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An important decision that retailers make involves selecting the number of items constituting their assortments. A key issue in making these decisions is the role of assortment size in determining consumers' choice of a retailer. The authors address this issue by investigating how consumer choice among retailers offering various-sized assortments is influenced by the attractiveness of the options constituting these assortments. The data show that consumer preference for retailers offering larger assortments tends to decrease as the attractiveness of the options in their assortments increases and can even lead to a reversal of preferences in favor of retailers offering smaller assortments. This research further presents evidence that the relationship between assortment size and option attractiveness is concave, such that the marginal impact of assortment size on choice decreases as the attractiveness of the options increases. Data from eight empirical studies offer converging evidence in support of the theoretical predictions.

*Keywords:* assortment, retailing, consumer choice, context effects, consumer behavior

## Assortment Size and Option Attractiveness in Consumer Choice Among Retailers

An important decision that retailers make involves selecting the number of items constituting their assortments in each product category. This decision involves optimizing the benefits and costs of the assortment size for both buyers and sellers. Thus, from a retailer's standpoint, smaller assortments are often considered more desirable for cost-related reasons, such as inventory, shelf space, and financing costs (Kurt Salmon Associates 1993; The Partnering Group 1998). In this context, several retailers have considered trimming their assortments to increase their profit margins. Despite the evident cost savings, this approach has faced resistance from retailers concerned that decreasing assortment size will have a negative impact on consumer attitudes toward the retailer (Arnold, Oum, and Tigert 1983; Louviere and Gaeth 1987), ultimately leading to lower purchase probability (Broniarczyk, Hoyer, and McAlister 1998).

The increasing impact of assortment size on retailer costs raises the question of how assortment size influences buyers' choice of a retailer. Thus, a retailer concerned with

creating a cost-efficient assortment might want to know whether reducing the number of items in its assortment will lead to a decline in store attractiveness and lower the likelihood of consumers choosing the store. In the same vein, a retailer concerned with broadening its customer base might want to know whether increasing the assortment size will result in greater store preference. Despite the conceptual and practical importance of understanding the impact of assortment size on consumer choice among retailers, existing research does not offer a clear answer to this question, and it has been argued that larger assortments can be both beneficial and detrimental to consumers (Broniarczyk 2008; Chernev 2008).

We address the question of how assortment size influences consumer choice among retailers by investigating the impact of the attractiveness of the options constituting these assortments on consumer preferences. Retailers vary in terms of the attractiveness of the items they carry. Some retailers carry options that are, on average, of higher quality and thus are likely to be perceived as more attractive. In contrast, other retailers carry options that are, on average, of lower quality and are likely to be perceived as relatively less attractive. In addition, some assortments can be perceived as more attractive because the items they carry match consumer preferences. To illustrate, assortments comprising best-selling items that are likely to appeal to a majority of buyers are likely to be perceived as more attrac-

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tive than assortments comprising less popular items. Likewise, assortments customized to fit the preferences of a particular customer segment are likely to be perceived as more attractive to that segment than assortments designed to appeal to a broader segment.

In this research, we argue that smaller assortments are more preferable when choosing among assortments comprising relatively more attractive options. We further propose that the relationship between assortment size and option attractiveness is concave, such that the marginal impact of assortment size on choice decreases as the attractiveness of the options increases. We also posit that consumer assortment preferences are a function of the perceived benefits and costs associated with the available assortments, such that the hypothesized assortment-attractiveness effect is more pronounced when the perceived costs of choosing from the larger assortment are high than when they are low. The data from eight empirical studies support our theorizing and offer converging evidence in support of the predictions.

### *THEORETICAL BACKGROUND*

Conventional wisdom suggests that larger assortments are beneficial to customers because more options in the choice set imply a greater likelihood that consumers will find an option matching their preferences (Baumol and Ide 1956; Hotelling 1929; Kahneman, Wakker, and Sarin 1997). It has also been argued that larger assortments enable consumers to fulfill their variety-seeking needs more effectively (Inman 2001; Ratner, Kahn, and Kahneman 1999; Read and Loewenstein 1995; Simonson 1990; Van Herpen and Pieters 2002), while offering customers greater decision flexibility in light of uncertainty about future tastes (Kahn and Lehmann 1991; Kahneman and Snell 1992; Kreps 1979; Shin and Ariely 2004).

However, recent research has shown that the benefits of greater variety are often offset by an increase in consumers' cognitive costs associated with choosing from a larger assortment. Accordingly, it has been argued that making a choice from a larger assortment requires greater cognitive effort than choosing from a smaller assortment simply because it involves evaluating more options (Iyengar and Lepper 2000; Shugan 1980). Thus, larger assortments are likely to be more confusing for consumers who are uncertain of their preferences because of the greater number of attributes and/or attribute levels that must be evaluated to form a preference and make a choice (Huffman and Kahn 1998; Sood, Rottenstreich, and Brenner 2004), as well as the increasing number of trade-offs that consumers must make when comparing the benefits and costs of different options (Chernev 2003a, b).

Building on prior findings, we argue that consumer choice among assortments is a function of the attractiveness of the options constituting these assortments, such that smaller assortments will be more preferred when choosing among assortments comprising relatively more attractive options. To illustrate, when choosing between a retailer that carries a larger assortment and one that carries a smaller assortment, consumers are more likely to prefer the smaller assortment when both assortments comprise relatively more attractive options than when they comprise relatively less attractive options.

The prediction that smaller assortments will be more preferred as option attractiveness increases is based on the notion that when choosing among assortments, consumers try to minimize the cost-benefit trade-offs associated with selecting a particular assortment. In terms of benefits, larger assortments offer a greater variety of options, which in turn increases the probability of a better fit between consumer preferences and the available choice alternatives. In terms of costs, choosing from larger assortments is associated with greater cognitive effort in evaluating choice alternatives and greater difficulty in making a choice. In this context, we argue that the marginal benefits from a larger assortment are a function of the assortment's attractiveness. Thus, in the case of assortments comprising relatively attractive options, the marginal benefit of having a larger assortment to choose from is likely to be less than when the choice involves assortments comprising relatively less attractive options.

