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Journal of Retailing

Diehl, K.; Herpen, E.; Lamberton, C.

<https://doi.org/10.1016/j.jretai.2014.10.003>

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Organizing Products with Complements versus Substitutes: Effects on Store Preferences as a Function of Effort and Assortment Perceptions

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Abstract

Retailers often organize at least part of their assortment by displaying complementary products from different product categories together (e.g., a pair of pants with a shirt) rather than grouping items by product type (e.g., a pair of pants with other pants). However, little is known about how retailers should choose between complement-based and substitute-based organizations. The present paper shows that consumers' preferences for such store organizations are a function of the effort and assortment perceptions cued by these organizational formats. Holding the underlying assortment constant, complement-based organizations are always more effortful than substitute-based organizations. This difference in effort can create downward pressure on complement-based store choice. Moreover, the effects of organization format on assortment perception depend on whether consumers hold a hedonic or utilitarian focus. When consumers have a highly hedonic focus, complement-based based stores create more positive assortment perceptions than substitute-based stores. Such positive assortment perceptions can, in turn, raise complement-based store choice. However, as consumers' utilitarian focus increases, substitute-based assortments are seen as both easier and more attractive, leading to a strong advantage in store choice. Our findings provide actionable guidance for retailers considering various store organizations and suggest opportunities for future research.

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Keywords: Assortment organization; Decision effort; Substitutes; Complements; Hedonic; Utilitarian

Introduction

Retailers can organize their products in multiple ways. Traditionally, retailers have tended to arrange products by product category, that is, in terms of substitutes. For example, a furniture store may group all chairs in one section of the store and all tables in another. However, retailers can also place products in complementary sets (also called consumption constellations; Englis and Solomon 1996), grouping together products from different product categories that share aesthetic features or are

associated with a particular consumer goal or context of use. That is, the same furniture store could instead present chairs and tables together to form dining room sets. Interestingly, there appears to be no consensus among retailers about which organizational format should be used and when: An examination of the top 50 online retailers (Internet Retailer Magazine 2012), revealed that while all retailers ordered options in terms of substitutes, 85 percent of retailers *also* organized options in complementary sets (see Appendix 1). Importantly, at present, academic marketing research has little insight to offer on the question of whether and when complement or substitute-based organizational formats increase store preference.

To help managers make informed decisions as to which organizational format to choose, the present paper specifically examines factors that drive consumers' store preference: effort and assortment perceptions. Holding the underlying assortment constant, we find that complement-based organizations are

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always perceived as more effortful than substitute-based organizations, which decreases consumers' preferences for stores that adopt such formats. Interestingly, consumers find complement-based organizations more effortful, not because they actively examine a larger amount of information, but because they become distracted by the sheer presence of complementary products and spend more time in the store.

However, complement-based organizational formats can still be preferred depending on the focus that consumers adopt for their shopping trip. When consumers shop with a hedonic focus, complement-based formats heighten assortment attractiveness, which increases store preference. When the hedonic focus is sufficiently strong, these positive effects on store preference can outweigh the negative effects of effort, such that complementary organizational formats may be preferred to their substitute-based counterparts. However, if consumers shop with a more utilitarian focus, substitute-based organizations tend to be preferred.

Our examination contributes to theory and practice in a number of ways. First, most prior research has focused on different ways in which an assortment can be organized *within a single product category* (e.g., Huffman and Kahn 1998; Lamberton and Diehl 2013; Morales et al. 2005). We, however, investigate the effect for assortment organization when *multiple product categories* are involved. This allows us to speak to a wider range of more complex retail contexts than have been addressed by prior work. Furthermore, complement-based organizations have primarily been studied for their potential in increasing cross-category sales for low ticket, functional complements (Drèze, Hoch, and Purk 1994; Goldsmith and Dhar 2008; Russell et al. 1999). Yet, while toothpaste purchases may trigger toothbrush purchases, consumers still buy toothpaste alone more frequently (Drèze, Hoch, and Purk 1994). Further, previously documented cross-selling effects may not exist or may not exist to the same extent for higher ticket items due to budget constraints. Hence it is important to understand how consumers who buy only a single product are affected when options are organized in complement-based sets. Our study moves beyond examining purchase incidence to examine the effects of assortment organization on consumers' perceptions as drivers of store choice. In taking this approach, we follow a long line of research (e.g., Boyd and Bahn 2009; Hoch, Bradlow, and Wansink 1999; Huffman and Kahn 1998; Kahn and Wansink 2004) that has demonstrated the critical importance of assortment perceptions.

As a whole, this research speaks not only to online retailers, who can offer multiple modes of organization to shoppers, but also to brick and mortar assortments where only one type of organization can be adopted at a time. Importantly, understanding the drivers of store choice allows retailers to strategically choose assortment organizations that will enhance consumer experience and maximize revisit likelihood. While we focus on assortment organization that is purely substitute-based or purely complement-based, our findings also provide a framework for future research that may examine alternate organization types and marketing contexts.

The Organization of Products

Effects of Assortment Organization

Retailers have long been interested in how store design can affect in-store behavior. One important but under researched design decision is how products are organized. Almost all retailers organize options into product categories. Prior research has established that the way in which products are organized within a product category matters. Specifically, prior research has studied the effect of grouping options by product attributes (Areni, Duhan, and Keicker 1999; Drèze, Hoch, and Purk 1994; Hoch, Bradlow, and Wansink 1999; Huffman and Kahn 1998), benefits (Lamberton and Diehl 2013), brand (Simonson, Nowlis, and Lemon 1993), or consumer goals (Morales et al. 2005). Results have shown that the way in which items in a single product category are organized affects attribute salience, decision difficulty, perceived similarity among items, and overall assortment satisfaction. How products are organized is of particular importance in the context of large assortments. Whereas the majority of work in that area has focused on comparing larger versus smaller unorganized assortments, some authors (e.g., Diehl, Kornish, and Lynch 2003) have argued that organizing assortments can reduce the demands of consumer processing.

However, what remains to be understood is how organizing products from *different* product categories affects consumers. Although Wind (1977) encouraged marketing researchers to take into account the set of different brands and products from *various* categories that consumers use, research heeding his advice has been limited. Since changing assortment organization is costly and difficult, retailers may not experiment much with these decisions themselves, but would welcome greater insight into why different organizational formats affect store preferences. We compare two basic organizational formats: substitute-based and complement-based. Substitute-based assortments group together items that share similar attributes. For example, a clothing retailer might put all pants in one section. Complement-based assortments of products are akin to *consumption constellations*, a term describing sets of products that fit together on the basis of stylistic or goal-based interrelationships spanning merchandise categories (Englis and Solomon 1996). Following this structure, the same retailer might show pants with appropriate shirts. We examine what drives consumers' preferences for these organizational formats.

Note that we do not speak to situations of either "system selling" or functional bundles of products that *only* work with their respective counterparts (e.g., HP ink cartridges only fit HP printers). Rather, we investigate situations where the focal product is generally part of a consumption constellation, but several different products or brands could complement its usage. In those situations, which span a large number of product categories and situations, the question remains whether or not and why complement-based organizations may be preferred.

To understand the effects of these organizational formats on store choice, it is necessary to examine how different formats shape consumers' perceptions of the store. Prior research on product organization in a single category has shown effects on

two managerially-important types of perceptions and drivers of store choice: perceptions of the decision making process (e.g., feeling overwhelmed; Huffman and Kahn 1998) and perceptions of the assortment (e.g., satisfaction with the assortment; Hoch, Bradlow, and Wansink 1999). The literature on choice overload likewise focuses on both assortment attractiveness and decision effort as relevant constructs when examining how consumers evaluate retail assortments (Chernev 2011; Scheibehenne, Greifeneder, and Todd 2010). Interestingly, these constructs can be expected to have countervailing effects on store choice – while heightened effort perceptions should have a negative effect on store choice, positive assortment perceptions should boost store choice. Both effects can occur independently from each other, and assortments can thus be both attractive and effortful at the same time (Iyengar and Lepper 2000). In addition, we will examine the search processes taking place in these different organizational formats. By doing so, we can more fully understand the effects of complement-based versus substitute-based organizations and the way they affect store choice.

Perceptions of the Decision Process

Effort is an important perception that consumers form about their shopping experience and that, once formed, drives store preference. Feedback on effort is readily available and easy to judge and hence is often heavily attended to in the decision process (Payne, Bettman, and Johnson 1993). Further, consumers often want to minimize their costs of thinking (Shugan 1980), and when assortments are taxing to choose from, consumers may decide to leave the store empty-handed (Iyengar and Lepper 2000). Hence, retailers generally strive to keep shopping effort low.

Retailers appear to believe that complement-based organizations simplify the shopping experience (Schiesel 2007). Past research provides some support for this belief. By presenting complementary products together, retailers provide consumers with information as to where and when the product may be used (Englis and Solomon 1996). Therefore, consumers may be able to choose products that match their needs more easily and, at the same time, quickly rule out items as irrelevant to their current needs. Contrary to these intuitions, we argue that there are three reasons why consumers' effort perceptions in complement-based organizations are likely to be heightened compared to substitute-based organizations: physical placement of target products, information search of non-target products, and mere competition for attention.

