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The proof of the pudding: On space utilization in retail practice and academia. A literature review and an exploratory study

Abstract

Category management is a process were retailers and FMCG manufacturers collaborate to get the best out of their expertise. However, despite the fact that numerous research studies have shown that visual stimuli in the in-store environment (i.e. bottom-up factors) have en effect on the customers' decision processes, most of the work done in the category management process is of top-down character. Hence, the decision trees, segmentation, and planograms are construed as if the shopping would occur in the heads of the shoppers without influence from the visual input provided by the range presentation in the store. In this paper we review research that could be useful in the category management process and exploratory test some of the ideas from the literature review in a field study. The results show that the category management process could benefit from including some research relying more on a bottom-up approach.

Introduction

It is widely recognized that a large share of all purchase decisions are influenced while the customers are in the store (Stilley, Inman, and Wakefield 2010). Often the customers postpone their decisions and go to the store with expectations to find inspiration of what to buy when they see the assortment (Lynch & Srull 1982; Baylay & Nancarrow 1998). In fact Stilley et al. (2010) even showed that customers planned to make unplanned purchases. The customers new they would spend more during their store visit than the items they could specify upon entering the store. Hence, it is widely accepted that bottom-up factors influence in-store decision-making (Chandon et al. (2009).

This, of course, is seen as an opportunity for retailers and FMCG companies working with in-store marketing. Hence, it is not surprising that different reports highlight that around 60% of the total marketing budget of FMCG companies go to in-store marketing (Ailawadi et al. 2009). Moreover, as competition in retail has intensified, retailers have had to move beyond a product focus to a focus on the store atmospherics such as layouts, fixtures, signage, etcetera (Spence et al., 2014). However, it is not easy to transform and convey the inspiration that these companies want to communicate to the customers. The stores are not only a showroom but also a space-efficient pantry for thousands of products competing for a limited space.

Category management is a process in which manufacturers and retailers collaborate to make use of the FMCG company's category-specific knowledge and the retailer's shopper knowledge. The aim is of course to create a range presentation that helps the customer to automatically become inspired and find what he or she wants (and more?). In the category management process, the involved companies often have a top-down focus, using focus groups and other interview techniques to understand the customers' decision processes. These decision processes are then compiled into decision trees. The decision trees, in their turn, are used to segment the assortment into various subcategories, which in their turn are used as a basis for which products should be put adjacent to each other in the planograms.

However, is it necessarily so that these top-down processes elaborated on in the decision trees go hand in hand with the shopper behavior in the store? There are several studies showing support for in-store factors (i.e. bottom-up factors) affecting customer behavior. Research has proven the effectiveness of displays, increased number of facings, signage etcetera (cf. Grewal et al., 2014). An intriguing example, comparing category management's top-down ideas to a bottom-up perspective, is found in the study by Drèze, Hoch, and Purk (1994). In the study the authors tried to make it easier for the customers to find the right cereals by segmenting the products into three subcategories (all family, kids, and adults). This was in accordance with the industry's thinking regarding the decision tree. However, by organizing the shelves in a manner so that all products within a subcategory (e.g. kids cereals) where adjacent to each other, the sales fell by 5% as opposed to when the assortment was presented brand-by-brand. Possibly the customers bought less when they were only presented to competing, and not complementary, products. Hence, sometimes ideas like decision trees need to be complemented by field studies to reach the full potential.

Purpose and structure of the paper

The purpose of this study is twofold. First we will make a literature review that will bring us to the conclusion that several bottom-up factors too need to be taken into account in the category management process. Second we will do an exploratory field study built on ideas from the literature review to see if we can add useful information to the category management process. The methods we use and the metrics we analyze should be seen as explorative rather than conclusive.

By top-down we mean processing that has its' origin in the mind of the consumers. By bottom-up factors we mean stimuli surrounding the customers that are being picked up by their senses to be processed to possibly shape their in-store behavior.

In the remainder of this paper there will first be a literature review. After that we move into the methods and results section. Finally there will be a discussion and a section on future research.

Literature

This literature review contains two sections. First we cover three research areas that we think are relevant to, and hence should become parts of the category management process. After that there will be a paragraph about research on category management.

