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This is a "Post-Print" accepted manuscript, which has been published in "Food Quality and Preference"

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Please cite this publication as follows:

van Herpen, E., & Bosmans, A. (2018). Arranging the assortment to arouse choice: Effects of goal-relevant assortment organization on food choice and variety perceptions. *Food Quality and Preference*, 64, 192-204. DOI: 10.1016/j.foodqual.2017.09.007

You can download the published version at:

<https://doi.org/10.1016/j.foodqual.2017.09.007>

Arranging the assortment to arouse choice: Effects of goal-relevant assortment organization on food choice and variety perceptions

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The authors acknowledge the financial support of TransForum (DOI: 10.1051/agro:2008022), an innovation program for the Dutch agricultural sector. The authors thank Muriel Verain for research assistance, and Cait Lamberton, Hans van Trijp, Arnout Fischer, and Ilona de Hooge for their feedback on prior versions of this manuscript.

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Abstract

Food retailers can present specific products in a separate category (e.g., separate section for organic products) or integrated into the mainstream shelf. This study investigates how assortment organization influences consumers' variety perceptions and product choice. We argue and show that when an assortment is organized according to an individual's goal (e.g., organics), he or she is more likely to choose a product that is in line with his/her goal (e.g., choose an organic product), compared to when products are presented in a mixed display or when categories are unrelated to this goal. Moreover, the results of three experiments show that when assortments are organized according to a relevant goal, people perceive more variety in the category with goal-consistent products (an in-category heterogeneity effect), but tend to see less variety in the category with products that are not consistent with their goal (an out-category homogeneity effect). This implies that food retailers can direct consumers' choice, as well as consumers' perception of the assortment, through assortment organization. Size of the category is shown to be a boundary condition.

Keywords: assortment; organization; variety; categorization; organics

1. Introduction: Assortment Organization and Choice

Food assortments include sets of products with special features, such as organic products or fair trade products. Especially when the overall assortment size is large and complex, as is often the case in online retail environments, retailers are faced with the challenge as to where to present these speciality products (Dahm, 2005; Kahn 2017). Imagine an online retailer introducing a line of organic products in the assortment. The retailer can place the organic product line separately from conventional products, in the hope that consumers will be more likely to notice these products. Alternatively, the retailer may integrate the new organic products with the mainstream products in the hope that consumers will encounter the organic products while browsing the webpage.

Retailers have a substantial influence over the food choices that consumers make, and they consciously attempt to influence buying patterns (Dawson, 2013). The position where individual food products are placed within an assortment influences the choices that consumers make (Bucher et al., 2016; Kongsbak et al., 2016; Missbach & König, 2016; van Herpen, Fischer, & van Trijp, 2015). For instance, the choice for a snack bar with low calorie content increases almost threefold when it is presented in the middle position of three snack bars rather than on the left (Keller, Markert, & Bucher, 2015). Not only the position of individual products influences product choice, the way in which an assortment is organized matters as well (Simonson, 1999). An assortment partitioned into the categories ‘fruit’, ‘vegetables’, and ‘cookies and crackers’ leads to more healthy choices than an assortment partitioned into ‘fruits and vegetables’, ‘cookies’, and ‘crackers’ (Chernev, 2012). Moreover, placing wines from a specific region in a special point-of-purchase display increases product choice from consumers’ preferred regions (Areni, Duhan, & Kiecker, 1999). It thus appears that assortment organization guides product choices, and that consumers are more likely to make product choices that are based on the organizing attribute. Does this mean that simply

adding a separate category to the assortment will boost sales of products in this category, say, the organic category when organic products are placed separately? Not necessarily.

The purpose of this paper is twofold. First, and most apparent, we reason that whether choice in a given category will increase or decrease (e.g., whether consumers will choose an organic product), will crucially depend on whether the category relates to consumers' shopping goals (e.g., whether consumers are inclined to buy organic products). Second, we argue that the interplay between assortment organization and consumers' shopping goals not only influences product choices, but also the amount of variety that consumers perceive in the category of interest, compared to the category not of interest.

Perceptions of variety within categories are highly relevant for retailers because consumers are more loyal to stores that are specialized in specific categories (i.e., category-dependent store loyalty) (Bell, Ho, & Tang, 1998). That is, a consumer with a goal to buy organic products will be more likely to visit a store when s/he believes that the store offers a varied assortment of organic products specifically. How much variety consumers perceive to be present in a set of food items can vastly differ from the variety that is indicated through objective variety measures (Haugaard, Brockhoff, & Lähtenmäki, 2016). Moreover, changes in assortment organization, which do not affect variety objectively, may affect perceptions of variety subjectively (Hoch et al., 1999). Research shows that merely organizing an assortment into categories without changing the products it contains can increase the overall perceived variety of this assortment (Lamberton & Diehl, 2013; Mogilner et al., 2008). For example, when the number of different jelly beans is large, people perceive more variety in an assortment of jelly beans, and will consume more of these candies, when they are presented in a separate container for each colour compared to when the colours are scrambled altogether (Kahn & Wansink, 2004). Our study extends this prior research by showing that the effects of assortment organization on variety perceptions should not be examined in isolation, but

depend on consumers' shopping goals.

2. The interplay between goals and categories

Research suggests that consumers' goals direct attention to information that is relevant or important for the goal (O'Brien & Meyers, 1987; Huffman & Houston, 1993). As a consequence, the organization of products as applied by a food retailer can be consistent or inconsistent with consumers' shopping goals. This may ultimately affect both product choice and variety perceptions.

Consider a consumer with a high interest in organic products. It can be assumed that if the organizing attribute is relevant for one's goal (i.e., being organic), people will increase their focus on the organizing attribute. This is likely to increase product choice from the organic category. Yet, effects on variety perceptions are less clear. On the one hand, communalities between products – especially those that are goal-related – will be highlighted, resulting in a decrease in perceived variety in the category of interest (i.e., “they are all organic”). This prediction is consistent with the idea that organizing products into categories increases the perceived similarity of products inside a category. For example, research on metaphorical thinking suggests that there is a strong association between mental representations related to the concept of similarity and that of closeness, such that objects that are physical close to each other are perceived as more similar than objects that are further away (Boot & Pecher, 2010; Casasanto, 2008). The notion that products that are placed together in categories are perceived to be more similar is also in line with the accentuation theory of Tajfel and Wilkes (1963), which argues that the classification of stimuli into categories influences the perceived similarity between stimuli whereby between-group differences are exaggerated and within-group differences are understated.

On the other hand however, instead of merely increasing consumers' focus on the

goal-related organizing attribute, organizing an assortment into categories may also increase the likelihood that consumers examine the goal-consistent products in more detail, at the expense of goal-inconsistent products. Cognitive resources are limited, and people simply cannot attend to all information present in their environment (Todd, Hertwig, & Hoffrage, 2005). Consumers tend to simplify choice tasks (Payne et al., 1990) by focusing on categories that are most in line with their goals (Morales et al., 2005; Simonson & Winer, 1992).

Whereas previous literature has shown that such a focus can decrease variety perception of the total assortment (Morales et al., 2005), we argue that this will instead increase variety perceptions of those parts of the assortment that are consistent with one's goal. That is, goal-consistent categories will receive more cognitive resources to inspect, deliberate, and choose among the alternatives. This implies that (1) organizing an assortment into product categories would draw consumers' attention to the organizing attribute, (2) this would increase the chance of choosing a product from the goal-consistent category, (3) the category that is consistent with one's goal (compared to those which are not) is processed in a more individuated and differentiated way, which would lead to a greater perceived variety within the goal-consistent category (an in-category heterogeneity effect), and (4) because less attention is focused on the goal-inconsistent category, variety perceptions for the goal-inconsistent category would decrease, compared to a mixed assortment or goal-unrelated categories (an out-category homogeneity effect).

