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# The Influence of Assortment Structure on Perceived Variety and Consumption Qualities

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# The Influence of Assortment Structure on Perceived Variety and Consumption Qualities

## **Abstract**

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.

## **Keywords**

aesthetic/hedonic consumption, health, nutrition, safety, judgment and decision making, perceptual processes, variety seeking/product trial

## **Disciplines**

Advertising and Promotion Management | Behavioral Economics | Business | Business Intelligence | Cognition and Perception | Cognitive Psychology | Marketing | Sales and Merchandising

# Assortment Structure's Influence on Perceived Variety and Consumption Quantities

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## **Assortment Structure's Influence on Perceived Variety and Consumption Quantities**

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 entropy) moderates the effect of actual variety on perceived variety. We further show that it is *perceived variety* which, 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 vary by over 300% from one occasion to another (Hermann and Mark 1975; Wansink 1994). Indeed, unless one is physically stuffed with food, he or she can always "make room for more" (Inman 2001; Birch et al 1987). 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 (or the entropy) of the frequencies of the items in the set 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 non-food 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 altering 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 we propose for understanding how assortment structure and variety influence consumption is illustrated in Figure 1. The first notion 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 mediator); perceived variety in turn increases anticipated consumption utility (which is a distal mediator); and 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.

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Insert figure 1 about here

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Defining Actual Variety

We define actual variety of the assortment as having two components. The first component is the number of distinct options, or number of conceptually distinct subcategories. In this research we consider simple assortments (such as jellybeans, 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/or marketers characterize as distinct subcategories. (We leave the discussion of these 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 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, Bradlow and Wansink 1999). All things being equal, an increase in actual variety will increase perceived variety. However, for sets with a *large* number of options, a disorganized assortment can make it more difficult for consumers to recognize and appreciate the full extent of the variety. On the other hand, for *small* sets, 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 (Shannon and Weaver 1949). Options that are rare or appear with low frequency carry more information (i.e., they are more diagnostic) when compared to 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 dominate 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. Number of replicates refers to the overall

size of the assortment (e.g., small or large). The symmetry or relative frequency of the assortment holds the size of the assortment constant and 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 review). There are several explanations

for this. First consumers in 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 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, Greenwald, Petry and Lang 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 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 jellybeans is organized into 24 flavors (as opposed to far fewer flavors), a consumer may assume that there is a reason the jellybeans are sorted and use that information to guide consumption quantities.<sup>1</sup> 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. In contrast, when an assortment is disorganized, there are no salient cues presented and thus nothing upon 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 (for instance 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 people make underlying the conduct of conversation or “conversational implicature,” (Grice 1975, Schwarz 1996) where it is proposed that people assume that communication messages

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<sup>1</sup> We thank a reviewer for this suggestion.

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 it often occurs outside of conscious awareness. We extend this notion of participants' "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 2x2 between-subjects design where we vary some combination of the actual variety of an assortment [either number of options (6 vs. 24), or number of replicates (single set of 6 vs. double set of 6)] 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 multi-celled 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 assortments, 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. For disorganized assortments, actual variety does not increase consumption

This hypothesis is tested in two unobtrusive outcome studies. Study 1 focuses on children selecting from both jellybean and bead assortments; Study 2 looks at 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 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 (6 vs. 24 colors), the second factor was organization (organized vs. disorganized), and the third (repeated) factor was product class (jellybeans and beads). Thirty-six 1<sup>st</sup> and 4<sup>th</sup> 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 jellybeans 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 jellybeans 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 jellybeans and beads. Each child participated in the same condition for the jellybean and the bead study and made their selections independently.

*Results and Discussion.* As expected, there were no significant effects or significant interactions due to 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 ( $F(1, 32) = 6.7, p = .01$ ). Organization of the assortment moderated the relationship between actual variety and consumption. As Figure 2a illustrates, when actual variety increased from 6 to 24, consumption quantities increased for organized assortments (5.9 to 14.0,  $p = .001$ ), but not for disorganized assortments (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 influences (Piaget 1969). Study 2 will determine whether this effect can be generalized to adults.

