response to its removal will also increase. But what if relative preference is held constant? Commitment to a choice option will, beyond preference for the option, be a function of two factors that are related to the process of comparing choice alternatives - whether the out-of-stock alternative is a member of the consumer's consideration set, and the degree to which the stockout is directed at the particular consumer.

Wicklund (1974) provides evidence that psychological responses to the removal of a person's ability to choose are only severe if there is a reasonable belief prior to the restriction that the participant would indeed have control over his or her own choices. If participants are told outright that they will have limited or no control over their choices in a social setting their reaction is much less severe than if they are led to believe they will have control, only to have it taken away. Thus, offering no choice initially versus removing it later leads to very different degrees of response from the individual. An analogy may be drawn to the consumer choice context: removing the "option to choose" initially through a stockout will lead to less severe response than will taking away an option through a stockout if the consumer had spent time thinking about the choice. We suggest that this will be particularly true for cases in which the consumer has relatively high preference for the alternative that is out-of-stock. Specifically, we suggest that for alternatives that pass a basic threshold of acceptability and are included as a member of the consumer's consideration set fall into this category. Clearly, if a consumer includes an alternative in his or her consideration set, they have engaged in some effortful processing to make that judgment, and assumed that the option to choose the alternative would be open to them. If a consumer does not include an alternative in his or her consideration set, presumably the value of the option to choose that alternative is negligible (i.e., the likelihood of choice is zero, and thus the option to choose this alternative is approximately zero also).

While in general more highly valued or preferred alternatives are more likely to be included in a consideration set, the prediction that stockouts of alternatives in the consideration set will lead to greater consumer response does not rely on differences in the underlying preference for an alternative. For example, under certain conditions a consumer may include his or her four most preferred alternatives in a consideration set, while in a different context a consumer may include only their three most preferred alternatives. We suggest that response to a stockout will be much greater for the fourth most preferred alternative when it was included versus not included in the consideration set. We argue that this is a function of the enhanced commitment to the alternative on the part of the consumer that considers the alternative. Therefore, we hypothesize the following:

H3: A stockout of an alternative in a consumer's consideration set will lead to lower levels of satisfaction and higher levels of store switching than a stockout of a non-considered alternative, even under conditions in which preference is held constant.

In his work on reactance, Brehm (1966) draws a clear distinction between a personally directed versus an impersonally directed elimination of freedom in terms of the degree of reactance that will be observed. He argues that when people believe they will be able to choose freely between options, having that freedom taken away in a manner that is perceived as personally directed is much more likely to lead to high levels of experienced reactance. Hammock and Brehm (1966), for example, told children that they were to be allowed to freely choose among two toys to take home. Half the participants were allowed to choose which of the two toys they wanted to take home, while for the second half, the administrator picked which toy the child received and said "Here are the toys. Hmm. Well, they both look the same to me. I guess I'm going to give you this one." As the child believed that other children remained free to choose their toys, he or she experienced a heightened level of reactance due to the perceived personalization of the constraint. This heightened reactance was manifest, at least in part, through increased attractiveness ratings of the toy they did not receive. Similarly, we argue that as the perceived personalization of a stockout announcement increases, the stockout will increase in attractiveness, and a decision maker's commitment to the alternative will increase. This increased commitment to the alternative then results in an increasingly

negative response to the stockout. Practical examples of personal stockout direction might include restaurants that have different options available to “regulars” than to walk-ins, golf courses that have tee times reserved for members (or certain types of members), airlines that reserve the best coach seats for their frequent flier participants, a major credit card that offers choice theatre tickets to gold (but not green) card members. Those who are walk-ins, non-members, etc. are often told the best options are not available to them. This stockout announcement has a much greater personal direction than does a typical stockout and is likely to generate more negative response. Thus,

H4: As a stockout announcement increases in the degree to which it is personally directed, consumers’ satisfaction levels will decrease, all else held constant.

Measuring Response to Stockouts

We weigh the magnitude of consumer response to stockouts in two ways, one evaluative and one behavioral. First, we measure consumer satisfaction with the decision process (*decision satisfaction*), one of a number of cognitive and affective responses which may result from a stockout. In a study of consumer durable purchases Westbrook, Newman and Taylor (1978) introduced the basic concept of satisfaction with consumers’ “*experiences in arriving at purchase decisions*.” They argued that while substantial research had been performed on consumer satisfaction with the use or consumption of a good, little research had addressed consumers’ experiences of learning about brands and product categories or deciding which option to purchase. Westbrook et al (1979) identified a set of aspects of the decision experience that they believed to be related to consumer satisfaction (e.g., quality and availability of information, store environment, worry about outcome). One of the major aspects on which they focussed was product availability - both in terms of breadth and depth of available choice options. They reported that by and large, consumers were relatively satisfied with the breadth and depth of choices available. However, more than 15% of their participants reported dissatisfaction due to too many or too few choices or being unable to find what they wanted. It is worth noting that while there were some small differences, consumers who were recent buyers (and were therefore currently consuming the product) reported very similar levels of satisfaction with their decision experiences as consumers who were prospective buyers. The act of

consumption did not appear to greatly affect their evaluation of their decision experience, suggesting that satisfaction with the decision experience was a relatively enduring construct.

Fitzsimons, Greenleaf and Lehmann (1997) take the subject of decision satisfaction a step further by demonstrating that decision satisfaction is a significant contributor to consumers' overall satisfaction judgments and is conceptually distinct from satisfaction with the consumption of a good. They find in various factor analyses that the underlying dimensions of decision and consumption satisfaction are separate and identifiable. In one study, Fitzsimons et al (1997) show that decision satisfaction and consumption satisfaction have differential consequences for retailers and manufacturers in terms of repeat purchase, word-of-mouth, etc. Decision satisfaction is shown to have a substantial impact on retailers and a minor effect on the brand purchased, while consumption satisfaction has a major impact on the brand but only minor consequences for the store in which the purchase was made. In a second study, they find that two aspects of the purchase experience, the time and reason for delay prior to purchase and consumer involvement, have differential effects on both consumption and decision satisfaction. Thaler's (1985) proposed transaction utility also raises the prospect of a utility or value specifically derived from the decision experience. Collectively, these papers suggest that decision satisfaction is an appropriate way to examine consumer response to changes in the decision environment, in particular consumer response to stockouts. Interestingly, these papers also suggest that the impact of stockouts on satisfaction will be primarily observed through measures of decision satisfaction, and not in more traditional measures of satisfaction with the consumption of the good or service.

In the following four studies we will examine the impact of both decision difficulty and personal commitment to a choice option on consumers' response to stockouts. In the first study, we examine consideration set membership and its relationship with the presence of a stockout, and demonstrate a negative effect of stockouts of considered brands on decision satisfaction. In studies 2 and 3 we keep commitment to the out-of-stock brand low, and show through two different manipulations (i.e. set size and an attraction-style set composition) that stockouts that decrease the difficulty of making a decision can lead to increases in consumer decision satisfaction. In the fourth

and final study, we return to the issue of considered alternatives, and show that both preference for, and consideration of the out-of-stock option lead not only to significant decreases in decision satisfaction but also to significant increases in store switching behavior. This store switching measure both provides additional information on the magnitude and impact of consumer response to stockouts, and validates our decision satisfaction measure by providing a link between the evaluative measure and behavior, thus reducing concerns of potential demand effects, etc. Interestingly, in each of these studies, we find a negligible effect of stockouts on satisfaction with the consumption of the good ultimately chosen. Thus, the effect of stockouts on actual behavior (i.e., store choice) is driven by satisfaction with the decision process.

STUDY 1 - Consideration Set Membership and Consumer Response to Stockouts

This study examines the relationship between a stockout (and the resultant loss of the option to choose the alternative) and consumer decision satisfaction. In addition to the basic negative impact of stockouts on consumer decision satisfaction (H1) this study attempts to explore the potential moderating role of consideration of the out-of-stock alternative on consumer response to stockouts. As hypothesized above (H3), we anticipate that consideration of the alternative that is out-of-stock will lead to much greater consumer response than if the out-of-stock alternative had not been considered, controlling for preference toward the alternative.

The first study is focussed on examining the loss of an option to choose a valued alternative and attempts to minimize the effect on consumer response to stockouts of changes in the difficulty of the decision. In each of the cases described in the first study, consumers that receive a stockout make choices that are tested to be equally or even less difficult than the choice made by consumers that do not receive a stockout. In this way, any negative consumer response due to a stockout is a conservative measure of consumers' reaction to losing an option to choose the out-of-stock alternative.