3. Overview of the studies

Three studies test how shopping goals influence the effect of assortment organization on product choice (experiment 1) and perceived variety of products in a goal (in-)consistent category (experiments 1 to 3). Experiment 1 investigates naturally occurring shopping goals by assessing if people with a high intrinsic interest in organic wines (but not those with a low

interest) are more likely to choose an organic wine and to perceive more variety in organic wines when these wines are presented in a separate compared to a mixed display. In this experiment, we also investigate if this effect is mediated by consumers' focused attention on the goal-consistent category, as we would expect. In experiment 2, people are provided an explicit goal to purchase caffeinated tea and effects in a goal-related presentation (i.e., caffeinated category) are compared to a goal-unrelated (i.e., fair-trade category) and mixed (i.e., no categories) displays. Experiment 3 extends these results by showing that category size is a boundary condition of the proposed in-category heterogeneity effect: when goal-consistent categories have too few products, consumers will notice the limited supply, such that less instead of more variety is perceived.

Because online grocery retailing has been rapidly growing over the past decades (Dawes & Nenycz-Thiel, 2013) and assortment organization is highly relevant for online retailers (Kahn, 2017), our experiments will test the hypotheses in the context of online food shopping. Because prior research has replicated effects of assortment organization in various settings, including pictorial displays, lab experiments, and real-life stores (e.g., Areni et al., 1999; Mogilner et al., 2008; Simonson & Winer, 1992), we assume that the hypothesized underlying process will extend to offline contexts as well.

5. Experiment 1: Intrinsic Interest and Perceived Variety

The main purpose of experiment 1 was to investigate whether a separated category increases choice of and leads to higher perceived variety in products that are in line with consumers' interests (goal-consistent products), but lower perceived variety in products that are not in line with their interests (goal-inconsistent products), in an assortment with objectively the same amount of variety in both categories. We expected that people with a high interest in organic wines choose more often for an organic wine and perceive more

variety in organic wines and less variety in non-organic wines when organic wines were presented in a separated category than when these products were presented in a mixed assortment. We also examined increased selective attention to goal-consistent products as the underlying process. Specifically, we investigated if the examination of goal-consistent products mediates the interaction effect between assortment organization and initial interest on variety perceptions.

5.1. Method

5.1.1. Participants and design

Participants ($n = 259$ students, 71 males and 188 females, average age 21 years) were randomly assigned to one of the conditions of a 2 group design (organization: separated vs. mixed display). Interest in organic wines was a measured individual difference variable. All participants were above the local legal drinking age.

5.1.2. Stimuli

The experiment was computer-based. Product assortments consisted of 16 red wines. Half of these wines were existing organic wines, and each of these organic wines was matched with a similar non-organic wine based on price range, region of origin, grape type, taste description, and bottle appearance to obtain equal objective product variety in both categories. An 'eco' label was superimposed on the pictures of the organic wine bottles to ensure that these could be clearly identified as organic on a computer screen. Pictures of the wine bottles were either all placed in random order on the same page, or split into two pages (eight organic wines on one page and eight non-organic wines on the other page). Participants in the latter condition could select which page they wanted to see first, and were free to move between pages with a single mouse click. Example screen shots are provided in Appendix A.

5.1.3. Procedure

Participants received instructions to select a bottle of red wine from an assortment of an online retailer. They were asked to assume that all wines fell within the same, affordable, price range. Next, they viewed the assortment. By clicking on products, they received additional realistic information on type of wine, country of origin, and a taste description. For organic wines the organic nature was stated here as well. After making their choice, participants answered questions related to the variety they perceived in organic and non-organic products, and to their overall interest in organic wines. At the end of the experiment, they were paid, debriefed, and thanked. The experiment took on average 5 to 6 minutes to complete.

5.1.4. Measures

Wine choice was recorded and coded as either organic or non-organic. The computer recorded which products were clicked on for closer examination, from which the proportion of organic wines examined (from the total number of wines examined) was calculated. Other measures were taken using 7-point scales. These measures were presented to participants after they had made their choice. Perceived variety in organic wines was measured with three items: “There were many different types of organic wine”, “There was a high variety of organic wines”, and “There was a very diverse assortment of organic wines” ($\alpha = .87$). Perceived variety in non-organic wines was asked with the same items ($\alpha = .89$). Interest in organic wines was measured using four items: “I am interested in organic wines”, “I would like to drink an organic wine”, “When I see organic wine in the store, I would definitely buy it”, and “I would like to know more about organic wines” ($\alpha = .91$).

5.2. Results

5.2.1. Interest in organic wines

Interest in organic wines ranged from the lowest (1) to the highest (7) point of the

scale, with a mean of 3.72 and standard deviation of 1.65 (25th percentile at 2.25, 50th percentile at 4.00, and 75th percentile at 5.00). Interest in organic wines was not influenced by assortment organization ($F(1, 257) = 0.74$, NS), indicating that the presence of an organic category did not influence consumers' intrinsic interest in organic wines.

5.2.2. Choice

Overall, 60.6 % of participants chose an organic wine. A logistic regression predicted choice of an organic wine from assortment organization, interest in organic wines, and the interaction between these two variables. Results showed a positive main effect of interest (Wald = 36.27, $p < .001$, $b = 0.58$) and no significant main effect of assortment organization (Wald = 0.87, NS). We also found a significant organization x interest interaction effect (Wald = 4.63, $p = .031$, $b = 0.21$). Interest in organic wines increased the choice of organic products for both types of organizations, but more for the separated display (Wald = 26.35, $p < .001$) than the mixed display (Wald = 10.23, $p < .01$).

5.2.3. Variety perceptions

Variety perceptions were analyzed using a repeated measures general linear model with organization as between-subjects variable, interest as individual difference variable (mean-centered) and category (i.e., organic vs. non-organic wines) as within-subjects variable. This analysis showed the expected significant three-way interaction between category x interest x organization ($F(1, 255) = 12.50$, $p < .001$), in addition to significant two-way interactions (category x organization: $F(1, 255) = 39.83$, $p < .001$ and category x interest: $F(1, 255) = 16.17$, $p < .001$) and no significant main effects.

To investigate the effect further, we examined each display (separated vs. mixed) in turn. When a *separated display* was used, the variety in organic wines was generally perceived to be higher ($M = 5.13$) than the variety in non-organic wines ($M = 4.85$; $F(1, 127) = 10.26$, $p = .002$). This was qualified by a significant category x interest interaction ($F(1,$

127) = 30.61, $p < .001$), whereby interest in organic wine had a positive effect on perceived variety in organic wines ($b = 0.20$, $t = 4.17$, $p < .001$) and a negative effect on perceived variety in non-organic wines ($b = -0.13$, $t = -2.72$, $p = .007$), as shown in panel A of Figure 1. This thus shows the expected in-category heterogeneity and also an out-category homogeneity effect for people who are interested in organic wines. In contrast, when a *mixed display* was used, the category x interest interaction was not significant ($F(1, 128) = 0.11$, NS). The only significant effect was the main effect of category ($F(1, 128) = 31.48$, $p < .001$): the perceived variety in organic wines was now lower ($M = 4.77$) than the perceived variety in non-organic wines ($M = 5.37$). See panel B of Figure 1.