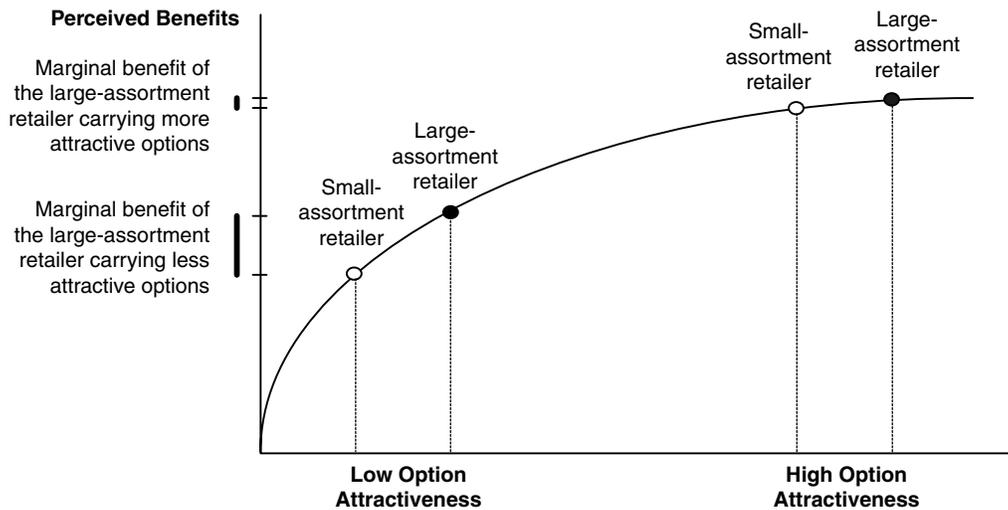
The proposition that the marginal benefits associated with large assortments tend to decrease as the perceived benefits of these assortments increase is consistent with the concavity of the value function (Bernoulli 1738; Kahneman and Tversky 1979; Tversky and Kahneman 1991), which asserts that an increase in an object's value on a particular attribute will be associated with a decrease in this attribute's marginal utility. The diminishing marginal utility is also implied by the psychophysical principle that sensitivity to changes along a particular dimension is reduced as the magnitude of that dimension increases (Stevens 1975; Torgerson 1958).

In marketing, the diminishing marginal value argument has been demonstrated in the context of new product development, in which new product features have been shown to contribute more value to relatively inferior products than to relatively superior products (Nowlis and Simonson 1996). The diminishing marginal value theory has been applied to the relationship between objective and subjective estimation of a product's size, in which consumers' sensitivity to changes in magnitude has been shown to decrease as the product size increases (Chandon and Wansink 2007).

With respect to consumer choice among assortments, the diminishing marginal value principle implies that increasing the attractiveness of the options in both larger and smaller assortments is likely to bring the assortments closer together in terms of the perceived consumer benefits. As a result, the perceived difference between these assortments will decrease with the increase in the options' attractiveness, which in turn will decrease the relative advantage of the larger set. Figure 1 illustrates this argument.

Thus far, the discussion has focused on the marginal benefits of larger assortments relative to smaller assortments as a function of assortment attractiveness. In terms of costs, however, choosing from larger assortments is associated with greater cognitive effort in evaluating choice alternatives and greater difficulty in making a choice (Chernev 2003a; Shugan 1980). Unlike the case of evaluating assortment benefits, the cognitive costs associated with increasing assortment size are not likely to be a function of assortment attractiveness. That is, the increase in cognitive costs from adding options to an assortment is likely to be similar for assortments comprising high- and low-attractiveness options.

Figure 1  
PERCEIVED BENEFITS AS A FUNCTION OF ASSORTMENT SIZE AND OPTION ATTRACTIVENESS



Notes: The marginal perceived advantage of the larger assortment is greater when option attractiveness is low than when it is high.

As a result, the benefits stemming from increasing assortment size are likely to be more relevant when assortments comprise relatively less attractive options. Thus, when choosing among assortments comprising attractive options, the marginal benefits of the additional options present in the larger assortment are likely to be less pronounced, thus weakening the preference for the larger assortment. Provided that the cognitive costs associated with evaluating larger assortments are increasing at a similar rate for assortments comprising more attractive and less attractive options, the cost-benefit trade-off is more likely to favor the smaller assortment as the attractiveness of both assortments increases.

We empirically test the proposed effect of option attractiveness on consumer choice among assortments in a series of eight experiments. Experiments 1 and 2 document the assortment-attractiveness effect across a variety of decision contexts. Experiments 3 and 4 offer additional direct evidence in support of the diminishing marginal value theory underlying the observed effects. Experiment 5 further investigates the underlying mechanism of the assortment-attractiveness effect by examining the impact of option attractiveness on consumers' information search patterns. Finally, Experiments 6a-6c examine consumers' assortment preferences as a function of the cognitive costs associated with choosing from the available assortments and identify key boundary conditions of the observed effects.

#### EXPERIMENT 1

The goal of Experiment 1 is to demonstrate that smaller assortments are preferable to larger assortments when option attractiveness is high than when it is low. Furthermore, this experiment aims to document the proposed assortment-attractiveness effect in a scenario in which consumers make real choices with direct consequences.

#### Method

Sixty participants in an executive education seminar were given a choice between two sandwich shops. The two shops offered sandwiches of similar quality but varied in terms of the size of their assortment. In particular, we informed participants that one of the shops (Black Forest) offered 9 sandwiches and that the other shop (Prairie Moon) offered 38 sandwiches. We told some of the participants that both shops used premium ingredients to offer great-tasting sandwiches and had an average consumer rating of 4.5 out of 5 stars (high-attractiveness condition); we told the remainder of the participants that both shops used average ingredients to offer fairly good sandwiches and had an average consumer rating of 1.5 out of 5 stars (low-attractiveness condition).

After the initial description of the two sandwich shops, each participant was given an envelope containing two menus (one from each shop) and was asked to select one of the two menus from which he or she would choose a sandwich. Both menus were folded and sealed so that participants could not preview the options before choosing one of the two menus. The name of the sandwich shop and the number of options were written on the outside of each menu. The menu with the greater number of options was also approximately 20% larger than the menu with fewer options. After selecting a menu, participants unsealed the menu and marked their most preferred sandwich. Participants received their sandwich of choice the following week.

#### Results and Discussion

We argue that assortment preference is a function of the attractiveness of the options constituting the assortments, such that the share of the smaller assortment will be greater for sets comprising relatively more attractive options. The

data from Experiment 1 show that 13.3% of participants selected the smaller assortment when choosing between sandwich shops offering less attractive options, compared with 40% who selected the smaller assortment when choosing between sandwich shops offering relatively more attractive options ( $\chi^2(1) = 5.03, p < .05$ ). This finding supports our prediction that choice among assortments is a function of the attractiveness of the options constituting these assortments, such that participants were more likely to choose the smaller assortment when option attractiveness was high than when it was low. These data also lend support to the prior findings that consumers often opt to forgo the potential benefits of larger assortments to simplify choice (Chernev 2003a, b; Huffman and Kahn 1998).