Study 1a

Study 1a is a two-by-two full factorial between-subjects design. The first factor is the inclusion or exclusion of the described alternative in the consideration set. The second factor is

whether the described alternative is available or is out-of-stock. The cover story for the experiment was that a large packaged goods manufacturer was interested in introducing a new granola bar and wanted feedback on some potential granola bar formulations. Fifty-four graduate business school students participated in this experiment, which required approximately 10 minutes to complete. As compensation for their participation, each participant was given a chance at one of two \$100 prizes which were randomly drawn.

Participants were presented initially with a booklet that contained the introduction outlined above, with a disclaimer stating that "... due to limits on sample quantities, all formulations may not be available to all participants." Participants also received a description of the alternatives and their ratings on each of four attributes (ratings were prefaced with the following statement: "The following are ratings of suggested granola bar formulations on a number of important dimensions which the R&D department commonly measures"). Participants received ratings of six formulations (A1, A2, B, C, D1, D2)¹ on four different product attributes: taste, grams of fat, calories, and days before product expires (see Appendix A). Participants were asked to place an X in a box beside the formulations which they would be most likely to consider choosing (either three or four of the six alternatives, depending on condition and instructions). The descriptions were developed in such a way that most participants would consider formulations A1, A2, and B if they were to consider three, and A1, A2, B and C if they were to consider four. Pretesting indicated that over 90% of participants made these particular assortment selections in each of the three and four alternative situations. The high degree of predictability of participant response was necessary to ensure the appropriate alternative was experienced as a stockout in the stockout conditions.² The four conditions are summarized below:

	Alternative Out-of Stock	Alternative Available
Out of Consideration Set	1. A1,A2,B/C*,D1,D2	2. A1,A2,B/C,D1,D2
In Consideration Set	3. A1,A2,B,C*/D1,D2	4. A1,A2,B,C/D1,D2

Alternatives that have an asterisk to their right are out-of-stock. All alternatives without an asterisk are available. Alternatives to the left of the front slash (/) are designed to be included in a participant's consideration set.

After indicating which alternatives they would consider, participants turned to the next page and examined an availability table. The availability table simply listed the formulations and beside each said either "Available" or "Not Available". Participants were then asked to select one of the alternatives which they had previously indicated they would consider choosing. Participants tore off the corresponding coupon, exchanged it for a product sample, consumed the sample and then responded to a brief questionnaire which measured their decision and consumption satisfaction levels, with decision and consumption items randomly interspersed.

In this design the same alternative is out-of-stock both for the in-consideration set and out-of-consideration set conditions. Thus, differences between the stockout/in-consideration-set and the stockout/not-in-consideration-set conditions are not due to differences in the item which is out-of-stock or, obviously, in preference for the constrained alternative (as it is the same alternative). In addition, the ultimate choice set is identical for participants in each of these two conditions (i.e., A1, A2 and B).

Results

Satisfaction was measured with two six-item scales, one to measure decision satisfaction and a second to measure consumption satisfaction (Fitzsimons, Greenleaf and Lehmann, 1997; see Appendix B for a list of the items). While decision satisfaction is our primary focus, Fitzsimons et al (1997) reported a moderate positive correlation between measures of decision and consumption satisfaction. Thus we measure each aspect of satisfaction separately, and include consumption satisfaction as a covariate in our analyses. The six-item measure of decision satisfaction (means for the six items ranged from 6.56 to 7.35) yielded a Cronbach coefficient alpha of 0.83 while the measure of consumption satisfaction had an alpha of 0.89. A factor analyses of the twelve items found two factors with eigenvalues greater than one, with the six consumption items loading highly on one factor while the six decision items loaded highly on a second factor. The correlation between

the two factors was $r=0.36$, similar to correlations of 0.21 and 0.35 reported in two studies in the Fitzsimons et al paper.³

Sample sizes, means and standard deviations for each of the four conditions on the composite consumption and decision satisfaction scales are shown in Table 1. An analysis of covariance with decision satisfaction as the dependent variable was computed. In addition to including consumption satisfaction as a covariate, two categorical variables and their interaction were included in the analysis of covariance: consideration set membership (in/out) and alternative availability (available/out-of-stock). The results of the analysis of covariance found the model was significant ($F(3,49) = 18.0, p < 0.0001$), with an R^2 of 0.595. Consumption satisfaction was a significant covariate ($F=48.3, p < 0.0001$). The main effect of consideration set membership was not significant, while the main effect for alternative availability was significant ($F=10.7, p < 0.01$). More importantly, the interaction between the two terms was also significant ($F=10.9, p < 0.01$) and can be seen in Figure 1.

-----Insert Table 1 about here-----

-----Insert Figure 1 about here-----

Planned contrasts were performed on the level of decision satisfaction between several of the conditions. As might be expected from the significant two-way interaction the magnitude of the stockout effect (the difference between an available and a stockout condition) varied across the consideration set conditions. Essentially, the negative stockout effect was significant only in conditions in which the stockout was a member of the participant's consideration set. A contrast between (i) the in consideration set and available condition (mean $ds=7.81$) and (ii) the in consideration set and out-of-stock condition ($ds=5.73$) demonstrated a significant difference ($F = 21.6, p < 0.0001$)⁴, while a contrast between (i) the not in consideration set and available condition ($ds=7.23$) and the (ii) not in consideration set and out-of-stock condition ($ds=6.99$) was not statistically significant ($F < 1$).

In addition, a similar analysis of variance was run with consumption satisfaction as the dependent variable, with the same two categorical variables and their interaction as were included in

the analysis of covariance: consideration set membership (in/out) and alternative availability (available/out-of-stock). Unlike decision satisfaction, however, the presence of a stockout had no significant main or interactive effects on consumption satisfaction ($F(3,49) = 0.38, p > 0.10$). While inclusion of decision satisfaction as a covariate to the consumption satisfaction model makes the overall model significant, the main and interactive effects of stockout and consideration set membership remain non-significant.

Study 1b

A replication of the Study 1a was also performed, with the addition of a personalized stockout condition in which participants received a stockout announcement which was targeted more directly towards them. While providing further opportunity to examine H1 and H3, Study 1b also permits an examination of H4.

Method

Study 1b is a 2 (inclusion or exclusion of the described alternative in the consideration set) X 3 (stockout announcement: none/impersonal/personal) between-subjects design. The procedure is very similar to that employed in Study 1a with a few minor modifications. In this study participants were also asked to attempt to guess the purpose of the study. 113 undergraduate students participated in this experiment, which required approximately 10 minutes to complete. As compensation for their participation, each was given \$3.

Participants received ratings of four granola bar formulations (A, B, C and D, corresponding to formulations A1, B, C and D2 in Study 1) on four different product attributes. They were asked to place an X in a box beside the formulations which they would be most likely to consider choosing (either two or three of the four alternatives, depending on condition and instructions). The descriptions were developed in such a way that most participants would consider formulations A and B if they were to consider two, and A, B and C if they were to consider three. The conditions are summarized below:

	Personal Stockout	Impersonal Stockout	No Stockout
Out of Consideration Set	1. AB/C*D	2. AB/C*D	3. AB/CD

In Consideration Set

4. ABC*/D

5. ABC*/D

6. ABC/D

Alternatives that have an asterisk to their right are out-of-stock. All alternatives without an asterisk are available. Alternatives to the left of the front slash (/) are expected to be included in a participant's consideration set.

After indicating which alternatives they would consider, participants turned to the next page and received one of three notes, depending on condition. Participants in the no constraint conditions received a note which read: "All alternatives are available at this time." Participants in the impersonal constraint conditions received a note which read: "Due to limitations in the number of samples prepared by the manufacturer, Formulation C is unavailable at this time." Finally, participants in the personally directed constraint received the following note: "Due to limitations in the number of samples prepared by the manufacturer, Formulation C is unavailable to you at this time." Otherwise the procedure mirrored Study 1a. A pretest was conducted with 18 participants, whom were asked subjects to rate whether they felt the message was directed towards them personally, with endpoints 1=not at all personally directed and 7=highly personally directed. Those receiving the non-personal announcement had significantly lower ratings (2.3) than those receiving the personal announcement (4.2; $p=.015$).