Physical placement of target products. By definition, grouping target products in sets with complementary products will increase the physical distance between target products from the same product category. As such, greater effort is needed to compare substitute products. This effort can be both physical (e.g., walking around, clicking between web pages) as well as cognitive (e.g., keeping information in working memory longer; Cooper-Martin 1993) and will heighten effort perceptions in complement-based sets.

Information search of non-target products. Placing products alongside complementary items may also increase information

acquisition for complementary, non-target, products. Even when there is no active purchasing goal at the moment, consumers may browse these complementary products (Bloch and Richins 1983; Moe 2003). While such search may be of interest to marketers as it may precede future purchase behavior, it may also increase consumers' sense of the amount of effort required by a given shopping trip.

Competition for attention. Even if consumers do not actively acquire information for complementary products, the mere presence of such information may distract them (Janiszewski 1998). Interestingly, for complements to act as distracters it is not necessary that consumers effortfully search complementary products or consider them relevant to their purchase goal (Perruchet et al. 2006). In a more cluttered environment it may simply be harder to quickly identify target products (Bravo and Farid 2006; van Herpen and Pieters 2007). Distraction may prolong the decision process by occupying processing resources, thus contributing to heightened effort perceptions. Given that all three of these factors predict heightened perceived effort in complement-based sets, we predict that shopping from such organizations will be seen as more effortful than choosing from substitute-based organizations.

H1. Organizing options alongside complementary products (complement-based organization) will lead to greater perceived effort than organizing options by product type (substitute-based organization).

Assortment Perceptions

Retailers are very interested in consumers' assortment perceptions as important determinants of future store choice and store loyalty (Broniarczyk, Hoyer, and McAlister 1998). When choosing an item from a product assortment, consumers' assortment perceptions are more strongly influenced by local information structures than non-local structures (Hoch, Bradlow, and Wansink 1999). In other words, the immediate surroundings of a target item play an influential role in determining consumers' perceptions.

Past research suggests several reasons why complement-based organizations may be perceived more positively by consumers than substitute-based organizations. First, organizing options in terms of complementary products will incidentally expose consumers to a greater number of product categories. Even when consumers do not immediately intend to buy from these categories, they value stores that offer wider selections (Huffman and Kahn 1998) in part because of the greater flexibility these allow in both current and future choices (Chernev 2006). Hence, incidentally exposing consumers and thus drawing attention to complementary products should increase the attractiveness of the assortment. Second, complement-based organizations may convey meaningful cues as to when and in what context a given product can or should be used (Englis and Solomon 1996). In doing so, complement-based organizations may make the non-target products more vivid and relevant to consumers than they would be if simply passed on a walk through

a substitute-based store or flipped past in a catalog. Therefore, we predict that:

H2. Organizing options alongside complementary products (complement-based organization) will lead to more positive assortment perceptions than organizing options by product type (substitute-based organization).

H3. Perceived effort will have a negative and assortment attractiveness will have a positive effect on store choice.

We will test these hypotheses in several studies. The first set of studies (1a and 1b) establish that complementary organizations can, as predicted, increase consumers' effort and at the same time heighten assortment perceptions. In particular, study 1b teases apart the effect of physical product distance from other potential sources of perceived effort. Study 2 then examines store preferences in a setting where a given participant experiences both complement and substitute-based assortment organizations prior to choosing a store. Further, study 2 examines both effort and assortment perceptions as drivers of this store choice, testing [Hypothesis 3](#). After establishing support for our general framework, studies 3 and 4 then investigate how having a more hedonic as opposed to utilitarian shopping focus may moderate our observed effects.

Study 1a – Organizing Products with Complements versus Substitutes

Study 1a provides an initial test of the effects of assortment organization on effort and assortment perceptions, both important drivers of store choice. Participants were instructed to choose a shirt they would like from a paper catalog featuring female clothing. Across conditions, assortments were identical. By looking through the catalog participants were exposed to the entire assortment.

Design and Procedure

This study used a two group between-subjects design. Eighty-seven females participated in this study as part of a larger experimental session for which they were paid. Participants were randomly assigned to choose a shirt from a catalog that grouped products either alongside products from the same category (substitute-based organization) or from different product categories (complement-based organization). Apart from the target category (shirts) each catalog featured seven other product categories (pants, skirts, bags, etc.). Each category featured eight products. Realistic prices and complementary sets were provided based on an actual retailer's offerings. Participants browsed the catalog at their own pace, selected a shirt, and answered the dependent measures.

Measures

All measures were taken on 9-point scales. Perceived effort was measured using the average of three items ($\alpha = .85$). Participants reported whether choosing the shirt was difficult (not at

all – very), as well as how much time (very little – a lot) and how much effort (very little – a lot) it took to choose the shirt. Assortment perceptions were also measured using the average of three items ($\alpha = .91$). Participants reported whether they were satisfied with the assortment, and whether the assortment was attractive, and inviting (not at all – very).

Results and Discussion

As predicted by [Hypothesis 1](#), choosing from the complement-based organization ($M = 4.07$) was seen as requiring more effort than choosing from the substitute-based organization ($M = 3.25$, $F(1, 85) = 5.50$, $p < .05$). Further, the complement-based organization ($M = 6.22$) led to more positive assortment perceptions compared to the substitute-based organization ($M = 5.59$, $F(1, 85) = 4.79$, $p < .05$), supporting [Hypothesis 2](#). This study thus provides initial support for the idea that different organizational formats can alter perceptions that we anticipate will subsequently drive store choice. Notably these effects are seen even when the assortment is constant across conditions and participants are exposed to all product categories. Next, a more complex design is used to specifically examine the different processes that may heighten perceptions of effort in complement-based organizations.

Study 1b – Sources of Perceived Effort in Complement-Based Organizations

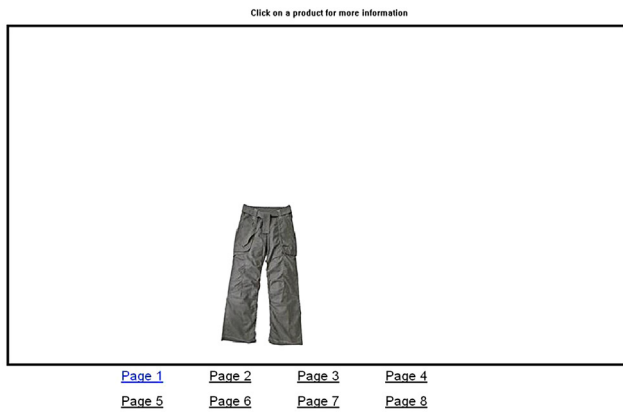
In this study we capture three contributing factors driving effort perceptions. In line with our previous discussion we examine physical distance of the target products, examination of non-target products, and mere distraction as potential factors driving effort perceptions.

Design and Procedure

Ninety-two female undergraduate students participated in this study as part of a larger session for which they received course credit. Participants were asked to choose a pair of pants from a computerized store featuring eight different pairs of pants. The study used a three group between-subjects design. One group saw all eight available pants on a single page (pants only, single page). A second group saw the same eight pants featured individually on eight separate pages (pants only, separate pages). The third group saw the same eight pants each featured on a separate page as part of an outfit, that is, surrounded by complementary products (complements, separate pages). Comparing the first two conditions ('pants only, single page' vs. 'pants only, separate pages') allows us to capture the extent to which physical distance contributes to effort perceptions. Comparing the latter two conditions ('pants only, separate pages' vs. 'complements, separate pages') allows us to capture the effects of adding complementary products on perceived effort while holding constant physical distance. Products were grouped into outfits based on actual offerings. See [Fig. 1](#) for screenshots of product presentations in different conditions.



Panel A: pants only, single page condition



Panel B: Pants only, separated pages condition



Panel C: Complements, separated pages condition

Fig. 1. Screenshots of first page encountered in study 1b.

Clicking on a picture of the pants revealed basic information (price, size, fabric) which was constant across conditions and also allowed participants to choose the pants. Clicking on complementary products in the complement condition revealed similar information but did not allow participants to choose anything.

Measures

After choosing a pair of pants at their own speed, participants responded to the same items measuring perceived effort as before, this time using a slider scale that was later translated into values between 0 and 100 ($\alpha = .85$). In order to choose a pair of pants, participants had to click on the picture, thus exposing them to some information. The computer captured how many unique pants they examined as a measure of breadth of search, which could range between 1 and 8. Further, the time participants spent in the store was captured as well. Assortment perceptions were also measured, however, since participants saw different assortments (i.e., only pants vs. pants and other products), these are not reported.

Results

Perceived effort. We estimated a three group ANOVA ($F(2, 89) = 2.22, p = .11$) with planned contrasts in order to compare effort perceptions between conditions. Surprisingly we did not find a significant difference between effort perceptions in the two “pants only” conditions. Whether pants were presented on a single page ($M_{1 \text{ page}} = 33.10$) or on different pages ($M_{8 \text{ pages}} = 29.61$) created comparable perceptions of effort ($F(1, 89) = .4, p > .5$). Yet, holding constant the physical distance between the target products and comparing the complement-based condition to the condition that separated pants on different pages revealed that complement-based organizations were perceived as more effortful ($M_{\text{complements}} = 40.94, F(1, 89) = 4.25, p < .05$).