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Insert figure 2 about here

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Study 2: Assortment Organization Influences General Consumption

This study generalizes the results of Study 1 on 123 adults who were recruited from local PTA organizations. They were told they would be participating in an experiment on television advertising. They were compensated with an \$8.00 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 jellybeans as a “thank you” for their participation. Each participant was randomly offered one of four different assortments of jellybeans, and it was their jellybean selection that was being observed through two unobtrusive cameras.

In the 2x2 between-subjects design, the assortments of jellybeans varied by the number of colors of jellybeans offered (6 vs. 24 colors) and by whether the jellybeans 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 jellybeans. 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 jellybeans eaten ( $F(1, 87) = 4.50, p = .05$ ). That is, as actual variety increased (6 to 24), consumption quantities also increased with organized assortments (12.7 to 28.3,  $p = .003$ ), but not with disorganized assortments (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 jellybeans 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 6 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 (6) constant in all assortments and 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/non-replicated vs. large/replicated – 6 cells vs. 2x6 cells) and organization (organized vs. disorganized) of the structure. When the assortment is organized, we hypothesize 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, Hoyer, and McAlister 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.

Holding the number of options constant, larger, organized assortments will elicit **2:** higher consumption quantities than smaller organized assortments. For disorganized assortments, larger assortments will not elicit higher consumption quantities than smaller assortments.

We used two product categories: M&M candies (which vary only by color, not taste) and small colored toy spiders. This study was a 3-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 number of replicates (single 6-cell tray vs. a 12-cell tray with double replicates), and the third (repeated) factor was product class (M&Ms 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 6-cell organized tray, each of the 6 colors of M&M's had their own cell. In the 12-cell organized tray, each of the 6 colors had two cells and these cells were not contiguous, but rather the organization resembled two 6-cell arrangements.

Thirty-six 1<sup>st</sup> and 4<sup>th</sup> 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&Ms, and were told to take as many as he or she wanted; each child was next shown a tray of spiders and 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 due to 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 ( $F(1, 32) = 9.01, p = .01$ ) that 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 Figure 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.

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Insert figure 3 about here

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#### 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. In the asymmetric assortments the relative frequency of one option dominates the other options. The 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 assortments, higher actual variety (a larger number of actual options)

should increase consumption quantities, because in the asymmetric assortments it is easier to appreciate the increased variety because the asymmetry provides a heuristic or short-cut for processing by cueing the dominant frequency options.

For more symmetric assortments, actual variety (the number of options available)

- 3:** will not increase consumption quantities. However, for asymmetric assortments, higher actual variety will increase consumption quantities.

To test the effect of assortment symmetry on consumption quantities, we designed four different assortments of M&Ms that varied by the number of colors available (7 vs. 10) and the symmetry or asymmetry of the distribution of the colors (10% vs. 30% brown). A preliminary study was conducted to make sure 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 asked to rate the samples 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&Ms 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 in Champaign, IL 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. Upon 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 ounce bowls of M&Ms along with pencils and paper. Each of the 12 experimental sessions involved between 9 and 12 participants.

The design of the study is a 2 x 2 between-subjects design where the colors (7 vs. 10 colors<sup>2</sup>) of chocolate candy are crossed with the symmetry of the distribution of items. 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 TV situation comedy (“Hazard County”) while eating as many chocolate candies 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 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 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 Figure 4). There was a significant interaction ( $F(1, 102) = 5.05, p = .01$ ) between color and symmetry on consumption quantities. For the asymmetric

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<sup>2</sup> The colors in the 7 color condition were dark brown, green, red, tan, yellow, red, and blue. In the 10 color condition included pink, dark green, and gold.

assortments, increasing actual variety from 7 to 10 increased consumption quantities from 55.9 candies to 99.0 candies (77% increase,  $p = .01$ ). Yet for the symmetric assortments, increasing actual variety led to no significant difference in consumption quantity (71.0 to 82.6, *ns*).

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Insert figure 4 about here

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After they had consumed the candies and after the remaining ones had been removed, participants were asked what they thought their anticipated consumption utility had been for their assortment. Although this measure is asked after they 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% brown) assortments rated their assortments as “more fun to eat” than those given the high variety—symmetric assortments (10 colors—10% brown) assortments (5.8 to 4.6,  $p = .05$ ). For the symmetric assortments, not only was the higher actual variety *not* preferred, but the results were directionally opposite – lower variety assortments were seen as “more fun to eat” (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 is moderated by assortment structure variables (either assortment organization, or symmetry) on consumption quantities. Having provided empirical support for the phenomenon, our next two studies attempt to provide some 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 their perceived variety of the assortment and their anticipated consumption utility before we asked them to select the jellybeans they wanted to consume.