### EXPERIMENT 2

Experiment 1 documents the assortment-attractiveness effect in a scenario in which consumers make choices from a single product category. Building on this finding, the goal of Experiment 2 is to generalize the observed effect by testing its validity in a variety of contexts and by employing alternative manipulations of assortment attractiveness.

#### Method

Two hundred forty-four participants made a choice between two assortments in one of three diverse categories: data CDs, dating services, and vitamin water. In the data CD scenario, participants were asked to imagine that they were buying a data CD and had the option of going to two retailers: one offering a selection of 6 brands and one offering a selection of 18 brands. In the dating service scenario, participants were asked to imagine that they decided to use a dating service and were given a choice of two services: one offering 8 potential date matches and one offering 24 matches. In the vitamin water scenario, participants were asked to imagine buying vitamin water from one of two local stores: one carrying 8 brands of vitamin water and one carrying 30 brands.

Participants in each scenario were randomly assigned to either a high- or a low-option-attractiveness condition. To increase external validity, this experiment used three different manipulations of option attractiveness. In the data CD choice, attractiveness was manipulated by informing participants either that both stores had five-star ratings (high attractiveness) or that both stores had one-star ratings (low attractiveness). In the dating service scenario, attractiveness of the decision set was manipulated by informing participants about the specifics of the match-generation process. In the high-attractiveness condition, participants were told that the potential date profiles were generated by matching 20 different personality dimensions. In contrast, participants in the low-attractiveness condition were told that potential dates were selected using a single personality dimension. In this context, we expected that assortments constructed by comparing a larger number of dimensions would be more attractive than assortments based solely on a single personality dimension. Finally, in the vitamin water choice, attractiveness was manipulated by varying the selection rule used to create the assortments. Thus, some of the participants were told that both stores carried only the most popular, best-selling brands, and others were told that both stores carried only low-priced, economy brands.

The assumption was that participants would use the market share information as a proxy for attractiveness by following the preferences of other consumers (Prelec, Wernerfelt, and Zettelmeyer 1997).

#### Results and Discussion

Based on random assignment, there were 80 participants in the data CD condition, 68 participants in the dating service condition, and 96 participants in the vitamin water condition. The data show that when choosing among data CD retailers, 32.3% of participants selected the smaller assortment when options were rated as relatively unattractive (single star), compared with 55.3% who selected the smaller assortment when the attractiveness of the options in both assortments was high (five stars). Similarly, when choosing a dating service, 22.2% of the participants selected the smaller assortment when choosing among relatively less attractive assortments, compared with 62.5% of the participants who opted for the smaller assortment when choosing among relatively more attractive assortments. Finally, when choosing among stores selling vitamin water, 35.4% selected the smaller assortment when both stores carried only brands that were not best sellers, compared with 64.6% who chose the smaller assortment when both stores carried only the most popular brands.

We tested the significance of this data pattern using a model in which choice of assortment was given as a function of option attractiveness, product category, and their interaction. Logistic regression analysis showed that the effect of option attractiveness on choice was significant ( $\chi^2(1) = 21.71, p < .001$ ), a finding that is consistent with the experimental predictions. Product category effects were not significant ( $\chi^2(1) = 1.28$ ), nor was the category  $\times$  attractiveness interaction ( $\chi^2(1) = 1.47$ ), suggesting that the observed assortment-attractiveness effect was consistent across the manipulations in the three experimental conditions. This finding indicates the robustness of the effect across product categories.

### EXPERIMENT 3

Building on the findings we reported in Experiments 1 and 2, the goal of Experiment 3 was to provide more direct evidence for the proposed diminishing marginal value theory by examining the differences in perceived attractiveness of the available assortments across experimental conditions. This experiment also involved an alternative manipulation of option attractiveness; instead of providing participants with information that explicitly manipulated the attractiveness of the options (as in Experiments 1 and 2), we manipulated the fit between consumers' subjective preferences and the composition of the available assortments.

#### Method

One hundred forty-one people were recruited to participate in an online survey of consumer preferences. The decision task involved jam, a category frequently used in prior assortment research (Chernev 2003a; Iyengar and Lepper 2000). Participants were asked to indicate their preferences for jam by rank-ordering the following four flavors: strawberry, blueberry, raspberry, and peach. Following the ranking task, participants were asked to imagine that they were

considering purchasing jam at one of two online specialty stores. One store was reported to carry a relatively small assortment of 9 jams, and the other carried a relatively large assortment of 54 jams.

Participants were then randomly assigned to either a high- or a low-attractiveness condition. Option attractiveness was manipulated by varying the degree of fit between participants' articulated preferences in the ranking task and the composition of the assortments among which they were asked to choose. Thus, in the high-attractiveness condition, participants were told that most of the jams in both stores were of the flavor that they had indicated in the ranking task as most preferred. In contrast, participants in the low-attractiveness condition chose among assortments consisting mostly of the jam flavors that they had ranked as least attractive. To illustrate, participants in the high-attractiveness condition who ranked blueberry as the most preferred flavor chose between stores that carried mostly blueberry jams. In contrast, participants in the low-attractiveness condition who ranked peach as the least preferred flavor chose between stores that carried mostly peach jams.

Participants chose the store from which they would prefer to buy the jam. Following their choice, participants were also asked to rate the attractiveness of each of the two assortments on a scale from 1 ("very unattractive") to 7 ("very attractive").

### Results and Discussion

To check the effectiveness of the attractiveness manipulation, we compared participants' ratings of the smaller and larger assortments in each experimental condition. Participants rated both assortments as more attractive when they were consistent with the preferences they articulated in the rating task ( $M = 5.30$ ) than when they were not consistent with these preferences ( $M = 3.56$ ). The difference in these ratings was significant ( $F(1, 139) = 100.19, p < .001$ ), lending support to the validity of the attractiveness manipulation.

The data show that 14.5% of participants selected the smaller assortment when options were low in attractiveness (primarily comprising the least preferred flavor), compared with 50.0% who selected the smaller assortment when the attractiveness of both assortments was high (primarily comprising the most preferred flavor). This difference in choice shares was significant ( $\chi^2(1) = 18.26, p < .001$ ), lending support to the proposition that choice among assortments is a function of the attractiveness of the options constituting these assortments.