Search of target products. Differences in effort perceptions could be affected by differential product search across conditions. We used the number of unique pants examined as a measure addressing this explanation. In line with results for effort, search did not differ between the two “pants only” conditions ($M_{1 \text{ page}} = 6.03$ and $M_{8 \text{ pages}} = 5.58; F(1, 89) = .4, p > .4$). Further, participants in the more effortful complement-based condition in fact searched a slightly *smaller* number of unique pants ($M_{\text{complements}} = 4.87$), the target product, than in the less effortful “pants only, separate pages” condition ($F(1, 89) = 1.34, p > .2$), though not significantly so. As such, product search does not seem to explain differences in effort perceptions between conditions.

Search of non-target products. We also examined the extent to which participants actively examined non-target products in the complement condition. Participants only clicked on a small number of non-target complementary products ($M = 1.73, t\text{-test vs. zero: } t(30) = 2.97, p < .01$). Examining the total number of products (i.e., pants and complementary products) participants examined, we did not find any difference between conditions ($F(1, 89) = 1.09, p > .3$) which further suggests that product search does not seem to explain differences in effort perceptions between conditions.

Time spent in the store. Finally, we examined how long participants spent in the store, as another correlate of how effortful the shopping process was. We find that physical separation significantly prolonged time spent in the store ($M_{1 \text{ page}} = 39.85 \text{ sec}$,

$M_{8 \text{ pages}} = 51.82 \text{ sec}$, $F(1, 89) = 4.24$, $p < .05$). Additionally, holding constant the physical separation, surrounding the target product with complementary products had a strong effect on time spent in the store ($M_{\text{complements}} = 83.40 \text{ sec}$, $F(1, 89) = 29.01$, $p < .0001$). Even net of time spent examining non-target products, store time was still significantly higher in the complement condition ($M_{\text{complements}} = 80.35 \text{ sec}$, $F(1, 89) = 53.79$, $p < .001$), indicating that the mere presence of the complementary products in addition to the physical separation may add to shopping complexity.

Discussion

Across two studies and two different retail settings (catalog and webpage) we find that complement-based organizations increase perceptions of decision effort. Additionally, study 1b captures different potential contributors to effort perceptions. We find that physical distance lengthens the shopping process and that participants also actively search non-target products to some extent. In addition, however, the mere presence of non-target products lengthens the decision process and heightens effort perceptions. These results suggest that even if the distance between target products would be similar across different organizations, and even if consumers would not actively examine non-target products, complement-based organizations would still be perceived as more effortful.

This has important managerial implications for retailers. Retailers who are worried about the increased effort associated with complement-based organizations might attempt to reduce this by placing product sets in relatively close proximity. Our results indicate that even if this may diminish the objective effort expended (in time), it may not diminish perceived effort, and it will most likely not be sufficient to overcome the heightened effort associated with complement-based organizations as compared to substitute-based organizations. Instead, retail managers who want to use complement-based organizations may devise ways to ease product comparisons for consumers and to avoid additional clutter or distractions in the store.

Study 2 – Choice of Complement or Substitute-Based Stores

Having established the effect of different organizational formats on effort and assortment perceptions, we now connect these factors to the outcome of ultimate importance: store choice. In real life, consumers visit different retailers when shopping. As a result, they may be exposed to stores using different types of organizations among which they choose their preferred format. To reflect this experience, study 2 allows participants to shop both a substitute and a complement-based store and to then choose one preferred store type. In addition to being ecologically valid, such a within-subject design has been recommended by Birnbaum (1999) in order to establish a context for participants, in the absence of which between-subject comparisons can be misleading.

Study 2 additionally investigates the way consumers acquire information while shopping, by capturing the strategies

consumers use to gather information about the target product, specifically, whether they tend to search by item or by attribute (Payne, Bettman, and Johnson 1993). Prior research has shown that display format governs how information is processed (Bettman and Kakkar 1977). Substitute-based organizations should facilitate attribute comparison across products by presenting target options next to each other. Therefore, we expect consumers shopping from substitute-based organizations to predominantly process information by attribute, not by product. Complement-based organizations, however, tend to separate target products from each other; thus consumers should find it easier to search by product than to compare products along a common attribute. As a consequence we expect consumers shopping from complement-based organizations to predominantly process information by product, not by attribute. Such changes in search behavior are important for retailers, because attribute- versus alternative-based processing of information has been shown to influence both the weighting of product attribute information and consumers' subsequent choice (Mantel and Kardes 1999).

Design and Procedure

In this study, 98 female students participated as part of a larger paid experimental session. They went on two shopping trips, buying a pair of pants once at a substitute-based and once at a complement-based store in counterbalanced order. Participants were asked to imagine they had received a 120 Euro gift card that could be used at two online clothing retailers. They were told they needed to buy a pair of pants for an upcoming job interview and asked to select a pair of pants from each of the two retailers; each time they had the full 120 Euros at their disposal. Participants were also told that one participant in the study would be randomly selected to receive the product or products they had chosen and any leftover money in cash. Due to logistical issues, the participant in fact received a general gift card for the total amount.

All products were identified by a picture, a short description of the item and a price. After selecting a pair of pants at each retailer, participants answered all dependent measures for the first retailer they encountered and then responded to the same set of measures for the second retailer. Subsequently, they indicated which of the two stores they would return to if they were to buy any other items. Note that when instructing participants to answer questions we always referred to the "first" or the "second" store. Never did the instructions mention the way these stores were organized. Evaluations and choices were later recoded as referring to either the substitute or the complement-based store. Finally, participants actually returned to the chosen store and could buy additional items, in order to check for possible effect of organizational format on additional purchases.

Using products available at actual retailers we created ten outfits consisting of pants (the target product), and four suitable complementary products (jackets, tops, jewelry, bags). For each participant five outfits were randomly assigned to each store. These outfits were then presented as a whole in the

complement-based trial or, in the substitute-based trial, were rearranged such that all pants were presented on one page, all jackets were presented on a separate page, etc. Thus for each participant each pair of pants had an equal chance of being displayed alongside complements or alongside substitutes. The home page from which participants navigated the store provided links to the available product categories (jackets, pants, tops, etc.) or simply to “outfit 1”, “outfit 2”, etc. depending on trial. Therefore, participants knew that the substitute-based store carried other products even if they did not enter any of the non-target categories.

Measures

The computer captured how long participants spent in the store and how often they assessed product and price information about individual products. The number of unique pants for which either product or price information was acquired was used as a measure of *breadth* of search. The number of times product and price information was acquired was used as a measure of *depth* of search. In addition, we measured the extent to which participants searched *by product* by counting the number of times they clicked on product (price) information for a given product and then on price (product) information for the *same product*. We measured the extent to which participants searched *by attribute* by counting the number of times they clicked on product (price) information for one product and then on product (price) information for a *different product*.

As before, responses were collected on unnumbered sliders and translated into values between 0 and 100. Perceived effort was based on the average of the same three items as before ($\alpha = .90$ and $\alpha = .88$ for the substitute and complement-based trials respectively). As in study 1a assortment perceptions were the average of three items: satisfaction with the assortment of pants, assortment attractiveness, and how inviting the assortment was perceived to be ($\alpha = .86$ and $\alpha = .92$ for the substitute and complement-based trials respectively).

Results

We estimated a mixed ANOVA with order of store type as a between-subject factor and store type as well as their interaction as within-subject factors. For all means see Table 1. We will start by examining search behavior and strategies.

Search of non-target products. Search for information about the non-target products was low and did not differ significantly between store type for either product ($F(1, 96) = 0.96, p > .3$) or price information ($F(1, 96) = 2.18, p > .14$).

Search of target products. Participants examined fewer unique options during the second ($M = 2.99$) compared to the first trial ($M = 3.53, F(1, 96) = 12.56, p < .01$) and also searched for less product ($M_{T1} = 4.50, M_{T2} = 3.29, F(1, 96) = 17.84, p < .01$) as well as less price information ($M_{T1} = 4.75, M_{T2} = 3.79, F(1, 96) = 7.60, p < .01$) during the second compared to the first trial. More importantly though, participants examined fewer unique options in the complement-based ($M = 3.05$) than the substitute-based store ($M = 3.47, F(1, 96) = 7.84, p < .01$), that is, they searched less broadly. Participants also acquired product

Table 1
Means in study 2.

| | Complement-based | Substitute-based |
|--|------------------|------------------|
| Time in sec** | 99.21 | 75.87 |
| Target products: breadth of search (unique pants examined)** | 3.05 | 3.47 |
| Target products: product information acquisition (count)* | 3.59 | 4.19 |
| Target products: price information acquisition (count) | 4.06 | 4.49 |
| Non-target products: product information acquisition (count) | 0.87 | 0.59 |
| Non-target products: price information acquisition (count) | 1.61 | 0.96 |
| Search by products (count)* | 3.33 | 2.67 |
| Search by attributes (count)** | 1.89 | 3.71 |
| Perceived effort (scale 0–100)** | 39.77 | 31.34 |
| Assortment perceptions (scale 0–100)** | 54.74 | 45.29 |
| Store choice** | 67.35 percent | 32.65 percent |

* $p < .05$.

** $p < .01$.

information about the target products less often when shopping from complement-based ($M = 3.59$) compared to substitute-based stores ($M = 4.19, F(1, 94) = 4.87, p < .05$), that is, they searched less deeply. Search for price information did not differ between conditions ($F(1, 94) = 1.59, p > .2$), presumably because across conditions prices paid affected participants' potential reward.