Results

Cronbach coefficient alphas of 0.78 for decision and 0.86 for consumption satisfaction were obtained for each of the six-item satisfaction measures. Similar factor analytic results to Study 1a were observed. Sample sizes, means and standard deviations for each of the six conditions on the composite decision satisfaction measure are shown in Table 1. One participant was excluded from the analysis after analyzing responses to the "guess the purpose of the study" question. While the vast majority of participants believed the cover story (many were interested in who the sponsor was, etc.) the excluded participant guessed that we were interested in responses "when something is taken away."

In addition to the consumption satisfaction covariate, two categorical variables were included in the analysis of variance as class variables: consideration set membership (in/out), and form of stockout announcement (none/impersonal stockout announcement/personal stockout announcement). The overall model was significant ($F(6,104) = 6.7, p < 0.0001$), as was the covariate consumption satisfaction ($F=5.3, p < .001$). The main effect of presence or form of stockout announcement was significant ($F=7.8, p < 0.001$), as was the main effect of consideration set membership ($F=3.9, p < .05$). As in Study 1a, the interaction between the two terms was significant ($F=3.8, p < 0.05$) and is shown in Figure 1.

Three planned contrasts were run for both the in-consideration set conditions and the not-in-consideration set conditions. The first contrast between (i) the in-consideration set and available announcement condition ($ds=6.57$) and (ii) the in-consideration set and *personal* stockout announcement condition ($ds=4.42$) demonstrated a significant difference ($F = 16.2, p < 0.0001$). Similarly, a planned contrast between (i) the in-consideration set and available announcement condition ($ds=6.57$) and (ii) the in-consideration set and *impersonal* stockout announcement condition ($ds=5.52$) also proved significant ($F=4.3, p < 0.05$). In the final in-consideration set contrast, between (i) the in-consideration set and *personal* stockout announcement condition ($ds=4.42$) and (ii) the in-consideration set and *impersonal* stockout announcement condition ($ds=5.52$), a significant difference was also observed ($F=7.9, p < 0.01$). However, consistent with our Study 1 results and with our expectations, when these three planned contrasts were run for the non-consideration set conditions no significant differences were found.

As in Study 1a, a parallel analysis was performed with consumption satisfaction as the dependent variable. The overall model as well as all main and interactive effects were not significant ($F(6,104) = 0.89, p > 0.10$). As in Study 1a inclusion of decision satisfaction as a covariate to the consumption satisfaction model makes the overall model significant, but the main and interactive effects of stockout and consideration set membership remain non-significant.

Discussion

The results of both Study 1a and Study 1b provide strong support for hypotheses 1, 3 and 4. As predicted, a stockout of an attractive choice alternative led to a negative consumer response. In addition, the stockout impact on decision satisfaction was related to whether the alternative was a member of the participant's consideration set, as evidenced by the significant interaction found between alternative availability and consideration set membership in both studies. These results support our contention that consumer response to stockouts is moderated by whether or not the stockout is a considered alternative. In addition, we find that negative consumer response to stockouts is greater to a personally directed stockout than to an impersonally directed stockout. Both impersonally directed stockouts and personally directed stockouts lead to significant decreases in consumer satisfaction levels. However, personally directed stockouts lead to significantly greater decreases in satisfaction versus a non-stockout situation than do impersonally directed stockouts. Given the relatively subtle manipulation of personal direction this is a particularly strong finding, and warns of potentially substantial practical implications.

Both consideration set membership and personal direction of the stockout announcement led to significant decreases in decision satisfaction due to a stockout, but did not have any significant effect on consumption satisfaction. While each of these factors appears to have influenced the degree to which consumers are committed to a particular out-of-stock choice option, this commitment does not appear to influence subsequent consumption satisfaction of other choice alternatives. These results are quite consistent with those reported by Fitzsimons, Greenleaf and Lehmann (1997) regarding the distinction between process and outcome in terms of satisfaction judgements. They report numerous examples in which factors that effect evaluations of the decision experience do not effect those of the consumption experience, and vice versa. We will return to this issue in Study 4 when we examine behavioral outcomes of exposure to stockouts.

In both components of Study 1 consumer response to a stockout is found to be negative (i.e., consumer decision satisfaction was lower in the presence of a stockout than in a similar control condition). We have argued that this negative consumer response is driven by consumer reactions to the loss of an "option to choose" an out-of-stock alternative that the decision maker is committed

to. We carefully controlled for changes in decision difficulty driven by the stockouts to be certain that increases in decision difficulty could not be driving any negative stockout effect. We believe that the first study presents convincing evidence that removing the option to choose a desirable alternative through a stockout can lead to a substantial decrease in decision satisfaction levels. However, one could interpret the results of Study 1 as potentially falling prey to a demand explanation. Participants may have reported lower decision satisfaction levels as they were annoyed that they had been “tricked” or manipulated by the administrator into believing all alternatives were available only to have one taken away. Studies 2 and 3 examine situations in which stockouts actually lead to increases in decision satisfaction, and while the principal purpose of the studies is to explore the role of decision difficulty in consumer response to stockouts, they also provide data that would not be consistent with the demand counter-explanation.

STUDY 2 - Set Size and Positive Response to Stockouts

As discussed above, we suggest that a second major influence on consumer response to stockouts is the effect of a stockout on the level of difficulty in making a decision. However, unlike the consistently negative effect of losing an option to choose, we suggest that decision difficulty can either decrease or increase due to the presence of a stockout. For example, the stockout may lead to a “head-to-head” comparison of two perfectly negatively correlated alternatives, and result in a more difficult decision than was the case prior to the stockout. This would be expected to yield negative consumer response and decreased decision satisfaction levels. Perhaps equally likely however, is the case in which a stockout reduces the difficulty associated with making a decision, either through moving away from a “head to head” comparison, or simply through reducing the number of comparisons between alternatives required of a decision maker. In this case, as hypothesized in H2, the stockout may actually lead to *higher* levels of satisfaction than a similar control condition with no stockout. The second and third study each focus on a case in which stockouts affect the difficulty of making a decision in such a way as to lead to positive consumer response and increases in decision satisfaction.

In Shugan's (1980) model of consumers' "cost of thinking" it becomes more costly and difficult to make a decision as the number of between alternative comparisons increases. While this "cost" may be counterbalanced at relatively small to moderate choice sets by an increase in the range of alternatives, etc. at some stage the benefit gained by adding another alternative is outweighed by the cost of the additional comparisons that are now necessary (e.g., While it is intuitively appealing that adding a third alternative will be viewed positively, adding a 100th alternative is much less likely to be viewed as positively). We propose that in situations in which the set of alternatives is quite large, stocking out of a lesser preferred alternative which offers limited range to the set (and therefore has a very small value associated with the option to choose this alternative) will potentially result in a positive consumer response. Such a result would only occur if (i) the value associated with the option to choose the out-of-stock alternative was small, and (ii) the difficulty of the decision decreased due to the stockout (versus a similar control condition with no stockout).

Method

Study 2 is a two-by-two between subjects factorial design with factors (i) size of the alternative set (six alternatives versus thirteen alternatives) and (ii) presence or absence of a stockout. The procedure was similar to that employed in Study 1. Participants in the small set size condition were presented with the same set of six alternatives as in Study 1a (see Appendix A). Participants assigned to the large set size condition received 13 alternatives (the original 6 plus 7 new alternatives). The additional seven alternatives were designed to have only minor differences from the first six alternatives, and to add little in terms of a range of choices, etc.. The same alternative was announced as out-of-stock in both small and large sets, and was one of the least preferred alternatives in the set (Alternative D1 in Appendix A). The least preferred alternative was constrained to minimize any value participants might associate with the option to choose this alternative. If participants were in the stockout conditions the out-of-stock alternative had a "NOT CURRENTLY AVAILABLE" tag printed over the alternative, in such a way that they could still examine the alternative's attribute information if they desired to do so. As inclusion of consumption satisfaction as a covariate in the previous study did not affect any of the substantive results, only

decision satisfaction items were collected from participants in an effort to reduce the time required to complete the study.

We expect that, consistent with H2, a stockout in the large alternative set condition will lead to an *increase* in participant levels of decision satisfaction versus a control condition with a large alternative set. In contrast, for small alternative set conditions, we do not anticipate an increase in decision satisfaction as the decrease in decision difficulty is not as great as in the large set situation. (Note that we also do not expect a large decrease in decision satisfaction due to losing the option to choose the out-of-stock alternative as they are not likely to be committed to the option: it is rated very lowly by participants, is not in their “considered” set, and thus is likely to have only a very small value associated with the option to choose it.) 184 undergraduate students were recruited to participate in exchange for compensation of \$3.