To test the proposed diminishing marginal utility theory, we examined the difference in attractiveness ratings between the large and the small assortments as a function of option attractiveness. The diminishing value argument predicts that the difference in attractiveness ratings of the larger and smaller assortments is likely to be greater when assortments comprise less attractive options than when assortments comprise more attractive options. The data show that the difference in perceived attractiveness between the larger and the smaller assortments was greater for assortments comprising relatively less attractive options ( $M_L = 4.35, M_S = 2.77, M_{Diff} = 1.58$ ) than for assortments

comprising relatively more attractive options ( $M_L = 5.85, M_S = 4.75, M_{Diff} = 1.10$ ). The differences in the attractiveness ratings of the larger and smaller assortments across the two experimental conditions were significant ( $F(1, 138) = 2.83, p < .05$ ), a finding consistent with the proposed diminishing marginal utility argument.

The data we report in Experiments 1–3 provide converging support for the hypothesis that choice among assortments is a function of the attractiveness of the options constituting these assortments, in that the smaller assortment is more likely to be chosen when option attractiveness is high than when it is low. Furthermore, as Table 1 shows, in three of the five product categories tested, the data show not only a decrease in the relative share of the larger assortment as attractiveness increased but also a preference reversal, such that the choice share of the smaller assortment was actually greater than that of the larger assortment; this striking result testifies to the strength of the assortment-attractiveness effect.

Conceptually, we argue that when choosing among assortments comprising more attractive options (compared with assortments comprising less attractive options), the marginal benefits of the extra options contained only in the larger assortment are likely to be less, thus weakening the preference for the larger assortment. This argument also implies that the impact of option attractiveness on choice among assortments is likely to be a function of the magnitude of the difference in size of the larger and the smaller assortments. In particular, the differential impact of option attractiveness on choice among assortments, which we documented in Experiments 1–3, is likely to be more pronounced when the difference in size between the larger and the smaller assortments is greater. To illustrate, the difference in the perceived benefit between a 9-item and an 18-item assortment on the one hand and a 9-item and a 54-item assortment on the other hand is likely to be greater when the attractiveness of the options constituting these assortments is low than when it is high. In this context, the difference in marginal benefits from varying the size of the larger assortment can lead to a change in the overall preference for the available assortments, making it more pronounced when the difference in size is greater. We test this proposition in Experiment 4.

**Table 1**  
EXPERIMENTS 1–3: THE IMPACT OF ASSORTMENT SIZE AND OPTION ATTRACTIVENESS ON THE CHOICE SHARE OF THE SMALLER ASSORTMENT

|              | Product Categories | Assortment Attractiveness |                   |
|--------------|--------------------|---------------------------|-------------------|
|              |                    | Low                       | High              |
| Experiment 1 | Sandwiches         | 13.3%<br>(N = 30)         | 40.0%<br>(N = 30) |
| Experiment 2 | CD retailer        | 32.3%<br>(N = 42)         | 55.3%<br>(N = 38) |
| Experiment 2 | Dating service     | 22.2%<br>(N = 36)         | 62.5%<br>(N = 32) |
| Experiment 2 | Vitamin water      | 35.4%<br>(N = 42)         | 64.6%<br>(N = 42) |
| Experiment 3 | Jam                | 14.5%<br>(N = 69)         | 50.0%<br>(N = 72) |

#### EXPERIMENT 4

The goal of Experiment 4 is to further test the diminishing marginal value theory by documenting that the impact of option attractiveness on assortment choice is a function of the magnitude of the size difference between the larger and the smaller assortments.

##### Method

Eighty-five participants were asked to make choices in four product categories—blender, gas grill, iron, and white paint—that could be purchased from one of two stores: one offering a smaller selection (9 options) and one offering a larger selection (either 18 or 54 options). Participants were randomly assigned to the conditions of a 2 (option attractiveness: high versus low)  $\times$  2 (relative size difference: small versus large) factorial design. Option attractiveness was manipulated using star ratings, an operationalization that is similar to the one used in the first experiment. The magnitude of the difference in size between the smaller and the larger assortments was manipulated by varying the size of the larger assortment. Thus, some of the participants were given a choice between a 9-item and an 18-item assortment (small-difference condition), and the others were given a choice between a 9-item and a 54-item assortment (large-difference condition). After presenting the decision scenarios, we asked participants to choose one of the two assortments for each product category.

##### Results and Discussion

We argued that the relative size difference of the assortments moderates the impact of option attractiveness on assortment choice, such that the assortment-attractiveness effect is likely to be more pronounced as the size difference between the assortments increases. Each of the 85 participants made four choices, yielding 335 observations (5 missing data points). The data show that when the difference between the larger and the smaller assortment was relatively small (choosing between a store with 9 options and a store with 18 options), 19.3% ( $N = 88$ ) of participants chose the smaller assortment when attractiveness was low, compared with 33.8% ( $N = 80$ ) of participants who chose the smaller assortment when the attractiveness was high ( $\chi^2(1) = 4.43, p < .05$ ). When the difference between the smaller and the larger assortments was more pronounced (9 versus 54 options), the preference for the smaller assortment increased from 14.5% ( $N = 76$ ) in the low-attractiveness condition to 50.6% ( $N = 91$ ) in the high-attractiveness condition ( $\chi^2(1) = 43.16, p < .001$ ). More important, the difference in the impact of option attractiveness on choice among assortments as a function of the magnitude of the difference in size of the larger and the smaller assortments was significant ( $\chi^2(1) = 4.20, p < .05$ ). This finding was consistent across all four product categories, signifying the robustness of the observed effect.

The results of this experiment lend support to the proposition that the impact of option attractiveness on choice is a function of the magnitude of the size difference between the larger and the smaller assortments, such that the impact of option attractiveness on choice becomes greater as the magnitude of the difference increases. We attributed this effect to the diminishing marginal value argument, accord-

ing to which the benefits stemming from increasing assortment size are likely to be greater when option attractiveness is low than when it is high. An alternative account for the observed results is that the increase in the options' attractiveness may lead to a change in consumers' information search pattern, such that choices from assortments comprising more attractive options are associated with less search. Indeed, it could be argued that when faced with an assortment comprising relatively more attractive options, consumers are likely to adopt a decision rule that requires a less intensive information search because of the increased likelihood of finding an acceptable alternative in such assortments. Thus, consumers who expect to do only a limited amount of processing are more likely to select the smaller assortment, whereas those who expect a more extensive information search are likely to select the larger assortment. As a result, the greater likelihood of selecting the smaller assortment when choosing among assortments comprising attractive options could potentially be attributed to a change in the search strategy rather than a change in consumer evaluation of choice alternatives. We examine the validity of this proposition in Experiment 5.

