PRODUCT ASSORTMENT

Chapter for Handbook of Consumer Psychology

Susan M. Broniarczyk

University of Texas at Austin

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Susan M. Broniarczyk is a Professor of Marketing at the McCombs School of Business, University of Texas at Austin, susan.broniarczyk@mccombs.utexas.edu. The helpful comments of Alex Chernev, Adam Duhachek, Joe Goodman, Jill Griffin and Wayne Hoyer are greatly appreciated.
Assortment is traditionally defined as the number of products offered within a single product category (Levy and Weitz 2001). Considerable consumer research has examined the influence of the choice set on consumer-decision making (see Behavioral Decision Theory chapter). These task and context effects though have typically been limited to small choice sets containing only three to six options. Yet, the size of product assortments confronting consumers has exploded in recent years with sprawling supermarkets, the entry of specialty category stores such as Best Buy electronics, and the advent of the Internet. For instance, the typical supermarket carries over 100 types of toothpastes varying on brand names (Colgate, Crest, Mentadent), benefits (tartar control, whitening, breath-freshening, sensitive), flavors (mint, cinnamon, citrus), and forms (gel, paste). Best Buy carries 183 televisions varying on brand names (Philips, RCA, Sony, Toshiba), display types (direct-view, flat panel, LCD, rear-projection, plasma), screen sizes (5”- 50”), resolution (EDTV, HDTV, standard), and aspect ratio (16:9, 4:3).

Increasing assortments are also evident in such consequential decisions as the 73 options for Medicare discount prescription cards (Salganik 2004) and the 25% growth in options available in 401(k) plans over the past few years (Mottola and Utkus 2003).

This chapter integrates the consumer behavior, marketing, and psychology literature to shed insight on how consumers make decisions in the face of such vast assortments. The Webster dictionary defines choice both as: 1) a sufficient number and variety to choose among and 2) the act of choosing (Webster 2003). Consumer research has established that decision-making from assortments is a hierarchical process with large product assortments attracting consumers in the first stage of choice and subsequently hindering the second-stage choice of selecting a final product (Kahn and Lehmann 1991).
The first part of the chapter will review the lure of assortments drawing on the retailing and variety-seeking literatures that broad assortments increase the probability that consumers will find their ideal product and offer flexibility for variety seekers. The next section examines how this lure though can backfire as vast assortments overload consumers, resulting in increased decision difficulty, lower choice accuracy, higher product regret, and a greater likelihood of purchase deferral. The chapter then reviews moderating conditions that may mitigate these negative consequences, enabling consumers to perceive the benefit of assortments without suffering the downsides of choosing from vast assortments. The chapter ends with a discussion of new assortment topics and future research opportunities and challenges.

**The Lure of Assortments**

Consumers express a desire for assortments and are drawn to stores that offer wide product selection (Arnold, Oum, and Tigert 1983). This lure isn’t surprising as assortments offer significant process-related and choice-related benefits.

**Process-Related Benefits**

Large assortments afford several benefits to consumers engaged in the process of choosing. First, the complexity associated with numerous products and the novelty associated with unique items provides stimulation that is inherently satisfying (Berlyne 1960). This stimulation is likely to be desirable for individuals with high optimal stimulation levels (Van Trijp, Hoyer, and Inman 1996) or consumers who derive pleasure from the shopping experience (Babin, Darden, and Griffin 1994). A plethora of options may also increase the anticipation of choosing. Savoring of the future choice and consumption experience may provide its own pleasure utility (Loewenstein 1987).
Large assortments are also appealing for their perceived freedom (Reibstein, Youngblood, and Fromkin 1975). Having a choice has been shown to increase intrinsic motivation and perceived control (Deci 1981, Langer and Rodin 1976) and predictions of satisfaction (Botti and Iyengar 2004). Product choice is an opportunity to express one’s individuality and such opportunities for self-determination contribute to the psychological well-being of individuals (Taylor and Brown 1988).

Another advantage of assortments is that a comprehensive set of products provides full information to assist in developing one’s preferences. Consumers can learn the relevant attributes, range of attributes, and attribute trade-offs for a category to make informed evaluations. Thus, a novice TV shopper may benefit from browsing Best Buy as the exposure to all products can be an educational experience enlightening consumers on the range of screen sizes, types of screen displays, and their associated prices. The proportion of the assortment devoted to each product type can also signal to consumers which options are the most popular or high market share products (Prelec, Wernerfelt, and Zettelmeyer 1997).

**Choice-Related Benefits**

The foremost benefit of large assortments is an increase in the probability that a consumer will find a product matching his/her ideal point as the number of products increases (Baumol and Ide 1956). For instance, a consumer who has researched a new TV purchase and decided their attribute preferences is more likely to find their optimal TV among Best Buy’s 187 than the 30 televisions offered at Costco. Therefore, a key advantage of large assortments is they provide maximal opportunity to obtain the ideal product satisfying a consumer’s preferences.
Another benefit of assortments is the provision of a diverse array of products for consumers to satisfy their needs across multiple contexts and multiple users. For instance, when purchasing toothpaste for the family, one may select a sensitive type for an elderly parent, a whitening type for a college-age daughter, a multi-color glitter toothpaste for a younger child, and a tartar control type for oneself all at a single location.

A desire to satisfy multiple tastes or variety-seek may also occur within a single consumer (see McAlister and Pessimeir 1982 for a classic review of variety-seeking). Consumers’ prior consumption experiences can lead them to become satiated on attributes and seek alternative products that offer high levels of another desirable attribute or attribute level (McAlister 1982). Consumers are more inclined to variety-seek in low risk, hedonic product categories (Van Trijp et al. 1996) with attribute satiation more likely to occur for sensory attributes such as flavor than non-sensory attributes such as brand (Inman 2001). Thus, broad assortments are appealing as they likely contain all of a consumer’s desirable attribute options to accommodate variety-seeking.

Large assortments also provide flexibility for consumers who are uncertain about their preferences and tastes (Kahn and Lehmann 1991). When future preferences are unclear, consumers take actions to maintain their future options (March 1978) and therefore prefer large assortments that provide flexibility (Kreps 1979). As the time until consumption increases, the uncertainty associated with future tastes increases (March 1978), and consequently assortments appear more attractive.

Simonson (1990) deftly illustrated how future preference uncertainty impacts variety-seeking by comparing consumers’ simultaneous versus sequential purchase of snacks to be received at the end of 3 successive classes. The students in the sequential
choice/sequential consumption condition made 3 separate choices, selecting one snack per class to be received that day. In contrast, the students in the simultaneous choice/sequential consumption condition selected all three snacks on Class 1 to be consumed that day and at the end of the next 2 classes. Results showed that students in the simultaneous choice condition were significantly more likely to select varied snacks than were students in the sequential choice condition, overestimating the likelihood that they would desire different snacks on future consumption occasions. This tendency to variety seek when choosing for multiple, future consumption occasions, termed the diversification bias (Read and Loewenstein 1995), has been attributed to an incorrect expectation of attribute satiation, desire to reduce the risk associated with potentially changing future tastes, and a desire to simplify the decision (Simonson 1990).

In summary, large assortments offer process-related benefits including stimulation, freedom of choice, and information about category attributes. Assortments also provide choice-related benefits including maximizing the likelihood of finding a single or multiple desired products and providing flexibility for variety seeking and uncertain preferences.

**Negative Choice Consequences of Assortments**

However, this lure of assortment benefits is often a promise unfulfilled. While some choice is clearly beneficial, Schwartz (2000, 2004) persuasively argues that we have crossed the threshold on manageable choice and that the extreme selection of choices currently available instead presents a “tyranny of freedom.” Assortments do indeed increase the probability that an ideal product is present on a store’s shelf, but locating that product on the shelf now becomes a challenging endeavor. Kahn and
Lehmann (1991) explicitly recognized this duality by modeling assortment utility as a hierarchical choice process. In their model, consumers first choose an assortment set that offers flexibility (e.g., choose between assortments offered by competing stores) and then in a subsequent stage confront the reality of choosing a single product from within the chosen assortment set (e.g., choose product at selected store).