Results

A pre-test of decision difficulty levels was conducted in which four groups of 15 participants evaluated the difficulty level of making a decision for each of the four conditions (1=not at all difficult, 7=extremely difficult). Results supported our contention that difficulty decreased significantly due to a stockout for large set sizes ($t=2.46, p<.05$), but not for small set sizes ($t=0.32, p>.10$). Results of the main study found a Cronbach coefficient alpha was 0.79 for the six-item measure of decision satisfaction. An analysis of variance was performed in which the categorical variables were the size of the alternative set (small/large) and alternative availability (available/out-of-stock). The results of the analysis of variance found the model was significant ($F(3,180) = 2.7, p<0.05$), with neither main effect statistically significant. The interaction between the two terms was, however, found to be statistically significant ($F=6.7, p<0.05$) and can be viewed in Figure 2. Two planned contrasts were performed on the level of satisfaction with the decision between several of the conditions. A contrast between (i) the large set size and available condition ($ds=7.12$) and (ii) the large set size and out-of-stock condition ($ds=7.97$) demonstrated a significant difference ($F = 6.81, p<0.01$) while the same contrast for the small set size conditions found no significant difference ($ds=7.61$ versus $ds=7.27$).

-----Insert Figure 2 about here-----

Discussion

The results of Study 2 are supportive of H2 and, interestingly, demonstrate an opposite pattern of results to Study 1. In a context of large set sizes in which the option to choose the stockout had little value associated with it, we observe a *positive* consumer response to a stockout. The results of Study 2 suggest that consumer response to stockouts is driven by more than simply their perceptions of the value of the option to choose the out-of-stock alternative. The difficulty of choosing an alternative is also related to consumer response to stockouts. This result is important not only from the perspective of understanding the role of difficulty in consumer response to stockouts, but also given the fact that it provides data that suggests that the results of Study 1 are not simply an experimental artifact. Of course, one might reasonably argue that in the current experiment we have manipulated not only the difficulty of the decision through changing the size of the choice set in which a stockout is observed, but perhaps some other factor. Thus in Study 3 we further examine conditions in which a stockout might lead to decreases in the difficulty experienced by a consumer when trying to choose a product option.

STUDY 3 – The Attraction Effect, Decreased Decision Conflict and Positive Response to Stockouts

Study 2 demonstrated that under certain conditions (i.e., large set sizes) stockouts can lead to positive consumer response, as hypothesized in H2. In the current study we extend these findings to examine another context in which the difficulty of the decision is effected by a stockout, and results once again in positive consumer response to the stockout. A considerable body of knowledge has been accumulated on the effect of the composition of the choice set on consumer affective and cognitive response (e.g., Lynch, Chakravarti and Mitra, 1991; Simonson and Tversky, 1992). A subset of this field has been coined “the attraction effect” and deals specifically with the effect of adding asymmetrically dominated alternatives to a choice set (Huber, Payne and Puto, 1982). When an asymmetrically dominated alternative is added to a choice set the probability of choosing the dominating brand increases relative to non-dominating brands. While many explanations for this effect have been forwarded it would appear that for sets in which a dominated brand is introduced

the consumer may have an easier time reaching a decision (as the dominated alternative might move the set away from a perfectly negatively correlated situation, for example).

Extending these findings to a stockout environment, participants are presented with the following choice set: In the control condition, participants receive a set of four alternatives, in which there are two alternatives that are equally balanced, or efficient frontier alternatives (alternatives A1 and A2, see Appendix A) and two asymmetrically dominated alternatives (alternatives B1 and B2). (Attribute levels were pretested to ensure the two alternatives were equally preferred, but negatively correlated on the two most important attributes. 14 participants received values for the two attributes for Alternative A1, and one of the attributes for Alternative A2, and were asked to fill in the fourth value in such a way that they would be indifferent between the two choices.) The third alternative is an asymmetrically dominated alternative located near one of the efficient frontier alternatives (alternative B1), while the fourth is an asymmetrically dominated alternative located near the second efficient frontier alternative (alternative B2). In the stockout conditions, one of the asymmetrically dominated alternatives, Alternative B1 or Alternative B2, is announced as a stockout. We suggest that making a choice from the full set of alternatives in the control condition, which would be a perfectly balanced and negatively correlated set of four alternatives, would be more difficult than making a choice in either of the stockout conditions (which would be a less balanced three item set). Further, as hypothesized in H2, we expect that the decrease in difficulty in the stockout conditions would be reflected in positive consumer response to the stockout.

Method

Study 3 is a two-by-two between subjects factorial design. The factors are (i) presence or absence of a stockout and (ii) alternative receiving the announcement (asymmetrically dominated alternative B1 or B2). Once again, the procedure was similar to that employed in previous studies. Participants received the same cover story, and were then presented with descriptions of four alternatives, A1, A2, B1 and B2 (see Appendix A). On the page containing alternative descriptions one of the asymmetrically dominated alternatives (either B1 or B2) had a tag printed over the alternative which read either "CURRENTLY AVAILABLE" or "NOT CURRENTLY AVAILABLE,"

depending on whether the participant was assigned to control or stockout conditions. Control conditions received an “available” announcements to control for any potential differences caused by increased salience due to the stockout announcement itself. Participants then made a choice, consumed a sample, and completed both decision and consumption satisfaction items. 197 undergraduate students participated in the study in exchange for a payment of \$3.

We suggest that, consistent with H2, a stockout of one of the asymmetrically dominated alternatives will lead to a positive consumer response to the stockout, as choosing from the stockout set will be less difficult than choosing from the balanced and negatively correlated set without a stockout. We would also expect, given a stockout, to see a shift in choice probabilities (consistent with the attraction effect) toward the “efficient frontier” alternative which has an asymmetrically dominated alternative still available, relative to the control set in which all alternatives are available. Specifically, if Alternative B1 is out-of-stock we would expect to see greater choice incidence of Alternative A2, while if Alternative B2 is out-of-stock we would expect to see greater choice incidence of Alternative A1.

Results

Both decision and consumption satisfaction scales proved reliable (alphas of 0.78 and 0.86, respectively), and a similar two-factor structure was obtained as in Fitzsimons et al (1997) and in previous studies. An analysis of covariance was performed for composite decision satisfaction in which the categorical variables were alternative availability (available/out-of-stock), which of the asymmetrically dominated alternatives received the announcement (either B1 or B2) and a two-way interaction between the two terms, with consumption satisfaction as a covariate. The overall model was significant ($F(4,192) = 5.48, p < 0.001$), as was the main effect of the stockout factor ($F=13.7, p < 0.001$). Consistent with previous studies, the consumption satisfaction covariate was also significant ($F=7.3, p < 0.001$). Neither the main effect of asymmetric alternative B1 versus B2 nor the two-way interaction was statistically significant. Two planned contrasts were performed on the level of decision satisfaction between each of the conditions. A contrast between the (i) Alternative B1 (low calorie, dominated) announced and available condition ($ds=5.65$) and the (ii) Alternative B1

announced as out-of-stock conditions ($ds=6.51$) was found to be significant ($F = 9.9, p<0.01$). A similar contrast between the (i) Alternative B2 (high taste, dominated) announced and available condition ($ds=5.88$) and the (ii) Alternative B2 announced as out-of-stock conditions ($ds=6.63$) was also significant ($F = 5.0, p<0.05$). As in previous studies, a parallel analysis with consumption satisfaction as the dependent variable was not significant ($F(4,192) = 0.89, p<0.10$), nor were either the main or interactive effects of the stockout/availability factor or that of which brand received the announcement.

Further support was obtained for our contention that an “attraction effect” would occur when a stockout was observed through an examination of the choice data. When either asymmetric alternative was out-of-stock the choice incidence of the opposite dominating alternative increased relative to the control condition. In other words, when Alternative B1 (low calorie, dominated) was out of stock 64.6% of the participants chose Alternative A2 (high taste, dominant), versus only 43.1% in the control condition in which Alternative B1 was announced as “Currently Available” (a test of proportions found this difference to be statistically significant, $t=2.14, p<0.05$). Similarly, when Alternative B2 (high taste, dominated) was out of stock 65.4% of the participants chose Alternative A1 (low calorie, dominant), versus only 42.6% in the control condition in which Alternative B2 received a “Currently Available” announcement (test of proportions was significant, $t=2.28, p<0.05$).