#### EXPERIMENT 5

The goal of Experiment 5 is to test the proposition that the observed assortment-attractiveness effect can be attributed to a change in consumer decision strategy rather than to a change in consumer evaluation of choice alternatives, as the diminishing marginal value theory argues. In this context, we examine the impact of option attractiveness on consumer information search and option evaluation patterns and, in particular, whether assortments comprising less attractive options are likely to be associated with more extensive evaluations.

##### Method

Ninety-four people were recruited to participate in an online survey on consumer preferences. They were asked to imagine that they had received a gift certificate for a box of chocolates that was redeemable at two stores. One store was reported to carry an assortment of 9 chocolates, and the other store was reported to carry an assortment of 54 chocolates. Participants had the option to search each of the assortments by clicking on the store image, which presented a list of all options from that store. After examining the assortment in the first store, participants could either select a chocolate from that store or search the assortment at the other store. Participants could navigate back and forth between the stores as often as they liked before making their final selection. Chocolates in each store were described by name (e.g., milk chocolate truffle) and by an image taken from Godiva chocolates. The larger assortment included all options contained in the smaller assortment, and there were no duplicates within either of the assortments.

Participants were randomly assigned to one of two option-attractiveness conditions. Attractiveness was manipulated in this experiment by providing an average chocolate rating score, which was identical for both assortments. In the high-attractiveness condition, both stores carried chocolates with an average rating of five stars, and

in the low-attractiveness condition both stores carried chocolates with an average rating of one star. The dependent variables were the assortment initially searched, the assortment ultimately selected, and the extent of the search, measured in terms of the number of times participants viewed one of the two assortments.

### *Results and Discussion*

To investigate how decision processes are influenced by the overall attractiveness of smaller and larger assortments, we examined which store the participants chose to search first. The data show that in the low-attractiveness condition, few participants first searched the smaller assortment (25.5%,  $N = 47$ ), a finding consistent with prior research (Iyengar and Lepper 2000). When option attractiveness was high, however, the search pattern was reversed; that is, participants were more likely to search the smaller assortment first (61.7%,  $N = 47$ ) than they were to search the larger one first. Analysis of these data shows that this difference in choice shares across the two attractiveness conditions was significant ( $\chi^2(1) = 11.86, p < .001$ ). This result is consistent with the findings of Experiments 1–4.

After searching between the stores as often as they wanted, participants selected an item from one of the two assortments. Participants' choice of an option from either the larger or the smaller assortment also revealed a pattern consistent with the experimental predictions. To be more specific, 25.5% ( $N = 47$ ) of the participants in the low-attractiveness condition selected an option from the smaller assortment, compared with 44.7% ( $N = 47$ ) of those in the high-attractiveness condition ( $\chi^2(1) = 3.71, p < .05$ ).

To test the possibility that consumers in the high-attractiveness condition were simply less likely to search before choosing, we examined the differences in the number of times participants searched the two stores across the experimental conditions. If participants in the high-attractiveness condition were indeed less likely to search before choosing, the total number of times they viewed each assortment should be lower when choosing between assortments comprising relatively more attractive options. The data show that the total number of times participants viewed each assortment varied between one (i.e., the participant chose from the first store he or she viewed) and six, with 90% of participants viewing the assortments three times or fewer. More important, the data show that the average number of store views across the two experimental conditions was virtually the same ( $M = 2.26$  versus  $M = 2.21$ ), a finding contrary to the proposition that participants choosing from more attractive assortments simply searched less.

An additional measure of participants' decision strategy involved comparing the number of participants who stopped searching after looking at a single assortment. We expected that if participants in the high-attractiveness conditions were indeed less willing to search, they would be more likely to stop searching after evaluating options in the assortment they initially considered. Contrary to this prediction, the data show that 42.6% ( $N = 47$ ) of the participants in the low-attractiveness condition made a choice after looking at a single assortment, compared with 25.5% ( $N = 47$ ) of those in the high-attractiveness condition ( $\chi^2(1) = 2.98, p < .10$ ). This finding suggests that the

increased preference for smaller assortments among relatively more attractive options cannot be directly attributed to participants in the high-attractiveness conditions being less willing to search.

These data document that increased preference for smaller assortments when choosing among relatively more attractive options cannot be readily attributed to a decrease in willingness to search as option attractiveness increases. Thus, the data show that there was no difference in the total amount of searching when choosing among less attractive or more attractive assortments. More important, the data indicate that the number of participants who selected an option from the first assortment they looked at was higher in the low-attractiveness condition, a finding that is directionally opposite to the prediction that people simply search less when choosing from attractive assortments.

Conceptually, we argue that option attractiveness moderates the impact of assortment size on choice by influencing the relative advantage of the larger assortment. However, the relative advantage of the larger assortment is a function of its benefits (e.g., the greater likelihood of finding the "ideal" option) and costs (e.g., the greater cognitive costs associated with evaluating a larger number of options). Indeed, in the absence of costs associated with making a selection from the larger assortment, consumers tend to choose that assortment because it has no disadvantages and there is nothing to be gained by choosing the smaller assortment. In contrast, when the perceived costs of selecting the larger assortment are prominent, the attractiveness of the assortment options is likely to have a greater impact on choice among assortments because there is much more to be gained by a potential change in the relative attractiveness of the larger versus the smaller assortment.

Therefore, we predict that the relative advantage of the larger assortment and, in particular, the prominence of the costs associated with choosing this assortment are likely to influence the strength of the assortment-attractiveness effect, such that it will be more pronounced when the perceived costs of choosing from the larger assortment are high than when they are low. We test this proposition in Experiments 6a–6c, in which we vary the relative advantage of the larger assortment using three alternative manipulations: (1) varying consumer decision focus (Experiment 6a), (2) varying the organization of the choice set (Experiment 6b), and (3) varying the complexity of the decision task (Experiment 6c).

### *EXPERIMENT 6A*

The goal of this experiment was to examine the impact of the prominence of decision costs on the strength of the assortment-attractiveness effect.