This stepwise conflict of initial attraction to assortments followed by difficulty in product choice was powerfully demonstrated in a series of studies by Iyengar and Lepper (2000). They found that large assortments initially attracted consumers, but the decision difficulty they encountered upon trying to make a choice was demotivating, increasing regret and leading consumers to walk away without making a purchase.

Specifically, Iyengar and Lepper (2000) compared consumer reaction to 6 products (small assortment) versus 24 products (large assortment) of a gourmet jam brand in a field study at an upscale grocery. They showed that consumers were more attracted to a sampling station when it offered a greater assortment with 60% of shoppers sampling in the large 24 product condition compared to only 40% of shoppers sampling in the small 6 product condition. Thus, consistent with the benefits of assortments discussed, consumers were lured by greater assortment to approach the sampling display.

Consumers who visited the sampling station had the opportunity to sample the jams and received a $1 coupon for the gourmet jam brand. However, they needed to visit the regular shelf display containing all jam options to make a purchase. Purchase likelihood exhibited a strikingly different pattern with consumers more likely to purchase after sampling from the small (30% purchase) than large (3% purchase) assortment. That is, although consumers were initially more attracted to the larger relative to smaller
sampling assortment, they were actually less inclined to buy. Notably, almost none of the consumers who approached the large assortment sampling station later made a product choice from the full shelf display.

In a follow-up laboratory study, Iyengar and Lepper (2000) compared subjects’ reactions to a forced choice from either a small (6 products) or large (30 products) choice set of Godiva chocolates. Their results further corroborated an attraction/difficulty duality with subjects reporting that it was both more enjoyable and more difficult to choose from a large relative to small assortment. After consuming their chosen chocolate, subjects in the large compared to small assortment condition reported being less satisfied with their product choice and experiencing higher levels of regret that other foregone options might have been more preferable.

A final purchase phase further demonstrated the negative consequences of choosing from a large product selection. As compensation for participation, subjects could receive either $5 or a 4-piece box of unspecified Godiva chocolates worth approximately $5. Almost half (48%) of subjects in the small assortment condition elected to receive a box of chocolate but only 12% of subjects in the large assortment condition elected to receive chocolate. Now, these chocolate purchase results may be viewed with some skepticism as the probability a subject’s chosen chocolate was contained in the 4 piece box was significantly lower in the large (4/30=13%) than small (4/6 = 67%) assortment condition. However, the fact that large assortment subjects reported lower satisfaction with their chosen chocolate does suggest that these subjects would be less inclined to purchase their chosen chocolate than more satisfied, small assortment subjects.
Chernev (2006) found that if the second stage of product choice was made salient, subjects’ preference for large relative to small assortments was dampened but not reversed. In one study, subjects were asked to choose a pen from either Store A offering a small assortment of 12 options or Store B offering a large assortment of 60 options (12 options from small set plus 48 additional options). When subjects were told that final choice would occur at a later time, 97% selected Store B offering the large assortment. However, when subjects were told that they would need to make an immediate product choice, 81% selected Store B offering the large assortment. Other manipulations of product-choice focus including choice justification and prior experience choosing from a large assortment were similarly shown to dampen but not reverse subjects’ preference for large relative to small assortments.

In summary, the two-stage process of consumer choice manifests a dual tension when consumers choose from large assortments. Large assortments are alluring and attract consumers. However, consumers appear to underestimate the decision difficulty they will encounter when they must choose a product from this vast array of options. Next, we review several research streams in consumer psychology to further illuminate three negative psychological consequences of selecting from large assortments: lower choice accuracy, lower satisfaction and higher regret, and higher choice avoidance. Table 1 summarizes the benefits and negative consequences of large assortments.

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Lower Choice Accuracy

It is widely accepted that human beings have a limited capacity to process information (Simon 1955). As the number of product alternatives increases, so does the cost of thinking (Shugan 1980). Thus, the notion that too many product choices may be difficult and overwhelming to consumers is not novel. Consumer psychologists in the 1970’s were cognizant of these limitations and attempted to ascertain when too much product packaging information would “overload” consumers.

A seminal study by Jacoby, Speller, and Kohn (1974) claimed to find evidence of information overload as the number of product alternatives increased. Information load was operationalized as a multiplicative function of the number of product alternatives (4, 8 or 12) X the number of product attributes (2, 4, or 6) per alternative. Information overload was operationalized as occurring when more information led to the negative consequence of decreased choice accuracy compared to a consumer’s ideal based on stated attribute preferences.

Although few doubted the potential for information overload, a lively debate ensued as to the veracity of this overload claim given Jacoby et al.’s (1974) data (Wilkie 1974, Summers 1974, Jacoby 1977). Reanalysis of the data showed that there was no evidence that a larger number of product alternatives led to information overload after choice accuracy was conditionalized on set size. That is, the finding of a larger number of product alternatives leading to lower choice accuracy was an artifact of failing to account for the higher chance probability of picking the best brand in small than large choice set sizes (Wilkie 1974). However, later researchers such as Malholtra (1982) solidly
demonstrated information overload when 10 or more alternatives were contained in the choice set.

Payne (1976) also provides evidence that increasing the information load (he referred to it as task complexity) leads consumers to resort to greater use of simplifying, choice heuristics. Using verbal protocols, he examined subject’s decision strategies when the number of alternatives varied between 2-12 options and the number of attributes varied between 4-12 dimensions. His results showed that the number of alternatives had a greater impact on decision strategy than did the number of attributes. Specifically, with 2 alternatives, subjects exhibited compensatory processing with most subjects examining all the attributes for both alternatives. However, as the number of alternatives increased, subjects’ decision strategies shifted to non-compensatory strategies of elimination by aspects and conjunctive models. Effectively, subjects reduced the information load by eliminating some of the alternatives on the basis of attribute criteria. Consistent with this premise, Payne, Bettman and Johnson (1993) showed that the attractiveness of selective, attribute-based heuristics such as elimination by aspects increases as the number of product alternatives increase. Thus, when faced with greater assortments, consumers are more likely to engage in non-compensatory processing and selectively attend to a subset of the total information. This contingent processing in the face of high information loads contributes to lower levels of choice accuracy.

The Jacoby debate also pointed out that one needed to account for both the relative attractiveness of the alternatives in the choice set and information quality when determining the cognitive load (Wilkie 1974, Summers 1974). As Summers (1974, p. 467) states, “Clearly, the greater the variability in the ‘attractiveness’ of the alternatives,
the easier it will be for the subject to select his ‘best’ brand.” Malhotra (1982) found support for this assertion showing that as the variability of the relative attractiveness of the alternatives in the choice set increased, choice accuracy increased and subjects reported greater certainty, less confusion, and greater satisfaction with the task.

An inverted U relationship likely exists between the number of alternatives in the choice set and their variability in relative attractiveness. That is, when the product set is initially small, the addition of alternatives likely expands the attributes offered and/or the range of attributes offered. However, when more alternatives are added to an already large product set, the options are less likely to introduce new attributes and more likely to occur within the range offered by existing attributes, thereby increasing the similarity and relative attractiveness of the alternatives (Lehmann 1998). Thus, we propose that the addition of product alternatives to a choice set initially increases a consumer’s choice accuracy but the continued addition of product options results in a decrease in a consumer’s choice accuracy.

Research on information quality is instructive to assortment researchers as it finds that the processing load for a constant number of product alternatives can vary substantially depending on the quality and type of attribute information presented. Three dimensions of attribute information that have been shown to affect the processing load of products in an assortment are attribute importance, the number of attribute levels, and the distribution of attribute levels across alternatives.

Keller and Staelin (1987) varied the number of product attributes (4, 8, 10 or 12) and the importance of the attributes (i.e., quality) holding constant the number of alternatives. For attribute quantity, they found an inverted U pattern such that more
attributes per alternative initially increased but then decreased choice accuracy. However, when the quality of the attribute information increased, subjects responded by using more of the available information in their decision. Thus, when deciding how much information to present for large assortments, this research suggests that marketers should limit and filter the availability of attribute information to only include the most important attributes.