[insert Figure 1 about here]

We furthermore analysed the results at a high (1SD above the mean) versus low (1SD below the mean) interest in organic wines, and observed that when interest in organic is high (1SD above the mean), perceived variety in organic wines was higher when products were presented in a separate compared to a mixed display ($b = 0.68$, $t(1) = 4.02$, $p < .001$) whereas the reverse pattern of results was observed for non-organic products ($b = -0.76$, $t(1) = -4.63$, $p < .001$) which is again consistent with both an in-category heterogeneity as well as an out-category homogeneity effect. Because a low interest in organic wines does not imply a high interest in non-organic wines, we did not expect effects for participants with a low interest in organic wines. After all, people with a low intrinsic interest in organic wines may likewise have low interest in non-organic wines. At a low interest in organic (1SD below the mean) the presence of the category did not affect variety perceptions for organic products ($t(1) = 0.52$, NS) but still tended to decrease variety perception for non-organic products ($b = -0.32$, $t(1) = -1.94$, $p = .05$).

5.2.4. Product examination

As expected, the proportion of organic products examined showed significant effects

for interest ($F(1, 255) = 47.59, p < .001$) and for the organization by interest interaction ($F(1, 255) = 17.56, p < .001$). Interest in organic wines positively affected the proportion of organic wines examined in both organizations ($b = 0.11, F(1, 127) = 45.88, p < .001$ for separated display and $b = 0.03, F(1, 128) = 5.32, p = .023$ for mixed display), but the effect was larger when organic products were separated. This indicates that participants were better able to focus on products that were in line with their interest when these were placed separately.

In the separated display condition, it was possible for participants to only view part of the total assortment. Participants initially chose to view one category and had to click to see the other category. To check if this affected our results, we ran analyses on only those participants who viewed both categories. Of the participants in the separate display condition, 65.1 % looked at both categories at least once. The reported effects on variety perceptions remained significant when excluding participants who did not view both categories, and result patterns were identical to those reported for the full sample.

5.2.5. Tapping into the process

A mediated moderation analysis, using the PROCESS method (model 7 of Hayes, 2013) was used to test whether the proportion of organic products examined mediated the interaction effect between interest and organization on variety perceptions. The dependent variable was the “difference score of variety perceptions”: perceived variety in organic products minus perceived variety in non-organic products. This variable thus indicated the extent to which a participant perceived more variety in organic products than in non-organic products, and is the appropriate variable to test our expectation that the organized assortment leads participants with a higher interest in organic wine to pay more attention to organic wines and, consequently, to see more variety in organic than non-organic wines. Organization was coded as 1 = separated and -1 = mixed. Interest was a mean-centered scale.

Model estimates are displayed in Figure 2. The interaction between interest and

organization affected the proportion of organic products examined ($b = 0.04, t = 4.19, p < .001$), and the proportion of organic products examined in turn affected variety perceptions ($b = 1.37, t = 4.94, p < .001$), indicating mediation. In fact, when examining the conditional indirect effects of interest on variety perceptions for each of the displays, bootstrapping results showed that the proportion of organic products examined was a mediator for both (95% confidence interval for mixed display .004 – .084, and for separated display .090 – .236). In support of our expectations, the non-overlapping confidence intervals indicated that mediation was stronger in the separated display than in the mixed display. Thus, the separated display allows people who are interested in organic wines to focus on these products, and this leads to in-category heterogeneity and out-category homogeneity in their variety perceptions.

[insert Figure 2 about here]

5.3. Discussion

Consistent with expectations, in an organized assortment (separated category), perceived variety of a goal-consistent category increases whereas perceived variety of a goal-inconsistent category decreases. This occurs because categories stimulate a more focused product examination, which in turn increases variety perceptions for the goal-consistent category at the expense of the other category. These in-category heterogeneity and out-category homogeneity effects were prominent when participants had a strong interest in organic wines. In addition, organizing an assortment according to consumers' interest also increases the likelihood that consumers choose a product in line with their interest.

6. Experiment 2: Explicit goals, perceived variety, and store evaluations

Experiment 2 extended the first experiment in several ways. Whereas experiment 1 investigated intrinsic interest in the category of organic products, experiment 2 investigated the effects of an explicit (external) shopping goal. We also explored whether increased

perceptions of variety in a category influence intentions to visit the store, intentions to recommend the store to friends, and perceived suitability of the store for purchases in specific categories. To rule out a possible effort explanation (switching screens in the separate category condition) for the results obtained in the previous experiment, both categories were presented on the same screen. In addition, a second control condition was added, in which products were presented in separate groups that were unrelated to the goal, to rule out that effects are due to separation in categories *per se* rather than to the match between goal and category, and to present a more realistic alternative assortment structure.

6.1. Method

6.1.1. Participants and design

Participants ($n = 157$ students, 72 males and 85 females, average age 21 years) were randomly assigned to one of the conditions of a 3 group design (organization: goal-related, goal-unrelated, vs. mixed display).

6.1.2. Procedure

The experiment was computer-based. Participants received instructions to select a tea from an assortment of a retailer. All participants were asked to imagine the following situation: “Imagine: You want to buy a box of tea, to drink while studying for the upcoming exams. You will drink the tea during the day and want to stay alert, so you are looking for a tea with caffeine”. So, all participants were given the goal to buy tea with caffeine.

Product assortments consisted of 24 different teas, presented on a single page in all conditions. In the mixed display condition, the teas were placed in random order, whereas in the two separated display conditions, the teas were separated in two categories by a divider line. These two categories were either teas with and without caffeine (goal-related display condition) or teas with and without fair trade logo (goal-unrelated display condition). In all

conditions, decaf teas and caffeine free teas were labelled as such on the tea packages, and fair trade logos were present for half of the teas with and half of the teas without caffeine. By clicking on a tea, participants obtained information about its flavor and type; whether the tea contained caffeine was noted here as well. Example screen shots are provided in Appendix B. After making their choice, participants answered several questions. They received 7 Euro in thanks for participation and the experiment took on average 4.4 minutes to complete.

6.1.3. Measures

Which tea was chosen was recorded and coded as either with or without caffeine. Adherence to the task was high, with on average 91.1 % of participants choosing a caffeinated tea. Hence, this variable was not analyzed further.

Perceived variety was measured using the same items as in experiment 1, but now using 100-point unnumbered sliders, and applied to caffeinated and non-caffeinated teas ($\alpha = .96$ and $\alpha = .93$, respectively). Perceived similarity was measured using three items (“I thought that the types of tea looked a lot alike, for the tea with caffeine”, “There was high resemblance in the teas with caffeine”, “There were many similarity between the teas with caffeine”, $\alpha = .92$; same items for teas without caffeine, $\alpha = .86$), also using the sliders.

Several constructs related to store preference were measured on 100-point unnumbered sliders. Specifically, we measured category-related appropriateness perceptions (two items: “This store is very suitable for someone who wants to buy tea with caffeine” and “This is a good store to buy tea with caffeine”, $\alpha = .88$ and same items for tea without caffeine, $\alpha = .82$), category-related intentions to visit the store (“I would certainly want to visit this store when I need tea with caffeine”), and category-related intentions to recommend the store (“I would recommend this store if a friend wants to buy tea with caffeine”). The same items were repeated for tea without caffeine.

6.2. Results

6.2.1. Variety perceptions

Variety perceptions were analyzed using a repeated measures general linear model with organization as between-subjects variable and category (i.e., caffeinated vs. non-caffeinated teas) as within-subjects variable. The expected two-way interaction between organization and category was marginally significant ($F(2, 154) = 2.60, p = .077$). Figure 3 provides a visual representation of our results.