#### *Method*

One hundred thirty-four participants were asked to imagine that they were purchasing products in four product categories—air conditioner, data CD, coffee maker, and vacuum cleaner—and had the option of going to two stores: one offering a selection of 9 options and one offering a selection of 24 options. We manipulated the perceived costs associated with making a choice from the larger assortment by asking participants to justify their choice of either an assortment (assortment-focus condition) or a particular

option from the selected assortment (option-focused condition). The basic premise of this manipulation was that focusing participants' attention on the choice of an assortment is more likely to emphasize the benefits of the larger assortment, whereas focusing on choosing an option is more likely to emphasize the costs associated with choosing among the variety of options in the larger assortment (Chernev 2006; Sood, Rottenstreich, and Brenner 2004).

Participants were randomly assigned to the conditions of a 2 (option attractiveness: high versus low)  $\times$  2 (decision focus: assortment versus option) factorial design. To increase the external validity of the experiment, we used several manipulations of assortment attractiveness. For two of the product categories in the first scenario (data CD and coffee maker), we manipulated option attractiveness by providing star ratings as in Experiment 4. For the other two product categories in the first scenario (air conditioner and vacuum cleaner), we manipulated attractiveness by providing participants with the average measure of the options' performance relative to a readily available benchmark. To illustrate, air conditioners were given an energy efficiency rating; in the high-attractiveness condition, participants were told that both stores carried air conditioners with an average rating of 11.5, and in the low-attractiveness condition, air conditioners had an average rating of 8.5. To calibrate participants' interpretation of these ratings, they were also told that the typical range of ratings was between 8 and 12. The vacuum cleaner manipulation involved power ratings of 4.5 (low) versus 9.5 (high) amps, in a range of 4 to 10.

### Results and Discussion

One hundred thirty-four participants each made four choices, yielding 530 observations (6 missing data points). The data summarized in Table 2 show that participants' choice of an assortment was indeed a function of decision focus and option attractiveness.

Analysis of the impact of decision focus on the strength of the assortment-attractiveness effect reveals that the moderating effect of decision focus is significant ( $\chi^2(1) = 4.93$ ,  $p < .05$ ). Thus, for participants who were asked to provide their rationale for choice of an option from the store they selected (option focus), the difference in the choice shares

of the smaller assortment increased from 28.3% in the low-attractiveness condition to 68.4% in the high-attractiveness condition ( $\chi^2(1) = 43.16$ ,  $p < .001$ ). In contrast, the difference between attractiveness conditions was smaller among participants who were told that they might be asked to provide the reasons for their choice of store (assortment focus). Specifically, only 19.6% chose the smaller assortment when attractiveness was low, compared with 35.7% who chose the smaller assortment when attractiveness was high, resulting in a de facto reversal of participants' preferences for larger versus smaller assortments ( $\chi^2(1) = 7.89$ ,  $p < .005$ ). These data show that the assortment-attractiveness effect is more likely to occur in scenarios in which decision costs associated with the selection of larger assortment are more salient to consumers and that this effect is less pronounced when the advantages of the larger assortment are readily transparent to consumers.

### EXPERIMENT 6B

The goal of this experiment was to examine the role of decision difficulty associated with making a choice from the available assortments and, in particular, the role of the organization of assortment options on the strength of the assortment-attractiveness effect.

#### Method

Eighty-two participants were asked to imagine that they were purchasing a telephone and computer monitor and had the option of going to two stores: one offering a selection of 9 options and one offering a selection of 24 options. Some of the participants were told that options were ordered according to their preferences, whereas others were not provided with information about the ordering of the options. The rationale for this manipulation was that ordering choice options according to consumer preferences essentially eliminated the costs associated with making a choice from the larger assortment, thus making its advantage readily transparent to consumers (Diehl and Zauberma 2005; Lynch and Ariely 2000).

Participants were randomly assigned to the conditions of a 2 (option attractiveness: high versus low)  $\times$  2 (organization of the assortment: ordered versus not ordered) factorial design. Option attractiveness was manipulated by varying

Table 2  
EXPERIMENTS 6A–6C: THE IMPACT OF ASSORTMENT SIZE AND OPTION ATTRACTIVENESS ON THE CHOICE SHARE OF THE SMALLER ASSORTMENT AS A FUNCTION OF DECISION COSTS

|               | Product Categories                                     | Assortment Attractiveness |                        |                    |                        |
|---------------|--|---------------------------|------------------------|--------------------|------------------------|
|               |  | Low                       |                        | High               |                        |
|               |  | Assortment Focus          | Option Focus           | Assortment Focus   | Option Focus           |
| Experiment 6a | Air conditioner, data CD, coffee maker, vacuum cleaner | 19.6%<br>(N = 133)        | 28.3%<br>(N = 152)     | 35.7%<br>(N = 112) | 68.4%<br>(N = 133)     |
|               |  | <i>Ordered Set</i>        | <i>Not Ordered Set</i> | <i>Ordered Set</i> | <i>Not Ordered Set</i> |
| Experiment 6b | Energy drink, nutrition bars                           | 15.8%<br>(N = 38)         | 30%<br>(N = 40)        | 7.5%<br>(N = 40)   | 54.3%<br>(N = 46)      |
|               |  | <i>Easy Task</i>          | <i>Difficult Task</i>  | <i>Easy Task</i>   | <i>Difficult Task</i>  |
| Experiment 6c | Telephone, computer monitor                            | 13.6%<br>(N = 44)         | 32%<br>(N = 50)        | 6.8%<br>(N = 44)   | 61.4%<br>(N = 44)      |

the popularity of the brands constituting the available assortments. Thus, some of the participants were told that both stores carried only the most popular brands, whereas others were told that both stores carried assortments comprising less popular brands.

### *Results and Discussion*

The data show that of the participants presented with a choice set in which alternatives were not ordered, 54.3% selected the smaller assortment in the high-attractiveness condition, compared with only 30% of those in the low-attractiveness condition, a pattern that is consistent with the data from the previous experiments. In contrast, of the participants presented with an assortment in which options were ordered according to participants' preferences, only 7.5% selected the small assortment when options constituting that assortment were described as being relatively attractive, compared with 15.8% in the low-attractiveness condition. Analysis of these data shows that the impact of option attractiveness on consumer choice among assortments is a function of the ordering of the items in these assortments ( $\chi^2(1) = 4.52, p < .05$ ). This finding is consistent with the proposition that the assortment-attractiveness effect is more likely to occur in scenarios in which decision costs associated with the selection of a larger assortment are greater (as in the case of unordered assortments) and is likely to be less pronounced when the costs associated with choosing from a larger assortment are lower (as in the case of ordered assortments).

### *EXPERIMENT 6C*

The goal of this experiment was to examine the role of decision difficulty associated with making a choice from the available assortments and, in particular, to determine its impact on the strength of the assortment-attractiveness effect.