Lurie (2004) advocates a comprehensive measure of cognitive information load that also incorporates the number of attribute levels and distribution of attribute levels. Drawing on Shannon’s (1949) information theory, he finds that the processing load of product alternatives increases with the number of attribute levels and is greatest when attribute levels occur with uniform probability (i.e., symmetry). When attribute levels are uniformly distributed across alternatives (50% have attribute level 1 and 50% have attribute level 2), consumers are unable to guess the attribute level for a given alternative and have to engage in more processing than if the attribute levels are non-uniform (90% have attribute level 1 and 10% have attribute level 2). The rare events in non-uniform distributions are especially informative to consumers and therefore lighten the cognitive load.

Consistent with Payne (1976), he shows that the higher levels of information load associated with multiple, uniformly distributed attribute levels lead consumers to be more selective in their attribute information acquisition and this leads to lower choice accuracy. As large relative to small choice sets typically offer a greater number of attribute levels, these results imply that the cognitive load is likely even greater than previously thought. Yet, his results also suggest that an increasing assortment size does not necessarily mean
an increasing cognitive load as the load can be mitigated if the attribute levels are non-uniformly distributed.

In conclusion, the information overload literature shows that the high cognitive load associated with large assortments decreases consumers’ choice accuracy. As the number of product alternatives increases, consumers are more likely to resort to noncompensatory processing and selectively attend to information as a way to cope with the high information load. The exact point of information overload is arguably a calibration issue that will vary by product category, consumer, and situation. However, researchers can be guided by the knowledge that the cognitive processing load of assortments is a function of the number and relative attractiveness of product alternatives, the number and quality of attributes, and the number and dispersion of attribute levels.

The decision difficulty engendered by the high cognitive load of assortments also can lead to lower satisfaction. Next we review the negative consequences of large assortments leading to lower satisfaction with the choice process, lower satisfaction with product choice, and higher regret with product choice.

**Lower Satisfaction and Higher Regret**

**Satisfaction with Choice Process.** The information overload research has also found that consumer satisfaction with the choice task decreases as the number of product alternatives increases (e.g., Maholtra 1982). The complexity of a large assortment increased consumer confusion and contributed to lower satisfaction.

Huffman and Kahn (1998) examined consumer choice for 12 alternatives of sofas or hotels each described on 18-19 attributes in either an attribute-based or alternative-based information presentation format. Their findings showed that information format
moderated the likelihood that a large assortment would lead to consumer confusion and lower satisfaction with the decision process. Specifically, subjects perceived less complexity with the choice set and were more satisfied with the decision process when assortment load was presented in an attribute-based format than an alternative-based format.

Apparently, when learning new information, it is easier for consumers to process information by attribute, comparing each alternative on a common feature. In contrast, presentation by alternative is more processing intensive as it requires consumers to integrate different attributes together to form an overall product assessment and then compare these overall assessments between different product alternatives. Thus, the cognitive load associated with processing assortments appears to be lighter when the information is presented in an attribute-based compared to alternative-based format and this positively impacts satisfaction with the choice process. This result implies that Internet retailers who possess the capability of attribute-based presentation have a distinct advantage in carrying broad assortments relative to brick-and-mortar retailers who are relegated to alternative-based presentation. Huffman and Kahn (1998) also found evidence that information format indirectly affected satisfaction with the choice through its influence on satisfaction with the process.

**Satisfaction with Product Choice.** Satisfaction with product choice is a comparison of the product’s performance relative to expectations (Oliver 1993). Thus, the reference point for satisfaction is internally generated (Tsiros and Mittal 2000). For the same level of product performance, consumers may have different product satisfaction experiences depending on their expectations.
Schwartz et al. (2002) and Schwartz (2004) speculate that having a wide range of options increases consumer expectations about what constitutes an ideal product. As a consumer’s ideal is composed of the best attributes of all product options considered, this ideal is likely to reach higher levels as more options are considered. So even if the chosen option is the best overall product amongst the choice set, it likely does not perform at the maximal performance level on all attributes. Consequently, the chosen product will fall short of a consumer’s ideal expectations resulting in low satisfaction. If large relative to small assortments increase consumer expectations, then consumers will be less satisfied for an equivalent level of product experience.

Large assortments may also increase the perceived likelihood of success of finding the ideal product. That is, large assortments may create the impression that one can “have it all” in limitless choice sets and not have to trade-off product attributes. Schwartz et al. (2002) and Schwartz (2004) further conjecture that as a result, any performance deficiencies of the product will be felt acutely by the consumer. Having a wide selection of options discounts the situation as a source of blame and freedom of choice puts any attribution of product failure squarely on the shoulders of the chooser. The negative affect associated with poor attribute performance will thus be heightened for large assortments and further contribute to a consumer’s lower satisfaction with product selection.

Regret with Product Choice. Regret is the result of comparing an outcome with a better outcome had a different alternative been selected (Tsiros and Mittal 2000). That is, regret is a comparison between the chosen outcome and foregone options. As large assortments by definition denote a substantial number of product options, the potential
for regret is high as there will be a substantial number of foregone options following choice.

Most regret research has examined situations where consumers know the outcome of the foregone alternatives. However, Tsiros and Mittal (2000) demonstrated that even if consumers do not know the outcome of these foregone alternatives, they may generate counterfactuals imagining how their outcome would have been different had they chosen differently. They found that subjects were more likely to generate counterfactuals when the chosen outcome was negative or not the status quo option. They conjecture that the reason switching from the status quo option results in regret is a subject’s sense of decision responsibility.

If consumers do feel greater decision responsibility when choosing from a large assortment, one might predict that the likelihood of consumers generating counterfactuals and experiencing regret increases as the size of the assortment increases. Also, if large assortments entice motivated consumers to seriously consider more options, consumers may experience a greater post-choice discomfort and sense of loss for these foregone alternatives (Carmon, Wertenbroch, and Zeelenberg 2003).

In summary, the higher cognitive load of large assortments is shown to lead to higher decision difficulty and consequently consumer dissatisfaction with the process of choosing from large assortments. Presenting the assortment information sequentially by attribute may facilitate processing and mitigate the negative effects on satisfaction. The large number of choice options associated with assortments may lead to lower satisfaction with the chosen outcome due to increased consumer expectations, greater self-blame, and higher regret that a foregone alternative would have been preferable to
the chosen option. These negative consequences of large assortment may deter consumers from choosing at all.

**Greater Choice Avoidance**

Choice avoidance is a tendency to avoid making a product choice by seeking an easy way out that involves no change or postponing choice (for excellent review, see Anderson 2003). Large assortments may trigger two choice avoidant behaviors, namely, a tendency to select the status quo option and a tendency to defer choice.

**Status Quo Option.** The status quo option is a preference for a product alternative that involves no change. For most consumer situations, the status quo option would entail selecting the same product previously purchased in the category or for new category purchases might entail selecting a brand previously purchased in another category. Hoyer (1984) finds that for frequently purchased, low involvement products, consumers use choice heuristics rather than engage in extended decision-making. Specifically, observing laundry detergent purchases in grocery stores, he found that 72% of consumers looked at only one package during choice from the category shelf display. Assuming the prior choice experience was satisfactory, choice of a status quo option allows for a relatively quick and low effort decision. Choice of a status quo option is also highly justifiable to oneself and others and therefore may reduce the potential for regret (Simonson 1992, Inman and Zeelenberg 2002). When faced with choosing from a large relative to small assortment, we would expect consumers to exhibit an even higher propensity of selecting a status quo option as a mechanism to cope with the choice complexity. The finding that availability of a favorite product was an important factor in
consumer’s perceptions of assortment is consistent with this premise (Broniarczyk, Hoyer, and McAlister 1998).

Choice of a status quo option has also been shown to occur for high involvement decisions albeit via a very different processing route. Luce (1998) found that for decisions involving trade-offs on emotionally laden attributes (e.g., how high a price a consumer is willing to pay for auto safety), subjects who engaged in prolonged deliberation experienced negative emotion. These subjects consequently resorted to choosing an avoidant option as a mechanism to cope with the negative emotion generated from trade-off difficulty. If large assortments increase noncompensatory processing (Payne 1976), such trade-off difficulty may be alleviated if emotional-laden attributes are not the attribute criteria basis on which alternatives are eliminated.