Total amount of information acquired. The overall number of price and/or product information pieces that participants acquired over both target and non-target products did not differ significantly by store type ($F(1, 96) = 0.05, p > .8$). However, while overall amount of information acquisition was comparable, which pieces were acquired differed, as reported above. Further, the sequence in which that information was acquired may also differ.

Search strategies. To evaluate the relative use of search sequences and strategies, a within-subjects ANOVA was used with search strategy (by product, by attribute) and store type as within-subject effects and number of either by product or by attribute transitions as the dependent measure. This analysis revealed a significant interaction between store type and search strategy ($F(1, 96) = 33.59, p < .0001$). As predicted, when shopping the complement-based store, participants searched more by product ($M = 3.33$) than by attribute ($M = 1.89, F(1, 94) = 23.77, p < .0001$). Further, when shopping in the substitute-based store they searched more by attribute ($M = 3.71$) than by product ($M = 2.67, F(1, 96) = 6.73, p < .05$).

Perceived effort. Replicating our previous findings with regard to Hypothesis 1, we found that it was more effortful to choose from the complement-based ($M = 39.77$) compared to

the substitute-based organization ($M = 31.34$, $F(1, 96) = 10.63$, $p < .01$).

Assortment perceptions. Replicating our previous findings and in line with [Hypothesis 2](#), arranging the store in a complement-based fashion ($M = 54.74$) led to more positive assortment perceptions than a substitute-based organization ($M = 45.29$, $F(1, 96) = 13.45$, $p < .001$).

Store choice. A logistic regression investigating store choice (0: substitute-based, 1: complement-based) shows that regardless of the order in which participants experienced the two stores ($\chi^2 = 0.2$, $p > .8$), 67 percent of participants preferred to return to the complement-based store for future purchases, while 33 percent chose the substitute-based store ($\chi^2 = 11.21$, $p < .001$).

In order to examine the unique effects of effort and assortment perceptions on store choice, we calculate the difference of perceived effort in the complement-based store minus perceived effort in the substitute-based store. We created a parallel measure for assortment perceptions and entered both measures into the logistic regression predicting choice of the complement-based store (to test [Hypothesis 3](#)). As expected, results showed that the more positive assortment perceptions of the complement-based store (relative to the substitute-based store) had a strong positive effect on choosing the complement-based store ($b = 0.10$, $\chi^2 = 19.81$, $p < .001$), while greater effort perceptions of the complement store (relative to the substitute-based store) had a negative but non-significant effect on store choice ($b = -0.02$, $\chi^2 = 1.71$, $p > .19$).

Purchases during return visit. Participants were allowed to return to the store of their choice, and could choose additional items in that store. During this final trip, they bought on average two items for 58 Euro. The amount of items bought and money spent did not differ by condition or the store to which they returned. We will discuss potential interpretations of this result in the discussion.

Discussion

In this study we tie store choices to how organizational formats affect effort and assortment perceptions as store choice determinants. Interestingly, when deciding which store to return to, the majority of consumers prefer the complement-based store. This choice is a function of both greater perceived effort and more positive assortment perceptions for complement-based structures. Supporting [Hypothesis 1](#), complement-based organizations increase perceived effort. Complementary products appear to tax consumers' processing resources, which prolongs time spent in the store and increases effort perceptions. In addition, however, complement-based organizations lead to more positive assortment perceptions. In the current situation we find that positive assortment perceptions outweigh negative effort perception in store choice. This finding with regard to store choice is particularly meaningful since participants had just experienced both stores and preferences were solicited when expanded effort presumably was still vivid in their mind. It is also important to note that the structure of the substitute-based store, in which participants started from a home page that listed all available categories, ensured that participants knew that the

substitutes-based store offered products in other categories, yet they had less desire to return there.

Further, our results also show that the organization of an assortment drives both *how many* target products consumers examine as well as *how* consumers acquire information about the target product. Complement-based organizations compared to substitute-based organizations reduce both the number of options examined (breadth of search) as well as how much product information is acquired about these options (depth of search). These complement-based organizations make it harder to compare target products and instead encourage search within products. In contrast, substitute-based organizations facilitate search strategies that compare target products along a specific attribute.

These differences in how and how much information is acquired can have important managerial implications. The number of options examined can alter the consideration set and thus affect price sensitivity ([Mitra and Lynch 1995](#)). Further, prior research has shown that the propensity to buy a product is lower when processing is more attribute-based as opposed to alternative-based ([Dhar 1996](#); [Mintz, Currim, and Jeliashkov 2013](#)), and that differences in information acquisition strategies (by attribute, by alternative) can affect choices in systematic and predictable ways ([Jiang and Punj 2010](#); [Mantel and Kardes 1999](#)).

We also note that, though not a central research question, we do not observe greater choice of complementary products among participants who chose to continue shopping after their first shopping goal is met. Unlike prior research, participants were endowed with the task of buying a single product, which may have overall limited their interest in shopping further. Moreover, these findings may also suggest situations that limit the ability of complement-based organizations in creating additional purchases. We elaborate more on these boundary conditions and moderators of complement-based purchase acceleration in the "General Discussion" section.

The previous studies have shown the effect of organizational format on consumer perceptions and store choice. However, since all studies so far were conducted in the domain of clothing, one may wonder whether the effects of complement-based organizations will remain the same for other product categories and across different consumer motives. This is what we turn to next.

Hedonic versus Utilitarian Focus

Our studies thus far, as well as prior research, have shown the benefits of complement-based product sets for products such as clothes, which are high in hedonic attributes and should evoke a more hedonic shopping focus ([Bell, Holbrook, and Solomon 1991](#); [Lam and Mukherjee 2005](#)). Yet, concentrating merely on situations with a high hedonic focus may be too narrow to recommend complement-based organizations for every retailer. The hedonic versus utilitarian distinction has been widely used in prior research ([Okada 2005](#); [Wakefield and Inman 2003](#); [Wertenbroch and Dhar 2000](#)) and may affect the focal decision processes as well as store choice. Based on the previously

identified drivers of effort, we do not expect effort perceptions of the assortment to be influenced by a hedonic versus utilitarian focus. Regardless of this focus, the increased physical distance between target products and the distraction brought by complementary products should make the complement-based organization more effortful.

However, whether consumers shop with a hedonic or utilitarian focus may alter the effects of assortment organization on assortment perceptions and hence on store choice. The hedonic/utilitarian distinction relates to what consumers focus on when they shop. Whether a given purchase decision is utilitarian or hedonic in focus could be either due to product type (Babin, Darden, and Griffin 1994) or a temporary task orientation (Kaltcheva and Weitz 2006). Product type is relevant due to the shopping focus that products can spontaneously evoke, which may be more hedonic or more utilitarian depending on the type of product involved. Hedonic goods have been defined as “ones whose consumption is primarily characterized by an affective and sensory experience of aesthetic or sensual pleasure, fantasy, and fun” (Werthenbroch and Dhar 2000, p. 61). Such hedonic goods will spontaneously evoke a hedonic focus. In addition, temporary task orientations may directly alter the adoption of a more hedonic or utilitarian focus (Kaltcheva and Weitz 2006).

Because complement-based organizations are generally based on symbolically based product complementarity (Englis and Solomon 1996; Solomon and Buchanan 1991), they may be particularly well-suited to consumers who shop with a hedonic focus. Specifically, a constellation or complement-based set is likely to create a positive gestalt experience (Solomon and Assael 1987) and evoke evaluations on product aesthetics and social impression (Bell, Holbrook, and Solomon 1991). In fact, McCracken (1988, p. 121) observed that “the meaning of a good is best (and sometimes only) communicated when this good is surrounded by a complement of goods that carry the same significance. [...] In other words, the symbolic properties of material culture are such that things must mean together if they are to mean at all”. This implies that the esthetics and symbolic meaning of a product are more apparent in complement-based assortments. This is exactly the type of information consumers appreciate when shopping with a hedonic focus.

In contrast, a utilitarian shopping focus is defined by an emphasis on functionality and functional attributes (Batra and Ahtola 1991). Given a utilitarian focus, a very different pattern of effects on assortment attractiveness may emerge. Specifically, we propose that when consumers have a utilitarian as opposed to hedonic focus, gains in assortment perceptions created by complement-based sets will not be seen. Consumers holding a utilitarian focus tend to search for concrete product information (Babin, Darden, and Griffin 1994) and prefer environments that facilitate acquiring such functional information about the products. Because substitute-based organizations support the comparison of this type of product information across similar options, as shown in study 2, we anticipate that substitute-based organizations will create more positive assortment perceptions when consumers shop with a utilitarian focus. Therefore, we anticipate that:

H4a. Complement-based assortments will be perceived as more attractive when shopping with a more hedonic (vs. a more utilitarian) focus.

H4b. Substitute-based assortments will be perceived as more attractive when shopping with a more utilitarian (vs. more hedonic) focus.

Holding the underlying assortment constant, study 3 compares the perceptions and store preferences of people that shop substitute-based and complement-based stores for either a product that should evoke more of a utilitarian focus or a product that should evoke a more hedonic focus. Finally, study 4 will hold constant the underlying assortment as well as the focal product, and will directly manipulate whether consumers shop with a more hedonic or more utilitarian focus.