#### *Method*

Ninety-one participants were asked to imagine that they were purchasing energy drinks and nutrition bars and had the option of going to two stores: one offering a selection of 9 options and one offering a selection of 24 options. The difficulty of the decision task was manipulated by varying the amount of relevant information to be evaluated in choice. Participants in the easy-choice condition were prompted to evaluate the available information on a single attribute, whereas those in the difficult-choice condition were prompted to evaluate the available options on seven different attributes. Participants were told that they were buying an energy drink (nutrition bar) for a friend who was concerned about either (1) the amount of caffeine (beta-carotene) only or (2) the amount of calories, caffeine, sodium, calcium, taurine, vitamin A, and iron (carbohydrates, protein, beta-carotene, biotin, niacin, and thiamin) it contains.

Participants were randomly assigned to the conditions of a 2 (option attractiveness: high versus low)  $\times$  2 (decision difficulty: high versus low) factorial design. Similar to the manipulation in Experiment 6b, the more attractive assortment was described as comprising the most popular brands, whereas the less attractive assortment was described as comprising less popular brands.

### *Results and Discussion*

Of the participants in the difficult-task condition, 61.4% selected the smaller assortment when assortments comprised attractive options, compared with only 32% who selected the smaller assortment when assortments comprised less attractive options. In contrast, of the participants in the easy-task condition, 6.8% selected the smaller assortment when both assortments comprised relatively more attractive options, compared with 13.6% who selected the smaller assortment when both assortments comprised relatively less attractive options. This data pattern was significant ( $\chi^2(1) = 5.34, p < .05$ ), indicating that the impact of option attractiveness on consumer choice among assortments is a function of the complexity of the decision task. This finding lends support to the proposition that the assortment-attractiveness effect is more likely to occur when consumers adopt a relatively complex decision strategy (e.g., employing a multiattribute evaluation strategy) and is less pronounced when consumers adopt a relative simple decision strategy (e.g., a lexicographic decision strategy).

### *GENERAL DISCUSSION*

An important aspect of a retailer's decision about how many items to carry in each product category involves understanding the impact of assortment size on consumers' choice of a retailer. Despite the importance of this issue, prior research has made conflicting predictions about the impact of assortment size on consumer choice among assortments. Thus, it has been argued that a larger number of items can both increase and decrease the probability of selecting an assortment. We address this conflicting evidence by demonstrating that consumer preference for larger assortments is a function of the attractiveness of the options constituting the assortments under consideration. We show that smaller assortments tend to be preferred primarily in cases in which the overall attractiveness of the options in the choice set is relatively high, whereas larger assortments tend to be preferred in cases in which these assortments comprise relatively less attractive options. Moreover, we show that the relationship between assortment size and option attractiveness is concave, such that the marginal impact of assortment size on choice decreases as the attractiveness of the options increases.

In addition to documenting that assortment choice is contingent on the perceived attractiveness of assortment options, we show that varying option attractiveness can even lead to a preference reversal in favor of the smaller assortment. Indeed, in five of the eight experiments, more than 50% of participants selected the smaller assortment when assortments comprised relatively attractive options, even though the majority of participants favored larger over smaller assortments when choosing among assortments comprising less attractive options. These counterintuitive findings attest to the strength of the impact of option attractiveness on choice among assortments.

The findings we report apply not only to scenarios in which the only information available to consumers before choice is assortment size but also to scenarios in which consumers can explore the options constituting the available assortments before making a choice. This is an impor-

tant finding because of the growing popularity of online retailing, which enables consumers to compare the assortments different retailers offer before selecting a retailer. In this context, we show that even when consumers go through several iterations when evaluating the available assortments, they are still more likely to select from the larger assortment when the available assortments comprise relatively less attractive options.

Note that the impact of option attractiveness on choice among assortments documented in this research is not independent of other factors that might influence consumer assortment size preferences. In particular, we argue that the assortment-attractiveness effect is likely to be a function of the perceived benefits and costs associated with choosing each of the available assortments. Thus, the assortment-attractiveness effect is likely to be more pronounced when the benefits and costs associated with choosing the larger and the smaller assortments are balanced and consumers are likely to be indifferent when choosing between the assortments. In contrast, when one of the assortments is clearly more preferred and its benefits outweigh the corresponding costs, the impact of varying the attractiveness of the assortment options is likely to be less pronounced.

In addition to the theoretical contribution of this research, our findings have several important managerial implications. To reduce inventory costs and optimize shelf space, many retailers carry a relatively narrow assortment of items within each category. To illustrate, Wal-Mart's assortment strategy involves carrying only the most popular brands and stockkeeping units within each product category (Singh, Hansen, and Blattberg 2006). Similarly, Apple's "six best" principle, adopted by its retail stores, distills third-party products to only six per category. In the same vein, Borders has recently reduced the number of books on display, focusing on the most popular titles (Trachtenberg 2008). Our finding that smaller assortments comprising relatively attractive items are actually more preferred than larger assortments offers empirical evidence that lends support to these assortment-reduction strategies.

Our research also has important implications for retailers with a portfolio of stores in different price-quality tiers (e.g., Kmart and Sears; Vons and Pavilions; Old Navy, Gap, and Banana Republic). In this context, our findings imply that these retailers might benefit from adopting different strategies for stores in high versus low price-quality tiers. Our findings show that varying assortment size might have a directionally opposite effect on consumer choice of a retailer, depending on the attractiveness of the items in the assortment. Thus, in the case of low price-quality assortments, decreasing assortment size is likely to decrease overall store preference; in the case of high price-quality assortments, the negative impact of narrowing the assortment is likely to be less pronounced and potentially even reversed, leading to an increase in overall store preference.