The literature we cover in the first section is retail research that probably would benefit any category project with the aim of creating a better store solution. A common factor in all the research in the review in this section is that it has a bottom-up focus. If these aspects are neglected in the category management process, and we think that is the case today, there is a risk that the results will be too theoretical. The first of the three areas we adress regards research on how sales of individual items can be enhanced by *space management*. This area is in one way incorporated in the category management process since the output of the process is a planogram and a planogram is a space management tool. However, the problem is that in category management, space management is seen as an output and not as an input to the process. Previous research has shown that there is a wide variation of the results of space management. For instance, the effects depend on the category (Curhan 1972) as well as the execution (Frank and Massy, 1970). Hence, the type of knowledge generated within this research field needs to be taken in earlier in the category management process. A second area of research that we will touch upon is *the visual appearance of the range*. This area differs from the first in that it is more of a perceptual image that is the focus of the analysis. Finally, the third research area regards research on *visual processes* that the customers use to navigate through the store. The ambition is not to in detail go through everything but rather to contribute by highlighting areas of research that could or should be of interest to managers and researchers involved in the category management process.

Research on space management

One area of research on bottom-up factors that received early attention was the study of space elasticity. Several studies between the second half of the 1960-ies and 1980-ies delivered findings that can be seen as parts of a larger puzzle as they focused on the sales of individual brands (Hall, Kopalle, and Krishna, 2010). In these studies it was for instance found that the average space elasticity was approximately 0.2 (Curhan, 1972

and 1973), that products differed in how sensitive they were with relation to space elasticity (Cox 1964 and 1970). That the differences in space elasticity also were true for entire departments (Desmet & Renaudin, 1998). Those products, which were already selling well were more space elastic (Frank & Massy, 1970). Furthermore it was found that space elasticity was dependent on the shelves height (Frank & Massy, 1970) and that it differed between brands (Curhan, 1973).

Some large-scale experiments were run with the ambition to find general laws regarding display effects. For instance Curhan (1974) dug deep for display effects in the fruit and vegetable department. He found that space elasticities were higher for these categories than for dry goods and that there as a lot to learn from dividing the department into smaller categories. Drèze, Hoch, and Purk (1994) found that the products' vertical position was more important than the horizontal one and that positioning was more important than the number of facings. In a couple of studies Wilkinson and colleagues Wilkinson et al. (1981) and Wilkinson et al. (1982) found like in the Curhan (1974) study, that in-store displays outperformed other types of campaign tools such as adds and discounts. Furthermore, numerous studies have shown the effect of working with special displays on sales (Chevalier, 1975a & b; and Nordfält, 2011 to mention a few).

From the early space optimization studies a couple of research stems developed. One stem was the development of algorithms for space optimization tools such as Spaceman or Apollo. The algorithms in these programs built on the pieces found in earlier research but also took the knowledge further. Anderson and Amato (1973) built in options to handle that different product lines had different space elasticities. Corstjens and Doyle (1981; 1983) included the option to take direct product costs into account and also they included the possibility to account for cross elasticities. Bultez (1989) elaborated on cannibalization, and Lim, Rodriguez, and Zang (2004) included variables such as horizontal and vertical positioning. Finally, Murray, Talukdar, and Gosavi (2010) tried to make planograms more realistic by including prices, display facing areas, package orientations, and shelf-space locations. A couple of studies have also been undertaken to measure the effects of working with space optimization (Yang and Chen, 1999).

Research on the visual appearance of the shelf

Even though the typical space optimization program can handle such factors as individual items' space elasticities, the optimal number of facings, how to position complementary products and so on, it typically misses out on such factors as the organization of the assortment. Hence, a rather dissimilar area of bottom-up driven research is more focused on the visual qualities of the products. Hoch, Bradlow, & Wansink (1999) showed that color and shape of the packages are important aspects of how the shelf is perceived by the customers. Broniarczyk et al. (1998) showed that the organization of the assortment was important to reach the full potential of a deep assortment. Kahn & Wansink (2004) and Kahn et al. (2013) take the analysis of color and organization one step further by showing how to, in detail, organize the shelf to increase the sales. According to these studies it is not only the facings and the shelf level that matters. It also becomes important if for instance eight package facings are put next to each other in a horizontal row (1 x 8), or if they two packages are put on top of each other in four rows (2 x 4), or if there are four packages on top of each other in two rows (4 x 2) (Nordfält et al, 2014).

Finally, Redden and Hoch (2009) show that a visually scattered shelf can be processed more as one unit if a visual frame surrounds it. This last finding resembles the wholesale packages that sometimes are used in the store shelves for some products (e.g., potato chips). The findings could also be used to explain the effects of sales stands that can work as a frame for the products. These studies on the visual appearance of the products in the shelf are reach in valuable information for the retailers but they are rarely used in the same kind of systematic way as the planograms are.