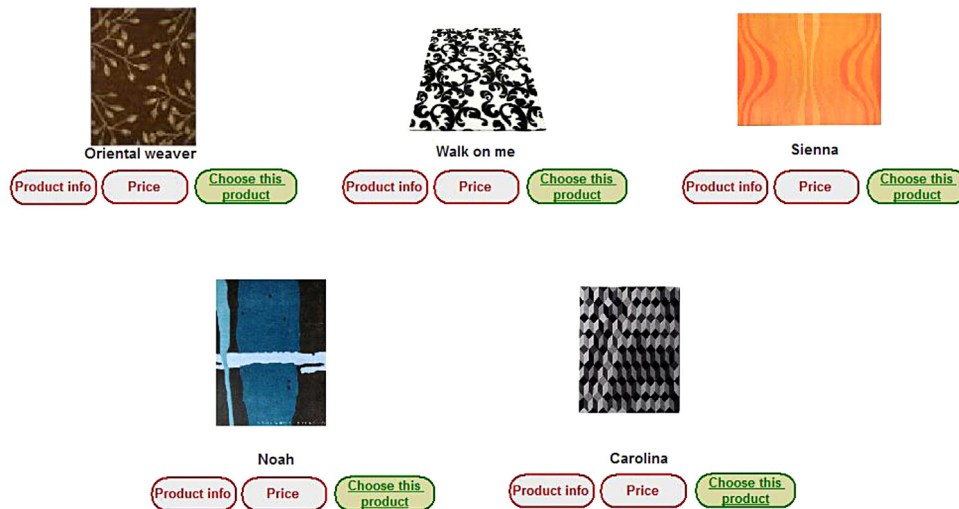
Study 3 – Effect of Complement versus Substitute-Based Organizations for More versus Less Hedonic Products

In study 3 we will contrast the effect of assortment organization for products that should evoke a hedonic or utilitarian focus. In order to not confound the manipulation of a focal product with different product assortments, the overall assortment is held constant. Among products typically used to furnish an office, participants were asked to choose either a relatively more hedonic product (i.e., a rug) or a less hedonic product (i.e., a printer) from the same assortment. We verified that rugs and printers spontaneously evoke a more hedonic (rugs) or utilitarian (printer) focus in a separate study ($n=68$ undergraduate students). In this small study, participants read a description of what a hedonic and utilitarian focus entails. They then rated both the extent to which they would focus on hedonic aspects and the extent to which they would focus on utilitarian aspects (9-point scales), when shopping for a printer and when shopping for a rug for their home office. Rugs evoked an hedonic focus to a larger extent ($M=7.37$) than printers ($M=3.65$; $F(1, 67)=199.78$, $p<.001$), and at the same time evoked an utilitarian focus to a lesser extent ($M=5.87$) than printers ($M=8.40$; $F(1, 67)=80.31$, $p<.001$).

Design and Procedure

This study followed a 2 (task: printer vs. rug) by 2 (order of stores: substitute-complement vs. complement-substitute) by 2 (store organization: substitute vs. complement) mixed design, with store as a within-subject factor and task and order of stores as between subjects factors. Participants were 242 undergraduate students (155 female, 87 male) who received a snack in return for their participation.

Participants were asked to imagine they needed to buy a rug (or a printer) and were then sent to two different simulated stores featuring office furniture. One store organized the assortment by product categories (CD racks, printers, rugs, desks and chairs), the other organized products by “rooms” (room 1, room 2, etc.). As in the previous studies, we used products available at actual retailers and assigned rooms randomly to each store. Examples of screen shots are provided in Fig. 2. For all products a



Panel A: Sample product page for focal product rug in the substitute-based store



Panel B: Sample page of focal product rug in the complement-based store

Fig. 2. Screenshots of pages encountered in study 3.

picture of the item, a short description, and the item's price were available. After choosing a focal item from each store, participants responded to questions about each of the stores the same way they did in study 2 (i.e., assessing "store 1" first and then answering questions about "store 2").

Measures

We used the same items to measure perceived effort ($\alpha = .77$ and $\alpha = .80$ for the substitute and complement-based trials respectively) and assortment perceptions ($\alpha = .85$ and $\alpha = .81$ for the substitute and complement-based trials respectively) as in study 2. Also as in study 2 we manipulated store organization within-subject. In addition to asking participants to choose

between stores, we also captured store preferences separately for each store. For each store we asked participants to indicate whether or not they would recommend the store to others ("I would recommend this store to others") using an unnumbered slider anchored at most definitely not (later translated to 0) and most definitely (later translated to 100).

Results

Perceived effort. Results showed a main effect of task ($F(1, 238) = 12.11, p < .001$), and a main effect of organization ($F(1, 238) = 219.76, p < .001$), whereas the interaction between organization and task was not significant ($F(1, 238) = 2.40, p > .1$). Participants felt it was more effortful to choose a printer

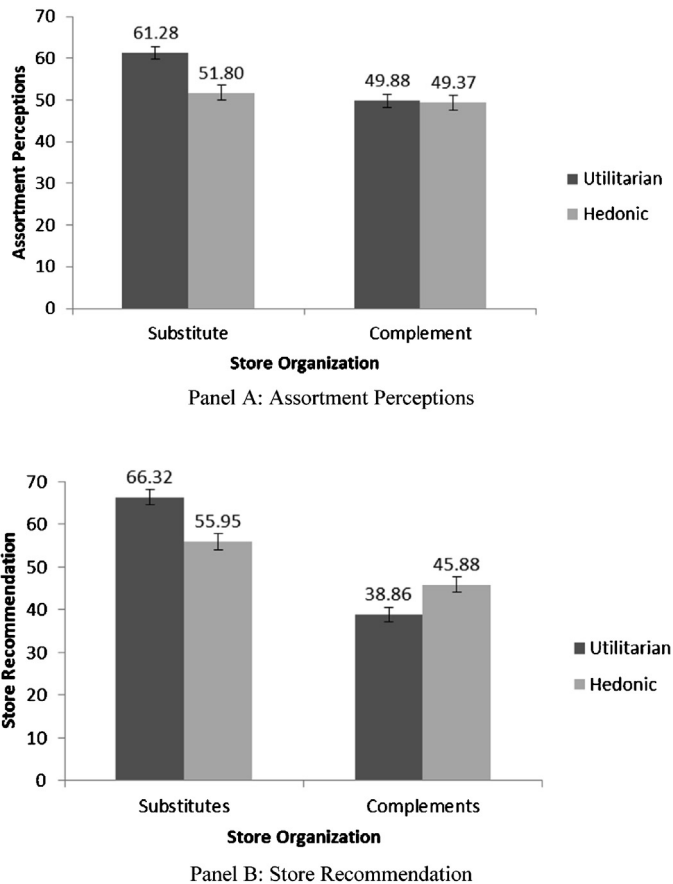


Fig. 3. Study 3 assortment perceptions and store recommendations as a function of organization and product type.

($M=46.91$) compared to a rug ($M=42.06$). More importantly, and replicating previous results, they felt it was more effortful to choose from the complement-based store ($M=58.61$) compared to the substitute-based store ($M=30.39$).

Assortment perceptions. With regard to assortment perceptions, results showed main effects of task ($F(1, 238)=12.54$, $p<.01$) and store organization ($F(1, 238)=13.74$, $p<.01$), such that the same assortment was perceived more positively when the task concerned the more utilitarian printer ($M=55.58$) compared to the more hedonic rug ($M=50.58$), and when the assortment was presented in substitutes ($M=56.58$) compared to complements ($M=49.63$). Importantly, however, we also found the predicted organization by task interaction ($F(1, 236)=5.78$, $p<.02$). Substitute-based organizations created more positive assortment perceptions when participants shopped for a utilitarian product ($M=61.28$) compared to when they shopped for a more hedonic product ($M=51.80$, $F(1, 238)=17.39$, $p<.0001$), supporting [Hypothesis 4b](#). However, in this study, complement-based sets created equally positive assortment perceptions, regardless of task ($F(1, 238)=0.05$, $p>.8$). See [Fig. 3](#), Panel A.

Store choice. A logistic regression of store choice, with task, store order and their interaction as independent variables, showed no significant effect of store order ($\chi^2(1)=0.43$, $p>.8$). Furthermore, as expected, there was a significant effect of task ($\chi^2(1)=14.44$, $p<.001$). Although overall participants

expressed a preference for the substitute-based store, they were more likely to choose the complement-based store when buying the more hedonic rug (30.0 percent) than when buying the utilitarian printer (9.0 percent). A marginally significant interaction between task and order ($\chi^2(1)=3.56$, $p=.06$) indicated that this effect of task (hedonic vs. utilitarian) on preference for the complement-based store tended to be stronger when the complement store was evaluated second (38.3 percent vs. 6.5 percent) than when it was evaluated first (21.7 percent vs. 11.7 percent).

In line with the previous study, to examine the effects of effort and assortment perceptions on store choice, we calculated difference scores for both assortment and effort perceptions (i.e., complement-based response minus substitute-based response) and entered these measures into a logistic regression predicting store choice. Results showed both the expected negative effect of effort ($b=-0.03$, $\chi^2(1)=10.95$, $p=.001$) and the expected positive effect of assortment perceptions ($b=0.06$, $\chi^2(1)=33.02$, $p<.001$), while the effect of task was reduced but still significant ($\chi^2(1)=7.14$, $p<.001$, suggesting partial mediation).

