



CHICAGO JOURNALS

Journal of Consumer Research, Inc.

The Influence of Assortment Structure on Perceived Variety and Consumption Quantities

Author(s): Barbara E. Kahn and Brian Wansink

Source: *Journal of Consumer Research*, Vol. 30, No. 4 (March 2004), pp. 519-533

Published by: [The University of Chicago Press](#)

Stable URL: <http://www.jstor.org/stable/10.1086/380286>

Accessed: 28/06/2014 18:47

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



The University of Chicago Press and Journal of Consumer Research, Inc. are collaborating with JSTOR to digitize, preserve and extend access to Journal of Consumer Research.

<http://www.jstor.org>

The Influence of Assortment Structure on Perceived Variety and Consumption Quantities

BARBARA E. KAHN
BRIAN WANSINK*

Increasing the actual variety of an assortment has been shown previously to increase the quantity consumed. We show, however, that consumption quantities are also influenced by the perceived variety of an assortment. In combination, six lab and field studies show that the structure of an assortment (e.g., organization and symmetry or entropy) moderates the effect of actual variety on perceived variety. We further show that it is perceived variety that in turn influences consumption quantities through anticipated consumption utility. Making salient other consumption rules, such as size of the assortment, moderates this effect. These findings are of immediate relevance to interdisciplinary researchers and to consumers and health practitioners who wish to better control food consumption.

If consumers are offered an assortment with three different flavors of yogurt, they are likely to consume an average of 23% more yogurt than if they are offered an assortment featuring only one flavor (Rolls et al. 1981). This example is typical of many consumption situations where consumers must decide how much of a product to consume when there are no formal guidelines to help them. When no optimal consumption level is suggested to a consumer, researchers have observed that a person's consumption quantity can commonly vary by over 300% from one occasion to another (e.g., Herman and Mack 1975). Indeed, unless one is physically stuffed with food, he or she can always make room for more (Birch et al. 1987; Inman 2001). While physiological factors (such as hunger) can account for some differences in consumption quantities, it is becoming increasingly evident that environmental contextual cues can also influence consumption. For example, previous research related to packaging has shown that package size (Folkes, Martin, and Gupta 1993), shape (Wansink and van Ittersum 2003), perceived volume (Raghubir and Krishna 1999), and actual volume (Wansink 1996) can all contribute to how much a person consumes. In the yogurt example, however, it is not packaging but, rather, the assortment variety that seems to be influencing how much consumers are likely to consume. But how do consumers interpret or perceive the

variety of an assortment, and why should this perception of variety affect consumption quantities?

In this research we show that structural aspects of an assortment moderate a consumer's perception of the actual variety. Specifically, this perception of assortment variety is influenced by the organization and by the symmetry of the frequencies of the items in the set (entropy) of the assortment. It is then this perceived variety of the assortment that influences consumption utility and ultimately contributes to consumption quantity. We show that perceived variety may also serve as a consumption rule or benchmark that consumers use to gauge how many items should be consumed.

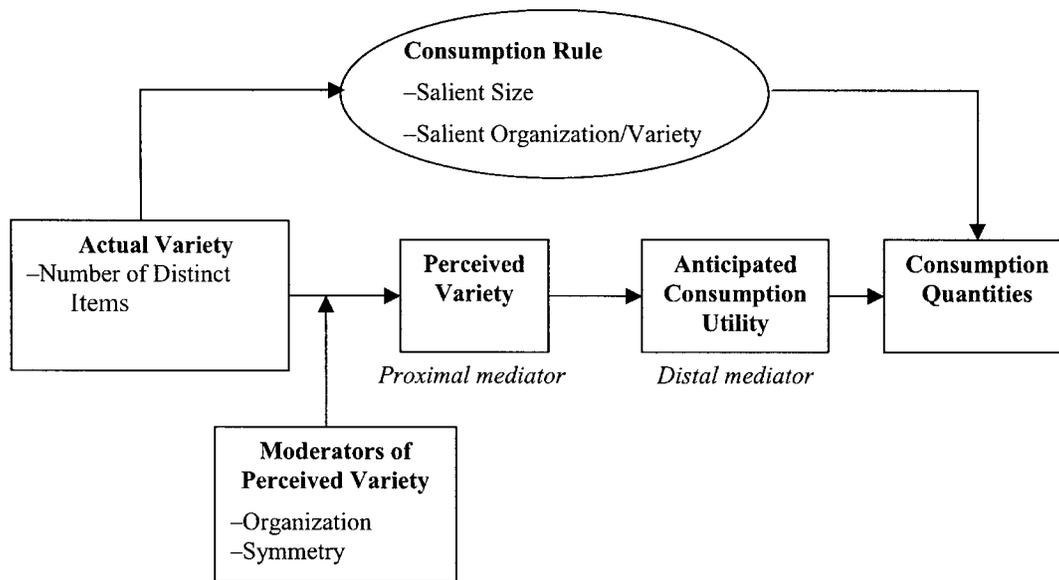
We find support for our proposals in a series of six lab and field experiments involving adults and children with both food and hedonic nonfood items. The first four studies clearly illustrate the robust phenomenon that assortment structure affects consumption quantities. The last two studies provide some evidence for our proposed processes. These findings are of relevance to interdisciplinary researchers, yet the most immediate implications of this research are directed toward consumers who can alter the structure of assortments so that they do not have unintended effects on consumption.

THE INFLUENCE OF ASSORTMENT STRUCTURE AND VARIETY ON CONSUMPTION QUANTITIES

The framework that we propose for understanding how assortment structure and variety influence consumption is illustrated in figure 1. The first notion that we propose in this framework is that actual variety may affect consumption quantities in one of two ways. First, we suggest that actual variety influences perceived variety (which is a proximal

*Barbara E. Kahn is the Dorothy Silberberg Professor of Marketing at the Wharton School, University of Pennsylvania, Philadelphia, PA 19104 (kahn@wharton.upenn.edu). Brian Wansink is the Julian Simon Research Scholar and professor of business administration, nutritional science, advertising, and agricultural and consumer economics at the University of Illinois, Champaign, IL 61820-6980 (Wansink@uiuc.edu). Thanks to Pierre Chandon, Se-Bum Park, and Jer-Yuan Chao for their help with this research.

FIGURE 1
HOW ASSORTMENT STRUCTURE AND VARIETY INFLUENCE CONSUMPTION



mediator), that perceived variety in turn increases anticipated consumption utility (which is a distal mediator), and that anticipated consumption utility in turn increases consumption quantities. Second, we suggest that perceived variety serves as a consumption rule or benchmark that consumers use to gauge how many items should be consumed. When an alternate consumption rule is made salient (such as the size of the assortment), this more salient rule should then have a stronger effect on consumption quantities. Further, we propose that structural aspects of the assortment, such as organization or symmetry, moderate the effect of actual variety on consumers' perceptions of variety.

Defining Actual Variety

We define actual variety of the assortment as having two components. The first component is the number of distinct options or the number of conceptually distinct subcategories. In this research we consider simple assortments (such as jelly beans, M&M's, and beads) where the options differ on a few attributes (such as colors or flavors). Thus, the actual variety in our studies is simple to define, because it is the number of colors or flavors presented. However, as assortments get more complex and differ on more than one attribute, the actual variety of the assortment is likely to become more complex. It then becomes an empirical exercise to determine what consumers and marketers characterize as distinct subcategories. (We leave consideration of these more complex issues to the "General Discussion" section and to future research.)

The second component of actual variety is the number of category replicates. Previous research has shown that when

a product category is given more physical space (has more shelf facings) in a retail store, consumers feel that there is more variety than if it is assigned to a smaller space (Broniarczyk, Hoyer, and McAlister 1998). Further, van Herpen and Pieters (2002) have shown that doubling the size of an assortment of replicated items increases the variety by as much as 42%. Thus, when consumers are offered 20 bowls of five different items, for example, there is more actual variety and more choice than if they were offered only five bowls of five different items.

The Moderating Effect of Assortment Structure on Perceived Variety

We consider two aspects of assortment structure that have been shown to influence consumers' perceptions of variety of an assortment: (1) organization (Hoch, Bradlow, and Wansink 1999) and (2) the relative symmetry in the frequencies of items (entropy) in the assortment (Young and Wasserman 2001).