[insert Figure 3 about here]

For perceived variety in caffeinated teas, results showed a significant effect of organization ($F(2, 154) = 10.90, p < .001$). Pairwise comparisons showed that participants perceived more variety in these goal-consistent caffeinated teas in the goal-related display ($M = 71.70$) than in a goal-unrelated display ($M = 53.46, p < .001$) or in a mixed display ($M = 54.19, p < .001$). The latter two conditions did not significantly differ ($p = .87$). For perceived variety in non-caffeinated teas, results showed no significant effect of organization ($F(2, 154) = 2.07, p = .13$). Thus, in this study we found evidence in line with in-category heterogeneity. Importantly, in-category heterogeneity occurred even when all products were presented on the same screen (ruling out that effects are due to switching between pages) and in comparison to a goal-unrelated display (ruling out that effects are due to group size). In contrast to this in-category heterogeneity effect, variety perceptions in the out-category did not significantly depend on assortment organization. This illustrates that variety perceptions for the in-category differ from those for the out-category, although the out-category homogeneity effect was not significant in this study.

6.2.2. Store appropriateness, intentions to visit, and intentions to recommend

Using ANOVAs with organization as between-subjects variable and category (caffeinated vs. decaffeinated tea) as within-subjects variable, effects were examined on (1)

the appropriateness of the store for buying caffeinated versus non-caffeinated tea, (2) intentions to visit the store, and (3) intentions to recommend the store to a friend. As expected, we found significant organization x category interactions for all three dependent variables ($F(2, 154) = 4.79, p = .010$ for appropriateness; $F(2, 154) = 4.25, p = .016$ for intentions to visit; $F(2, 154) = 5.84, p = .004$ for intentions to recommend). In all cases, the store was evaluated more positively for caffeinated teas in the goal-related display condition than in the other two conditions, whereas store evaluations for non-caffeinated tea did not significantly differ across conditions. Details are provided in Table 1.

[insert Table 1 about here]

6.3. Discussion

Again, evidence was found for an in-category heterogeneity effect: participants with a goal to purchase caffeinated tea perceived more variety in caffeinated tea when these products were organized in an assortment that was related to their goal, compared to when products were presented in a goal-unrelated or mixed display. In this experiment, no out-category homogeneity effect was observed and perceived variety scores for the decaffeinated teas were quite high. One reason for these relatively high variety perceptions of decaffeinated teas, and perhaps also the absence of an out-category homogeneity effect here, is that people would usually expect to see less variety in decaffeinated teas compared to caffeinated teas as this category is typically small. Whereas consumers' expectations about the variety offered in a category is beyond the scope of the present study, it would be interesting to see how the size of a given category (large vs. small) would affect our proposed in- and out-category effects. In the studies so far, the goal-consistent and goal-inconsistent categories were of equal size. In reality, categories typically differ in size, often substantially so. One of the main purposes of the next experiment is to investigate how the size of categories (i.e., small vs. large)

influences the proposed effects of assortment organization. We expect that assortment size is a boundary condition: Increased attention to a goal-related category and comparative processes to differentiate products should only increase perceived variety for the category when the number of products is sufficiently large. When a category consists of only a few different products, thus having low actual variety (cf. Hoch et al., 1999; Kahn and Wansink, 2004), increased attention would instead emphasize the low degree of variety. In that case, variety perceptions for the goal-consistent category should not increase, and we might even observe a reverse effect in which the variety perceptions of the goal-consistent category decrease. Experiment 3 empirically tested this.

7. Experiment 3: Size Matters

In the previous study, all participants had the same goal (“buy caffeinated tea”), and the effect of goal-related category organization was investigated by manipulating the organizing attribute of the assortment (related [contains caffeine or not] vs. unrelated [fair trade or not] vs. mixed). In the present study, we kept the organizing attribute constant (related [contains caffeine or not] vs. mixed), but we manipulated people’s goals (to buy caffeinated vs. decaffeinated tea). When people have the goal to look for caffeinated teas, an in-category heterogeneity effect was expected for caffeinated teas, and an out-category homogeneity effect for decaffeinated teas. Likewise, when the goal is to buy decaffeinated tea, we expected an in-category heterogeneity effect for decaffeinated teas and an out-group homogeneity effect for caffeinated teas. In line with the previous experiment, we directly manipulated people’s goals, this time by instructing participants that their friend requests a caffeinated (vs. decaffeinated) tea thereby ensuring that categories containing caffeinated (vs. decaffeinated) teas was the focus of interest. The tea assortment (20 flavours of tea) contained either a few (4) or many (16) goal-consistent products, and we expected that people perceive

more variety in goal-consistent products (caffeinated or decaffeinated teas, depending on task instructions) in the separate compared to the mixed display condition (i.e. the in-category heterogeneity effect) when the goal-consistent category was large, but not when there were just a few goal-consistent products.

7.1. Method

7.1.1. Participants and design

One hundred-fifty nine undergraduate students participated in this experiment in return for a monetary compensation of 7 Euro. They were randomly assigned to one of the conditions of a 2 (organization: separated vs. mixed display) x 2 (goal: caffeinated vs. decaffeinated) x 2 (size: large vs. small goal-consistent category) design. Ninety-four of the participants were male and 65 female, with an average age of 20.3 years.

7.1.2. Stimuli and procedure

As in experiment 2, bagged tea of the brand Stash was used. Sixteen flavours of caffeinated and sixteen flavours of decaffeinated were selected, and 20 of them were randomly presented on a one-page computer screen, either in an organized display (i.e., caffeinated and decaffeinated teas separately) or in a mixed, unorganized, display, depending on the organization condition. Participants were asked to choose a tea flavour in this simulated online tea store. In the caffeinated goal condition, they were instructed: “Imagine that you regularly drink a cup of tea with your roommate. You are planning to buy a pack of tea. Your roommate does not like decaffeinated tea, and asks you to buy caffeinated tea.” In the decaffeinated goal condition instructions were similar, except that participants were instructed that their roommate does not like caffeinated tea and asks to buy decaffeinated tea.

In the large in-category condition, participants were presented with 16 teas in line with their goal (i.e., 16 caffeinated teas in the caffeinated goal condition or 16 decaffeinated teas in

the decaffeinated goal condition) and (a random sample of) 4 teas not in line with their goal (i.e., 4 decaffeinated teas in the caffeinated goal condition or 4 caffeinated teas in the decaffeinated goal condition). In the small in-category condition, they were presented 4 teas in line with their goal, and 16 teas not in line with their goal. A line visually separated the two categories in the separated display condition, and labels were provided for these categories. All decaffeinated teas were indicated as such on the tea pack (either “decaf tea” or “caffeine free” is mentioned). As in the previous experiments, clicking on a bag of tea provided participants with more information about that tea, and the opportunity to either buy that tea, or to return to the tea assortment. After choosing a tea, they all answered several questions.

7.1.3. *Measures*

Choice of tea was recorded and coded as either caffeinated or non-caffeinated. As in the previous experiment, adherence to this request was high, with overall 86.2 % of participants following the request, and the variable was not analysed further.

Variety in the category was again measured using an unnumbered 100-point slider. The same three items were used as in the previous experiments ($\alpha = .96$ for caffeinated and $.95$ for decaffeinated). In addition, to test effects on store consideration, we asked participants to what extent they believed that this online store would be “a good store to buy caffeinated teas” and “a good store to buy decaffeinated teas”.