Choice Deferral. Choice deferral encompasses postponing product choice either to search for more information or better alternatives or to simply choose not to purchase any of the available options. Greenleaf and Lehmann (1995) propose a typology of reasons why consumers defer product choice decisions. Reasons include perceived performance and financial risk, perceived social and psychological risk, being too busy to devote time to the decision, and needing to gather information or seek the advice of another. Large assortments exacerbate the likelihood of these deferral reasons occurring. A greater number of product alternatives makes it more difficult to determine the best performing product, increases one’s concern that one is choosing the right product, increases the time needed to make a decision, and increases the likelihood that one may seek information to simplify one’s task.
Iyengar, Jiang, and Huberman (2004) demonstrated the negative consequences of increasing option sizes on employee participation in retirement plans. Examining Vanguard 401(k) data, they found a 1.5% reduction in plan participation for every 10 fund options added. For instance, retirement plans that offered only 2 fund options had 75% employee participation whereas retirement plans that offered 59 fund options had only 60% employee participation. Thus, having a greater number of retirement fund options led to an increased incidence of choice deferral with employees electing not to participate at all in their retirement plans.

One reason large assortments may lead to choice deferral is if they increase the number of difficult attribute trade-offs consumers face (Luce 1998). Certainly, retirement fund plans that ask consumers to trade-off risk versus reward among fund options for their future financial security is an emotionally difficult decision.

Paralleling the prior discussion on choice accuracy, choice deferral has also been found to occur if the similarity between options increases, making consumers uncertain as to which is the single best alternative (Dhar 1997). Extensive processing of an assortment set that contains options of relatively equally attractiveness exacerbates rather than resolves preference uncertainty and thereby increases the coping mechanism of choice deferral. However, choice deferral has been shown to be mitigated if assortments offer high attractive options or factors such as time pressure increase the extent of non-compensatory processing (Dhar and Nowlis 1999). Dhar (1997) also showed that if consumers have the opportunity to select multiple alternatives, choice deferral decreased as consumers no longer had to choose between their uncertain preferences.
In conclusion, we have reviewed three potential negative consequences of large assortments on consumer-decision making: lower choice accuracy, lower satisfaction and higher regret, and greater choice avoidant behavior. Higher cognitive loads generally associated with large assortments were shown to lead to non-compensatory processing and lower choice accuracy. The decision difficulty associated with choosing from a vast number of product options was shown to lead to lower satisfaction with the choice process, lower satisfaction with the chosen option, and higher regret that one of the foregone alternatives was preferable to the chosen option. Large assortments were shown to lead to a higher incidence of choice avoidant behavior due to their decision complexity, difficult attribute trade-offs, and similarity in relative attractiveness of options.

The above discussion paints a bleak picture of consumer choice from broad assortments. Although initially attracted to large assortments, consumers suffer a multitude of negative consequences when subsequently choosing from these sizeable choice sets. Next, we discuss several moderating factors that offer the possibility of a brighter picture whereby consumers may receive the benefits of assortments with limited negative consequences.

MODERATING ASSORTMENT FACTORS

Perceptions of Assortment

An assumption of early assortment research was that consumer perceptions of the assortment offered in a product category were a one-to-one function of the number of products offered in that category. The high processing load presented by broad assortments though makes it unlikely that consumers process all product information in extensive detail. Thus, more recent research has questioned this assumption and provided
insight into the factors that affect how consumers actually perceive assortment including the composition of the product set and assortment display and organization.

**Availability of Favorite Product and Shelf Display.** Broniarczyk et al. (1998) found that in addition to the number of unique products offered, assortment perceptions were also a function of the heuristic cues of shelf space size and availability of favorite product. In a laboratory study, subjects shopped for microwavable popcorn in two mock stores, a base store containing 48 products, each receiving one shelf facing, and a test store and then made a surprise comparative rating of assortment. The test store varied the number of products offered (12, 24, 36, or 48) and the size of the shelf space (one shelf facing per product versus a constant 48 product facings). The smaller product sets contained the most attractive options and duplicate shelf facings in the constant shelf space condition. Results showed that if shelf space was held constant and a consumer’s favorite was still available, subjects perceived no difference in the assortment offered by either the 24 or 36 product test stores relative to the 48 product base store. In fact, subjects actually perceived the 36 product store to offer more assortment than the 48 product base store if shelf space was held constant. This higher assortment perception was apparently due to the duplication of the most attractive products making it easier for consumers to find their favorite products.

A field study corroborated the findings that assortment perceptions were not a direct function of the number of products offered. Customers reported no change in assortment perceptions when the number of products offered in five high-selling categories in a convenience store were reduced by 50%. However, customers reported that it was now easier to shop. These findings led Broniarczyk et al. (1998) to suggest
that assortment perceptions are a multidimensional construct comprised of both a
cognitive dimension (total number of products offered, size of shelf space devoted to
category) and an affective dimension (availability of favorite product, ease of shopping).
Importantly, this research on assortment perceptions suggests the possibility of a win-win
situation whereby a reduction in the number of products offered has the positive benefit
of reducing consumers’ processing load without altering the perceived assortment that
consumers find alluring.

Product and Attribute Similarity. Consistent with the information load literature,
research also finds that product and attribute similarity are important dimensions
underlying consumer’s perceptions of assortment. Hoch, Bradlow, and Wansink (1999)
and Van Herpen and Pieters (2002) developed two mathematical models of assortment
perception that they experimentally tested using hypothetical visual stimuli varying on
color, shape, and name.¹

Hoch et al. (1999) model the perceived assortment of a product category as the
dissimilarity of product pairs and find that uniqueness of product pairs is critical with
assortments containing duplicates severely penalized. Their results showed that attribute
differences between products had a significant positive impact on assortment perceptions
even when the number of products was held constant. However, adding a unique feature
had diminishing returns if the products already differed on multiple attributes.

Attributes have also been shown to vary in their importance in affecting consumer
perceptions of product assortment. In their visual task of hypothetical products, Hoch et

¹ The product dissimilarity model of Hoch et al. (1999) and the attribute based model of Van
Herpen and Pieters (2002) have been shown to be mathematically similar if assortment size is accounted
for (Hoch, Bradlow, and Wansink 2002).
al. (1999) found that the attributes of color and shape exerted the greatest influence on assortment perceptions. For actual grocery products where consumers have a priori preferences, brand name and flavor have been shown to be more important attributes than package size in affecting consumers’ assortment reaction (Boatwright and Nunes 2001, 2004). Therefore, one might hypothesize that consumers would perceive a small product set size that varies on important attributes as offering greater assortment than a larger product set size that offers minimal variation on important attributes.

Van Herpen and Pieters (2002) model the perceived assortment of a product category as a function of the dispersion of attribute levels across all products in the category and the correlation between product attributes. An assortment was perceived to be varied to the extent that multiple attribute levels were present and largest when all attribute levels occurred in equal proportions (i.e., symmetrical dispersion) and a low level of association existed between attribute pairs. Their results showed that although significant, product set size had a much smaller impact on assortment perceptions than attribute dispersion and disassociation, particularly if the initial assortment size was large.

Attribute dispersion may differentially affect the cognitive and affective dimensions of assortment perceptions. Van Herpen and Pieters’ (2002) finding of higher perceived assortment for symmetrical attribute dispersions is consistent with Lurie’s (2004) findings that symmetrical dispersions (e.g., 2 plasma TVs, 2 rear projection TVs) have a higher cognitive load than asymmetrical dispersions (e.g., 1 plasma TV, 3 rear projection TVs). Similarly, subjects in Kahn and Wansink’s (2004) research rated symmetrical assortments as more complex and less fun to process than asymmetrical assortments. However, Kahn and Wansink (2004) speculate that the ease of processing
associated with a rare options in an asymmetric dispersion will lead to greater perceived assortment than a symmetric dispersion. Direct measures of perceived assortment were not collected, but subjects were found to consume greater quantities from an asymmetrical than symmetrical assortment. Thus, the cumulative effect of attribute dispersion on the cognitive and affect dimensions of assortment perceptions remains open for future investigation.