Previous research has suggested that an assortment's organization (ranging from organized to disorganized) can influence perceived variety (Hoch et al. 1999). All things being equal, an increase in actual variety will increase perceived variety. For sets with a large number of options, however, a disorganized assortment can make it more difficult for consumers to recognize and appreciate the full extent of the variety. By contrast, for small sets, the organization of the assortment may make it relatively obvious that there are not many alternatives available, whereas disorganization can obscure this fact and increase the perception of variety. Thus, for small sets, disorganized assortments may appear to have

more perceived variety, but the opposite might be true for assortments with a large mix of different options. In general, the organization of an assortment (organized vs. disorganized) may influence consumption by influencing the perceived variety of an assortment.

Another structural-related aspect of the assortment that may influence perceptions of variety is the relative frequencies (or entropy) of the items within the assortment (e.g., Shannon and Weaver 1949). Options that are rare or appear with low frequency carry more information (i.e., they are more diagnostic) when compared with those that are common and appear with high frequency. Empirical evidence shows that people can and do use these relative frequencies of items within an assortment (Kahn 1995; Simonson and Winer 1992) to evaluate collections of items and to determine visual display variability (Young and Wasserman 2001). Thus, even if the number of items included in the choice set is constant, it may be cognitively easier to assimilate and appreciate an assortment's variety if the relative frequencies of the items are unequal and one (or a few) items dominates than if there is an equal distribution of all the items in the set. Note this measure of relative frequency is different from the number of replicates measure discussed in our definition of actual variety. The number of replicates refers to the overall size of the assortment (e.g., small or large). The symmetry or relative frequency of the assortment (holding the size of the assortment constant) refers to the relative distribution of the options within the set.

Assortments get more complex as the number of options in the assortment increases. When this occurs, asymmetric distributions might be easier to process than symmetric distributions because in the asymmetric situation there is a natural order to processing the variety—the dominant items will be processed and appreciated first, and then the remaining items can be identified. When the assortment is symmetrically distributed, there is no easy heuristic for processing the variety. When there are only a small number of options in an assortment (and, thus, the assortment is not complex at all), the increased complexity offered by symmetric distributions may increase perceived variety. Thus, analogous to the hypothesized effects of organization, we believe that the symmetry of the distribution of the items within an assortment may influence consumption by increasing perceived variety.

The Influence of Perceived Variety on Anticipated Consumption Utility

In the absence of other consumption rules being made salient, we hypothesize that increases in perceived variety increase anticipated consumption utility, and this results in larger consumption quantities. Perceived variety can increase anticipated consumption utility both affectively and cognitively.

From an affective perspective, previous research has shown that variety is generally considered positive (Ratner and Kahn 2002) and may result in consumers feeling more

positive affect. As a result of being in a good mood, people evaluate nearly everything more positively (see Schwarz [1998] for a review). There are several explanations for this. First, consumers in a positive mood differentially recall material from memory and are more likely to recall positive material (Isen et al. 1978). Second, consumers use their feelings as sources of information; when they feel happy, they perceive the stimuli as more positive (Schwarz and Clore 1983). Third, increases in variety may change one's immediate feeling toward the products (Edell and Burke 1986; Pham et al. 2001), and such feelings are often used by consumers to predict their future consumption experiences (Pham 1998). In any event, if increases in perceived variety increase positive feelings, people should also anticipate a higher enjoyment of the items to be consumed, and this should result in their desire to consume more.

In addition to the positive affective reactions associated with increases in perceived variety, there may also be cognitive reactions. Studies have shown that consumers believe that varied consumption sets offer a more favorable, interesting consumption memory than do sets less-varied sets (Ratner, Kahn, and Kahneman 1999). For example, listening to a diverse assortment of music produces more favorable memories than does listening to only one type of music. This increase in variety or diversity elicits more attention (Kahneman 1973) and stimulates more elaborate network encoding in memory (Bradley et al. 1992) than does less-varied or less-arousing stimuli. Because consumers are paying more attention to the diverse stimuli and are feeling happier because they anticipate more favorable consumption memories, they should anticipate higher levels of consumption utility for assortments with higher perceived variety. These increases in anticipated consumption utility should lead to increased consumption quantities.

Thus, as figure 1 illustrates, we hypothesize that both perceived variety and anticipated consumption utility mediate the effects of assortment variety on consumption quantities. In this way, perceived variety is the proximal mediator, as it is close in time to the initial actual variety variable, and anticipated consumption utility is the distal mediator in that it directly precedes the outcome—consumption quantity.

Consumption Rules

In addition to the mediated process described above, figure 1 also illustrates a parallel process that may be operating. Specifically, the actual variety of the assortment together with how the assortment is structured may serve as a consumption rule that suggests a consumption quantity that is acceptable to consume. This is similar to Schwarz's (1996) concept of a conversational rule. For organized assortments, the number of distinct subcategories or the number of replicates (actual variety) may serve as a benchmark that participants use to gauge how many items should be taken. For example, if a tray of jelly beans is organized into 24 flavors (as opposed to far fewer flavors), a consumer may assume that there is a reason the jelly beans are sorted and use

that information to guide consumption quantities.¹ Specifically, if there is a social norm to choose more variety (Ratner and Kahn 2002), an organized larger assortment may signal that larger consumption amounts will be socially acceptable. By contrast, when an assortment is disorganized, there are no salient cues presented and, thus, nothing on which to create a consumption rule. As a result, even when disorganized assortments differ in actual variety, this will be less reflected in consumption quantities. However, if some particular aspect of the assortment were made salient (e.g., if participants are specifically asked to note the size of the assortment), then that aspect would likely serve as a consumption rule.

This idea of a consumption rule is similar to the assumption that people make underlying the conduct of conversation or conversational implicature (Grice 1975; Schwarz 1996), where it is proposed that people assume that communication messages convey some useful information, so they try to make sense out of statements people say even if they do not seem to make sense in a literal way. Similarly, Schwarz (1996) argues that people participating in experiments may assume that information offered to them is relevant to their task, and they try to make sense of it. This process has been shown to be relatively automatic and often occurs outside of conscious awareness. We extend this notion of helpful responsive behavior to consumers' reactions to various assortments.

EMPIRICAL TESTS OF THE PROPOSED FRAMEWORK

In the first four studies, we test how assortment variety and assortment structure affect consumption quantities. Each study consists of a 2×2 between-subjects design where we vary some combination of the actual variety of an assortment (either the number of options [six vs. 24] or the number of replicates [single set of six vs. double set of six]) and assortment structure (organization [organized vs. disorganized] or the symmetry or entropy of the assortment [symmetric vs. nonsymmetric]). In each study, one of the four assortments in the design is presented to participants in multicelled trays. In disorganized assortments, all items were randomly dispersed throughout the cells of the tray. In organized assortments, the items were organized in the cells of the tray by color or flavor. In the fifth study we measure process variables to begin to provide support for our hypothesized framework. Finally, in the sixth study we manipulate the salience of another assortment variable—assortment size—in order to illustrate the participants' use of consumption rules.

In the first two studies, we examine the moderating effect that the organization of an assortment has on how variety is perceived. Specifically, with organized assortments, we expect that increasing actual variety should increase consumption quantities. However, with disorganized assort-

ments, it becomes more difficult to distinguish the level of actual variety. As a result, we believe that increases in actual variety will not necessarily increase consumption quantities.

H1: Organization moderates the relationship of actual variety on consumption quantities. For organized assortments, more actual variety (more options available) increases consumption quantities to a greater degree than it does with disorganized assortments.

This hypothesis is tested in two unobtrusive outcome studies. Study 1 focuses on children selecting from both jelly bean and bead assortments; study 2 examines an adult choice.