Discussion

These results provide additional support for H2, and show that decreasing decision difficulty through a stockout can actually lead to a positive consumer response. As in Study 2, the stockout was an alternative which had a low value associated with the option to choose it (in this case it was a dominated alternative), and through stocking out this alternative the choice between the alternatives was made easier. A stockout of an asymmetrically dominated alternative reduced the choice set to two strong alternatives which were equally matched but negatively correlated and a third alternative which was dominated by one of the two strong alternatives. Not only did the stockout lead to a shift in choice probabilities which suggested an “attraction” style effect was operating, but consumer response measured through decision satisfaction also showed participants

were more satisfied in the stockout condition than in comparable full choice, but higher conflict conditions.

Study 4 – Consumer Behavioral Response to Stockouts

Each of the first three studies have demonstrated interesting effects of stockouts, both positive and negative, on consumers' satisfaction with the decision process. While this evaluative measure of the impact of a stockout is clearly important, the question of whether the stockout will result ultimately in any behavioral change naturally follows. Numerous researchers have shown links between satisfaction and various behavioral outcomes (e.g., complaining behavior, repeat purchase intentions, etc.; see Yi 1991). Thus in this study we not only examine the impact of stockouts of considered versus non-considered brands on decision satisfaction, but also examine a behavioral outcome – store switching behavior.

In Study 1 we examined the impact of consideration set membership on response to stockouts, but held preference for the out-of-stock item constant. In the current study we relax this constraint and manipulate the level of preference for the out-of-stock alternative by constraining either the first brand added to the participant's consideration set, the last brand added to his or her consideration set, or an alternative not included in their consideration set. We expect that as preference for the stockout item increases, consumer response to the stockout will also increase. We therefore expect response to a stockout of the first item added to the consideration set to be stronger than response to a stockout of the last item added to the consideration set, which in turn will be stronger than response to a stockout of a non-considered item.

We conduct Study 4 in a computer (i.e., simulated web) shopping environment, and change the product category to CD's of popular music. This context provides us with more flexibility in terms of our stockout manipulation, generalizes the results to a different product category, and allows us to test H1 and H3 using behavior as a dependent variable. Further, in the first three experiments, we had to rely on careful pre-testing to ensure that the item that we announced as out of stock fit a particular preference profile (e.g., the third most preferred brand). In a computer shopping environment we are able to have the out-of-stock item vary by individual. For example, if our

manipulation is to constrain the most preferred brand, it is no longer necessary that this brand be the same for all participants – we can now announce as out-of-stock each individual’s favorite brand. In addition, while we had to rely on careful pre-testing to ensure particular consideration set sizes and compositions in earlier studies, we are able to relax this constraint for Study 4. This computer CD retail experience also has the side benefit of enhancing the external validity of our findings, as internet retailers have become more and more common shopping outlets for many US CD purchasers.

Method

Study 4 is a two-by-three full factorial between-subjects design. The first factor is whether the highlighted alternative is available or is out-of-stock. The second factor is the degree of preference held for the highlighted alternative (first item added to consideration set, last item added to consideration set, or item not included in the consideration set). The cover story for the experiment was that a national music retailer was interested in studying how consumers choose CD’s from a set of alternatives, and in introducing some new on-line and in-store groupings or displays. Participants were told that they would be asked to examine CD assortments at one of two internet CD retailers, and to ultimately select a CD that they would be interested in taking home (a sub-set of the subjects were to be awarded the CD they chose). 294 undergraduate business school students participated in this experiment, which required approximately 10 minutes to complete, in partial fulfillment of a course requirement.

After an introductory screen, participants were asked to choose which store they would like to visit by clicking on an icon for either CDMax or Music Music (two fictional retailers). After clicking either of the icons participants visited the virtual music store and were presented with an assortment of 10 CDs, and were instructed to “indicate which of these CD’s you would be most interested in selecting by clicking the box beside the CD. You may pick up to 9 but no less than 2.” Participants saw the name of the artists, the name of the albums, and a photograph of the album cover. Beside each of the album covers was a small check box, and the label “Yes, I would consider purchasing this CD.” The CD’s themselves included a range of artists that were pretested to appeal to a broad

range of the participant population. Regardless of which virtual store they visited (i.e., CDMax or Music Music) participants were exposed to identical assortments (although they believed the assortments differed across stores). Upon completion of the consideration task, participants proceeded to the following screen, and were asked to indicate which of the CD's they would like to choose. Immediately after this notice, and before they could indicate their choice, they received the stockout/available notice. In both cases they received a notice (either that the option was available or out-of-stock) to ensure that any observed stockout effect was not due to a difference in salience of the item driven by the stockout announcement. If available, they received a notice that reads "The <artist's name inserted> CD is currently available," and a green highlight frame surrounded the photo of the album cover. If participants received a stockout announcement their notice read: "Unfortunately the <artist's name inserted> CD is out of stock and is not currently available," and a red X was placed over the photo of the album cover. The artist that was highlighted in the announcement was determined by the participant's assignment on the second condition. If assigned to the "first item added to consideration set" condition, the highlighted artist was the first artist that the participant had clicked as being willing to consider. If assigned to the "last item added to consideration set" group, the highlighted artist was the last artist that the participant had clicked as being willing to consider. Finally, if assigned to the "item not included in the consideration set" condition, the highlighted artist was selected randomly from all non-considered artists. After clicking the "Okay" button, participants could then view all of the CD's. The view was identical to the consideration screen, but the labels beside each CD read "I choose this CD," and the highlighted CD remained highlighted. After making a CD choice, participants were thanked, and were led to believe the CD study was complete.

After finishing an unrelated 30 minute filler task participants were informed that we would like them to make another virtual CD shopping excursion. They received the following notice: "At this point we would like you to make another virtual CD shopping trip. Each CD retailer generates a new set of options for you at each visit. Therefore, if you choose to shop at the same CD retailer as you did before you will receive a different set of options to choose from." Participants proceeded through

an identical consideration and purchase experience as in their first store choice and visit, but with a different assortment of CD's for their second visit. On their second visit they did not receive either an availability or a stockout notice. Upon completion of the second shopping visit participants answered three decision satisfaction questions about each of their store visits. They answered the three most general items from the six-item decision satisfaction measure used in Studies 1-3 (items D1, D3 and D6 in Appendix B) for their first shopping experience, and then again for their second shopping experience. Only the three most general decision satisfaction items were collected to ensure that the more specific items were not biasing consumers' responses to the general items. Both sets of decision satisfaction measures were collected after both shopping trips were complete to ensure that there was no demand effect of answering the initial shopping trip satisfaction items on store switching behavior. As participants answered these questions on the computer the format was slightly different than in previous versions. They moved a sliding bar along a scale with the same endpoints as in previous studies. However, as the scale could be interpreted continuously, no 1-7 scale was offered. Rather, horizontal position on the sliding bar scale was converted to a number from 1-100, where 100 was most satisfied.

Results

As no actual consumption of the CD's that were selected took place, only decision satisfaction measures were collected for each shopping trip. The three-item measure of decision satisfaction yielded Cronbach alphas of 0.82 and 0.84 for the first and second shopping trips, respectively. Participants reported moderate satisfaction with the decision process for both shopping trips (3-item mean DS = 56.7 for trip one and mean DS = 63.5 for trip two). As the second shopping trip was identical across all six conditions, we anticipated no differences in reported decision satisfaction for this trip. As expected, a 2 (announced item out-of-stock/available) X 3 (announced item: first item added to consideration set, last item added to consideration set, or item not included in the consideration set) analysis of variance on decision satisfaction for the second shopping trip was not significant ($F(5, 287) = 1.16, p=.330$), nor were either main effect or the two-way interaction.