Store recommendations. Estimating the same mixed ANOVA for store recommendations as for assortment perceptions revealed a main effect of store order ($F(1, 238)=7.07$, $p<.01$), such that participants were more likely to recommend the second ($M=54.26$) than the first store ($M=49.25$). More importantly we found both a main effect of organization ($F(1, 238)=89.94$, $p<.0001$, $M_S=61.17$, $M_C=42.34$) and an organization by task interaction ($F(1, 238)=19.33$, $p<.0001$, see [Fig. 3](#), Panel B). In line with the results for store choice, substitute-based stores were more likely to be recommended when the shopping task was utilitarian ($M=66.31$) compared to hedonic ($M=55.95$, $F(1, 238)=17.28$, $p<.0001$). Complement-based stores, however, were more likely to be recommended when the shopping task was hedonic ($M=45.88$) rather than utilitarian ($M=38.86$, $F(1, 238)=7.86$, $p<.01$).

We examined the mediating roles of effort perceptions and assortment attractiveness by entering both measured assortment and effort perceptions as repeated measures variables in the mixed ANOVA model estimated above for recommendations. We found that when including the mediators, effort had a negative ($b=-.25$, $F(1, 236)=21.32$, $p<.0001$) and assortment perceptions had a positive ($b=.59$, $F(1, 236)=118.01$, $p<.0001$) effect on recommendations. Effects of both store organization ($F(1, 236)=13.50$, $p<.001$) and the interaction of task and store organization remained significant ($F(1, 236)=11.85$, $p<.001$) but are reduced, suggesting partial mediation.

Discussion

This study compared the effect of assortment organization for products that on their own evoke a more versus less hedonic focus. As expected, substitute-based stores create more positive assortment perceptions when shopping for a product that evokes a more utilitarian versus a more hedonic focus. Contrary to study 2 though, for complement-based organizations, we do not find a boost in assortment perceptions when shopping for the more hedonic product. As argued before, we expect

complement-based organizations to only boost assortment perceptions when a hedonic focus is evoked. In this study, neither product category nor customer factors seem to have created a sufficient hedonic focus for this effect to occur. We offer two potential explanations: In study 2 we followed prior research on consumption constellations which has used clothing extensively, maybe due to the category's effectiveness. In the context of office furniture, however, rugs may be less able to evoke a hedonic focus than was the case for the stimuli (i.e., clothes) used in study 2. Further, the sample in study 2 was entirely female for sampling practicality. We later realized that prior research shows that in the product category of clothing, hedonic motives play an important role for female shoppers but not for male shoppers (Chang, Burns, and Francis 2004). This may have caused hedonic motives to play a larger role in study 2 than would have been the case in a sample of mixed gender.

Importantly, we find that both effort and assortment perceptions affect store recommendations, lending support to our prediction that whether consumers prefer complement or substitute-based stores depends on the interplay and relative strength of these effects. Furthermore, as expected, store choice and recommendations for the complement-based store are higher among people wanting to buy a product evoking more of a hedonic focus than among people wanting to buy a product evoking a more utilitarian focus. Although the group of people choosing the complement-based store is not the majority, even for the hedonic focus product, its size may be sufficient for a retailer to specifically cater to this group.

Although the overall assortment was held constant, rugs and printers differ on a number of dimensions other than their ability to evoke a hedonic versus utilitarian focus. Hence study 4 will hold the overall assortment as well as the target product constant and manipulate whether consumers focus more on the hedonic or on the utilitarian aspects of a given product. In addition to providing a cleaner set-up to examine the effect of assortment organization, this manipulation also allows us to extend the concept of a hedonic versus utilitarian focus beyond the product category itself, showing that a task focus on hedonic (or utilitarian) aspects can have similar effects to that of shopping in a product category spontaneously evoking a more hedonic (or utilitarian) focus. This is important because retailers may be able to suggest through in-store promotional material or store design whether consumers should shop with a more hedonic or utilitarian task focus, allowing them to still use complement-based sets in product categories that by themselves do not create a very strong hedonic focus and hence would favor substitute-based organizations.

Study 4 – Effect of Complement versus Substitute-Based Organizations when Consumers Adopt a More versus Less Hedonic Focus

In study 4, we hold the target item constant (a sofa) but manipulate consumers' hedonic or utilitarian focus while shopping. Also, following prior research (Diehl 2005; Zauberaman 2003) study 4 uses a principal-agent task that allows us to manipulate

this aspect of the task with precision (i.e., whether participants shop with a more hedonic or utilitarian focus) while reducing the potential of reactance to the instructions.

Design and Procedure

This study followed a 2 (task focus: utilitarian vs. hedonic) by 2 (order of stores: substitute-complement vs. complement-substitute) by 2 (store organization: substitute vs. complement) mixed design, with store organization as a within-subject factor. Two hundred students (102 male, 86 female, 12 did not provide an answer) participated in this study in two separate waves (November, February) as part of a larger session for which they received course credit. In order to allow us to manipulate task focus, participants were asked to shop for a sofa for a friend (principal-agent task). This friend either asked them to find them a more utilitarian, practical sofa or a more hedonic, pleasing sofa (see Appendix 2 for exact wording of the task). Participants shopped for a sofa from two stores (counterbalanced), one arranged in sets of substitutes (rugs, sofas, coffee tables, bookcases, lamps), the other organized by rooms (room 1, room 2, etc.), where each room featured one item from each of the five product categories. As in the previous studies, we used products available at actual retailers and all products were described by a picture, a brief product description, and its price. Similar to study 3, we created ten rooms, randomly assigned five rooms to each store and either displayed them as rooms or organized the items contained in these rooms by product category. After making a selection from each of the stores, participants responded to the dependent measures.

Measures

Essentially the same measures as before were taken with respect to perceived effort ($\alpha = .86$ and $\alpha = .87$ for the substitute and complement-based trials respectively) and assortment perceptions ($\alpha = .85$ and $\alpha = .90$ for the substitute and complement-based trials respectively), with the caveat that each item was prefaced by "Given your friend's preferences" in order to clarify the focus of the assessment. We also asked participants for each store whether they would recommend the store to their friend using an unnumbered slider anchored at "definitely not" (later translated to 0) and "definitely" (later translated to 100). Finally in order to assess the success of our manipulation we asked participants to respond to statements that measured the extent to which they focused on either the utilitarian or hedonic aspects of the sofa. All statements were prefaced by "when choosing for my friend" and were measured using seven point scales anchored at "strongly disagree" (1) and "strongly agree" (7). Assessing the utilitarian focus, we asked participants to what extent they focused on the description of the sofa (vs. the picture), the sofa's functional aspects, and how the sofa would be used ($\alpha = .83$). Assessing the hedonic focus, we asked participants to what extent they focused on the pictures of the sofa and the sofa's appearance ($\alpha = .85$). Responses for the three utilitarian and two hedonic items were averaged to form the utilitarian and hedonic manipulation check respectively. Overall

the two manipulation check measures were strongly negatively correlated ($r = -0.59, p < .0001$).

Results

We analyzed the data using a mixed ANOVA model with task focus and order of store as between-subject factors and store as a within-subject factor. We also controlled for which wave respondents participated in (November $N = 69$, February $N = 131$) as a between-subject covariate.

Manipulation check. With regard to the manipulation check assessing the extent to which participants adopted a utilitarian focus we found only a main effect of task ($F(1, 195) = 171.31, p < .0001$), such that those in the utilitarian task condition ($M = 5.0$) said that they focused more on functional aspects of the products than those in the hedonic task condition ($M = 2.79$). Further, for the manipulation check of hedonic task focus we again only found a main effect of the task manipulation ($F(1, 195) = 141.25, p < .0001$), with those in the hedonic task condition stating that they focused more on hedonic aspects of the products ($M = 6.24$) than those in the utilitarian task condition ($M = 4.03$), suggesting that the manipulation of task focus was successful.

Perceived effort. We found both a main effect of presentation order ($F(1, 195) = 4.94, p < .05, M_{\text{sub-compl}} = 42.14, M_{\text{compl-sub}} = 37.60$) and a main effect of trial ($F(1, 196) = 11.72, p < .0001$), where the second trial ($M = 43.72$) was seen as slightly more effortful than the first trial ($M = 36.11$). Most importantly, we again found a main effect of organization ($F(1, 196) = 32.76, p < .0001$) such that the substitute-based store ($M = 33.74$), was seen as less effortful than the complement-based store ($M = 46.09$) as predicted by [Hypothesis 1](#) and replicating our prior results. As expected, shopping task did not affect perceived effort in any way.

Assortment perceptions. With regard to assortment perceptions there also was a main effect of presentation order ($F(1, 195) = 4.37, p < .05, M_{\text{sub-compl}} = 50.68, M_{\text{compl-sub}} = 54.93$). Further, as before, we also found a main effect of organization ($F(1, 196) = 21.10, p < .0001$), such that at baseline the substitute-based store created more favorable perceptions ($M = 57.97$) than the complement-based store ($M = 47.56$). Importantly, this main effect was qualified by an interaction of organization and task focus ($F(1, 196) = 8.42, p < .01$). Substitute-based organizations created more positive assortment perceptions when participants focused on utilitarian ($M = 61.95$) as opposed to hedonic aspects ($M = 54.51, F(1, 195) = 5.52, p < .02$), supporting [Hypothesis 4b](#). For complement-based organizations, the opposite was true as predicted by [Hypothesis 4a](#). Those shopping with a hedonic focus had more positive perceptions of the complement-based assortment ($M = 50.60$) than those with a utilitarian focus ($M = 44.06, F(1, 195) = 4.63, p < .04$). See [Fig. 4](#), Panel A.