Study 1: Assortment Structure Influences Children's Consumption

For an unobtrusive test of whether the structure of an assortment influences selection and consumption, we initially used children as participants because they have been shown to be sensitive to structural influences (Piaget 1969). In this study, a three-factor design was used with a repeated measure on the last factor. The first factor was size of assortment (six vs. 24 colors), the second factor was organization (organized vs. disorganized), and the third (repeated) factor was product class (jelly beans and beads). Thirty-six first- and fourth-grade elementary school children participated in the study as part of in-class demonstrations. Four adults went into the elementary school classes with trays of jelly beans and beads. The students in each class were randomly divided up into four groups. Each child in each group was first shown a tray of jelly beans and told to take as many as he or she wanted; each child was next shown a tray of beads and told to take as many as he or she wanted. There was no cover story or explanation for offering these children these selections, but their behavior indicated they had no difficulty in selecting jelly beans and beads. Each child participated in the same condition for the jelly bean and the bead study and made their selections independently.

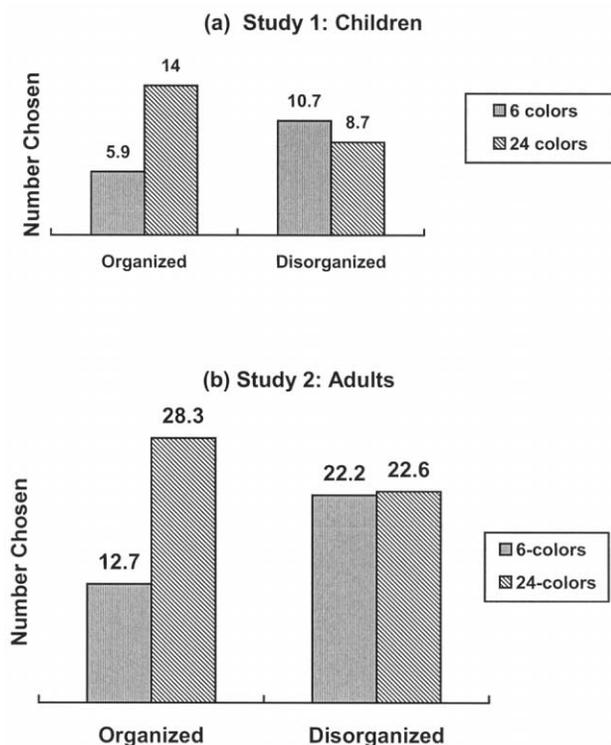
Results and Discussion. As expected, there were no significant effects or significant interactions because of product class, grade of participant, or gender, so results were collapsed across all of those factors, and we conducted a repeated-measures ANOVA. Consistent with hypothesis 1, there was a significant interaction of organization and size of assortment ($F(1, 32) = 6.7, p = .01$). The organization of the assortment moderated the relationship between actual variety and consumption. As figure 2a illustrates, when actual variety increased from six to 24, consumption quantities increased for organized assortments (from 5.9 to 14.0, $p = .001$) but not for disorganized assortments (from 10.7 to 8.7, NS).

While the results support our hypothesis, they do so with a population—children—that was knowingly selected because they are thought to be highly sensitive to structural

¹We thank a reviewer for this suggestion.

FIGURE 2

THE IMPACT OF ASSORTMENT STRUCTURE ON CONSUMPTION



influences (Piaget 1969). Study 2 will determine whether this effect can be generalized to adults.

Study 2: Assortment Organization Influences General Consumption

This study generalizes the results of study 1 on 123 adults who were recruited from local parent teacher associations. They were told that they would be participating in an experiment on television advertising. They were compensated with an \$8 donation to their organization and the chance to win a \$100 raffle for themselves. While waiting to watch the commercials (which was merely a cover story context for the study), they were offered jelly beans as a thank you for their participation. Each participant was randomly offered one of four different assortments of jelly beans, and it was their jelly bean selection that was being observed through two unobtrusive cameras.

In the 2×2 between-subjects design, the assortments of jelly beans varied by the number of colors of jelly beans offered (six vs. 24 colors) and by whether the jelly beans were organized by color or whether the colors were scrambled altogether (organized-disorganized). The primary dependent variable was how many jelly beans each participant selected and ate. Of the 123 recruited participants, 32 elected

not to eat any jelly beans. In all, 91 people participated fully in the study.

Results and Discussion. Consistent with study 1, the organization of the assortment once again moderated the relationship between actual variety and consumption. Consistent with the hypothesized moderating interaction specified in hypothesis 1, the organization of the assortment (organized vs. disorganized) influenced the actual number of jelly beans eaten ($F(1, 87) = 4.50, p = .05$). That is, as actual variety increased (from six to 24), consumption quantities also increased with organized assortments (from 12.7 to 28.3, $p = .003$) but not with disorganized assortments (from 22.2 to 22.6, NS). Figure 2b illustrates this moderating relationship. This provides additional support for our framework.

The same interaction was found when analyzing how many jelly beans the participants believed they had eaten ($F(1, 87) = 8.68, p = .004$). Again, organization moderated the relationship between actual variety and consumption quantities. As actual variety increased (from six to 24), consumption quantities from organized assortments increased (13.1 to 26.8, $p = .05$) but not from disorganized assortments (20.0 to 14.6, NS).

Study 3: Assortment Size, Assortment Structure, and Consumption Quantity

We have defined actual variety as a function of the number of distinct items (which was tested in studies 1 and 2) and also as a function of the number of distinct replicates. We test this latter aspect of actual variety while holding the number of options (six) constant in all assortments, and we examine the moderating influence of assortment structure on consumption quantities. Because of their sensitivity to assortments, we again returned to children as in study 1.

We vary the size of the tray (small-nonreplicated vs. large-replicated—six cells vs. 2×6 cells) and organization (organized vs. disorganized) of the structure. When the assortment is organized, we hypothesize that the size of the assortment should influence consumption quantities. Specifically, if we hold the number of colors constant and double the size of the assortment, each color in an organized assortment will have two facings. These double facings should increase the perceived variety (Broniarczyk et al. 1998; van Herpen and Pieters 2002), which should increase anticipated consumption utility and lead to larger consumption quantities. When the assortment is disorganized, however, the two different sizes of assortments may not increase perceived variety.

H2: Holding the number of options constant, larger, organized assortments will elicit higher consumption quantities than smaller, organized assortments. This difference, however, will be found to a lesser extent with disorganized assortments.

To examine this hypothesis initially, we examined the selection behavior of children. We used two product cate-

gories: M&M candies (which vary only by color, not taste) and small colored toy spiders. This study was a three-factor design with a repeated measure on the last factor. The first factor was the organization of the assortment (organized or disorganized), the second factor was the number of replicates (a single six-cell tray vs. a 12-cell tray with double replicates), and the third (repeated) factor was product class (M&M's and spiders). Each of the four assortments offered the same six colors of M&M's or spiders; we changed only the size of the assortment and organization. In the six-cell organized tray, each of the six colors of M&M's had their own cell. In the 12-cell organized tray, each of the six colors had two cells, and these cells were not contiguous, but, rather, the organization resembled two six-cell arrangements.

Thirty-six first- and fourth-grade elementary school children participated in the study as part of an in-class demonstration. As in study 1, adults went into the classrooms and randomly divided the students into four groups. Each child in each group was first shown a tray of M&M's and was told to take as many as he or she wanted; each child was next shown a tray of spiders and was told to take as many as he or she wanted. Each child participated in the same cell for both studies. The dependent variable of interest was the number of items chosen. There were no significant effects or significant interactions because of product class, grade of participant, or gender, so results were collapsed across these factors and a repeated-measures ANOVA was used to analyze the results.

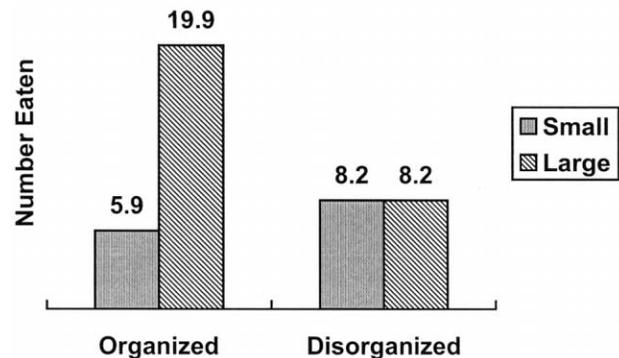
Results and Discussion. There was a significant effect of size of tray ($F(1, 32) = 9.98, p = .01$) and a significant effect of organization ($F(1, 32) = 4.04, p = .05$). What is most relevant, however, is the significant interaction between size and organization ($F(1, 32) = 9.01, p = .01$), which is in line with our hypothesis. Consistent with hypothesis 2, the larger tray leads to increased consumption quantities, and this interaction was driven by the large, organized condition (see fig. 3). Once again, these results cannot be explained simply by an increase in the number of different colors chosen in the 12-cell organized assortment as there were no differences between the numbers of different colors selected in each condition.