7.2. *Results*

7.2.1. *Perceived variety*

A four-way repeated measures analysis of variance was conducted with goal, organization, and size of the in-category as between-subjects variables, and category (caffeinated vs. decaffeinated) as within-subjects variable. Results of this analysis can be found in table 1. As can be seen in this table, this analysis revealed a significant four-way

interaction ($F(1, 151) = 31.12, p < .001$) as well as other significant main and interaction effects.

[insert Table 1 about here]

When the in-category was large, results showed a significant category x organization x goal interaction ($F(1, 151) = 32.45, p < .001$). Pairwise comparisons confirmed evidence of in-category heterogeneity effects, both when the goal was to choose a caffeinated tea ($F(1, 151) = 3.88, p = .051; M_{separated} = 73.19$ vs. $M_{mixed} = 59.17$ for perceived variety in caffeinated teas) and when the goal was to choose a decaffeinated tea ($F(1, 151) = 4.45, p = .037; M_{separated} = 86.30$ vs. $M_{mixed} = 71.56$ for perceived variety in decaffeinated teas). Overall then, participants perceived more variety in goal-consistent teas when these tea were presented in a separated ($M_{separated} = 78.25$) compared to a mixed ($M_{mixed} = 65.37$) display. Additionally, pairwise comparisons also confirmed evidence of out-category homogeneity effects, both when the goal was to choose a caffeinated tea ($F(1, 151) = 7.39, p = .007; M_{separated} = 35.33$ vs. $M_{mixed} = 54.82$ for perceived variety in decaffeinated teas) and when the goal was to choose a decaffeinated tea ($F(1, 151) = 46.76, p < .001; M_{separated} = 15.38$ vs. $M_{mixed} = 62.89$ for perceived variety in caffeinated teas). Aggregating the caffeinated and decaffeinated goal conditions, participants perceived less variety in teas *not* consistent with their goal, when these teas were presented in a separated ($M_{separated} = 25.36$) compared to a mixed ($M_{mixed} = 58.86$) display.

When the in-category was small, the pattern of results was different, as expected. Results showed a significant category x organization x goal interaction ($F(1, 151) = 4.86, p = .029$). Subsequent pairwise comparisons showed that the in-category heterogeneity effect was absent in the condition with the goal to buy caffeinated tea ($F(1, 151) = 0.96, p = .329$) and was reversed in the condition with the goal to buy decaffeinated tea ($F(1, 151) = 7.730, p = .006; M_{separated} = 25.18$ vs. $M_{mixed} = 44.87$ for perceived variety in decaffeinated teas). The

outgroup-homogeneity effect was also absent, both when the goal was to buy caffeinated tea ($F(1, 151) = 0.09, p = .764$) and when the goal was to buy decaffeinated tea ($F(1, 151) = 1.445, p = .231$). Figure 4 provides a graphical illustration of our effects.

[insert Figure 4 about here]

7.2.2. Store consideration

As with variety perceptions, a four-way analysis of variance was conducted with goal, organization, and size of the in-category as between-subjects variables, and category (caffeinated vs. decaffeinated) as within-subjects variable, now with store consideration as the dependent variable. Results of this analysis can be found in table 1. As can be seen in this table, this analysis revealed a significant four-way interaction ($F(1, 151) = 19.73, p < .001$) as well as other significant main and interaction effects.

When the in-category was large, results showed a significant category x organization x goal interaction ($F(1, 151) = 17.04, p < .001$). When the goal was to choose a caffeinated tea, a separated display did not affect store consideration for purchasing a caffeinated tea compared to a mixed display ($F(1, 151) = 0.16, p = .693$), but participants were less likely to consider the store for purchasing a decaffeinated tea when teas were separated ($M = 34.70$) than mixed ($M = 60.00; F(1, 151) = 12.16, p = .001$). When the goal was to choose a decaffeinated tea, participants were more likely to consider the store for the purchase of decaffeinated tea when a separated display was used ($M = 88.15$) than when a mixed display was used ($M = 74.10; F(1, 151) = 3.51; p = .063$). At the same time, they were less likely to consider the store for the purchase of caffeinated tea when a separated display was used ($M = 32.89$) than when a mixed display was used ($M = 59.70; F(1, 151) = 11.184, p = .001$). Overall then, the pattern of results thus confirms our expectations: With the single exception for the consideration of the store for the purchase of caffeinated teas when this was the goal, participants were more likely to consider the store for the in-category of products and less

likely to consider the store for the out-category of products when the display was separated rather than mixed.

When the in-category was small, results were again different, as expected. Here as well, we found a significant category x organization x goal interaction ($F(1, 151) = 4.67, p = .032$), and the pattern is in line with the results for variety perceptions. When the goal was to buy a caffeinated tea, store considerations were not affected by display ($F(1, 151) = 0.02, p = .904$ for store consideration for the purchase of caffeinated tea and $F(1, 151) = 0.26, p = .610$ for store consideration for the purchase of decaffeinated tea). When the goal was to buy a decaffeinated tea, store consideration for the purchase of caffeinated tea was likewise not significantly affected by display ($F(1, 151) = 2.44, p = .120$), but store consideration for the purchase of decaffeinated teas was lower in the separated display ($M = 37.00$) than in the mixed display ($M = 56.62; F(1, 151) = 6.67, p = .011$).

7.3. Discussion

As expected, both in-category heterogeneity and out-category homogeneity effects as a result of assortment organization are found when the in-category is large, but not when it is small. Hence, size of the category is an important boundary condition for these effects.

In this experiment, both categories are substantially different in size (4 versus 16 products). This is especially apparent in the separated display, where the larger category clearly overwhelms the smaller category. If organization would simply draw attention to this difference in category size, one would expect that participants in all conditions would see more variety in the larger category in a separated organization than in a mixed display. This is not the case. Only participants for whom the larger category contains the in-category products actually respond to the assortment organization and perceive more variety in this larger category in a separated display than in a mixed display. No such effect is found for

participants for whom the larger category contains out-category products. This shows that, as we have argued, focused attention to the category is essential to increase variety perceptions.

Assortment organization and consumers' goals not only affect variety perception, but also store consideration for future purchases. We find evidence that consumers are more likely to consider the store for a purchase in the in-category of products in the separated display (assuming that the category is of sufficient size), but less likely to consider the store for purchases in the (current) out-category of products. Thus, whereas the use of categories may be beneficial for stores when consumer preferences are relatively stable, they may be less beneficial when consumers are more inclined to switch between categories over time.

8. General Discussion

Organizing an assortment (e.g., wines) into relevant categories (e.g., organic versus non-organic wines) guides consumers to goal-consistent categories. This has important implications for the decision making process and for how consumers evaluate the category. Consumers are more likely to choose a product that is in line with their goal, and they perceive more variety in their in-category of products and less variety in their out-category of products when a goal-relevant organization is used. The underlying process is one of more focused attention. In a goal-relevant separated display, consumers can more easily focus on products from the goal-consistent category at the expense of products from other categories, which leads to a differentiation of products presented in this goal-consistent category. Additionally, in a goal-relevant separated display, consumers are more likely to consider the store for future purchases in their in-category of products and less likely to consider the store for out-category products than in a mixed display. Thus, in the case of organic products, consumers who are interested in organics are more likely to choose organic products and appreciate the offered variety when a separated category of organic products is used.