Consistent with figure 1, we believe that 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 disorganized), actual variety will not increase perceived variety, and anticipated consumption utility will not correspondingly increase.

For organized assortments, increased actual variety (the number of options  
4: available) will increase perceived variety, which should increase anticipated consumption utility, which in turn should increase consumption quantities. For disorganized assortments, actual variety will not increase perceived variety, nor anticipated consumption utilities, nor consumption quantities.

This study was similar to study 2 except that before adult participants chose any jellybeans 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 jellybeans as they wanted. While temporarily covering their containers, we then asked them to estimate how many jellybeans they believed they took, how many

different colors they believed they took, how many different colors they thought were (in total) in the assortment, and to judge the aesthetics of the assortment. After they watched the commercials, approximately 45 minutes later, we asked them to recall the jellybean consumption experience and to rate the enjoyment they experienced while eating the jellybeans. 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 jellybeans and were dropped from the study. Five others were deleted from the analysis because they accidentally spilled the jellybeans or they emptied the entire tray onto the table and scooped the jellybeans 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 the perceived variety in the assortments ( $F(1, 98) = 4.18, p = .04$ ). As shown in table 1, when assortments were disorganized, the 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;  $p = .01$ ).

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Insert table 1 about here

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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 6 to 24) increased consumption



utility (4.7 to 6.0,  $p = .01$ ). Yet for disorganized assortments, increasing the actual variety did not increase consumption utility (6.2 to 5.4,  $ns$ ).

Even though participants answered detailed questions, their consumption replicated the findings from Study 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 organizational structure moderated the relationship between actual variety and consumption. For the organized assortments, increasing the actual variety (from 6 to 24) increased consumption quantities (18.2 to 39.6,  $p = .004$ ). For disorganized assortments, increasing the actual variety did not increase consumption quantities (25.5 to 21.3,  $ns$ ).

*Mediation Results.* Figure 1 indicates that organization and actual variety influence consumption quantities and that this influence is mediated through perceived variety and through anticipated consumption utility. Following the multi-step 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 x 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).<sup>3</sup>

- (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 x 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 the Mean-Squares.
- (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 x 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 the Mean-Squares.
- (4) *Anticipated consumption utility mediates the effects of perceived variety on consumption.* Anticipated consumption utility and consumption are correlated ( $r = .19, p = .05$ ), perceived variety influences anticipated consumption utility ( $F(1, 100) = 56.66, p = .0001$ ). When anticipated consumption utility is included in the regression

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<sup>3</sup> We report the percentage reduction of Mean Squares (MS) of the mediated effect because in ANCOVA changes in  $\omega^2$  also reflect changes in the MS error that are unrelated to the experimental factor of interest, see Pham & Muthukrishnam (2002).

analysis for consumption on perceived variety, the  $F$ -statistic ( $F(1, 99)$ ) is reduced from 3.32 ( $p = .07$ ) to 0.91 ( $p = .34$ ), and there is a 73% reduction in the Mean-Squares.

(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 is 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 the Mean-Squares. Further the effects of anticipated utility remains significant as the proximal mediator ( $F(1, 95) = 3.30$ ,  $p = .07$ ) but the effects of perceived variety, the distal 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 6-color set because they can clearly pick out the colors they like and 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 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 jellybeans 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 there was an average 9.2 colors in the assortments. Thus, as hypothesized, more than simply the actual variety of the set is affecting their perceptions.

We also find no evidence that the aesthetics of the various assortments influenced consumption. The interaction of organization x 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 aesthetics does not mediate consumption quantities (there was no reduction in the  $F$ -statistic for consumption quantity when aesthetics is 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 jellybeans 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 6 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 there were the same available jellybeans to choose 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 jellybeans.

*Discussion.* Together, these studies support the perspective 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

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 a benchmark 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 assortment structure and variety has on consumption quantities.