Study 4: The Impact of Assortment Symmetry on Consumption Quantity

In this study, we examine another structural assortment variable—the symmetry of the distribution of items within the assortment—to determine how it influences the relationship between actual variety and consumption. Here, we once again vary the number of options in the set, but we also vary the relative frequencies of each option.

In the symmetric assortments, the relative frequency of each of the options is roughly equivalent. These symmetric assortments are analogous to the disorganized assortments in earlier experiments, and as such we predict that the actual variety (the number of options available) should not increase consumption quantities. However, for the asymmetric as-

FIGURE 3
THE IMPACT OF TRAY SIZE AND ORGANIZATION ON CONSUMPTION (STUDY 3)



sortments, we predict that a higher actual variety (a larger number of actual options) should increase consumption quantities. In the asymmetric assortments, the relative frequency of at least one option will dominate the other options. These dominant items will serve as a starting place or anchor for the consumer to process the additional variety in the set. Therefore, having this heuristic or shortcut for processing will help consumers appreciate the variety as it increases.

H3: For more asymmetric assortments, actual variety (the number of options available) will increase consumption quantities to a greater extent than would occur with symmetric assortments.

To test the effect of assortment symmetry on consumption quantities, we designed four different assortments of M&M's that varied by the number of colors available (seven vs. 10) and by the symmetry or asymmetry of the distribution of the colors (10% vs. 30% dark brown). A preliminary study was conducted to make sure that this manipulation influenced participants' processing of assortment variety as hypothesized. To accomplish this, 44 undergraduates were shown the four different assortments of M&M candies and were asked to rate each sample with respect to its variety of color and its perceived variety of flavor (1 = low variety; 7 = high variety). As expected, the results indicated that 10 colors represented more actual variety than seven colors (4.1 vs. 5.3; $F(1, 41) = 8.4, p = .01$). Furthermore, symmetric distributions were rated as more complex (1 = less complex and 7 = more complex) than asymmetric distributions (4.8 vs. 3.9; $F(1, 41) = 5.3, p = .05$). Since M&M's taste identical regardless of their color, there were no differences in their perceptions of how the flavors would vary across the different samples.

In the actual study, 105 adults were recruited by telephone with the understanding that they would be watching commercials and providing feedback on them. They were paid \$12.50 for their participation. On arrival to a central facility, each participant was told that since it was late in the day and they might be hungry, we would provide some drinks

and some snacks to help thank them for their participation. After selecting their beverage in the back of the room, they were led to their seat and given 16-oz. bowls of M&M's along with pencils and paper. Each of the 12 experimental sessions involved between nine and 12 participants.

The design of the study is a 2×2 between-subjects design in which the colors (seven vs. 10 colors) of M&M's are crossed with the symmetry of the distribution of items.² The symmetry of the distribution of items was operationalized by altering the percentage of the mix that was dark brown (low = 30% vs. high = 10%). The participants were randomly assigned to each of the four experimental conditions. In a well-lighted room, participants were shown a pilot show for a television situation comedy (*Hazard County*) while eating as many M&M's as they wanted. After the show was over, they were asked to complete a questionnaire.

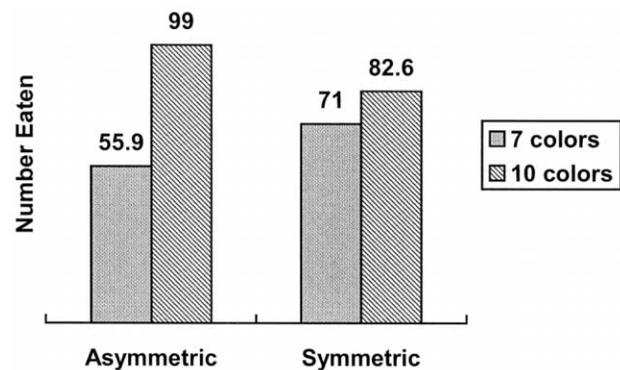
As they were handed the questionnaire, their bowl of candy was taken from them and weighed. In the questionnaire, participants were asked to estimate how many candies they had consumed in the past hour. For control purposes, they were also asked whether they believed the candies tasted different than each other, and they were asked to indicate what their anticipated consumption utility had been for each of the assortments. In this study, we operationalized this construct by asking how much fun they had anticipated that they would have eating their assortment of M&M's. When analyzing the data, the number of hours since they had eaten their prior meal, their gender, and their arrival time that afternoon were used as covariates.

Results and Discussion. Consistent with hypothesis 3, increasing the amount of variety in an assortment increased consumption only for asymmetric assortments and not for symmetric ones (see fig. 4). There was a significant interaction ($F(1, 102) = 5.05, p = .01$) between color and symmetry on consumption quantities. For the asymmetric assortments, increasing actual variety from seven to 10 increased consumption quantities from 55.9 candies to 99.0 candies (77% increase, $p = .01$). Yet for the symmetric assortments, increasing the actual variety led to no significant difference in consumption quantity (from 71.0 to 82.6, NS).

After they had consumed the candies and after the remaining candies had been removed, participants were asked what they thought their anticipated consumption utility had been for their assortment. Although this measure was asked after they had made their choices (in order to avoid demand effects), the results support the notion that anticipated consumption utility was driving the process. Those who had been given the high variety–asymmetric assortments (10 color—30% dark brown) rated their assortments as more fun to eat than those who had been given the high variety–symmetric assortments (10 colors—10% dark brown; from 5.8 to 4.6, $p = .05$). For the symmetric assortments, not

²The colors in the seven-color condition were dark brown, green, red, tan, yellow, red, and blue. The 10-color condition also included pink, dark green, and gold.

FIGURE 4
THE IMPACT OF ASSORTMENT SYMMETRY ON CONSUMPTION (STUDY 4)



only was the higher actual variety not preferred, but the results were directionally opposite—lower variety assortments were seen as more fun to eat (from 4.7 to 3.8, $p = .05$).

Together, these four studies illustrate the basic framework that we are proposing. In each study, the effect of actual variety on consumption quantities is moderated by assortment structure variables (either assortment organization or symmetry). Having provided empirical support for the phenomenon, our next two studies attempt to provide additional empirical support for the proposed framework in figure 1.

Study 5: A Process Study of Assortment Structure and Consumption Quantity

Study 5 examines the specific process through which assortment structure influences consumption. We use a similar choice task as was unobtrusively used in outcome studies 1 and 2. However, in order to provide empirical support for the process illustrated in figure 1, we asked participants about the perceived variety of the assortment and their anticipated consumption utility before we asked them to select the jelly beans they wanted to consume.

Consistent with figure 1, we believe that the assortment structure can either facilitate or mitigate the relationship between actual variety and consumption quantities. For organized assortments, increased actual variety should increase perceived variety, which should increase anticipated consumption utility, which in turn should increase consumption quantities. However, when assortment structure mitigates the effects of actual variety on consumption quantities (such as when the structure is disorganized), actual variety will have less of an effect on perceived variety and anticipated consumption utility.

H4: For organized assortments, increased actual variety (the number of options available) will increase perceived variety, which should increase anticipated consumption utility, which in turn should

increase consumption quantities. For disorganized assortments, actual variety will have less of an effect on increasing perceived variety, anticipated consumption utilities, or consumption quantities.

This study was similar to study 2 except that before adult participants chose any jelly beans they were asked to evaluate the assortment, the variety of the assortment, and their anticipated consumption utility. After answering these questions, they were told to take as many jelly beans as they wanted. Following their selection, we temporarily covered their containers and asked them to estimate how many jelly beans they believed that they took, how many different colors they believed that they took, and how many different colors they thought were (in total) in the assortment. They were also asked to judge the aesthetics of the assortment. After they watched the commercials, approximately 45 min. later we asked them to recall the jelly bean consumption experience and to rate the enjoyment they experienced while eating the jelly beans. All scaled questions were answered on nine-point scales and are provided in the appendix.