Our study furthermore shows that the size of the in-category is a boundary condition for the in-category heterogeneity effect. When a category is small, variety perceptions do not increase as a result of using separate categories. For a sufficiently large category, consumers notice and appreciate the offered variety and in-category variety perceptions increase. For a small category, they notice more readily that variety is low and in-category variety perceptions do not increase.

These results extend prior research on the influence of the point-of-sale environment on consumer choice and variety perceptions. Prior research has shown how consumers can be induced to choose more healthy or sustainable food products based on the position of these products in a display (Bucher et al., 2016; Kongsbak et al., 2016; Missbach & König, 2016) and the layout of the assortment (van Herpen et al., 2015). Building on this, the current study shows that the effect of assortment organization depends on consumers' purchase goals. Using a separate category for special products, such as organics, will increase the purchase of organic products among consumers who are interested in organics, but at the same time allows consumers who are not interested in this category to bypass these products. Depending on the type of consumers who visit a retailer, placing organics separately from mainstream products could thus increase or decrease their sales levels. Moreover, whereas previous studies have mainly focussed on point-of-sale contexts, we show that effects of assortment organization are relevant in online contexts too.

The results also extend prior research in other ways. For instance, prior research has indicated that larger assortments are processed differently from smaller assortments, as they may trigger simplifying heuristics (Iyengar and Lepper, 2000; Broniarczyk et al., 1998), but this alone cannot explain why two categories of equal size receive different variety ratings. Similarly, prior research has indicated that an increase in the number of categories can increase perceptions of assortment variety (Chang 2011; Mogilner et al., 2008). The current

study extends this and shows that variety perceptions of specific categories are affected differently and can increase or decrease depending on consumer goals. Consumers indeed seem to bypass categories that do not match their shopping goals, as first demonstrated by Morales et al. (2005), and this can have serious implications for the perceived variety of products presented in these categories. Hence, rather than showing that *total* assortment variety can either increase or decrease, as prior research has focused on, our results show that variety perceptions *within* categories are affected differently depending on consumer goals.

8.1. Implications

The finding that consumers perceive more variety in goal-consistent products, but less variety in goal-inconsistent products when an assortment is organized according to the relevant goal, has important implications for food retailers. More specifically, when interest in a category is high, consumers perceive more variety in and are more likely to choose from this category, which has implications for the way retailers organize their assortments. Goal-related displays will increase the likelihood that consumers will re-visit and recommend the store to friends. Importantly, results also suggest that using a separated display might backfire. Separated displays are only helpful when the goal-consistent category is sufficiently large and consumers' initial interest in the category is also high (as consumers who are less interested will bypass the category more easily).

Our three studies used simulated online stores. Yet, given that prior research on the effects of assortment organization in online stores (Chang, 2011) has shown results that are in line with effects found in real-life stores (Mogilner et al., 2008), implications are likely to extend to real-life stores as well.

New food products are constantly being introduced, and some of these concern drastically new products defining new product areas. Currently, it is common for many

retailers to first introduce a new product area in a separate section to increase awareness and only after awareness is high to place these on the mainstream shelf (Dahm, 2005). This has several advantages, as the separate section tends to be a more sheltered environment, with lower volume expectations and often no slotting fees. In fact, retailers have been given the advice to use a separate organic section in their stores to attract new consumers and increase awareness (Lazarus, 2010). This leads to a situation where “integration of ... [organic] products into mainstream aisles has become more common in regions where the natural and organic market is well-developed” (Dahm, 2005). Yet, our results suggest that this is opposite to what would be advisable from a consumer behaviour viewpoint. Only when consumer interest is high, a separate location will stimulate sales as well as variety perceptions.

Also, food retailers may want to entice consumers to buy from a specific category (Dawson, 2013). For instance, retailers may want to increase sales of more sustainable choices (e.g., organic or fair trade products) or of higher-margin products (e.g., products of the store brand). Retailers who want to promote sustainable or otherwise ‘special’ products as part of their store image often present these products in a separate section. Whereas this should increase the salience of the attribute, it may not necessarily increase the perception of variety in these products and sales levels for these products. As discussed, when consumers’ initial interest in the product category is low, retailers may be better off by integrating these products in the existing assortment. When retailers want to draw consumers who are interested in niche products away from these products (e.g., draw consumers from a niche brand to a store brand) a mixed display may also be beneficial. Instead of presenting the niche brand as a separate category, a mixed display can help retailers increase the purchase of store brands among consumers whose initial interest was with the niche brand.

8.2. *Limitations and future research*

There are several limitations to our study which could inspire future research. First, we focused on product categories (tea, wine) for which consumers generally do not have a strong internal category structure. When a strong internal category structure exists, deviations from this structure may not be appreciated by all consumers (Morales et al., 2005; Poynor and Wood, 2010).

Second, our empirical studies used student samples and generalizability to non-students should thus be considered. Several prior papers on the effects of assortment organization have included studies with both student and non-student samples, showing similar effects across these studies (Areni et al, 1999; Mogilner et al., 2008; Poynor Lambertson & Diehl, 2013). Studies on assortment organization using children and using adults have also resulted in comparable effects (Kahn & Wansink, 2004). Therefore, it seems likely that our results will also replicate to non-student samples.

Third, we examined categories within a product assortment. Yet, the distinction between what is a category is malleable to some extent (Sujan & Dekleva, 1987): within a category of drinks, tea could be seen as a subcategory. Regardless of what is considered the overall category, in-category heterogeneity and out-category homogeneity effects could occur. Thus, within any overall category (e.g., drinks), consumers should perceive more variety in the in-category for which they visit a store (e.g., tea for a tea-lover) and less variety in the out-category (e.g., coffee) in a separated display than in a mixed display.

Moreover, our studies involved simulated online stores, a relevant application due to the growth of online food retailing (Dawes & Nenycz-Thiel, 2013). Even though some differences in consumer responses to assortment displays on computer screens versus in real-life stores exists, especially related to how consumers respond to the display location of specific products (van Herpen et al., 2016), effects of assortment organization appear to

generalize across different ways of assortment presentation (Areni et al., 1999; Mogilner et al., 2008; Simonson & Winer, 1992). Future research could further examine the generalizability of our findings to real-life stores.

In our experiments, the categories could be easily switched between by a single mouse-click (experiments 1) or were presented on the same screen (experiments 2 and 3). The latter rules out that additional search effort required in the separated display is a necessary condition for the in-category heterogeneity effect. Even when products can be easily viewed on the same computer screen, this effect on perceived variety appears. Still, additional search effort in a separated display might increase the size of these effects as future research may examine. In reality, comparisons across categories can be especially difficult, for example when these are placed in separate areas of the store. This might increase consumers' tendency to focus on a category and magnify the effects that we found.

Another avenue for future research is to investigate the importance of specific category labels. In all three experiments, the categories were explicitly labelled (e.g., "organic" versus "non-organic" section), hereby increasing the salience of the organizing attribute. It remains unclear whether similar effects will be observed when it is less obvious why products are placed in a separate subsection. Without a clear category label present, consumers' prior knowledge and internal category representations will probably affect the ease with which the organizing attribute, and its goal-relatedness, will be noticed.

Finally, future research could examine the effects of on-line sorting tools, which allow consumers to impose different organizations on a product assortment. Prior research has examined how sorting tool in online shopping affect choice quality (Diehl, 2005) and decision processes (Häubl & Trifts, 2000). Yet, effects of the use of sorting tools on perceived assortment variety have not (yet) been examined.