- If the consumption rule, “size of the assortment,” is made salient, this rule will
- 5: govern consumption quantities. Specifically, consumption quantities will be larger for larger assortment sets than for smaller assortments sets. However, if that

consumption rule is not made salient, then as in hypothesis 2 larger, organized assortments will elicit higher consumption quantities than smaller organized assortments. For disorganized assortments, larger assortments will not elicit higher consumption than smaller 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 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 and after buying their ticket; participants were randomly assigned to one of the four stations and asked to choose candy from the tray. The trays were set up as in Study 4 except that jellybeans were used instead of M&Ms. All of the trays had the same 6 flavors of jellybeans and were organized in a 2 x 2 design that varied organization (organized vs. disorganized) and size (6 vs. 12 cells).

We expanded our basic 2x2 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 jellybeans 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 2x2x2 between-subjects design.

***Results and Discussion.*** As predicted in hypothesis 5, there was a significant 3-way interaction on quantity of jellybeans 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 to 18, 25.9, 23.5). Thus, once again it is shown that assortment structure influences consumption (see Figure 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 jellybeans they selected. In this high salience case, participants chose significantly more jellybeans 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).

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Insert figure 5 about here

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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 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 over-estimate 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 realistic 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 non-normative ways (e.g., Folkes, Martin and Gupta 1993, Raguhbir and Krishna 1999, Wansink 1996, and 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 showed 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. If actual variety is increased in a disorganized manner, the resulting impact on consumption will be lessened 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 non-foods (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 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 mean square 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 over-ridden 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. 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).

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Insert Table 2 about here

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## Limitations and Future Research

While consumption-related research has implications for theory and for consumers, one of the reasons it is not more widely studied is because of the difficulty in doing so. Consumption is simultaneously and subtly influenced by physical, social, cognitive, 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 (versus 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, so it was relatively easy to determine the actual variety of the assortment. However, assortments in retail settings may be more cumbersome to compute because they may contain items that have a greater number of attributes and a greater range of attribute. Further, in our consumption situations, organized and disorganized assortment structures were easy to manipulate. However, in retail settings, one is unlikely to see “disorganized” assortments 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 (for example 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 or not. 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 volume (Chandon and Wansink 2002).

Another area that we investigated was the role of consumption rules in determining consumption decisions. In our somewhat simplified assortment decisions, it seemed relatively

clear how the organization of jellybeans 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, another area that has the potential for further study is that which shows how increases in perceived variety can 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 6 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 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 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 paper, 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 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<sup>a</sup>

#### Perceived Variety (alpha = .81)

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

#### 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 jellybeans 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 jellybeans looks really colorful
3. This assortment of jellybeans looks aesthetically pleasing

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<sup>a</sup> All scales yielded one factor solutions and were measured where 1=strongly disagree and 9=strongly agree unless otherwise noted.

<sup>b</sup> 1=Very little variety and 9=Very much variety

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**TABLE 1**  
 THE IMPACT OF ASSORTMENT STRUCTURE AND ACTUAL VARIETY  
 ON CONSUMPTION AND ITS ANTECEDENTS<sup>1</sup>

<b>The Antecedents of Consumption Quantity (Study 5)</b>	<b>Organized Assortment Structure</b>		<b>Disorganized Assortment Structure</b>		<b>F-values (d.f.)</b>		
	<b>Low Actual Variety</b>	<b>High Actual Variety</b>	<b>Low Actual Variety</b>	<b>High Actual Variety</b>	<b>Structure</b>	<b>Variety</b>	<b>Structure x Variety</b>
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)	0.63 (1,106)	14.54** (1,106)
Consumption Quantity (Number of jelly beans)	18.2 (13.3)	39.6 (34.1)	25.5 (39.8)	21.3 (23.0)	0.93 (1,104)	2.26 (1,104)	4.99* (1,104)