Of the 138 recruited participants, 23 indicated that they did not like jelly beans and were dropped from the study. Five others were deleted from the analysis because they accidentally spilled the jelly beans or emptied the entire tray onto the table and scooped the jelly beans into their pockets. The analysis was based on the 110 remaining participants.

Results and Discussion. Consistent with hypothesis 4, actual variety and organization interacted to influence perceived variety in the assortments ($F(1,98) = 4.18, p = .04$). As shown in table 1, when assortments were disorganized, perceptions of variety were more similar for the small and large assortments (6.5 vs. 7.5; $p = .05$) than when the assortments were organized (4.9 vs. 7.0; $p = .01$).

As predicted, there was an interaction that influenced anticipated consumption utility ($F(1,106) = 14.54, p = .0002$). These results are consistent with hypothesis 4, that assortment structure can moderate the extent to which actual variety influences consumption utility. For the organized assortments, increasing the actual variety (from six to 24) increased consumption utility (from 4.7 to 6.0, $p = .01$). Yet for disorganized assortments, increasing the actual variety did not increase consumption utility (from 6.2 to 5.4, NS).

Even though participants answered detailed questions, their consumption replicated the findings from studies 1 and 2. This suggests that taking our process measures in this study did not generate serious demand effects. Once again, there was a significant interaction on consumption quantity ($F(1,104) = 4.99, p = .03$) such that the organizational structure moderated the relationship between actual variety and consumption. For the organized assortments, increasing the actual variety (from six to 24) increased consumption quantities (from 18.2 to 39.6, $p = .004$). For disorganized

assortments, increasing the actual variety did not increase consumption quantities (from 25.5 to 21.3, NS).

Mediation Results. Figure 1 indicates that the organization and actual variety influence consumption quantities and that this influence is mediated through perceived variety and through anticipated consumption utility. Following the multistep process suggested by Baron and Kenny (1986), we find support for partial mediation.

1. *Perceived variety partially mediates experimental effects on consumption quantity.* Perceived variety and consumption quantity are correlated ($r = .18, p = .07$), and the manipulated variables (organization \times actual variety) influenced perceived variety ($F(1,98) = 4.18, p = .04$). Furthermore, when perceived variety is included in the regression analysis for consumption quantity on the manipulated variables, the F -statistic ($F(1, 104)$) is significantly reduced from 4.99 ($p = .03$) to 2.45 ($p = .12$), and there is a 50% reduction in the mean squares (MS).³
2. *Anticipated consumption utility partially mediates experimental effects on consumption quantity.* Anticipated consumption utility (affect) and consumption quantity are correlated ($r = .19, p = .05$), and the manipulated variables (organization \times actual variety) influenced anticipated consumption utility ($F(1,106) = 14.54, p = .001$). When anticipated consumption utility is included in the regression analysis for consumption quantity on the manipulated variables, the F -statistic ($F(1,104)$) is significantly reduced from 4.99 ($p = .03$) to 2.73 ($p = .10$), and there is a 46% reduction in MS.
3. *Perceived variety partially mediates experimental effects on anticipated consumption utility.* Perceived variety and anticipated consumption utility are correlated ($r = .60, p = .001$), and manipulated variables (organization \times actual variety) influenced perceived variety ($F(1,98) = 4.18, p = .04$). Also, when perceived variety is included in the regression analysis for anticipated consumption utility on the manipulated variables, the F -statistic ($F(1, 106)$) is significantly reduced from 14.54 ($p = .0002$) to 6.93 ($p = .01$), and there is a 66% reduction in MS.
4. *Anticipated consumption utility mediates the effects of perceived variety on consumption.* Anticipated consumption utility and consumption are correlated ($r = .19, p = .05$), and the perceived variety influences anticipated consumption utility ($F(1,100) = 56.66, p = .0001$). When anticipated consumption utility is included in the regression analysis for consumption on perceived variety, the F -statistic ($F(1,99)$) is reduced from 3.32 ($p = .07$) to 0.91

³We report the percentage reduction of MS of the mediated effect because in ANCOVA changes in ω^2 also reflect changes in the MS error that are unrelated to the experimental factor of interest (see Pham and Muthukrishnan 2002).

TABLE 1

THE IMPACT OF ASSORTMENT STRUCTURE AND ACTUAL VARIETY ON CONSUMPTION AND ITS ANTECEDENTS

The antecedents of consumption quantity (study 5)	Organized assortment structure		Disorganized assortment structure		F-values (df)		
	Low actual variety	High actual variety	Low actual variety	High actual variety	Structure	Variety	Structure × variety
Perceived variety of the assortment (1 = low, 9 = high)	4.9 (1.4)	7.0 (1.4)	6.5 (1.4)	7.5 (1.0)	13.89** (1, 98)	26.91*** (1, 98)	4.18* (1, 98)
Anticipated consumption utility of the assortment (1 = low, 9 = high)	4.7 (1.7)	6.0 (1.3)	6.2 (.94)	5.4 (1.8)	2.54 (1, 106)	.63 (1, 106)	14.54** (1, 106)
Consumption quantity (no. of jelly beans)	18.2 (13.3)	39.6 (34.1)	25.5 (39.8)	21.3 (23.0)	.93 (1, 104)	2.26 (1, 104)	4.99* (1, 104)

NOTE.—Standard deviations and degrees of freedom are in parentheses.

* $p < .05$.** $p < .01$.*** $p < .001$.

($p = .34$), and there is a 73% reduction in MS.

5. *Both perceived variety and anticipated consumption together mediate the effects of the experimental effects on consumption.* Finally, after partialling out both perceived variety and anticipated utility, the effects of the experimental factors are fully dissipated ($F(1, 95) = 1.74$, $p = .19$; down from $F(1, 98) = 4.18$, $p = .04$ without the mediators), representing a 64% reduction in MS. Further, the effects of anticipated utility remain significant as the distal mediator ($F(1, 95) = 3.30$, $p = .07$), but the effects of perceived variety, the proximal mediator, disappears ($F(1, 95) = .91$, $p = .34$).

Eliminating Alternative Explanations. One alternative conjecture for these results is that participants are simply choosing more colors in the organized 24-color set than in the organized six-color set because they can clearly pick out the colors they like and because there may be more preferred colors in the larger than in the smaller set. However, we find no support for this conjecture. There is not a significant interaction on the number of colors that participants chose in the different conditions ($p > .60$), nor are there significant main effects (p 's $> .20$). The average number of colors chosen by the participants was 4.9.

Similarly, it did not seem as if the participants were processing the assortment only by the number of colors (actual variety) in the total set. When asked to assess how many different colors of jelly beans they thought there were in the assortment, there was, again, no significant interaction ($p = .65$) and no significant main effects (p 's $> .15$). Participants thought that there was an average 9.2 colors in the

assortments. Thus, as hypothesized, these perceptions are being influenced by more than simply the actual variety of the set.

We also find no evidence that the aesthetics of the various assortments influenced consumption. The interaction of organization × number on an aesthetic rating is not significant. Furthermore, the aesthetic rating of the assortment was not significantly correlated with consumption quantities ($p > .10$), and an aesthetics rating does not mediate consumption quantities (there was no reduction in the F -statistic for consumption quantity when an aesthetics rating was added to the regression).

Finally, we did a retrospective enjoyment task to see if there were differences in recalled enjoyment. These results again disproved the alternative explanation that participants in organized assortments were able to choose their favorite jelly beans more easily and that this is what drives the results. If this alternative explanation were the case, we should see higher levels of enjoyment for the 24-organized condition as opposed to all of the others. This was not so.

We did, however, find a significant interaction ($F(1, 104) = 9.90$, $p = .002$). The 24-organized cell was not remembered any more fondly than either the six- or 24-option disorganized cells (6.8 vs. 6.5 and 6.6), but, interestingly, the smaller organized assortment was remembered least fondly (4.9). This is somewhat surprising because the same jelly beans were available to be chosen in the smaller disorganized assortment as in the smaller organized assortment, but in the organized assortment, it was presumed that participants could more easily choose their most favorite jelly beans.