8.3. *Conclusion*

The present study examined how the presence of a separate category of products in an assortment (e.g., a separate shelf section for organic products) affects consumers' perceptions of variety (of both organic and non-organic products). A separated display allows consumers to focus their attention better than a mixed display. This subsequently tends to increase the perceived variety for 'in-category' products, that is, for the specific category that is in line with consumers' goals. At the same time, it tends to decrease the perceived variety for 'out-category' products, that is, for the alternative category. Assortment organization can thus trigger in-category heterogeneity and out-category homogeneity effects.

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Appendix A

Wine assortments used in Experiment 1

Click on the picture of a wine bottle for more information



Mixed display

Click on the picture of a wine bottle for more information



Click on the picture of a wine bottle for more information



Separated display, presented on two pages (one page visible at a time)

Appendix B

Tea assortments used in Experiment 2



Met cafeine

Zonder cafeine

Separated display, goal-related



Fair Trade

Overige

Separated display, goal-unrelated



Mixed display

Table 1: ANOVA results and means for store appropriateness, intentions to visit, and intentions to recommend, experiment 2

Dependent variable	Effect of organization for caffeinated teas	Effect of organization for non-caffeinated teas
Appropriateness for buying	$F(2, 154) = 11.27; p < .001$	$F(2, 154) = 1.81; p = .17$
Goal-related display	71.55 ^a	
Goal-unrelated display	59.13 ^b	
Mixed display	53.77 ^b	
Intentions to visit	$F(2, 154) = 5.67; p = .004$	$F(2, 154) = 0.95; p = .39$
Goal-related display	66.21 ^a	
Goal-unrelated display	56.62 ^b	
Mixed display	50.67 ^b	
Intentions to recommend	$F(2, 154) = 6.23; p = .003$	$F(2, 154) = 0.94; p = .39$
Goal-related display	66.64 ^a	
Goal-unrelated display	57.88 ^b	
Mixed display	51.21 ^b	

Note. Means with different subscripts significantly differ from each other at $p < .05$.

Table 2: ANOVA results for perceived variety and store consideration, experiment 3

	Perceived variety		Store consideration	
	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>
Category	6.10	.015	2.98	.086
Category * goal	6.23	.014	0.46	.500
Category * organization	0.17	.685	0.53	.469
Category * size	0.44	.507	0.03	.855
Category * goal * organization	6.01	.015	1.90	.171
Category * goal * size	161.54	<.001	109.96	<.001
Category * organization * size	4.01	.047	2.32	.130
Category * goal * organization * size	31.12	<.001	19.73	<.001
Goal	1.14	.286	4.39	.038
Organization	12.62	.001	4.24	.041
Size	1.87	.174	1.63	.204
Goal * organization	4.87	.029	0.01	.923
Goal * size	0.51	.477	0.06	.804
Organization * size	2.10	.149	2.48	.117
Goal * organization * size	1.87	.174	1.44	.232

Note. Degrees of freedom are 1, 151.

Figure 1

Perceived variety as function of category and interest in organic, for separated and mixed display; experiment 1

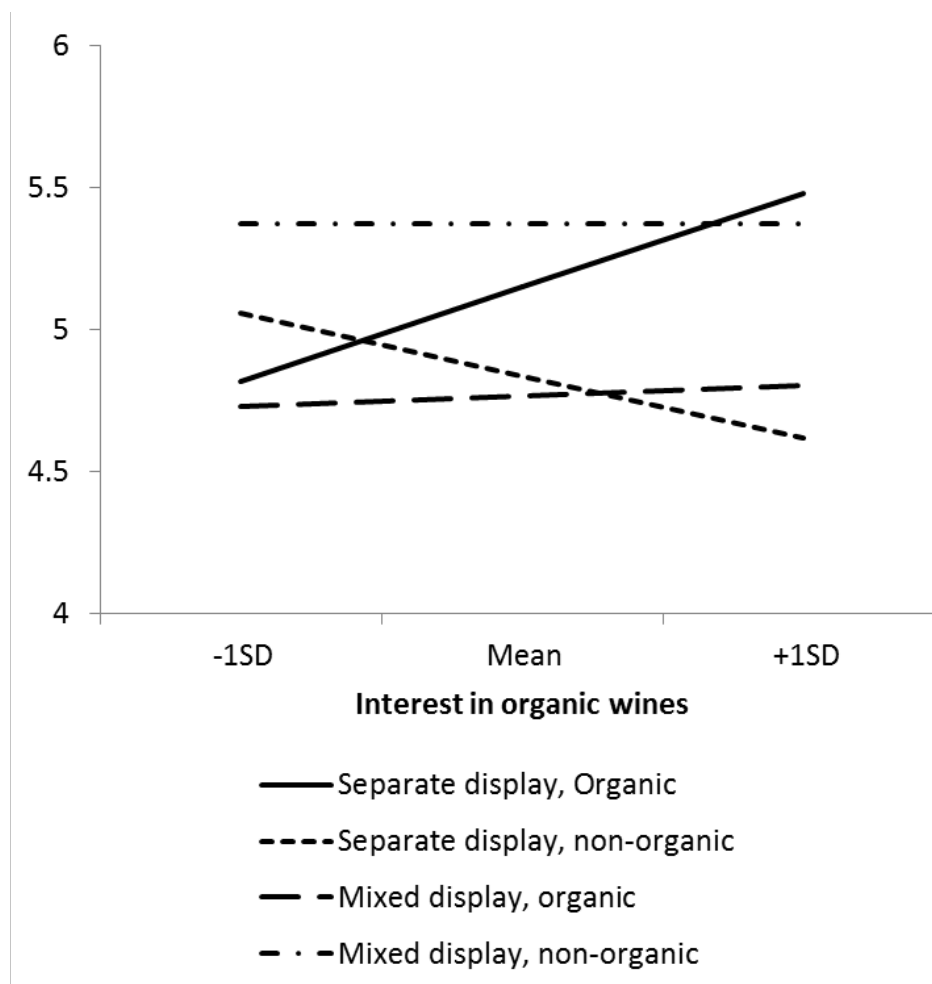
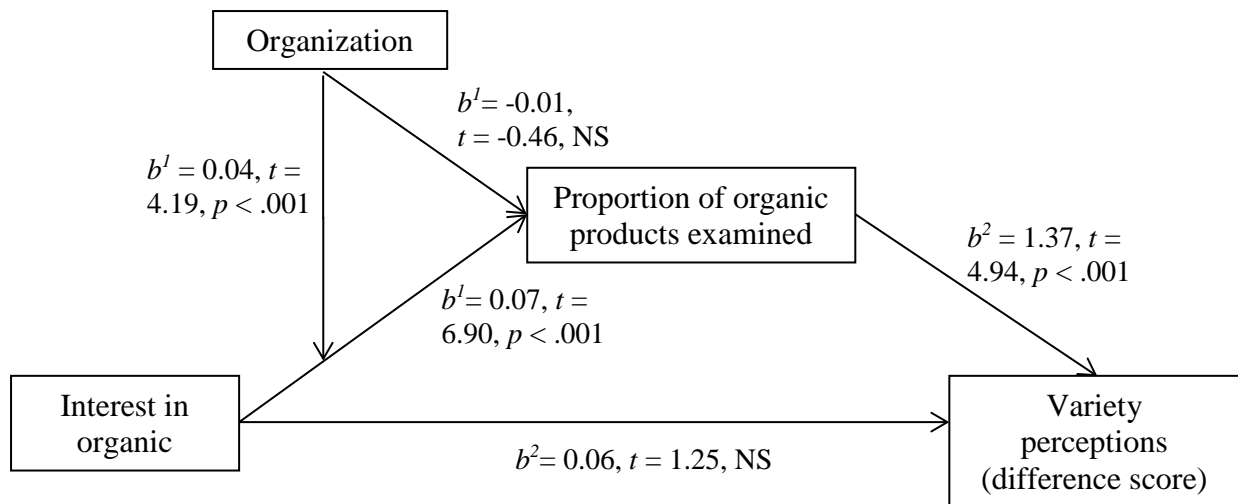


Figure 2

Proportion of organic products examined as a mediator for variety perceptions; experiment 1



Note: Organization coded as 1 = separated display, -1 = mixed.