A parallel 2X3 analysis of variance run on decision satisfaction for the first shopping trip was significant ($F(5, 288) = 8.97, p < 0.001$), as was expected given the manipulation of stockout conditions was performed during the first shopping trip. The main effect of the stockout manipulation was significant ($F = 19.13, p < 0.001$) indicating that consumers were less satisfied when they experienced a stockout. In addition, the main effect of degree of commitment (as indicated by order of consideration – first, last or not at all) was also significant ($F = 7.24, p < 0.001$). Both main effects were, however, qualified by a significant two-way interaction ($F = 5.61, p < 0.001$). Cell means and the overall pattern of results are shown in Figure 3a. Planned contrasts were performed comparing conditions in which the highlighted alternative was available to conditions in which the highlighted alternative was out-of-stock for each of the three “commitment” or consideration levels. When the highlighted alternative was not in the participant’s consideration set there was no significant difference in satisfaction with the decision process between available ($ds=59.7$) and stockout conditions ($ds=58.1; F = 0.15, p > 0.10$). When the highlighted alternative was the first alternative added to the consideration set, participant’s were dramatically less satisfied if it were out-of-stock ($ds=39.2$) versus available ($ds=60.3; F = 26.95, p < 0.001$). Respondents also reported significantly lower levels of decision satisfaction in the stockout ($ds=55.8$) versus available ($ds=65.7$) conditions when the highlighted alternative was the last alternative added to their consideration set ($F = 5.87, p < 0.05$).

-----Insert Figure 3 about here-----

We measured behavioral response to stockouts by tracking the rate of store switching across conditions. Participants were free to choose either of the CD retailers, CDMax or Music Music, at each of two shopping occasions. If participants shopped at a different store on their second visit than they did on their first, we treated them as store switchers. Switching incidences for each of the six conditions are shown in Figure 3b. The pattern of store switching is very similar to the pattern observed in the decision satisfaction data: under conditions in which participants reported low levels of decision satisfaction we observe high levels of store switching, and vice versa. We ran a categorical analysis of variance (i.e., via the SAS CATMOD procedure) using maximum likelihood

estimation to analyze the relationship between our manipulated variables and switching behavior. Similar to the analysis of levels of decision satisfaction, we observed a significant main effect of stockouts on store switching behavior ($\chi^2 = 5.25$; $p < .05$) and a significant main effect of the degree of preference or consideration ($\chi^2 = 6.36$; $p < .05$). Once again, this main effect was qualified by a significant two way interaction ($\chi^2 = 10.53$; $p < .01$) such that stockouts led to greater levels of store switching as preference or consideration for the alternative that was out-of-stock increased. Planned contrasts of the store switching probabilities found no significant difference between store switching levels in stockout (52.2%) versus available (64.6%) conditions when the highlighted item was not included in the consideration set ($\chi^2 = 1.48$; $p > .10$). However, when the highlighted item was the first item added to the consideration set, a significant increase in store switching levels was observed for stockout (86.0%) versus available (56.1%) conditions ($\chi^2 = 9.33$, $p < .01$). Similarly, when the highlighted item was the last item added to the consideration set, a marginally significant difference in store switching behavior was observed between stockout (80.8%) and available (65.2%) conditions ($\chi^2 = 2.96$, $p = .085$).

Discussion

The principal goal of the fourth study was to extend our examination of consumer response to stockouts from the evaluative or affective domain (i.e. decision satisfaction) to the behavioral realm. The specific behavior chosen was a measure of store switching behavior. As participants in our study had a chance to receive one of the CD's that they ultimately chose, store choice was an important decision. Our results demonstrate that when consumers were exposed to a stockout, in particular of a highly considered or preferred alternative, they were significantly less likely to return to that store on a subsequent visit. For example, when the stockout was of the item consumers first added to their consideration set (e.g., their most preferred alternative) we observed a 53% increase in the consumers' likelihood to switch stores on their second store visit; when the item that was out-of-stock was the last alternative they would consider the increase in store switching likelihood was still 24%. Thus, we find strong evidence that stockouts lead to substantial behavioral responses by consumers, in addition to having strong effects on satisfaction with the decision process.

The results of Study 4 both replicate and extend the results of Study 1 in terms of consumer response to stockouts with respect to consumers' perceptions of decision satisfaction. As observed in Study 1 in a different product category, participants reported lower levels of decision satisfaction when an item they had included in their consideration set was announced as out-of-stock. No such drop in reported decision satisfaction was observed when the item that was out-of-stock had not been included in their consideration set. The results of Study 4 confirm what was expected, and is fairly intuitive: within a consideration set, consumers will respond more aggressively to a stockout as the item that is out of stock increases in preference (in this case measured through the timing of inclusion in the consideration set). Study 4 also extends the results of earlier studies by demonstrating that the impact of stockouts on consumers' satisfaction with the decision process are relatively enduring. In this case, the negative effects of being exposed to a stockout endured over a 30 minute time lag and over a second shopping experience in which no stockout was observed. Thus, a shopping experience in which no stockout is experienced did not dampen the negative perception of the stockout that the consumer experienced.

CONCLUSIONS

This paper proposed that consumers notice, and indeed react and respond to, the presence of a stockout in their choice sets. These stockouts matter even when they are not of the most preferred option. Stockouts are shown in a series of studies to impact consumer's evaluations of their decision experience, resulting in significantly different levels of decision satisfaction than comparable groups of consumers that do not receive a stockout. In addition, exposure to stockouts is found to predict changes in the subsequent shopping behavior of consumers. Consumers exposed to a stockout are substantially less likely to return to the same store on their next shopping trip. The magnitude of the shift in store switching behavior (over a 50% increase in the most extreme case) magnifies just how powerful an impact a stockout can have on a consumers' purchase experience.

The findings of four studies indicate that stockouts lead to substantial consumer response in a number of different choice contexts. Response to a stockout was found to be a function of two

primary forces – the degree to which a consumer was personally committed to the out-of-stock alternative, and changes in the difficulty of making a decision due to a choice set shift caused by the stockout. Studies 2 and 3 demonstrated in two separate choice contexts that when personal commitment to the out-of-stock alternative was low, and a stockout led to decreased decision difficulty, or an easier decision, consumers' decision satisfaction levels actually increased. We argued that a decision maker's personal commitment was increased as preference for the alternative increased, and found in Study 4 that stockouts of alternatives that were more preferred did, as is intuitively appealing, lead to more negative consumer response. We also argued that personal commitment was increased if a decision maker was actively considering the alternative, and showed in both Study 1 and Study 4 that a stockout of an alternative in a decision maker's consideration set led to significantly more negative response than a stockout of a non-considered alternative. Study 1 also showed that when a stockout announcement increased in the degree to which it was personally directed, that stockout led to increasingly negative response. Overall, the results of the four studies presented demonstrate that consumer response to stockouts, both in terms of reported decision satisfaction levels and observed store switching behavior, are strongly influenced by the decision maker's commitment to the out-of-stock alternative and any changes in decision difficulty caused by the stockout.

Interestingly, in both studies in which a measure of consumers' satisfaction with the consumption of the chosen alternative were taken (i.e., Study 1 and Study 3) we observed no significant effect of exposure to a stockout on consumption satisfaction. While consumption satisfaction (e.g., how good the chosen granola bar tasted) was significantly related to decision satisfaction evaluations, it was not itself directly affected by any of our stockout manipulations. While this result may seem on the surface to be counter-intuitive it is entirely consistent with previously demonstrated dissociations of experiences with process and outcome in both legal and organizational justice domains (Sheppard, Lewicki and Minton 1992; Thibault and Walker 1975). Fitzsimons, Greenleaf and Lehmann (1997) found a strong relationship between decision satisfaction and store consequences, and a strong relationship between consumption satisfaction

and brand consequences, but only very weak links between decision satisfaction and brand, and consumption satisfaction and store. Our results provide support for the notion that factors that affect decision satisfaction do not have to, and in fact often may not, be reflected in consumption satisfaction evaluations. The present results clearly show that stockouts affect consumers' evaluations of their decision experience, but not their consumption experience. Further, the effect on the consumers' decision experience is strong enough to be evidenced in subsequent store choice decisions.

Practically, the issue of optimal product or service assortment and the associated stocking decision is perhaps most directly affected by consumer reaction to stockouts. Tradeoffs must be made between the breadth of product assortment and the firm's ability to maintain adequate levels of inventory for each of the products and brands the firm decides to carry. This decision is further complicated by recent financial pressures on inventory managers who have, in general, responded by adopting "just-in-time" inventory management techniques. Thayer (1989) suggests that it may in fact be this increased financial pressure, and the resultant inventory management techniques, which is responsible for the generally increasing levels of stockouts. This leads to questioning the general notion that greater assortment is always desirable, as it can in many cases be quite costly. In some cases, it may be desirable to have a lower assortment and the lower out-of-stock levels that are typically associated with a smaller number of products in a category. In support of this basic principle, Broniarczyk, Hoyer and McAlister (1998) show that consumers' perceptions of assortment can be unaffected when certain low preference items are eliminated and shelf space is held constant. Thus the number of SKU's in a category may be trimmed without effecting assortment perceptions, and presumably satisfaction with the decision experience.