The affective dimension of consumer satisfaction with the assortment was modeled in Kahn and Lehmann (1991)’s previously discussed hierarchical choice model. Assortment utility was modeled as the sum of the utility of the most preferred product in the set and the utilities of the remaining acceptable products weighted by the amount of uniqueness they offer. Thus, consistent with Broniarczyk et al. (1998), the most preferred or favorite product exerts a disproportionately strong influence on consumer assortment judgments and consistent with Hoch et al. (1999) and Van Herpen and Pieters (2002), the uniqueness contributed by other products in the set is also an important element underlying consumer perceptions of assortment.

**Assortment Organization.** The information format of the assortment has also been shown to interact with the number of products offered in affecting consumer perceptions of assortment. An organized assortment (e.g., by brand or by flavor) provides a structure that facilitates consumer processing of the range of products offered. Thus, Kahn and Wansink (2004) found that for large assortments, perceived assortment is higher for organized displays that help consumers appreciate the broad range of options. However, for small product sets, organization facilitates consumer recognition that the number of
products offered is limited and consequently perceived assortment was higher for disorganized relative to organized assortments.

Organization of an assortment display also increases the similarity of adjacent products. Consequently, Hoch et al. (1999) found that consumer’s processing mode interacts with assortment organization in affecting consumers’ perceptions of assortment. Specifically, consumers may evaluate the assortment display from two different processing orientations: a choice task versus a browsing task. When engaged in a choice task, consumers focus on specific attribute information to achieve their preferences. An organized assortment facilitates locating the portion of the display containing products that help achieve their attribute objectives and consequently leads to higher perceptions of assortment. In contrast, when engaged in a browsing task, consumers process the display holistically and a disorganized assortment is perceived as offering greater assortment.

However, not all organizations are equally effective at facilitating consumers processing of the assortment. Morales et al. (2005) show that the external structure of the assortment organization interacts with the internal representation of the category that the consumer brings to the decision situation. Specifically, Morales et al. (2005) show that when a consumer’s internal structure for the category matches the external structure of the shelf display, the consumer is more likely to perceive greater assortment and be more satisfied with his/her choice. Thus, a consumer who is brand loyal when choosing a TV (e.g., Sony) will perceive a greater assortment when the display is organized by brand as the complete range of a brand’s offering are now located in one section of the shelf display (e.g., direct-view, plasma, rear projection, HD, standard, all sizes). Conversely,
a consumer who is most concerned about resolution will perceive a greater assortment when the product display is congruently organized by resolution (e.g., all HD TVs, all ED TVs, all direct view TVs).

Congruency between the external assortment organization and a consumer’s internal structure on assortment perceptions was more important for consumers with high product category familiarity. For low familiarity consumers, their internal structures were less-well developed and consequently it was more important for the assortment organization to be congruent with their situational shopping goals (e.g., big-screen TV for entertainment room, small TV for kitchen).

In conclusion, perceived assortment extends beyond the number of products offered. Consumer assortment perceptions are also affected by the composition of products in the assortment, heuristic cues, and the format in which products are presented. Assortment perceptions are higher to the extent that the product set contains more unique alternatives, attributes and attribute levels, low levels of inter-attribute correlation, and preferred options. Thus, a product set containing a few, unique items may be perceived as offering greater assortment than a product set containing more, but similar items. Furthermore, holding the number of products and product set composition constant, products displays that occupy greater space and are organized to facilitate consumer processing of the assortment lead to higher perceptions of assortment. These findings offer prescriptions to marketers regarding conditions whereby consumers may reap the process and choice-related benefits of assortment without suffering detrimental processing loads.

**Assortment Attribute Type**
The assortment models of Hoch et al. (1999) and Van Herpen and Pieters (2002) showed that attribute dissimilarity increased assortment perceptions. This attribute dissimilarity can be further specified as either an alignable/nonalignable or a complementary/noncomplementary attribute difference. Markman and Medin (1995) define alignable attributes as different levels of the same attribute so consumers are making tradeoffs within an attribute. Nonalignable attributes, on the other hand, involve comparisons among different attributes so consumers are making tradeoffs between attributes. For instance, in computers, an alignable attribute would be processor speed that could vary from 1.60GHz, 2.40GHz, 2.80GHz, 3.00GHz. A nonalignable attribute would be computer peripherals that could range from monitor, printer, fax, to speakers.

Nonalignable attributes are more likely to increase perceived assortment than alignable attributes. However, Gourville and Soman (2005) showed that increasing brand assortments of nonalignable attributes had a negative impact on brand choice. They compared choice between two brands, Brand A offering a single product option and Brand B offering either a single product option or five product options. When Brand B increased its product assortment from one to five options and the attribute differences were nonalignable, its market share relative to Brand A decreased from 53% to 40%. However, when the attribute differences were alignable, the opposite pattern emerged. When Brand B increased its product assortment from one to five options and the attribute differences were alignable, its market share relative to Brand B increased from 53% to 73%.

Gourville and Soman (2005) examined two causal mechanisms underlying this differential effect of assortment type on product choice. First, nonalignable assortments
place a heavier cognitive load on consumers than alignable assortments as comparisons between attributes are more difficult than comparisons across levels within an attribute. Thus, consumers may choose to simplify their decision by selecting the brand offering fewer options. Second, nonalignable assortments have been shown to lead to higher regret than alignable assortments. When choosing between nonalignable attributes, consumers with budget constraints must trade-off between attributes. These consumers are likely to experience a sense of regret about foregone options as a computer peripheral choice of a monitor means completely foregoing a printer, fax, or speakers. When choosing among alignable attributes, however, regret is minimized as the choice between levels of a common attribute (e.g., 1.6GHz versus 2.0Ghz) still results in the consumer obtaining that attribute (e.g., a computer processor). Their experimental results supported both cognitive load and regret as causal mechanisms underlying the decreased choice likelihood for assortments differentiated on nonalignable attributes.

Chernev (2005) found similar moderating effects for the attribute type of complementarity on choice deferral from varying brand assortments. Complementary attributes were characterized as attributes whose utilities were additive increasing overall product attractiveness (e.g., tartar control + cavity protect for toothpaste) whereas noncomplementary attributes were characterized by their nonadditive utilities decreasing overall product attractiveness (e.g., mint flavor + banana flavor of toothpaste).

Chernev (2005) showed that choice deferral was higher when the options in the choice set were differentiated by complementary relative to noncomplementary attributes and that this effect was moderated by assortment size. Comparing choice sets comprised of two options versus five options, he found that when choosing among options
differentiated on complementary attributes, 65% of subjects deferred choice in the larger choice set compared to 50% of subjects deferring choice in the smaller choice set. On the other hand, when choosing among options differentiated on noncomplementary features, an opposite pattern was observed such that subject were less likely to defer choice for the larger (27%) compared to smaller (42%) choice sets.

Choice protocols in Chernev (2005) revealed that consumer expectations increased more for complementary than noncomplementary attributes. As assortment size increased, a subject’s ideal product contained an aggregation of a larger number of attributes if the assortment was differentiated on complementary compared to noncomplementary attributes. As this increased ideal point is often unrealistic due to product or budget constraints, its unavailability led to a higher incidence of consumers deferring purchase.

Griffin and Broniarczyk (2005) find that this quest for the ideal product can lead consumers to continue searching for products even when it has diminishing returns on satisfaction. In an Internet search task, subjects searched more when options were nonalignable than alignable. Yet, this further search decreased subjects’ satisfaction as the nonalignable options necessitated difficult trade-offs. These findings suggest that consumers may self-create large assortments of attractive options, and as a result, self-inflict negative decision-making consequences.

In summary, choice likelihood was shown to decrease as assortment size increased, particularly if the assortment was differentiated on nonalignable and complementary attributes. Three causal mechanisms of higher cognitive load, increased product expectations, and higher regret were shown to underlie the higher levels of
choice avoidance associated with increasing assortments differentiated on nonalignable and complementary attributes. These findings are troublesome as the very attribute types (nonalignable, complementary) that positively impact assortment perceptions are the cause of subsequent choice difficulty. The constructs of attribute alignability and complementarity are conceptually very similar although inversely related. Most complementary attributes would be nonalignable (e.g., a computer would increase in attractiveness if it offered multiple peripherals of monitor, printer, and speakers). However, one could envision instances where complementary attributes have common, alignable levels (e.g., strawberry and banana make attractive combination flavor of strawberry-banana) and hence may increase the attraction of the assortment while limiting the deleterious effects on choice.