Store recommendations. With regard to whether or not participants would recommend the store to their friend, there was a main effect of store organization ($F(1, 196) = 21.86, p < .0001$) indicating that overall, the substitute-based store ($M = 60.78$) was recommended somewhat more strongly than

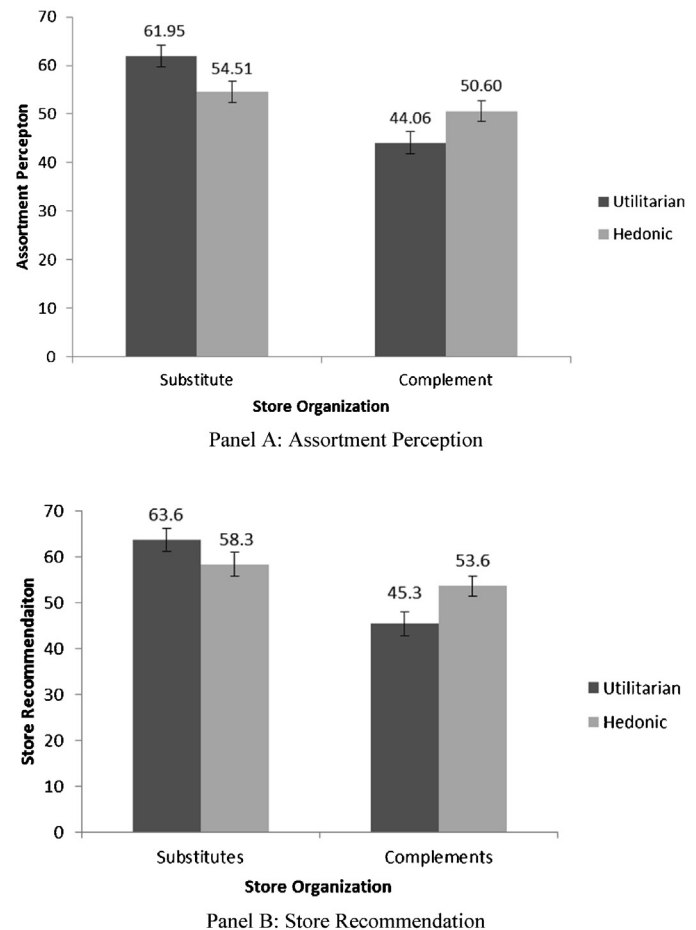


Fig. 4. Study 4 assortment perceptions and store recommendation as a function of organization and task orientation.

the complement-based store ($M = 49.74$). Importantly though this main effect was qualified by an organization by task interaction ($F(1, 196) = 7.08, p < .01$, see [Fig. 4](#), Panel B). The complement-based store was more strongly recommended when consumers focused on hedonic ($M = 53.56$) than on utilitarian aspects ($M = 45.34, F(1, 195) = 5.95, p < .02$). This was not the case for the substitute-based store, where no significant effect of consumer focus was found ($M_U = 63.62, M_H = 58.30, F(1, 195) = 2.07, p > .15$).

Again we examined the mediating effect of effort and assortment perceptions by adding both as repeated measures variables in the model estimated above for recommendations. In that model both effort ($F(1, 194) = 10.47, p < .01$) and assortment perceptions ($F(1, 194) = 144.16, p < .0001$) were significant predictors of store recommendations. Further, the effect of store organization ($F(1, 194) = 0.93, p > .3$) and the organization by task interaction ($F(1, 194) = 0.61, p > .4$) were no longer significant, suggesting full mediation.

Discussion

This study examined the effect of store organization across different decision foci, holding the target product constant. With regard to decision effort we find an effect of store

organization but no main effect of or interaction with decision focus, as expected. Assortment perceptions, in contrast, are affected not only by the organization of the items but also by whether consumers have an hedonic or utilitarian focus. Complement-based organizations create more positive perceptions when consumers have a hedonic focus, while substitute-based organizations create more positive assortment perceptions when consumers have a utilitarian focus. Store recommendations are likewise affected: the complement-based store is more strongly recommended when consumers focus on hedonic aspects.

General Discussion

Marketers increasingly either format their assortment in terms of complementary product sets (e.g., Rooms to Go) or offer complement-based sets as an alternative way of browsing products (e.g., BananaRepublic.com) in order to draw consumers to their store. In this research we have examined how organizing the same assortment either by substitutes or by complements affects consumers' preferences for one store over the other. Importantly, we do so by examining two underlying and counteracting drivers of store choice: perceptions of the shopping process (i.e., how effortful it seems to shop in the store) and perceptions of the store's assortment.

We demonstrate that shopping from complement-based sets takes longer and is perceived as more effortful than shopping from substitute-based sets, even though consumers search complement-based sets less broadly *and* less deeply. In disentangling different contributors to effort perceptions we show that increased effort is not due to actual in-depth search of non-target products (study 1b, study 2). Rather, our results suggest that presenting complementary products alongside the target product mostly distracts consumers (study 1b), which requires processing resources and lengthens shopping time.

Although substitute-based organizations are generally less effortful, it would be an oversimplification to recommend that they be used in all cases. Rather, whether this organizational format is preferred by consumers depends on the interplay between effort and assortment perceptions. Complement-based organizations create more positive assortment perceptions when consumers shop with a hedonic rather than utilitarian focus. Our findings show that both product category (study 3) and explicit consumers objectives (study 4) can create such a hedonic focus. We expect the interplay of product category and consumer motives to jointly create greater or less hedonic focus. Indeed, in study 2, where women's tendency toward a more hedonic focus was likely to be very strong (see [Chang, Burns, and Francis 2004](#) for a discussion of the importance of hedonic motives for female clothing shoppers), we see an overall preference for the more effortful complement-based sets. Future research and application should be aware of the interplay of consumer and category factors in creating a strong hedonic focus. Substitute-based organizations, in contrast, are seen more positively when consumers shop with a utilitarian compared to a hedonic focus. In such cases, the use of substitute-based organizational formats can be clearly recommended.

Theoretical and Managerial Contributions

Our research makes a number of theoretically important and managerially relevant contributions, with clear implications for retailers. While prior research has examined the effects of organization in a single product category, we examine different types of organizational formats when products from multiple categories are involved. Almost all retailers need to make decisions about assortment organizations that involve multiple categories. As such our findings, which extend beyond single product categories, should be of great importance to them. We explore perceptions of effort and the assortment as drivers of store choice – outcomes that have important implications for long-term customer retention. These types of variables have been important in prior research on product assortments, especially in the context of choice overload ([Iyengar and Lepper 2000](#); [Scheibehenne, Greifeneder, and Todd 2010](#)). We show that, even when, as in our case, the number of choice options does not change, the organization of an assortment has relevant and crucial effects on consumer perceptions.

Substantively, retailers should be careful when choosing to employ one or another product organization. Our findings suggest that complement-based organizations should be preferred in highly hedonic product categories, such as for clothing. In such domains, complement-based sets can boost assortment perceptions and increase store choice. If retailers still want to use complement-based sets in categories for which a hedonic focus is not spontaneously evoked, our research suggests that increasing consumers' consideration of hedonic aspects of these products can make complement-based organizations more palatable.

Further, when retailers want to limit product search to reduce competitive pressure, complement-based sets should be considered. After all, consumers are less likely to search by attribute, and thus make fewer direct price comparisons between products. Moreover, consumers tend to examine fewer products in these assortments, and they tend to examine these products in less detail. Even though consumers thus search less in complement-based assortments, they experience the decision-making process as more effortful. The mere presence of surrounding complementary products appears to increase the perceptions of effort, and retailers need to take this into consideration when deciding how to organize their assortment.

Our findings may also extend to other related contexts. Pinterest.com, a website that allows users to combine (mostly) pictures to create virtual pinboards has garnered considerable interest among marketers both as a communication tool and as a sales channel ([Chafkin 2012](#)). We suggest that effects similar to those we demonstrate for assortment organizations may also drive whether a product category or brand can successfully leverage Pinterest as a marketing tool. Based on our findings we would expect that hedonic categories would benefit most from the type of complementary collection promoted by Pinterest. In fact the top categories of boards created on Pinterest (1. Home (17.2 percent of boards), 2. Arts and crafts (12.4 percent), 3. Style and fashion (11.7 percent), Van Grove 2012) are all highly hedonic categories for which we would argue such complementary presentations are particularly helpful. Similarly the

strongest growing brands (May to July 2012) on Pinterest all sell highly hedonic products (1. Barney's New York, 2. Nordstrom, 3. Sephora, 4. Victoria's Secret, 5. Williams-Sonoma). Based on our research we would suggest marketers of more utilitarian products should focus on hedonic aspects of their products if they want to use this type of tool successfully. For example Oreck vacuum cleaners (<http://pinterest.com/oreck/>) created a Pinterest page that does not feature the product itself but rather boards such as the one titled “stunning floors” which feature pictures of home flooring or one titled “furry friends” with pictures of dogs and cats. As such, our framework and its underlying mechanism may also guide marketers in when and how to use complement-based sets in situations that extend beyond assortment organizations.