Interest in organic is a mean-centered variable.

Variety perceptions are perceived variety in organic products minus perceived variety in non-organic products.

b^1 = regression coefficients representing the effect of goal, organization, and their interaction on the proportion of organic products examined (i.e., the mediator).

b^2 = regression coefficients representing the effect of goal and proportion of organic products examined on the dependent variable.

Figure 3

Perceived variety as a function of assortment organization; experiment 2

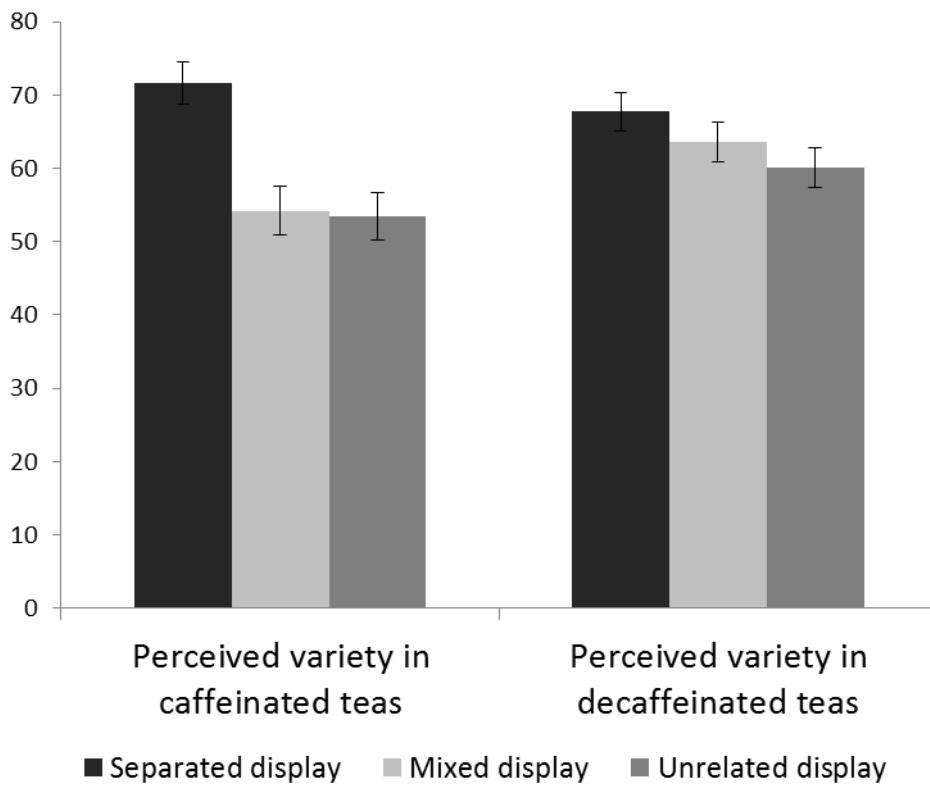
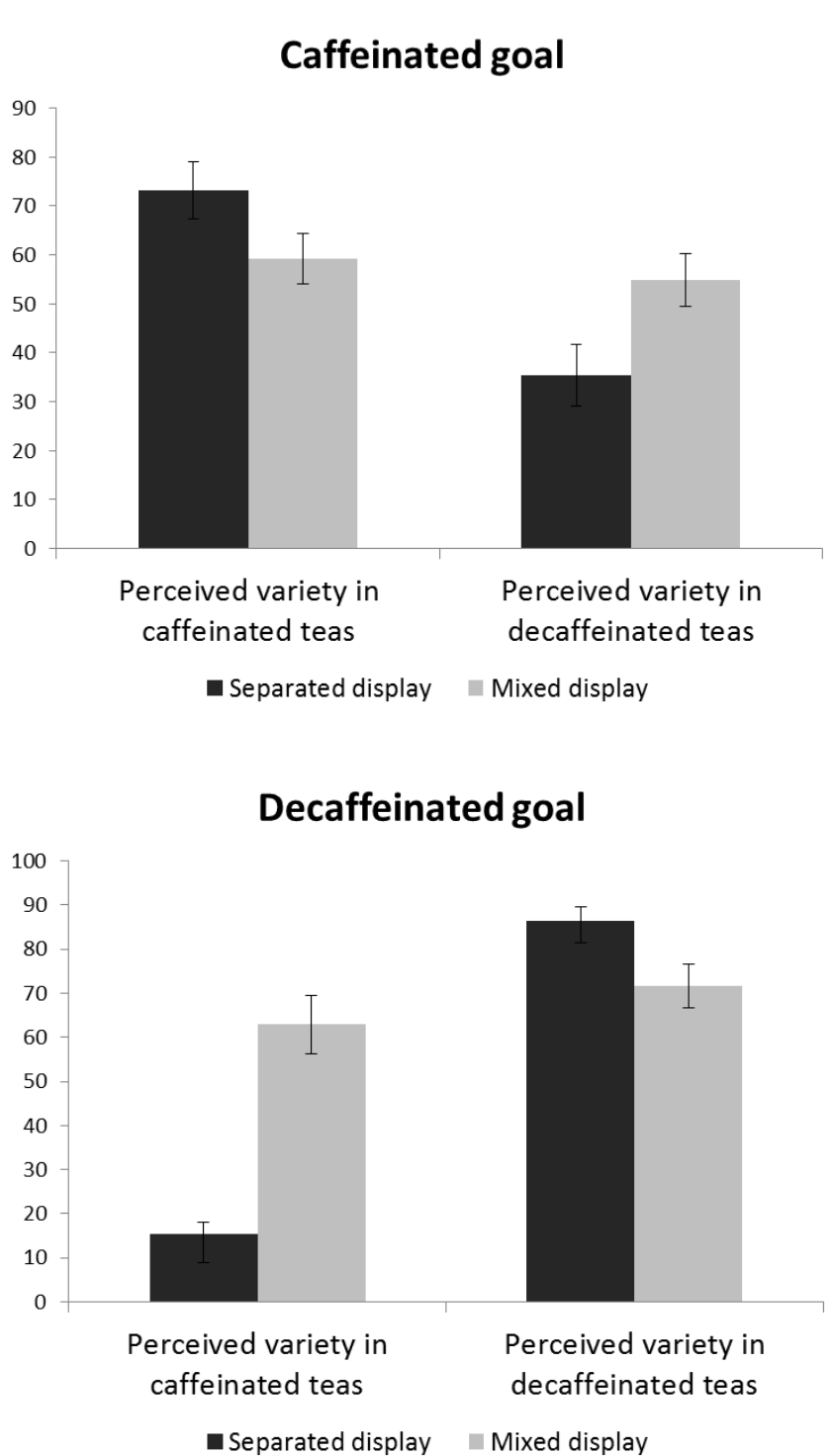


Figure 4

Perceived variety as a function of size of the category, goal, and display; experiment 3

A. Large in-category



B. Small in-category