**Preference Development**

Consumer knowledge may also be helpful in offsetting the higher cognitive loads and increased product expectations of large assortments. A choice task though requires more than a mere knowledge of product attributes and product alternatives. In order to make a choice, the key is that consumers have developed preferences regarding attribute levels and formulated trade-offs on the relative importance of these attributes. Consumers with well-developed preferences have been shown to have an easier time processing large assortments, higher levels of satisfaction, and higher likelihood of choice from large assortments (Huffman and Kahn 1998, Chernev 2003a, 2003b).

In their study of consumer choice from large assortments, Huffman and Kahn (1998) examined the effects of preference development by varying 3 levels of a learning manipulation that occurred prior to choice. Specifically, they manipulated whether
consumers had: 1) attribute knowledge where subjects were exposed to all attributes and attribute levels, 2) attribute preference where subjects expressed preference for attribute levels, or 3) attribute importance where subjects first rated relative importance between attributes and then expressed within attribute preferences.

Study 1 of Huffman and Kahn (1998) compared knowledge of attributes versus preferences for attributes (#1 vs. #2) on consumer choice of 12 alternatives of sofas or hotels each described on 18-19 attributes. Their results showed that subjects who had expressed attribute preferences perceived the choice set as less complex than consumers who merely had knowledge of the attributes. However, the learning manipulation of attribute knowledge versus attribute preference had no effect on the percentage of consumers who expressed a readiness to make a choice or satisfaction with choice.

A second study compared the two higher preference development levels of attribute preference versus attribute importance (#2 vs. #3). The choice context was 12 hotel alternatives each described on 25 attributes. Their results showed that subjects in the attribute preference condition perceived the choice set as less complex, were more satisfied with their chosen alternative, and more likely to believe they had made optimal choice than subjects in the attribute importance condition. That is, subjects who had expressed their attribute preferences had a more positive experience choosing from a large assortment than did subjects with more well-developed preferences that had also expressed relative attribute importance. This finding is likely attributable to the learning manipulation task being onerous for attribute importance subjects (trade-offs on 25 attributes) and their dissatisfaction carrying over to their later assortment choice. Thus, Huffman and Kahn (1998) recommend that if one is trying to assist novice consumers in
choosing from a large assortment that developing attribute preferences strikes the correct
balance between not being overwhelming in the learning phase and assisting in the
product choice phase.

Chernev (2003a, 2003b) also posits that making a product choice from an
assortment is a two-stage process of first deciding an ideal attribute combination and then
locating the product in the assortment that best matches this ideal. He finds that
consumers with well-developed preferences have an easier time choosing from
assortments as their ideal product is already constructed. In contrast, consumers who do
not possess well-developed product face the difficult two-stage process of first deciding
their ideal attribute combination under a high cognitive load and then locating the product
in the assortment that best matches this ideal.

In Chernev (2003a), subjects were asked to choose a product from either a small
assortment containing 4 options or a large assortment containing 16 options (the 4
options from the small set and 12 additional options). The options were described on 4
attributes that could vary on 4 levels. Comparable to the attribute preference learning
manipulation in Huffman and Kahn (1998), half of his subjects articulated their attribute
preferences and half of subjects were simply exposed to the attribute information prior to
choice (#2 vs. #1). His results showed that more subjects elected to choose a product
from the large instead of the small assortment when they had articulated their preferences
(96%) than when they had just received attribute information (72%). Thus, having more
developed preferences increased the likelihood of consumers choosing a product from a
large assortment. It is notable though that the majority of subjects in both conditions
elected to choose from the large compared to small assortment set.
Chernev’s (2003a) second study showed that consumers’ initial search was more alternative-based (compared to attribute-based) when attribute preferences were expressed (92%) than when subjects merely had attribute knowledge (33%). Furthermore, subjects who had articulated their preferences examined only about half as many piece of information as subjects who only had attribute knowledge (13.4 vs. 22.1 information items). These process results support Chernev’s proposed two-staged model as subjects who had expressed their attribute preferences prior to choice exhibited more selective, alternative-based processing trying to locate their ideal product. In contrast, subjects who had not articulated their preferences engaged in more attribute-based processing as they needed to complete the initial stage of determining their ideal product from the large assortment display prior to proceeding to second stage of product choice.

This differential processing of assortments as a result of preference development has also been shown to affect the strength of consumers’ preference for their product choice from an assortment if subjects have constructed an ideal point either via Huffman and Kahn’s (1998) attribute importance manipulation (#3) or simply being asked to think about their ideal in an open-ended format (i.e., no explicit attribute rating scales). Chernev (2003b) found that for large assortments, subjects had a lower propensity to switch their choice when preferences were articulated (13% switching) than when they were not articulated (38% switching). An opposite pattern was observed for small assortments whereby subjects who had articulated preferences had a higher propensity to switch from choice (27%) compared to subjects who had not formed their preferences (9% switching). For consumers with well-developed preferences, a large assortment increases the probability of finding a match with their ideal and thus they are less inclined
to switch. However, these same consumers will not fare as well in finding a close match to their ideal in the small assortment set, and thus are more likely to switch.

In conclusion, having well-developed preferences facilitates consumers choosing from large assortments. Consumers who have well-developed preferences encounter less decision difficulty, are more likely to choose from large assortments, and have both stronger preferences for and are more confident in their chosen alternative than consumers who do not possess well-developed preferences. Consumers with well-developed preferences have already formed an ideal product and large assortments maximize the likelihood that the consumer’s ideal product is available.

Maximizer-Satisficer

Individual difference variables will also affect how consumers deal with the challenge of choosing a product from a large assortment. In his seminal work that recognized the cognitive limitations of human ability, Simon (1956) suggested that for complex decisions, after one considered all the time, effort, and psychological cost involved in making a rational choice, satisficing or choosing an acceptable option rather than the best option was often an optimal strategy. Schwartz and colleagues (Schwartz et al. 2002) have developed an individual difference scale to measure an individual’s propensity to be a Maximizer versus a Satisficer. Maximizers have the goal of choosing the absolute best product. Satisficers, on the other hand, have the goal of choosing a product that is good enough to meet their standards for acceptability.

The Maximizer-Satisficer scale of Schwartz et al. (2002) is comprised of 13 items that load on 3 factors. The first factor captures the extent to which an individual is on the look out for better options (e.g., imagine all possibilities, channel surf looking for better
TV or radio shows). The second factor captures the extent to which an individual struggles to pick the best product (e.g., difficulty selecting best video, use of lists of recommended options). The third factor captures the extent to which an individual has high standards (e.g., never settle for second best).

In a series of studies, Schwartz and colleagues demonstrated that maximizers compared to satisficers have significantly lower levels of life satisfaction, happiness, optimism, and self esteem and significantly higher levels of regret and depression. Additionally, maximizers were shown to engage in more product comparisons, social comparisons, and counterfactual comparisons but feel less satisfied with their decision. The higher incidence of comparisons and counterfactuals contributes to higher levels of product regret.

In the pursuit of obtaining the best product, maximizers have been found to achieve higher task performance but do worse subjectively than satisficers. Iyengar, Wells, and Schwartz (2006) compared the job search process of university graduates who were categorized on the basis of Schwartz et al. (2002)’s scales as maximizers or satisficers. Their research showed that maximizers obtained jobs with 20% higher starting salaries than satisficers. However, maximizers were less satisfied with the jobs they obtained and experienced greater negative affect through the job search process than satisficers. Apparently, the lower satisfaction and negative affect were driven by maximizers’ pursuit of more job opportunities and greater social comparison to peers. Of particular relevance for assortment, they found that an increase in the number of options considered was associated with a steeper decrease in outcome satisfaction for maximizers...
compared to satisficers. That is, maximizers searched more job options, but the more options the searched, the less satisfied they were with their final option.