<sup>1</sup> Standard deviations in parentheses

\* p<.05; \*\* p < .01

**TABLE 2**  
**IMPLICATIONS FOR HOW ASSORTMENT STRUCTURE INFLUENCES CONSUMPTION**  
**QUANTITIES**

	<b>Organization Influences Consumption (Studies 1 &amp; 2)</b>	<b>Size Influences Consumption (Study 3)</b>	<b>Symmetry Influences Consumption (Study 4)</b>	<b>Perceived Variety Partially Mediates Consumption (Study 5)</b>	<b>Consumption Rules Influence Consumption (Study 6)</b>
<b>Research Opportunities</b>	<ul style="list-style-type: none"> <li>• When does organization influence consumption through a cognitive versus perceptually mediated path?</li> <li>• Will a disorganized store influence purchase quantities?</li> </ul>	<ul style="list-style-type: none"> <li>• Will duplicated offerings in a store increase purchases?</li> <li>• Keeping quantity constant, will two half-size offerings increase consumption the same as one full-size offerings?</li> </ul>	<ul style="list-style-type: none"> <li>• Does repeated exposure to asymmetric assortments decrease their impact on perceived variety and on consumption?</li> <li>• Is part of the influence of symmetry related to scarcity theory or to a collection mentality?</li> </ul>	<ul style="list-style-type: none"> <li>• Does perceived variety change as satiation increases; does it change with subsequent exposure to the assortment?</li> <li>• Does variety cause consumers to anchor on their expectations of consumption utility?</li> </ul>	<ul style="list-style-type: none"> <li>• When do consumption rules not over-ride the more central processing of perceived variety?</li> <li>• Can consumption rules also explain the effects that large shopping carts or large plates have on behavior?</li> </ul>
<b>Consumer Implications</b>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Consumers may be able to control consumption by organizing less structured offerings.</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Duplicated offerings can stimulate consumption.</li> </ul>	<ul style="list-style-type: none"> <li>• 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, collectables and collecting.</li> <li>• Minimal variation in the size of serving bowls may over stimulate consumption..</li> </ul>	<ul style="list-style-type: none"> <li>• People are often surprised at how much they consume, showing they may have been influenced at a basic or perceptual level.</li> </ul>	<ul style="list-style-type: none"> <li>• Large inventory levels in one’s home pantry could increase the quantity of food one believes is appropriate for a meal.</li> <li>• Health care professionals and dieticians can stimulate consumption among nutritionally deficient individuals by offering smaller helpings of more items.</li> </ul>