Our results are of course, subject to a number of limitations. The most important caution relates to the interpretation of the store switching data and their relationship to stockouts. The switching cost in our shopping simulation is essentially zero, and of course most consumers do have non-zero switching costs in most categories. Thus the magnitude of the observed behavioral responses to stockouts may represent the upper end of consumer response. Having observed this

limitation, it should also be said that an increasing proportion of consumer choices are being made in domains with extremely low store switching costs (e.g., the internet) and that increases of store switching of more than 50% in low switching environments are still likely to translate to fairly substantial switching rates in higher switching cost contexts. The issue of deciding not to choose (Dhar 1997) was not examined in this paper. Rather, participants were required to make a choice. This assumption is not entirely unrealistic as consumers are often under time pressure or are in geographically constrained situations which require immediate choice. However, as has been suggested by previous research (Greenleaf and Lehmann 1995; Schary and Christopher 1979), consumers often will decide not to choose in response to a stockout situation. The link between assortment, the decision to choose or delay, and short and long run decision satisfaction is clearly a subject worth further investigation.

One important area that we did not address in the current research is that of the availability of options that have symbolic meaning. We have assumed that if an option has no probability of being selected, that option will not elicit a negative response should it be out-of-stock. However, there are occasions when items a consumer would never choose do provide some symbolic value that the consumer wishes to preserve. For example, diehard Democrats value the option to choose a Republican, despite the fact they would never do so (compared to a one-party system); smokers want a non-smoking area to be available, despite never selecting to sit in it (presumably to separate smoke-sensitive consumers from them). For both of these groups of consumers, the symbolic value of an option they would never choose could potentially lead to a negative response, should that option be taken away. The issue of stockouts of symbolically valued items presents an interesting arena for further research.

Assuming that an occasional out-of-stock occurrence cannot be avoided, the issue of how best to manage the consumer is one which also provides some interesting opportunities for research. We touched on the issue in this paper by examining the effect of both considering the out-of-stock alternative and the degree of personalization of the stockout announcement. Developing effective strategies to manage dissatisfaction due to stockouts would be both useful and interesting.

For example, is suggesting an available alternative a positive or negative strategy? What does the answer to this question depend on? A related issue is that of differences across individuals in terms of their sensitivity to stockouts. Are there segments (or cultures) which are more or less sensitive to stockouts and are they identifiable? U.S. consumers in general seem likely to respond strongly to stockouts. Perhaps this is not the case in other cultures where stockouts are more accepted. We hope that the current research has provided a foundation upon which many of these research questions may be explored.

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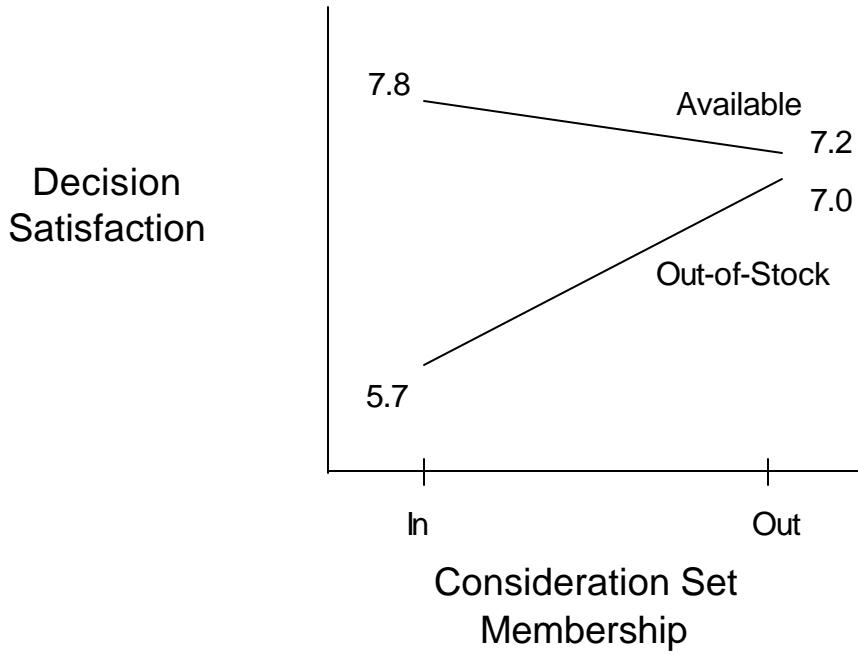
Study 1 Results on Decision Satisfaction Index By Condition
Means and (Standard Deviations)

Condition	n	Study 1 Decision Satisfaction	Study 1 Consumption Satisfaction	n	Study 1b Decision Satisfaction	Study 1b Consumption Satisfaction
Personal stockout, not in consideration set	--	--	--	19	5.82 (1.31)	6.00 (2.65)
Impersonal stockout, not in consideration set	13	6.99 (1.55)	6.27 (2.67)	18	5.99 (1.32)	6.03 (2.10)
Available, not in consideration set	14	7.23 (1.28)	6.75 (1.84)	19	6.20 (1.16)	6.61 (1.83)
Personal stockout, in consideration set	--	--	--	19	4.42 (1.30)	5.81 (2.12)
Impersonal stockout, in consideration set	13	5.73 (2.07)	6.26 (2.08)	18	5.52 (1.97)	6.32 (2.66)
Available, in consideration set	14	7.81 (1.42)	5.99 (2.15)	19	6.57 (1.57)	6.76 (1.76)