Thus, maximizers have a more difficult time selecting from a broad product assortment than satisficers. Maximizers are more likely to engage in compensatory processing and be overwhelmed with the cognitive load of large assortments. Conversely, satisficers are more likely to engage in non-compensatory processing to find an acceptable alternative that meets their minimal attribute cut-offs. As maximizers engage in more exhaustive product searches and consider more options, their product ideal becomes less obtainable in a single product than the ideal of a satisficer, and consequently they are less satisfied with their product choice. As assortment size increases, maximizers relative to satisficers are more likely to experience higher levels of regret due to their propensity to engage in social comparison and counterfactual reasoning.

Table 2 summarizes the four moderators of consumer choice from large assortments: assortment perceptions, assortment attribute type, consumer preference development, and the individual difference variable of maximizer-satisficer. Consumer assortment perceptions are shown to extend beyond the number of products offered and also be affected by the composition of products in the assortment, heuristic cues, and the format in which products are presented. Therefore, a smaller product set that is properly composed and organized can lead to higher assortment perceptions than a larger product set as well as facilitate choice. Assortments that were differentiated on nonalignable and complementary attributes though were shown to lead to a higher cognitive load, greater product expectations, and higher regret, and consequently, lower choice incidence. Two
individual consumer factors were then shown to be capable of mitigating these negative
decision-making consequences. Consumers with well-developed relative to less-
developed preferences were shown to have less difficulty processing large assortments,
higher levels of satisfaction with the choice process, higher incidence of choosing a large
compared to small assortment, and greater preference with their chosen option. Secondly,
consumers with exhibited satisficer relative to maximizer tendencies were shown to be
less susceptible to the negative psychological consequences of large assortments
experiencing higher satisfaction with the choice process and lower regret with product
choice.

Next we discuss some new directions being explored in assortment research, the
effects of assortment on consumption and well-being.

**Assortment Effects on Consumption and Well-Being**

Assortment research has begun to move beyond examining product choice and
address the later consumer-decision making stage of product consumption. The general
finding is that individuals consume greater quantities as assortment size increases. Rolls
et al. (1981) showed that the number of options in an assortment affected consumption
quantity with subjects consuming more yogurt when presented with three than one flavor
of yogurt.

Extending this research, Kahn and Wansink (2004) found that perceived
assortment mediates the effect of actual assortment on consumption. As previously
discussed, Kahn and Wansink (2004) showed that consumer perceptions of assortment
are influenced by information structure variables. Specifically, they demonstrated that increasing the number of options increased perceived assortment more for organized and asymmetric assortment structures. In Study 2, subjects were ostensibly recruited for a study on television advertising and offered either 6 or 24 jelly bean options while they waited. The assortment structure varied whether the display was randomly disorganized or organized by flavor and color. Their results showed that as the assortment size increased from 6 to 24 options, consumption quantity increased for organized assortments (from 12.7 to 28.3) but not for disorganized assortments (22.2 and 22.6, respectively).

Increases in perceived assortment led subjects to anticipate higher enjoyment of the items to be consumed and this desire led them to consume greater quantities. When assortment size was made salient, subjects appeared to use the size of the assortment as consumption norm to gauge how many items to consume. Providing corroborating evidence in an experimental financial setting, Morrin et al. (2006) find that increases in the number of mutual funds offered in 401(k) plans led to increases in the number of funds investors placed in their investment portfolios.

The consequences of product assortments on consumer well-being is a topic of growing commentary. Kahn and Wansink (2004) suggest that health practitioners should be particularly cognizant of the effects of assortment size and structure on consumption in the mounting battle with obesity. Anecdotal evidence also suggests that increasing assortments may have negative consequences on consumer’s mental health. Schwartz (2000, 2004) wonders if exploding product assortments are related to the rising depression rates in the United States. Although assortments offer the lure of control over product choice, the decision difficulty, lower satisfaction, and higher regret associated
with choice from assortments may make the ultimate lack of control self-evident and contribute to depression.

Choice from a large assortment may also have a detrimental impact on subsequent consumer choices and behavior. Baumeister and Vohs (2003) demonstrate how product choice is ego-depleting and the energy expended in a current choice may leave a consumer with less willpower for a subsequent task. As choosing from large assortments is taxing, particularly for maximizers, this research suggests that maximizers may have less self-control for a subsequent product task. Mick, Broniarczyk, and Haidt (2004) speculate that choices from large assortments may cumulatively lead to a self-focus due to the repeated creation and activation of one’s preferences. This self-focus may diminish the quality of subsequent other-focused activities such as later social interactions and altruistic behavior. In sum, initial evidence exists that broad assortments increase product consumption and thought-provoking reflections ponder their psychic toll.

**Summary and Future Directions**

Product assortments are a complex phenomenon, alluring but wrought with choice difficulty. Consumers find large assortments attractive for their process-related benefits of stimulation, choice freedom, and informative value and for their choice-related benefits of higher ideal product availability, ability to satisfy multiple needs in a single location, potential for variety-seeking, and flexibility for uncertain future preferences. However, the freedom and flexibility offered by assortments was shown to often backfire on consumers when then subsequently encounter difficulty choosing a product from within this assortment. Large relative to small assortments are associated with higher cognitive loads, difficult trade-offs, small differences in relative option attractiveness,
and more foregone options upon choice. Consequently, large assortments were shown to lead to a greater incidence of failure to obtain the best product, dissatisfaction with the choice process and chosen product, higher regret with the chosen product, and a higher likelihood of choice avoidant behavior.

A key question is to what extent consumers recognize the downsides of large assortments for later choice. Even when product choice was made salient, the majority of subjects were shown to still be drawn to larger relative to smaller assortments (Chernev 2006). The multi-dimensional nature of consumer assortment perceptions indicate that consumers have some implicit recognition of the dual tension between the attractiveness of assortments and subsequent difficulty of choosing a product from within the assortment. The cognitive dimension of assortment perceptions appears to capture the attractiveness of assortments being positively related to the number of unique options and size of assortment display. The affective dimension of consumer assortment perceptions appears to recognize the difficulty of choosing from large assortments being positively related to ease of shopping, ease of locating a favorite product, and congruency with shopping goals.

The pinnacle of assortment research is discovering how marketers can keep the gain and reduce the pain associated with choosing from large assortments. Research on consumer assortment perceptions suggests that product sets that are selectively comprised of favorite and unique products and appropriately organized and displayed can lead a choice set containing fewer products to be perceived as offering greater assortment than another choice set containing more products and simultaneously facilitate consumer choice.
Limiting the number of products though may prove difficult in product categories where consumer preferences are heterogeneous. In such cases, retailers should be cognizant that increasing product sets by adding options differentiated on nonalignable and complementary attributes will prove particularly taxing for consumer choice and may lead to lower choice incidence, particularly for consumers with ill-defined preferences and maximizer tendencies. Choosing from large assortments was shown to be easier if the assortments were differentiated on alignable or noncomplementary attributes and consumers possessed well-developed preferences or were willing to satisfice their product choice.

Research Challenges

Designing experiments to compare the effect of a small versus large number of product options would appear to be a straightforward task. However, there are a number of complexities that an assortment researcher needs to appreciate. First, one needs to determine the number of options that constitutes a small versus large assortment. As evidence suggests that having 10 or more options alters the complexity of the choice task (Maholtra 1982), one might argue that 10 or more options constitutes a large assortment. Yet, by today’s marketplace standards, ten options is a small choice set. Moreover, such an argument assumes that there is a threshold above which assortments become difficult to process without any further effects of additional increases in the number of options. That is, it assumes no difference between 10 versus 100 options. A serious limitation of assortment research is that much of it has been conducted comparing only two levels of option size. Future assortment research should consider manipulating at least 3 option size levels to rule out calibration issues and to test for non-linear effects.
A second challenge for assortment research is determining the composition of options within small versus large assortments. If a researcher is interested in isolating the effect of assortment size on a dependent variable of interest, s/he would need to control for or equate the option sets on a host of variables in order to rule out alternative explanations. The option sets would need to be equated on number of attributes, number of unique attributes, number of attribute levels, dispersion of attribute levels, and type of attribute differentiation. Additionally, the options sets would need to be equated in terms of attractiveness of options, trade-off difficulty, and relative difference in attractiveness between options. Quite a challenge! Other researchers may feel that assortment is interesting because of its natural correlation with many of these factors (i.e., large assortments offer more attributes and attribute levels) and prefer testing with higher ecological and lower internal validity. These researchers may determine the composition of the smaller option set by including only the most attractive options or by randomly drawing subsets of the options from the large option set to increase generalizability.