Discussion. Together, these studies support the per-

spective that assortment structure moderates the relationship of actual variety on consumption quantities. Furthermore, we find evidence that changes in perceived variety and anticipated consumption utility partially mediate the effect of actual variety and assortment structure on consumption quantities. Given that the results indicate only partial mediation (in the 50%–60% range) of perceived variety and anticipated consumption utility and, further, that the correlations between anticipated consumption utility and consumption quantities and the correlations between perceived variety and consumption quantities are only in the .18–.19 ranges, it seems that there must be something else occurring. In addition to influencing the perceived variety, assortment structure and actual variety might also provide consumers with consumption rules that may influence their consumption. For instance, it is possible that participants who were given large, organized assortments may have used the number of distinct subcategories or replicates (actual variety) as benchmarks to gauge how many items should be taken. Yet if the assortment was disorganized, there would be no salient cues, and differences in the number of distinct subcategories would not influence consumption. That is, while perceived variety influences consumption quantity, consumption could also be influenced by consumption rules that are made salient. This will be examined in study 6.

Study 6: The Impact of Assortment Structure Salience on Consumption Quantity

The objective of study 6 is to make consumption rules salient to determine whether such rules can override the cues provided by assortment structure and variety. In this study, we will force participants to generate an internal consumption norm or benchmark by asking them to estimate the overall size of the tray. Analogous to how internal anchors eliminate the effect that external anchors have on purchase quantities (Wansink, Kent, and Hoch 1998), we believe that making a consumption norm salient will eliminate the effect that assortment structure and variety have on consumption quantities.

H5: If a consumption rule, such as the size of the assortment, is made salient, this rule will govern consumption quantities. Specifically, consumption quantities will be larger for larger assortment sets than for smaller assortment sets. If that consumption rule is not made salient, however, then, as in hypothesis 2, larger organized assortments will elicit higher consumption quantities than smaller organized assortments. This effect will be less strong for disorganized assortments.

By reserving a local movie theater for a private screening for 120 summer school students, we received permission to conduct study 6 as a field study during two afternoon matinees of *Pearl Harbor*. In addition to the 120 international MBA students and spouses in attendance, another 50 people from the community attended the movie. For the experiment,

four stations were set up in opposite corners of the movie lobby; after buying their ticket, participants were randomly assigned to one of the four stations and asked to choose candy from the tray located in each corner. The trays were set up as in study 4 except that jelly beans were used instead of M&M's. All of the trays had the same six flavors of jelly beans and were organized in a 2×2 design that varied organization (organized vs. disorganized) and size (six vs. 12 cells).

We expanded our basic 2×2 design to examine how consumers would be influenced if we forced them to articulate an internal benchmark that might serve as a potential consumption cue. At each of the four stations, half of the participants were randomly asked to estimate the total number of jelly beans in the tray (around 750) and then choose how many they wanted. The other half were asked to choose how many they wanted and then to estimate how many there were. Thus, the resulting study was a $2 \times 2 \times 2$ between-subjects design.

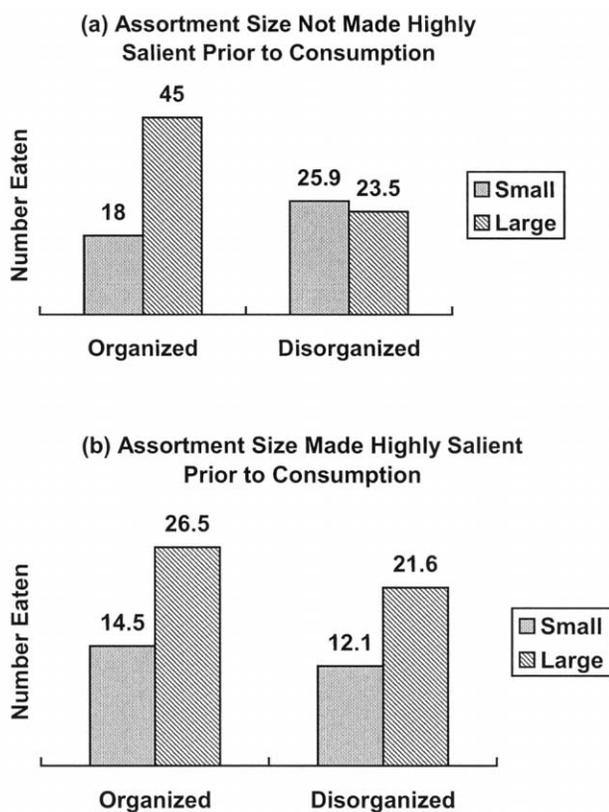
Results and Discussion. As predicted in hypothesis 5, there was a significant three-way interaction on the quantity of jelly beans chosen ($F(1, 172) = 5.27, p = .02$). When there was no internal consumption cue (when we did not ask participants to estimate the size of the assortment prior to their selection), we replicated the results from the children's experiment (study 4). That is, participants chose significantly more from the organized, larger tray than from all other trays (45 compared with 18, 25.9, and 23.5). Thus, once again it is shown that assortment structure influences consumption (see fig. 5). However, when the participants were asked to think about the size of the tray before making their selection, only the size of the tray influenced how many jelly beans they selected. In this high salience case, participants chose significantly more jelly beans in both conditions with the larger tray (regardless of organization) than in the conditions with the smaller tray (26.5 and 21.6 vs. 14.5 and 12.1).

This same interaction pattern was found in their estimates of size. When participants estimated the size of the tray first and then chose, they believed that the two trays were closer in size (274 vs. 455) than if they chose first and then estimated the size of the tray (163 vs. 759). These results seem to indicate that participants who were first asked about the size of the tray internalized this aspect of the choice situation. The literature on conversational rules would suggest that asking this question in advance sensitized the participants to the size of the tray, leading them to use the tray size to help them decide how many to select. When participants estimated the size of the trays after their selection, both the actual size of the trays and the perceived variety of the tray will have influenced their decision. This would lead participants to overestimate the size of the larger trays. This was what was found.

Study 6 shows that when size is made salient, it dominates the choice of how many to choose. However, when the size of the tray is not made salient, assortment structure becomes the guiding cue for how many to take. To make this a re-

FIGURE 5

THE IMPACT OF ASSORTMENT SIZE SALIENCE AND ORGANIZATION ON CONSUMPTION QUANTITY (STUDY 6)



alistic field experiment and to not sensitize participants to our hypotheses, we did not take extensive process measures. Nevertheless, the process results in study 5 imply that the anticipated consumption utility was highest with organized, larger assortments.

GENERAL DISCUSSION

It is widely assumed across disciplines that increasing the actual variety of an assortment can increase the quantity consumed (Rolls et al. 1981). We show, however, that the perceived variety of an assortment can also influence consumption even when actual variety is unchanged. Thus, our findings contribute to the existing consumer literature that shows that various perceptual cues influence consumption in nonnormative ways (e.g., Folkes et al. 1993; Raghurir and Krishna 1999; Wansink 1996; Wansink and van Ittersum 2003). While others have looked at the perceptual cues of packaging or containers, we investigate the perceptual cues that are linked to assortments. Specifically, we show that merely changing the perceived variety of an assortment can change one's consumption quantities when the assessment

of that perceived variety is linked in time with the consumption quantity decision.

Altering an assortment's structure—its organization or symmetry—can increase or decrease consumption quantities depending on the size of the assortment. Within the range of variety we investigated, if actual variety is increased in a disorganized manner, the resulting impact on consumption will be less than if the actual variety were introduced in an organized or more easily appreciated manner. This was found with both children and adults and was found with both foods (M&M's and jelly beans) and nonfoods (toy spiders and beads). What this result emphasizes is that some portion of the increased consumption of a varied assortment is attributable to factors other than the actual variety per se.

We also provided some evidence of the underlying process. In support of our framework presented in figure 1, we found that assortment structure moderates the influence of actual variety on perceived variety, and perceived variety influences the anticipated consumption utility that a consumer believes the assortment will deliver. In addition, we found evidence that perceived variety and anticipated consumption utility mediate the effects of assortment structure and variety on consumption. The mediated impact of perceived variety and anticipated utility on consumption was only partial, however, with MS reductions in the 50%–60% range. This suggests that there are potentially other factors—such as consumption rules—that are also influencing consumption quantities.