FIGURE 1

The Interaction Between Consideration Set Membership and Stockout

Study 1



Study 1b

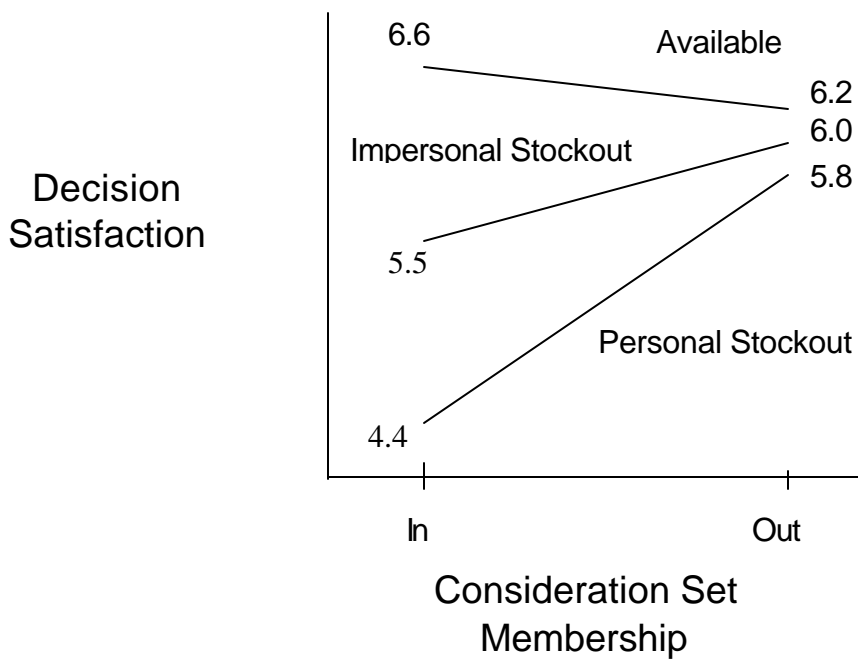


FIGURE 2

Consideration Set Size and Consumer Response to Stockouts

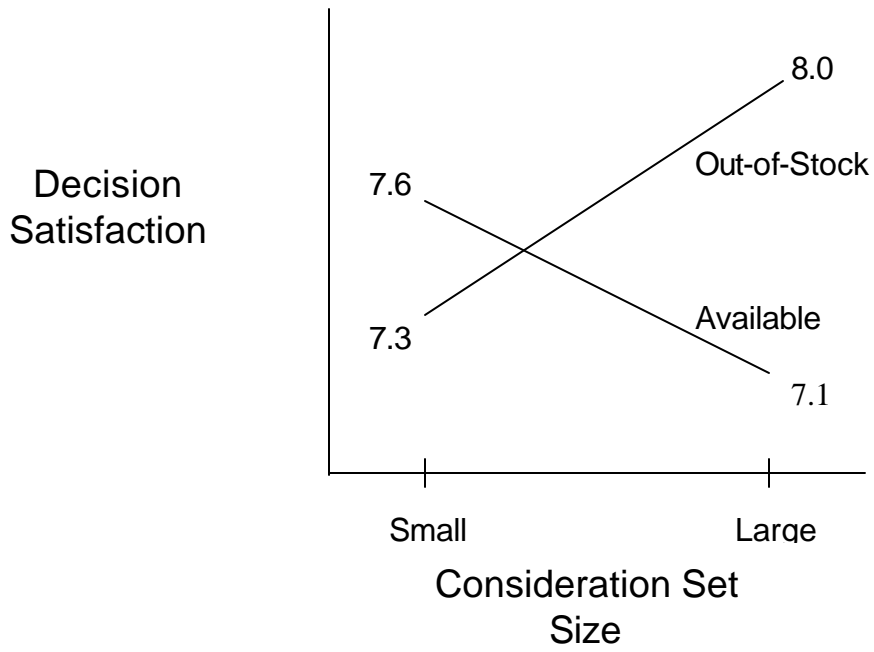


FIGURE 3

Decision Satisfaction and Store Switching Probability as a Function of Stockouts

Figure 3a – Decision Satisfaction

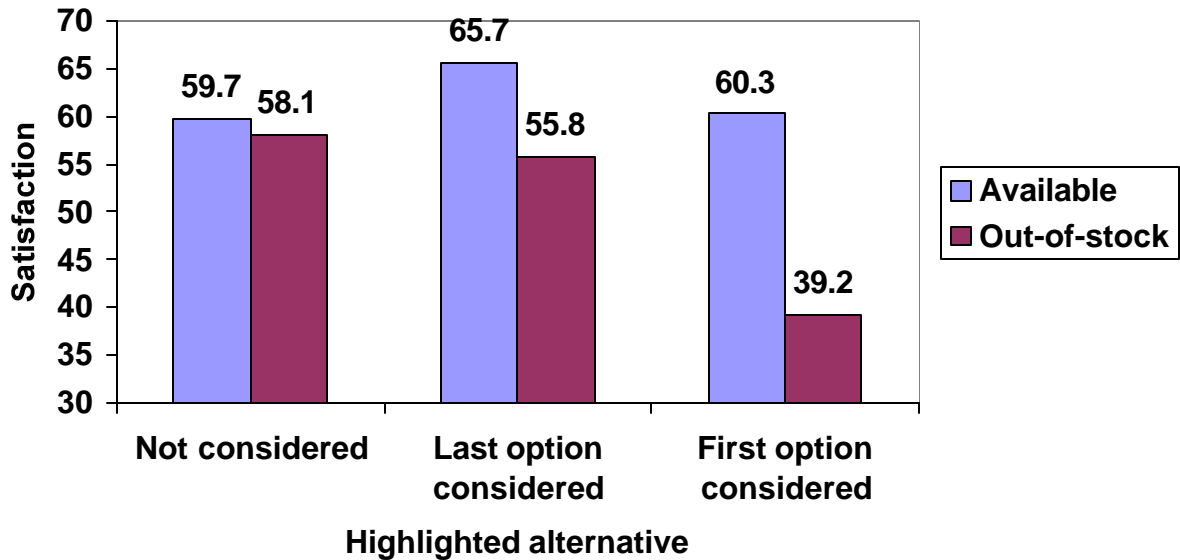
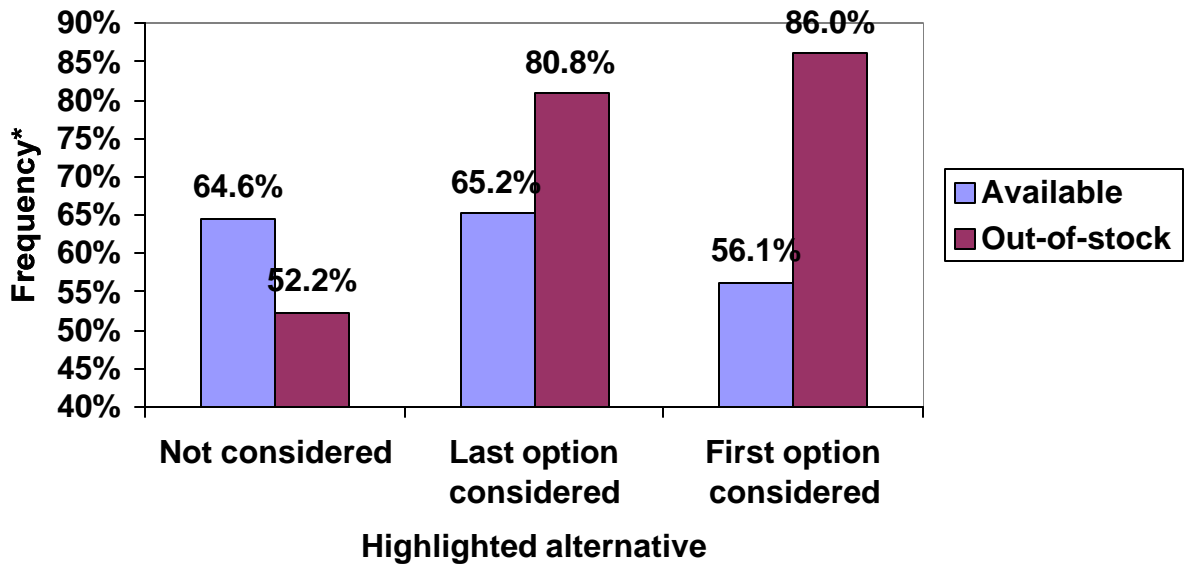


Figure 3b – Store Switching Frequency



* Percentage of respondents that chose a different store on their second shopping trip than on their first.

APPENDIX A

Alternative Descriptions

Study 1

FORMULATION:	A1	A2	B	C	D1	D2
Taste(1=poor taste; 10=excellent taste):	9	10	6	5	4	3
Grams of Fat:	2.0	3.0	1.6	2.0	8.0	6.0
Calories:	170	175	175	165	170	165
Days before Product Expires:	105	105	100	110	110	110

Study 3

FORMULATION:	A1	A2	B1	B2
Taste(1=poor taste; 10=excellent taste):	7.5	9.0	6.0	8.0
Calories:	125	300	150	365
Days before Product Expires:	100	105	100	110

APPENDIX B

Satisfaction Items

(All items have endpoints 1=strongly agree, 10=strongly disagree, unless otherwise noted.)

Consumption Satisfaction Items.

- C1. My choice turned out better than I had expected.
- C2. Given the identical set of alternatives to choose from, I would make the same choice again.
- C3. How satisfied were you with the product you chose? (endpoints 1=extremely satisfied, 10=extremely dissatisfied)
- C4. I am very displeased with the product I purchased.
- C5. I am very happy with the product I purchased.
- C6. Thinking of an ideal example of the product I purchased, my choice was very close to the ideal example.

Decision Satisfaction Items.

- D1. I found the process of deciding which product to buy frustrating.
- D2. Several good options were available for me to choose between.
- D3. How satisfied or dissatisfied are you with your experience of deciding which product option to choose? (endpoints 1=extremely satisfied, 10=extremely dissatisfied)
- D4. I thought the choice selection was good.
- D5. I would be happy to choose from the same set of product options on my next purchase occasion.
- D6. I found the process of deciding which product to buy interesting.

FOOTNOTES

¹ To improve clarity for the reader, all choice alternatives are labeled alphabetically in descending order of preference (note that participants did not view these labels). For example, a choice set of three alternatives with two equally preferred options, each of which is preferred to the third, would be labeled in this paper A1, A2, and B.

² Fifty-two of the 54 participants chose as predicted. Analyses did not differ meaningfully between the 52 and 54 participant data sets. Thus, the full 54 participant version is reported.

³ In addition to the reported six-item composite measure of decision satisfaction, we also computed a three-item measure which consisted of the three most general decision satisfaction items (D1, D3 and D6 in Appendix B). In each of the studies reported in the paper, as might be expected given the reliability and factor analytic results, there were no substantial differences between the full six-item and the three-item composite measures. Thus we report only the six-item measure, as in Fitzsimons, Greenleaf and Lehmann (1997).

⁴ All planned contrasts have the same error degrees of freedom as the overall model throughout the paper.