Research on holistic and parallel visual processes

Another stream of retailing research that is seldom included in the discussion of category management and space optimization has focused on different visual processes depending on if the customer is orienting him- or herself, evaluating a product or verifying a choice (Russo & Leclerc, 1994). Early studies by Hoyer (1984) and Dickson and Sawyer (1990) used manual observers to identify the customers' decision processes. More lately path tracking (Sorensen, 2009) and eye tracking has been used (Gidlöf et al., 2013). In common for all these studies are indications that most of the visual stimuli in the store are never even seen but left unnoticed at the orientation stage. Hence, to be a truly useful optimization tool, the process of deciding on the new planogram should incorporate knowledge of both the browsing and a more analytical process. Old school retailers sometimes talk about the width of traditional shopping streets, and claim that they should be about seven meters wide since that ensures that a regular shopper can browse both sides simultaneously without having to turn his or her head. In environmental psychology Gil et al. (2009) found that "spatial accessibility", a combination of visibility of paths and the distance from the entrance, could explain 26 percent of customer movements. Very little of this kind of research is taken into consideration in the process of making the categories more shopper oriented. Moreover, Bezawada et al. (2009), test for order and distance effects of aisle and display placements of complementary categories. Their floor management approach is of course of vital importance for category planners.

Category management

In an effort to compile research and practical wisdom the retail industry together with academia started the category management project some twenty-five years ago. The process has been explained several times before so we will not go through it here (cf. Desrochers and Nelson, 2006). Two large-scale studies that came out of this effort were Fader and Lodish (1990) and Dhar, Hoch, and Kumar (2001). In both these studies the researchers elaborated on ways to categorize the assortment more from a behavioral, than from a production kind of perspective. The results are promising and several new insights can be drawn from them. For instance market penetration seem to have a great influence on campaign effectiveness, greater than purchase frequency (Fader and Lodish, 1990).

There have also been a number of previous studies with the aim to increase the relevance of the category management process. For instance in a study by Desrochers and Nelson (2006), the focus was to describe how the very same SKU (e.g. ketchup) could be seen as serving different purposes depending on where it was put in the store (e.g., in the condiment department or in the picnic isle).

The situation of category management 2014

However, despite all the accumulated knowledge generated throughout the years in the fields related to category management only some seem to be taken into account in the industry practice. And even if category management project and processes still go on today it seems to be with lower ambitions than fifteen years ago. In an interview with the chairman of the board of ICA, Sweden's leading grocery retailer, who also happens to own one of Sweden´s largest grocery retail stores, he explains that the category management effort ran into too many problems and the solutions often became too theoretical.

In the remainder of this paper we will go through a category management project that was undertaken during the first half of 2014. In this project we experimented with new methods building on ideas from the literature review above and based on more of a bottom-up approach.

Method and results

Since this study is of an exploratory character in which we did several small analyses we will not separate the method's section from the result's section. In the beginning of the chapter, however, we will explain some of the conditions for the study but later we will explain what we did and ho it turned out interchangeably.

The main Category management project and the top-down methods

The part of the main project reported in this paper started as smaller complement to a larger category management project between a large manufacturing company, Orkla, which is one of Scandinavia's leading FMCG companies, and Sweden's largest grocery retailer ICA. The aim of the main project was to improve and modernize the biscuits and crackers category. The purpose of the side project was to look for possible methodological improvements to the usual methods used in projects like this.

The main study included three data collections and a trend spotting. The data collections were: a focus groups study, a consumer safari where interviewers interviewed consumers in their homes and a shop along where researchers followed shoppers around a store. The results from these data collections and the trend spotting were then discussed during a workshop. After that project went into a rather separate phase where different segmentations were discussed. Examples of the discussed segmentations were if the products should be sorted dependent on their package shape, flavor, brand or consumption situation. There was also a discussion about possibly getting new fixtures before the pilot testing took place. The output of the project was new planograms that were pilot tested and then implemented.

In the following we will only highlight some of the, in our view, more interesting results. There is not room for an exhaustive description of all the data, but rather we will focus on what we think is enough to show the merits of the used approach.