A third challenge of assortment research is the potential for option size to bias or impede hypothesis testing. As was demonstrated in the information overload debate, option size biased testing of choice accuracy, as the chance probability of selecting the best brand was higher for a smaller compared to large assortment. Therefore, an appropriate measure of choice accuracy is conditionalized on set size. Option size may also impede the testing of satisfaction as a dependent variable. Satisfaction is based on the difference between performance outcomes and expectations. But one can only equate outcomes for options that are common to both small and large assortments. If a subject is less satisfied with an option that is unique to the large assortment set, one will be
uncertain whether this is due to the product performing poorly (outcome-driven) or because of high expectations.

**Research Opportunities**

Numerous assortment topics are avenues for future research. Decision aids that provide tools to help consumers with ill-defined preferences navigate the selection of product options from broad assortments would appear to be a commonsense intervention. But nascent research on filters and recommendations suggest that decision aids may be a double-edged sword. Morales et al. (2005) show that on-line mechanisms that filter the assortment do decrease consumer confusion and facilitate choice, but do so at the expense of lower assortment perceptions. Broniarczyk et al. (2005) found that recommendation signage had the unexpected downside of heightening rather than alleviating the negative affect consumers experience during choice. As the number of product options increased, the likelihood that the recommendation was associated with a consumer’s initial product inclination decreased, and the consumer now faced greater conflict trying to decide which one to buy.

Other decision aids may have similar unintended negative consequences. For instance, providing consumers with descriptions of product options to help determine the product that best meets their needs is likely to further contribute to cognitive overload. Additionally, product descriptions may cause a higher sense of attachment to foregone alternatives, thereby leading to a higher sense of loss and discomfort following product choice (Carmon et al. 2003). Additional research is warranted to identify decision aids that assist consumers through the complexity of choosing among a large number of options yet maintain high consumer perceptions of assortment.
Future research should also examine the generalizability and boundary conditions of extant assortment findings. Much of the assortment research to date has used hedonic product categories where consumers are likely to be promotion-focused and attracted to assortments. Limited research has examined the effect of assortment for prevention-focus choices such as medical and financial decision-making. Botti and Iyengar (2006) suggest that for emotion-laden decisions among negative options (e.g., choosing the best cancer treatment), consumers are repelled, not attracted, by choice. They recommend the inclusion of a default option and option to delegate choice to assist consumers making prevention-focused choices.

Lastly, research examining the greater societal effects of vast assortments is a promising avenue for future research. Kahn and Wansink’s (2004) result that perceived assortment is positively related to consumption quantity has far-reaching consequences for obesity, compulsive buying, and consumer debt. The intriguing effects of assortment on consumer future decision-making orientations and well-being are relatively untested and remain a fruitful area for inquiry and empirical validation.

**Conclusion**

Large assortments offer consumers numerous benefits, rendering them initially attractive, but ultimately causing a multitude of negative decision-making consequences when consumers face the daunting task of selecting a product from a vast array of options. Consumer research has only recently begun to examine the moderating factors and the extent of implications of product assortments. The challenge for consumer researchers is to decide which of the many worthwhile future assortment directions to pursue first.
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### TABLE 1
Benefits and Negative Consequences of Assortment

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<thead>
<tr>
<th>Benefits of Assortment</th>
<th>Negative Consequences of Assortment</th>
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<tr>
<td><strong>Process-Related Benefits</strong></td>
<td><strong>Lower Choice Accuracy</strong></td>
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<tr>
<td>• Stimulation and Shopping Pleasure</td>
<td>• Increases Difficulty Locating Preferred Product on Shelf</td>
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<tr>
<td>• Positive Anticipation of Choosing</td>
<td>• Increases Cognitive Information Load, which is a positive function of:</td>
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<td>• Freedom of Choice</td>
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<td>• Opportunity to Learn About Product Category</td>
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<td>• Attract Consumers to Shelf Display</td>
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<tr>
<td><strong>Choice-Related Benefits</strong></td>
<td><strong>Lower Decision Satisfaction</strong></td>
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<tr>
<td>• Increases Probability of Finding Ideal Product</td>
<td>• Increases Decision Difficulty and Consumer Confusion</td>
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<tr>
<td>• Increases Probability of Finding Multiple Products to Accommodate Multiple Users</td>
<td>• Increases Decision Responsibility</td>
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<tr>
<td>• Opportunity for Variety-Seeking</td>
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<td>• Flexibility for Uncertain Preferences</td>
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<td><strong>Negative Consequences of Assortment</strong></td>
<td><strong>Lower Product Satisfaction</strong></td>
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<td>• Lower Choice Accuracy</td>
<td>• Increases Product Expectations</td>
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<td>• Increases Difficulty Locating Preferred Product on Shelf</td>
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<td>• Increases Cognitive Information Load, which is a positive function of:</td>
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<td>o # of Alternatives</td>
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<td>o Similarity in Relative Attractiveness of Alternatives</td>
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<td>o # of Attributes and Attribute Levels</td>
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<td></td>
<td>o Uniform Attribute Distribution and Low Attribute Importance</td>
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<tr>
<td>• Increases Likelihood of Non-Compensatory Processing</td>
<td></td>
</tr>
<tr>
<td>• Lower Decision Satisfaction</td>
<td><strong>Greater Product Regret</strong></td>
</tr>
<tr>
<td>• Increases Decision Difficulty and Consumer Confusion</td>
<td>• Increases # of Foregone Alternatives</td>
</tr>
<tr>
<td>• Increases Decision Responsibility</td>
<td></td>
</tr>
<tr>
<td>• Lower Product Satisfaction</td>
<td><strong>Greater Choice Avoidance</strong></td>
</tr>
<tr>
<td>• Increases Product Expectations</td>
<td>• Increases Likelihood of Choosing Status Quo Option</td>
</tr>
<tr>
<td>• Increases Likelihood of Deferring Choice</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 2

**Assortment Moderating Factors**

<table>
<thead>
<tr>
<th>Assortment Perceptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Assortment perceptions are positively related to # of products offered. However, assortment perceptions are not one-to-one function of # of products offered. Smaller product sets may be perceived as offering greater assortment than larger product sets.</td>
</tr>
<tr>
<td>- Holding # of products constant, assortment perceptions can be increased by:</td>
</tr>
<tr>
<td>- Offering more preferred products</td>
</tr>
<tr>
<td>- Offering more unique attributes and alternatives</td>
</tr>
<tr>
<td>- Offering more variability on important attributes</td>
</tr>
<tr>
<td>- Increasing size of product display</td>
</tr>
<tr>
<td>- Organizing product display congruent with consumers’ internal category representations and/or shopping goals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assortment Attribute Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Assortments differentiated on alignable (vs. non-alignable) attributes exhibit a lower incidence of choice avoidance.</td>
</tr>
<tr>
<td>- Assortments differentiated on non-complementary (vs. complementary) attributes exhibit a lower incidence of choice avoidance.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consumer Preference Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>- When choosing from large assortments, consumers with well-developed (vs. less-well developed) preferences:</td>
</tr>
<tr>
<td>- Encounter less decision difficulty</td>
</tr>
<tr>
<td>- Engage in more alternative-based search for preferred alternative</td>
</tr>
<tr>
<td>- Exhibit higher levels of decision satisfaction</td>
</tr>
<tr>
<td>- Exhibit higher levels of product satisfaction and lower levels of product regret</td>
</tr>
<tr>
<td>- Exhibit lower levels of choice deferral</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consumer Maximizer-Satisficer Tendency</th>
</tr>
</thead>
<tbody>
<tr>
<td>- When choosing from large assortments, consumers who possess satisficer (vs. maximizer) tendencies:</td>
</tr>
<tr>
<td>- Engage in less extensive decision-making</td>
</tr>
<tr>
<td>- Exhibit higher levels of decision satisfaction</td>
</tr>
<tr>
<td>- Exhibit lower levels of product regret</td>
</tr>
</tbody>
</table>