**FIGURE 1**  
**HOW ASSORTMENT STRUCTURE AND VARIETY INFLUENCE**  
**CONSUMPTION**

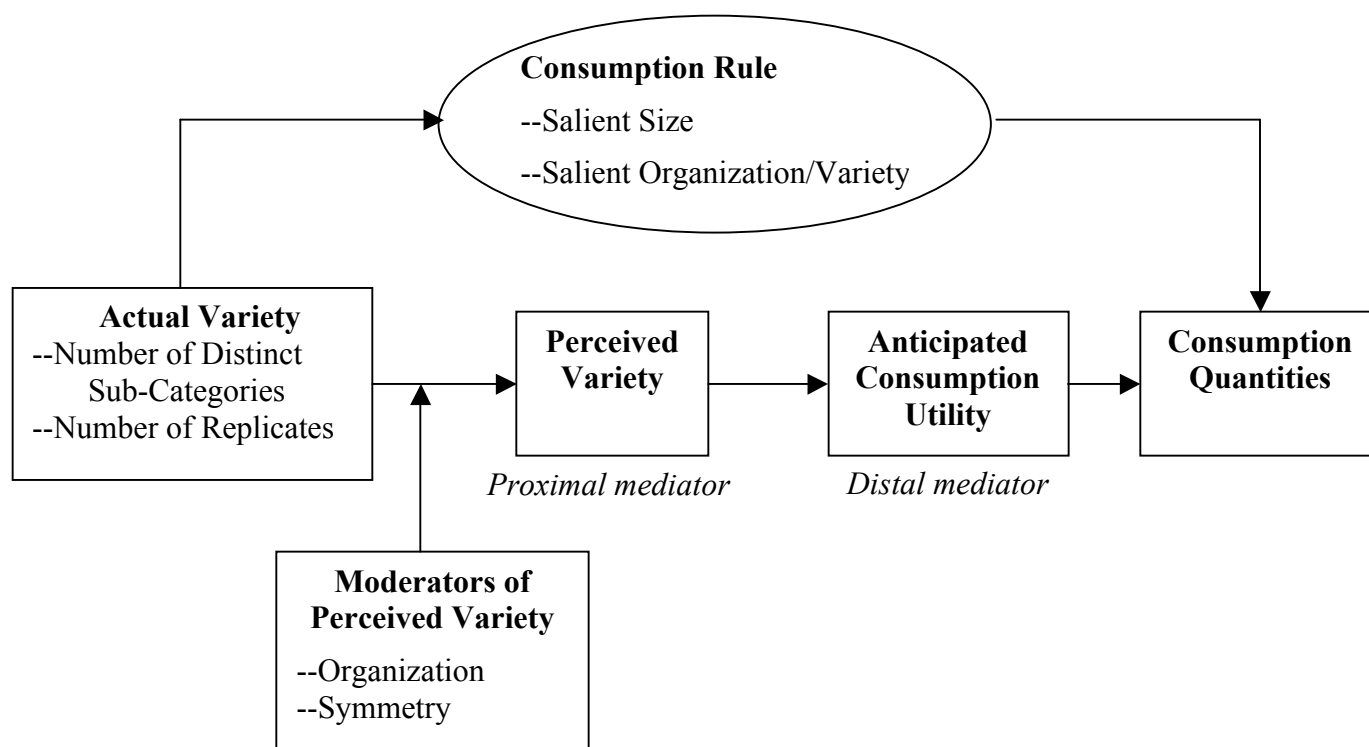
**FIGURE 2**  
**THE IMPACT OF ASSORTMENT STRUCTURE ON CONSUMPTION**

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

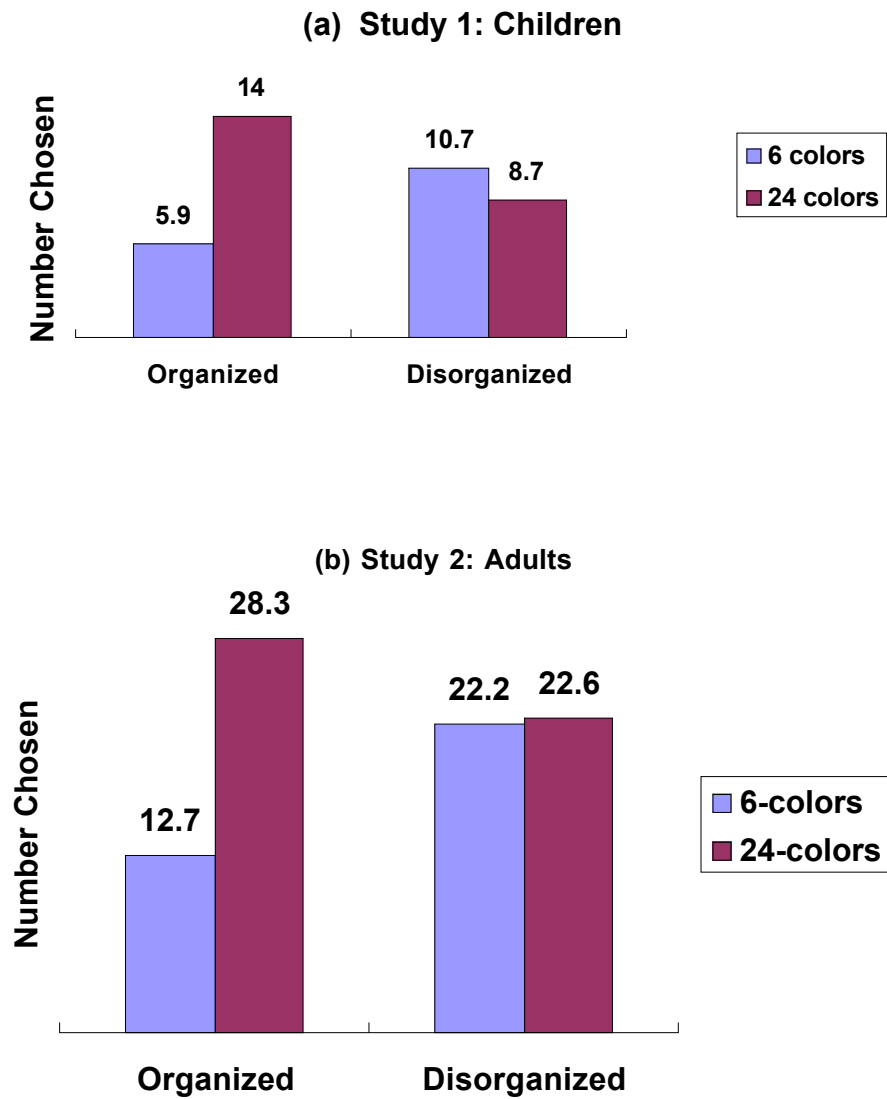
**FIGURE 4**  
**THE IMPACT OF ASSORTMENT SYMMETRY ON CONSUMPTION**  
**(STUDY 4)**