Thus, in addition to influencing perceived variety, assortment structures might also provide consumers with consumption norms that guide them in selecting consumption quantities. We show evidence of this: when either the size of the assortment or the number of options offered were large, participants selecting from organized assortments appeared to use size as a cue to consume more. Yet if the assortments were not organized, these variables did not influence consumption quantities. It appears that perceived variety and anticipated consumption utility influence consumption quantity up to a point, and then the quantity decision appears to be influenced further by consumption rules. Indeed, study 6 indicated that these cues provided by assortment structures can be overridden by forcing participants to generate an internal consumption norm or benchmark (e.g., asking participants to estimate the overall size of the tray). These results show that the conversational rules that Schwarz (1996, 1998) found in experimental situations extend to consumption-related field experiments.

For researchers, it is important to know that perceptions of variety can influence consumption. For consumers, however, it is more important to know that they can physically adjust their environment in order to help control their intake (Wansink 2004). Thus, in following up on the discussion that Baumeister (2002) initiated on self-control, our results suggest a way that consumers can more carefully monitor their consumption behavior. Baumeister suggests that when people are less able to monitor their behavior, they practice less self-control. For example, he suggests that international travelers who have more difficulty converting currencies are

less able to monitor their spending patterns in foreign countries. Similarly, our results suggest that consumers are not aware of the effects that increases in perceived variety in an assortment have on consumption quantity. As a result, they are less able to monitor (and hence control) their consumption quantities. While marketing actions might provide unintended reactions from susceptible consumers, our results suggest alternate efforts that can contribute to consumer welfare (see table 2).

Limitations and Future Research

While consumption-related research has implications for theory and for consumers, one of the reasons that it is not more widely studied is because of the difficulty in doing so. Consumption is simultaneously and subtly influenced by physical, social, cognitive, and perceptual influences, and efforts to obtain process measures can introduce confounding biases. Indeed, most consumption quantity studies have low levels of external validity because they are strictly controlled nutritional feeding tests that exclusively examine outcome (vs. process) measures.

To examine consumption assortment structures in a context that was realistic, we examined pieces of our framework

in ways that would not create demand effects. Our first four studies unobtrusively examined consumption without collecting process measures. Study 5 examined the underlying process, and we found evidence of partial mediation. It is important to note, however, that there are potential reactance problems that can occur when consecutively measuring the mediators and dependent variables (Feldman and Lynch 1988). The potential for self-generated validity runs high and might tend to inflate results. Even under these conditions, the effect sizes were less strong than expected, and we still found only partial mediation, thus suggesting there may be other processes underlying our results.

One area for future research would be to study more complicated increases in actual variety that may occur in retail settings. In our study, we simplified the assortments so that they varied only on one dimension, such as color or flavor, and so it was relatively easy to determine the actual variety of the assortment. However, variety may be more cumbersome to compute for assortments in retail settings, because they may contain items that have a greater number of attributes and a greater range of attribute levels. Further, in our consumption situations, organized and disorganized assortment structures were easy to manipulate. However, in retail settings, one is unlikely to see disorganized assort-

TABLE 2

IMPLICATIONS FOR HOW ASSORTMENT STRUCTURE INFLUENCES CONSUMPTION QUANTITIES

	Organization influences consumption (studies 1 and 2)	Size influences consumption (study 3)	Symmetry influences consumption (study 4)	Perceived variety partially mediates consumption (study 5)	Consumption rules influence consumption (study 6)
Research opportunities	When does organization influence consumption through a cognitive versus a perceptually mediated path? Will a disorganized store influence purchase quantities?	Will duplicated offerings in a store increase purchases? Keeping quantity constant, will two half-size offerings increase consumption the same as one full-size offerings?	Does repeated exposure to asymmetric assortments decrease their impact on perceived variety and on consumption? Is part of the influence of symmetry related to scarcity theory or to a collection mentality?	Does perceived variety change as satiation increases; does it change with subsequent exposure to the assortment? Does variety cause consumers to anchor on their expectations of consumption utility?	When do consumption rules not override the more central processing of perceived variety? Can consumption rules also explain the effects that large shopping carts or large plates have on behavior?
Consumer implications	Organization is relevant for mixed assortments in bowls (or "grab bags"), buffets, potlucks, or dinner table settings. It may also be relevant in retail contexts. Consumers may be able to control consumption by organizing less-structured offerings.	Assortment size or duplication is commonly found in the form of multiple product facings, multiple offerings of party snacks, duplicated buffet lines, family dinners with multiple dishes, and perhaps even in retail displays. Duplicated offerings can stimulate consumption.	The symmetry of an assortment is an issue wherever multiple units (and perhaps sizes) of options are involved, such as at holiday dinners, toys in play areas, and collectables and collecting. Minimal variation in the size of serving bowls may overstimulate consumption.	People are often surprised at how much they consume, showing that they may have been influenced at a basic or perceptual level.	Large inventory levels in one's home pantry could increase the quantity of food one believes is appropriate for a meal. Health-care professionals and dieticians can stimulate consumption among nutritionally deficient individuals by offering smaller helpings of more items.

ments per se. Because of more complex variety and constraints imposed by retailers, the interaction of assortment structure and assortment variety is likely to be more complex in a retail environment. Some recent research has begun to examine these issues. For example research by Morales et al. (2002) shows that for assortments of items that are described by many attributes (e.g., ties or cosmetics), perceptions of variety are a function of whether the assortments are organized in a manner consistent with the internal schema for the category. Retail settings also differ from our experimental settings in that the consumption decision is generally made long after the purchase decision. Future research might also investigate whether the effect of perceived assortment variety systematically affects purchase quantities, which in turn has been shown to influence consumption frequency and the volume of stockpiled products (Chandon and Wansink 2002).

We also investigated the role of consumption rules in determining consumption decisions. In our somewhat simplified assortment decisions, it seemed relatively clear how the organization of jelly beans could operate as a consumption rule for large choice sets even though we did not explicitly manipulate or measure this. In actual retail settings, the consumption rules may be less obvious. Thus, understanding exactly what serves as a consumption rule and how they operate is an area for future research.

Finally, it will be important for future research to investigate how increases in perceived variety might eventually lead to decreases in consumption. It is likely that assortments that are too cognitively complex can inhibit processing (Huffman and Kahn 1998; Kahn and Lehmann 1991). Thus, too much actual variety can cause perceived variety to become too cognitively laborious to process. While we do not specifically test this notion, Iyengar and Lepper (2000) showed that an overly extensive set of choices can undermine one's satisfaction and motivation to consider the options. When they increased the number of options (flavors of jam) from six to 30, the choice became more complex, and consumers became increasingly frustrated, dissatisfied, and regretful of their choice. In a consumption-quantity context, what may occur is that one might simply backtrack to the default level or quantity he or she would have normally consumed. For example, consider a Thanksgiving dinner. As the number of items increases, one may very well try to keep up with the variety being offered. After some point, however, he or she may simply give up and chose the quantity he or she would have normally have chosen. In this research, we do not consider situations where the assortment becomes too complex, but we acknowledge that this is likely to be a limiting factor.

Conclusion

Consumption is a context where understanding fundamental behavior has immediate implications for consumer welfare. When consumers perceive the variety of an assortment as high, they are more likely to consume more product than when variety is perceived as lower—even when

actual variety is held constant. In this article, we showed how consumption is influenced by the organization, size, and entropy of an assortment. Yet simply knowing the relationship between assortment structure and consumption will not eliminate its biasing effects on consumers. People are often surprised at how much they consume, and this indicates that they may be influenced at a basic or perceptual level of which they are not aware. The most immediate implication of this research lies in directly altering the structure of assortments so that they do not have unintended effects. For dieters, diabetics, or those limiting their food intake, assortments can be altered to limit their consumption. Alternatively, dieticians in hospitals or nursing homes (or even parents of finicky children) may want to alter assortments to increase the consumption of those under their care.