Limitations and Future Research

We examine the effects of substitute and complement-based organizations in their pure forms (i.e., for a given choice all options are either organized by substitutes or by complements). These cases are analogous to many brick and mortar stores or marketing communications where only one type of structure is presented to consumers at a time. However, retailers may also present hybrid structures. For example, retailers may present the bulk of their assortment by grouping together substitutes (e.g., couches, chairs, tables), but may present some of their items in terms of complementary sets (e.g., set up one specific living room). Future research may examine these more mixed forms of complement and substitute-based organizations.

Further we examined how consumers *react* to assortment organizations that are presented by the retailer. However, in some settings they may be able to choose how they want to explore options. It is an interesting question whether our effects will hold in such contexts. On the one hand consumers may benefit when they are allowed to control the information they receive (Ariely 2000), suggesting that as long as they can choose the type of organization they prefer, they will perceive any assortment organization for any product category as more attractive and less effortful. On the other hand, consumers often do not have great insight into what would be best for them and how to choose advantageously. If that is the case, they may choose poorly exposing them to assortment organizations they find effortful and where they perceive the assortment poorly. Given these opposing predictions, it remains a question for future research how choice over the organization will affect consumers and retailers. Such future research may also investigate consumers' decisions to defer from choosing at all.

Retailers may want to use complement-based organizations in an attempt to generate additional sales for product categories in which purchases are made less frequently or which have a lower penetration (Drèze, Hoch, and Purk 1994). In study 2 we allowed participants to also purchase complementary products, yet complement-based organizations did not generate more sales than substitute-based organizations. Importantly, our research shows that even in situations such as in study 2 where complement-based organizations do not generate additional

sales, retailers may want to implement this type of organization for its positive effects on assortment attractiveness.

In our study, effort and assortment perceptions have been shown to be important drivers of store choice as well as store recommendations. For retailers, a thorough understanding of why assortment organization matters, and how consumers are affected, can be helpful when deciding on their assortment strategy. The identification of the drivers of store choice is thus of importance. Although effort and assortment perceptions appear as the main processes involved throughout our experiments, there may be additional mediators involved, as future research could investigate.

Obviously, the absence of a purchase increase in our data does not rule out that complement-based organizations could increase cross-category purchases. We do, however, caution that in the academic literature the effectiveness of such tactics has only been empirically demonstrated (Drèze, Hoch, and Purk 1994) for low cost consumable products which are functional complements (i.e., fabric softeners and detergents, tooth paste and tooth brushes). We focused on complementary sets of higher priced, durable products. Such products may not trigger co-purchases as previously shown because, compared to packaged goods consumables, such purchases may be more likely to be subject to budget constraints. More importantly even, with consumables, running out of one item (e.g., detergent), makes cross purchases (e.g., fabric softener) more likely. The same may not be the case for durables, where a new pair of pants can be combined with an existing inventory of shirts. Examining the ability of complement-based organizations to increase cross category purchase incidents would be an important avenue for future research.

Our studies focused on relatively large and coherent complementary sets. Whereas effects on choice effort may hold also for less coherent sets, effects on assortment attractiveness are more dependent on how consumers assess the gestalt and may diminish when sets would be less coherent. Thus, complementary sets in which prototypical product categories are excluded or in which products with a vastly different brand image are included may not stimulate positive assortment perception to the same extent as shown here, something that future research may want to examine. Furthermore, in our studies as well as in most prior research, complementarity is based on joint product usage (e.g., a sofa that will be used alongside a book case). However, products can also complement each other by jointly performing a value expressive function without functional dependence or joint usage. For example a hybrid car, compact fluorescent light bulbs, and reusable shopping bags may be considered complementary with respect to the consumption goal of demonstrating environmental concern, but they tend not to be used together. Future research may explore how jointly arranging functionally unrelated but value expressively complementary products affects consumers' decision processes.

Whereas research on optimal assortment composition has been prolific (e.g., Boatwright and Nunes 2001; Borle et al. 2005), the breadth of these open questions signals that research on how a given assortment is organized is managerially interesting, theoretically important, and warrants greater investigation.

Acknowledgement

The authors thank Saskia van Beek for her help in setting up study 1A and Vellore S. Arthi for creating the assortments used in study 2. The authors also want to thank Jeff Inman, Joe Nunes, and Rebecca Naylor for inspiration and comments on previous instantiations of this work.

Appendix 1. Organization Found at Online Site of Top 50 Retailers

| Company | URL | Substitute based organization | Complement based organization |
|-----------------------------|----------------------|-------------------------------|-------------------------------|
| Amazon.com Inc. | Amazon.com | Yes | Yes |
| Staples Inc. | Staples.com | Yes | Yes |
| Apple Inc. | Store.Apple.com | Yes | Yes |
| Dell Inc. | Dell.com | Yes | Yes |
| Office Depot Inc. | Officedepot.com | Yes | Yes |
| Walmart | walmart.com | Yes | Yes |
| Sears Holdings Corp. | Sears.com | Yes | Yes |
| Liberty Media Corp. | QVC.com | Yes | No |
| OfficeMax Inc. | Officemax.com | Yes | Yes |
| CDW Corp. | CDW.com | Yes | Yes |
| Best Buy Co. | Bestbuy.com | Yes | No |
| Newegg Inc. | Newegg.com | Yes | Yes |
| Netflix Inc. | Netflix.com | Yes | No |
| SonyStyle.com | store.sony.com | Yes | No |
| W.W. Grainger Inc. | grainger.com | Yes | Yes |
| Costco Wholesale Corp. | costco.com | Yes | Yes |
| Macy's Inc. | macys.com | Yes | No |
| Bath and Body Works | bathandbodyworks.com | Yes | Yes |
| Victoria's Secret Direct | victoriassecret.com | Yes | No |
| HP Home & Home Office Store | shopping.hp.com | Yes | Yes |
| J.C. Penney Co. Inc. | jcpenny.com | Yes | Yes |
| L.L. Bean Inc. | llbean.com | Yes | Yes |
| Target Corp. | target.com | Yes | Yes |
| Systemax Inc. | circuitcity.com | Yes | Yes |
| Gap Inc. Direct | gap.com | Yes | Yes |
| Williams-Sonoma Inc. | williams-sonoma.com | Yes | Yes |
| HSN Inc. | hsn.com | Yes | Yes |
| Overstock.com Inc. | overstock.com | Yes | Yes |
| Amway Global | amway.com | Yes | Yes |
| Toys 'R' Us Inc. | toysrus.com | Yes | Yes |
| Avon Products Inc. | shop.avon.com | Yes | Yes |
| Kohl's Corp. | kohls.com | Yes | Yes |
| Buy.com Inc. | buy.com | Yes | Yes |
| Redcats USA | selected.tgw.com | Yes | Yes |
| Nordstrom Inc. | shop.nordstrom.com | Yes | Yes |
| Symantec Corp. | norton.com | Yes | Yes |
| Vistaprint Ltd. | vistaprint.com | Yes | Yes |

Appendix 1 (Continued)

| Company | URL | Substitute based organization | Complement based organization |
|-------------------------------|---------------------|-------------------------------|-------------------------------|
| PC Connection Inc. | pcconnection.com | Yes | Yes |
| Saks Direct | saksfifthavenue.com | Yes | Yes |
| Neiman Marcus Group Inc., The | neimanmarcus.com | Yes | Yes |
| Cabela's Inc. | cabelas.com | Yes | Yes |
| BarnesandNoble.com Inc. | barnesandnoble.com | Yes | Yes |
| Blockbuster Inc. | blockbuster.com | Yes | No |
| Home Depot Inc., The | homedepot.com | Yes | Yes |
| Musician's Friend Inc. | musiciansfriend.com | Yes | Yes |
| 1-800-Flowers.com Inc. | 1800flowers.com | Yes | Yes |
| drugstore.com Inc. | drugstore.com | Yes | Yes |
| Peapod LLC | peapod.com | Yes | Yes |
| Urban Outfitters Inc. | urbanoutfitters.com | Yes | Yes |
| Gilt Groupe | gilt.com | Yes | Yes |
| J. Crew Group Inc. | jcrew.com | Yes | Yes |

Appendix 2.

Utilitarian Task Description

Your friend tells you the following about the type of sofa that would work best in the new apartment.

Your friend says: "Get me a sofa that works!"

The sofa will get a lot of use, so functionality is crucial. The sofa should fit at least two people, be easy to take care of, and should last a while.

However the sofa's appearance is not important. Your friend does not care at all about whether the sofa is fashionable as long as it is functional.

So your friend tells you to mostly focus on the facts about the sofa when making your choice. That is, focus on aspects of the sofa that make this sofa functional for your friend, such as its size and material, do not rely on the aesthetics of the sofa when choosing.

Hedonic Task Description

Your friend tells you the following about the type of sofa that would work best in the new apartment.

Your friend says, "Get me a sofa that looks great!"

The sofa will be placed in a prominent place in the room, so the appearance of the sofa is crucial. Your friend wants a sofa that is fashionable and pleasant to look at.

However the sofa's functionality is not important. Your friend does not care at all about whether the sofa is functional as long as it looks good.

So your friend tells you to mostly rely on the aesthetics of the sofa when making your choice. That is, focus on aspects of the sofa that make the sofa visually and sensory satisfying for your friend, such as its color and design, do not rely on the functionality of the sofa when choosing.

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