#### REFERENCES

- Arnold, Stephen J., Tae E. Oum, and Douglas J. Tigert (1983), "Determinant Attributes in Retail Patronage: Seasonal, Temporal, Regional, and International Comparisons," *Journal of Marketing Research*, 20 (May), 149–57.
- Baumol, William J. and Edward A. Ide (1956), "Variety in Retailing," *Management Science*, 3 (October), 93–101.
- Bernoulli, Daniel (1738), "Specimen Theoriae Novae De Mensura Sortis," *Commentarii Academiae Scientiarum Imperialis Petropolitanae*, 175–92. (English translation in *Econometrica*, 1954, Vol. 22, pp. 23–36.)
- Broniarczyk, Susan (2008), "Product Assortment," in *Handbook of Consumer Psychology*, C. Haugtvedt, P. Herr, and F. Kardes, eds. New York: Lawrence Erlbaum Associates, 755–79.
- , Wayne D. Hoyer, and Leigh McAlister (1998), "Consumers' Perceptions of the Assortment Offered in a Grocery Category: The Impact of Item Reduction," *Journal of Marketing Research*, 35 (May), 166–76.
- Chandon, Pierre and Brian Wansink (2007), "Is Obesity Caused by Calorie Underestimation? A Psychophysical Model of Meal Size Estimation," *Journal of Marketing Research*, 44 (February), 84–99.
- Chernev, Alexander (2003a), "Product Assortment and Individual Decision Processes," *Journal of Personality and Social Psychology*, 85 (July), 151–62.
- (2003b), "When More Is Less and Less Is More: The Role of Ideal Point Availability and Assortment in Consumer Choice," *Journal of Consumer Research*, 30 (September), 170–83.
- (2006), "Decision Focus and Consumer Choice Among Assortments," *Journal of Consumer Research*, 32 (June), 50–59.
- (2008), "Product Assortment and Consumer Choice," working paper, Kellogg School of Management, Northwestern University.
- Diehl, Kristin and Gal Zauberan (2005), "Searching Ordered Sets: Evaluations from Sequences Under Search," *Journal of Consumer Research*, 31 (March), 824–32.
- Hotelling, Harold (1929), "Stability in Competition," *The Economic Journal*, 39 (March), 41–57.
- Huffman, Cynthia and Barbara E. Kahn (1998), "Variety for Sale: Mass Customization or Mass Confusion?" *Journal of Retailing*, 74 (Fall), 491–513.
- Inman, J. Jeffrey (2001), "The Role of Sensory-Specific Satiety in Attribute-Level Variety Seeking," *Journal of Consumer Research*, 28 (June), 105–120.
- Iyengar, Sheena S. and Mark R. Lepper (2000), "When Choice Is Demotivating: Can One Desire Too Much of a Good Thing?" *Journal of Personality and Social Psychology*, 79 (December), 995–1006.
- Kahn, Barbara E. and Donald R. Lehmann (1991), "Modeling Choice Among Assortments," *Journal of Retailing*, 67 (Fall), 274–99.
- Kahneman, Daniel and Jackie S. Snell (1992), "Predicting a Changing Taste: Do People Know What They Will Like?" *Journal of Behavioral Decision Making*, 5 (3), 187–200.
- and Amos Tversky (1979), "Prospect Theory: An Analysis of Decision Under Risk," *Econometrica*, 47 (March), 263–92.
- , Peter P. Wakker, and Rakesh Sarin (1997), "Back to Bentham? Explorations of Experienced Utility," *Quarterly Journal of Economics*, 112 (May), 375–405.
- Kreps, David M. (1979), "A Representation Theorem for Preference for Flexibility," *Econometrica*, 47 (May), 565–77.
- Kurt Salmon Associates (1993), *Efficient Consumer Response: Enhancing Consumer Value in the Grocery Industry*. Washington, DC: Food Marketing Institute.
- Louviere, Jordan J. and Gary J. Gaeth (1987), "Decomposing the Determinants of Retail Facility Choice Using the Method of Hierarchical Information Integration: A Supermarket Illustration," *Journal of Retailing*, 63 (1), 25–48.
- Lynch, John G., Jr., and Dan Ariely (2000), "Wine Online: Search Costs Affect Competition on Price, Quality, and Distribution," *Marketing Science*, 19 (Winter), 83–103.

- Nowlis, Stephen M. and Itamar Simonson (1996), "The Effect of New Product Features on Brand Choice," *Journal of Marketing Research*, 33 (February), 36–46.
- The Partnering Group (1998), "Efficient Assortment: Best Practices Report," report, Efficient Consumer Response, (accessed February 24, 2009), [available at [http://www.ecrnet.org/04-publications/blue\\_books/pub\\_1998\\_efficient\\_assortment.pdf](http://www.ecrnet.org/04-publications/blue_books/pub_1998_efficient_assortment.pdf)].
- Prelec, Drazen, Birger Wernerfelt, and Florian Zettelmeyer (1997), "The Role of Inference in Context Effects: Inferring What You Want from What Is Available," *Journal of Consumer Research*, 24 (June), 118–25.
- Ratner, Rebecca K., Barbara E. Kahn, and Daniel Kahneman (1999), "Choosing Less-Preferred Experiences for the Sake of Variety," *Journal of Consumer Research*, 26 (June), 1–15.
- Read, Daniel and George Loewenstein (1995), "Diversification Bias: Explaining the Discrepancy in Variety Seeking Between Combined and Separated Choices," *Journal of Experimental Psychology: Applied*, 1 (March), 34–49.
- Shin, Jiwoong and Dan Ariely (2004), "Keeping Doors Open: The Effect of Unavailability on Incentives to Keep Options Viable," *Management Science*, 50 (May), 575–86.
- Shugan, Steven M. (1980), "The Cost of Thinking," *Journal of Consumer Research*, 7 (September), 99–111.
- Simonson, Itamar (1990), "The Effect of Purchase Quantity and Timing on Variety-Seeking Behavior," *Journal of Marketing Research*, 27 (May), 150–62.
- Singh, Vishal P., Karsten T. Hansen, and Robert C. Blattberg (2006), "Market Entry and Consumer Behavior: An Investigation of a Wal-Mart Supercenter," *Marketing Science*, 25 (5), 457–76.
- Sood, Sanjay, Yuval Rottenstreich, and Lyle Brenner (2004), "On Decisions That Lead to Decisions: Direct and Derived Evaluations of Preference," *Journal of Consumer Research*, 31 (June), 17–25.
- Stevens, Stanley Smith (1975), *Psychophysics: Introduction to Its Perceptual, Neural, and Social Prospects*. New York: John Wiley & Sons.
- Torgerson, Warren S. (1958), *Theory and Methods of Scaling*. Oxford: John Wiley & Sons.
- Trachtenberg, Jeffrey A. (2008), "Borders Tries About-Face in Shelf Space Display," *The Wall Street Journal*, (March 12), B1–B2.
- Tversky, Amos and Daniel Kahneman (1991), "Loss Aversion in Riskless Choice: A Reference-Dependent Model," *Quarterly Journal of Economics*, 106 (November), 1039–1061.
- Van Herpen, Erica and Rik Pieters (2002), "The Variety of an Assortment: An Extension to the Attribute-Based Approach," *Marketing Science*, 21 (Summer), 331–41.

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