APPENDIX

SCALES USED IN STUDY 5

Perceived Variety ($\alpha = .81$):⁴

1. This assortment of jelly beans gives me a lot of variety for me to enjoy
2. This assortment of jelly beans gives me at least one flavor I like
3. This assortment of jelly beans offers more ways to enjoy it
4. How much variety do you think there is in this assortment?⁵

Anticipated Consumption Utility ($\alpha = .92$):

Eating from this assortment would make me . . .

1. Feel happy after eating from it
2. Feel enjoyable because of the wide variety
3. Feel fun as I ate it
4. Feel excited as I ate it
5. Feel positive as I ate it
6. Feel enjoyable as I ate it
7. Feel satisfied as I ate it

Memory of Enjoyment ($\alpha = .84$):

The assortment of jelly beans I took was . . .

1. Aesthetically pleasurable to consume
2. Enjoyable to eat
3. Exciting to eat

Aesthetics of the Assortment ($\alpha = .93$):

1. This assortment of jelly beans will be aesthetically pleasurable to consume
2. This assortment of jelly beans looks really colorful
3. This assortment of jelly beans looks aesthetically pleasing

⁴All scales in appendix list yielded one factor solutions and were measured where 1 = strongly disagree and 9 = strongly agree unless otherwise noted.

⁵1 = very little variety and 9 = very much variety.

[David Glen Mick served as editor and Wayne D. Hoyer served as associate editor for this article]

REFERENCES

- Baron, Rubeen M. and David A. Kenny (1986), "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations," *Journal of Personality and Social Psychology*, 51 (December), 1173-1182.
- Baumeister, Roy F. (2002), "Yielding to Temptation: Self-Control Failure, Impulsive Purchasing and Consumer Behavior," *Journal of Consumer Research*, 28 (March), 670-676.
- Birch, Leann Lipps, Linda McPhee, B. C. Shoba, Lois Steinberg, and Ruth Krehbiel (1987), "'Clean Up Your Plate': Effects of Child Feeding Practices on the Conditioning of Meal Size," *Learning and Motivation*, 18 (August), 301-317.
- Bradley, Margaret M., Mark K. Greenwald, Margaret C. Petry, and Peter J. Lang (1992), "Remembering Pictures: Pleasure and Arousal in Memory," *Journal of Experimental Psychology: Learning, Memory and Cognition*, 18 (2), 379-390.
- Broniarczyk, Susan M., 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), 166-176.
- Chandon, Pierre and Brian Wansink (2002), "'Does Stockpiling Accelerate Consumption': A Convenience Salience Framework of Consumption Stockpiling," *Journal of Marketing Research*, 39 (August), 321-335.
- Edell, Julie A. and Marian C. Burke (1986), "Ad Reactions over Time: Capturing Changes in the Real World," *Journal of Consumer Research*, 13 (June), 114-118.
- Feldman, Jack M. and John G. Lynch, Jr. (1988), "Self-Generated Validity and Other Effects of Measurement on Belief, Attitude, Intention, and Behavior," *Journal of Applied Psychology*, 73 (August), 421-435.
- Folkes, Valerie, Ingrid Martin, and Kamal Gupta (1993), "When to Say When: Effects of Supply on Usage," *Journal of Consumer Research*, 20 (December), 467-477.
- Grice, H. P. (1975), "Logic and Conversation," in *Syntax and Semantics, 3: Speech Acts*, ed. P. Cole and J. L. Morgan, New York: Academic Press, 41-58.
- Herman, C. Peter and Deborah Mack (1975), "Restrained and Unrestrained Eating," *Journal of Personality*, 43 (December), 647-660.
- Hoch, Stephen, Eric T. Bradlow, and Brian Wansink (1999), "The Variety of an Assortment," *Marketing Science*, 18 (4), 527-546.
- Huffman, Cynthia and Barbara E. Kahn (1998), "Variety for Sale: Mass Customization or Mass Confusion?" *Journal of Retailing*, 74 (4), 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.
- Isen, Alice M., Thomas E. Shalcker, Margaret S. Clark, and Lynn Karp (1978), "Affect, Accessibility of Material in Memory, and Behavior: A Cognitive Loop?" *Journal of Personality and Social Psychology*, 20 (January), 203-53.
- 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 (6), 995-1006.
- Kahn, Barbara E. (1995), "Consumer Variety-Seeking among Goods and Services," *Journal of Retailing and Consumer Services*, 2 (3), 139-148.
- Kahn, Barbara E. and Donald R. Lehmann (1991), "Modeling Choice among Assortments," *Journal of Retailing*, 67 (Fall), 274-299.
- Kahneman, Daniel (1973), *Attention and Effort*, Englewood Cliffs, NJ: Prentice-Hall.
- Morales, Andrea, Barbara E. Kahn, Cynthia Huffman, Leigh McAlister, and Susan M. Broniarczyk (2002), "Consumer Appreciation of Assortment Variety: The Effects of Congruency between Internal and Retailer's External Organization," Department of Marketing Working Paper Series, Wharton School, University of Pennsylvania, Philadelphia, PA, 19104.
- Pham, Michel Tuan (1998), "Representativeness, Relevance, and the Use of Feelings in Decision Making," *Journal of Consumer Research*, 25 (September), 144-159.
- Pham, Michel Tuan, Joel B. Cohen, John W. Pracejus, and G. David Hughes (2001), "Affect-Monitoring and the Primacy of Feelings in Judgment," *Journal of Consumer Research*, 28 (2), 167-188.
- Pham, Michel Tuan and A. V. Muthukrishnan (2002), "Search and Alignment in Judgment Revision: Implications for Brand Positioning," *Journal of Marketing Research*, 39 (February), 18-30.
- Piaget, Jean (1969), *The Mechanisms of Perception*, London: Routledge & Kegan Paul.
- Raghubir, Priya and Aradhna Krishna (1999), "Vital Dimensions in Volume Perception: Can the Eye Fool the Stomach?" *Journal of Marketing Research*, 36 (August), 313-326.
- Ratner, Rebecca K. and Barbara E. Kahn (2002), "Private vs. Public Consumption: The Impact of Impression Management on Variety Seeking," *Journal of Consumer Research*, 29 (September), 246-257.
- 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.
- Rolls, Barbara J., Edward A. Rowe, Edmund T. Rolls, Breda Kingston, Angela Megson, and Rachel Gunary (1981), "Variety in a Meal Enhances Food Intake in Man," *Physiology and Behavior*, 26 (February), 215-221.
- Schwarz, Norbert (1996), *Cognition and Communication: Judgmental Biases, Research Methods and the Logic of Conversation*, Mahwah, NJ: Erlbaum.
- (1998), "Warmer and More Social: Recent Developments in Cognitive Social Psychology," *Annual Review of Sociology*, 24 (1), 239-64.
- Schwarz, Norbert and Gerald L. Clore (1983), "Mood, Misattribution and Judgments of Well-Being: Informative and Directive Functions of Affective States," *Journal of Personality and Social Psychology*, 24 (September), 161-99.
- Shannon, Claude E. and Warren Weaver (1949), *Information Theory*, Champaign: University of Illinois Press.
- Simonson, Itamar and Russell S. Winer (1992), "The Influence of Purchase Quantity and Display Format on Consumer Preference for Variety," *Journal of Consumer Research*, 19 (June), 133-138.
- Van Herpen, Erica and Rik Pieters (2002), "The Variety of an Assortment: An Extension to the Attribute-Based Approach," *Marketing Science*, 21 (Summer), 331-341.
- Wansink, Brian (1996), "Can Package Size Accelerate Usage Volume?" *Journal of Marketing*, 60 (July), 1-14.

- (2004), "Environmental Factors That Unknowingly Increase Food Intake and Consumption," *Annual Review of Nutrition*, 24, 341–378.
- Wansink, Brian, Robert J. Kent, and Stephen J. Hoch (1998), "An Anchoring and Adjustment Model of Purchase Quantity Decisions," *Journal of Marketing Research*, 35 (February), 71–81.
- Wansink, Brian and Koert van Ittersum (2003), "Bottoms Up! Peripheral Cues and Consumption Volume," *Journal of Consumer Research*, 30 (December), 455–463.
- Young, Michael E. and Edward A. Wasserman (2001), "Entropy and Variability Discrimination," *Journal of Experimental Psychology: Learning, Memory and Cognition*, 27 (1), 278–293.