**FIGURE 5**  
**THE IMPACT OF ASSORTMENT SIZE SALIENCE AND**  
**ORGANIZATION ON CONSUMPTION QUANTITY (STUDY 6)**

**FIGURE 1**  
**HOW ASSORTMENT STRUCTURE AND VARIETY INFLUENCE**  
**CONSUMPTION**

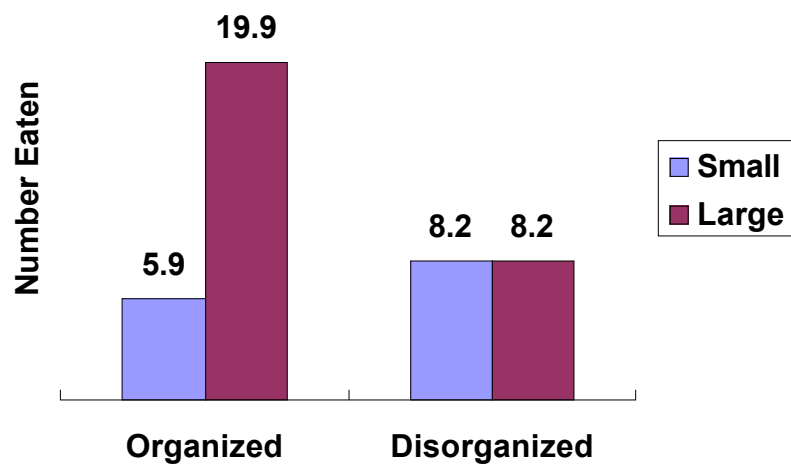


**FIGURE 2**  
**THE IMPACT OF ASSORTMENT STRUCTURE ON CONSUMPTION**

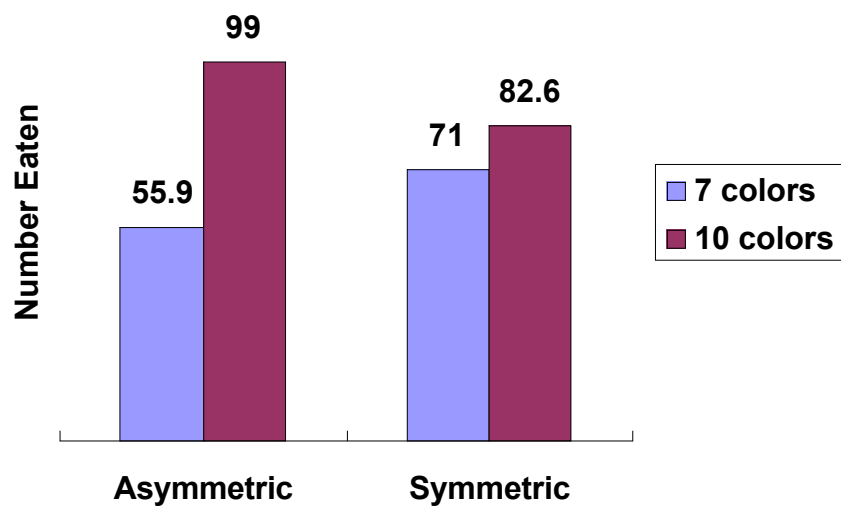




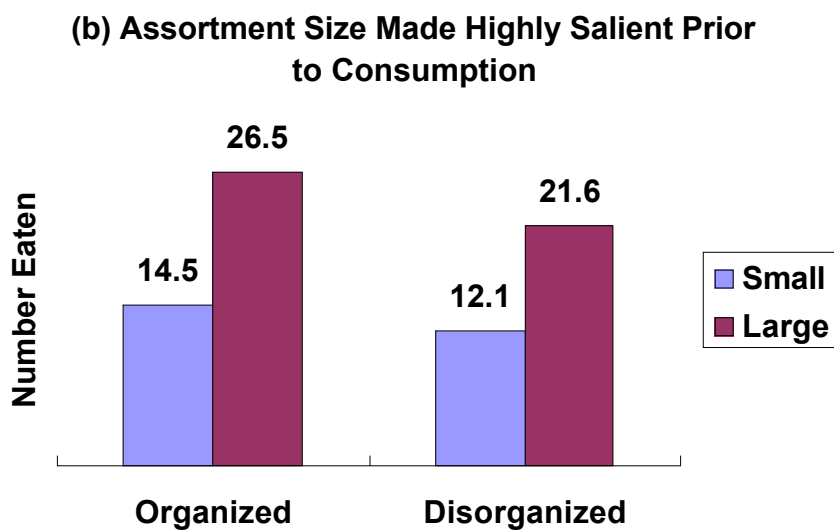
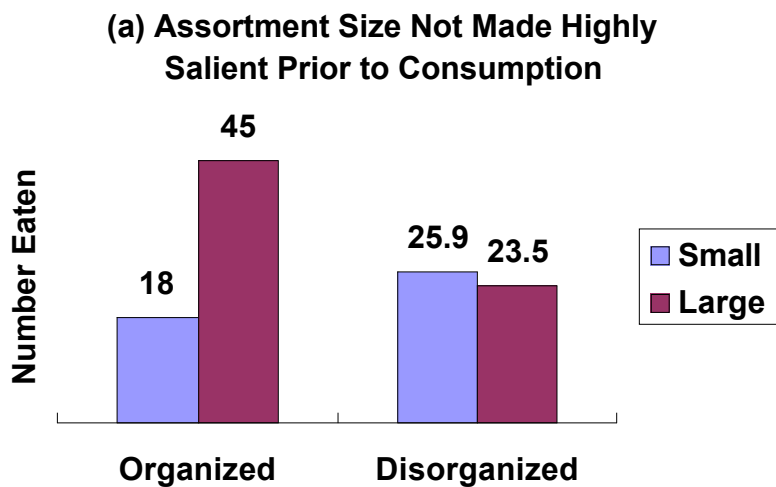
**FIGURE 3**  
**THE IMPACT OF TRAY SIZE AND ORGANIZATION ON**  
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**FIGURE 4**  
**THE IMPACT OF ASSORTMENT SYMMETRY ON CONSUMPTION**  
**(STUDY 4)**



**FIGURE 5**  
**THE IMPACT OF ASSORTMENT SIZE SALIENCE AND ORGANIZATION ON CONSUMPTION QUANTITY (STUDY 6)**



## **1) THE INFLUENCE OF ASSORTMENT STRUCTURE AND VARIETY ON CONSUMPTION QUANTITIES**

2) Defining Actual Variety

2) The Moderating Effect of Assortment Structure on Perceived Variety

2) The Influence of Perceived Variety on Anticipated Consumption Utility

2) Consumption Rules

## **1) EMPIRICAL TESTS OF THE PROPOSED FRAMEWORK**

2) Study 1: Assortment Structure Influences Children's Consumption

3) *Results and Discussion.*

2) Study 2: Assortment Organization Influences General Consumption

3) *Results and Discussion.*

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

3) *Results and Discussion.*

2) Study 4: The Impact of Assortment Symmetry on Consumption Quantity

3) Results and Discussion.

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

3) *Results and Discussion.*

3) *Mediation Results.*

3) *Perceived variety partially mediates experimental effects on consumption quantity.*

3) *Anticipated consumption utility partially mediates experimental effects on consumption quantity.*

3) *Perceived variety partially mediates experimental effects on anticipated consumption utility.*

3) *Anticipated consumption utility mediates the effects of perceived variety on consumption.*

3) *Both perceived variety and anticipated consumption together mediate the effects of the experimental effects on consumption.*

3) *Eliminating Alternative Explanations.*

3) *Discussion.*

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

3) *Results and Discussion.*

**1) GENERAL DISCUSSION**

2) Limitations and Future Research

2) Conclusion