The bottom-up methods

In this section we will go through our alternative bottom-up tests. The division between top-down and bottom-up methods is perhaps not as clear-cut as it could be. We use the terms rather metaphorically. For instance the shop along study in the major project could be considered a bottom up approach. As mentioned above our definition of top-

down versus bottom-up lies both in the focus of study and in where it is assumed that the decision process starts. We define a top-down approach as an approach where the idea is that the consumer is in control over the process since it starts in the consumers' mind. It could be likened to what Lynch and Srull (1982) refer to as memory-based judgments. A bottom-up approach on the other hand is when a visual or other stimuli in the store captures the attention or otherwise shapes the processing of the customer. This could be likened to what Lynch and Srull (1982) refer to as stimulus-based judgments. Consequently, in the methods we used we tried to draw conclusions from the store and the shelf layouts to see how they had an effect on purchase behavior. Hence, instead of having a decision tree in the mind of the consumer as a point of departure we looked at the physical environment of the store and the range presentation to see if and how it had shaped the customer behavior.

It should be noted that the tests below build upon existing data. Hence, we have not been experimenting. However, most retailers, even chain store companies, have a rich variety of different store layouts, fixtures, signs, planograms, etcetera. This variety can be used for retail analytic purposes. We are of the opinion that the retailer can learn a lot by comparing the effects of the variety of different already implemented solutions.

An initial step was to decide on which stores we should include in the study. We needed 12 stores to do the in-depth study explained below (of which only nine were used in all analyses for logistic and data collecting issues) and 20 more stores for a basket analysis. We had two arguments that we used in this selection process. Firstly we wanted to go to both large and small stores. This was because we figured that the shopper would behave differently if the shopping trip were more of a trip to a convenience store than a major shopping trip (Kahn & Schmittlein, 1992). Hence we selected some stores from ICA's large store format (ICA MAXI – a hypermarket) and some from the smallest format (ICA Near – a convenience store). Secondly we wanted some spread in how good the stores were doing in our target category, cookies and crackers. Hence, we sorted the stores on the cookies and crackers share of the stores' total sales. This measure, however, did not prove to be so useful since the spread was rather small. On average the share of sales for the category was really small. It was only 0.7% of the stores' total sales (the spread was between 0.67-0.72 with one exception further explained below).

Research assistants

As helpers in the project twenty students were trained as research assistants. They were involved in all parts of the project, both the main study and this bottom-up study. The students went to the 12 stores that were selected for the in-depth study to collect ranking reports for the cookies and crackers' sales, to take photos of all fixtures, displays and other visible areas of the target departments. To collect store layouts and mark out the target shelves in the photos.

We printed the photos and created a collage of the fixtures and displays resembling the actual departments. Onto these collages we pasted the sales ranks to look for any patterns. The results from this are reported below.

Step one – analyzing the shelves using space management theory

The ideas behind both the methods and the analyses in the first step primarily build on the space management literature presented above. First the store´s ranking reports

were compared to the format's average and the shelves in the store in an effort to see if we could understand the sales figures by merely looking at how the products were presented.

Large individual differences

A first reflection is that all the ten useable stores included in this step of the analysis had rather different ranking reports. All of their ranking reports also deviated from the average for the format. For instance the three top selling products were different in all stores. The most popular brand that also held the most consistent ranking between the stores was the private label digestive cracker. It's ranking position at the five different hypermarkets were that it was ranked as number one in one store, as number two in two stores, as number six in one store, and as number seven in one store. The other brands were more spread out than that.

This spread indicates that there are store level differences that influence the shopping behavior. Most retailers do analyze the local markets were they put stores to adapt to the environment. However, in this case we had controlled for as many external differences as possible. The stores we compared were all from the same store format and they were all located in similar locations. Hence, there is reason to believe that other than external market factors caused the variations between the stores. As a matter of fact no shelves looked the same from store to store and the target category was positioned differently in every store. Frank and Massy (1970) found that products that were already selling well were more space elastic. It is not impossible that this has been a driving force behind the great spread in how the shelves were organized. Perhaps every individual store manager had increased the space for what was selling well at that particular store. We also found interior design aspects that partially could explain differences between the stores in how the category was approached by the customers. For instance in one store we found that as soon as the customers walked by a pillar located in the aisle they looked down, meaning that all the products displayed in the proximity of that pillar dropped in sales.

Shelf space and positioning explaining sales

The ICA MAXI stores carried some 500 SKUs in the category, so as to make it manageable we divided the category into micro categories. We reasoned that we wanted to find examples of significant effects rather than to be able to make sweeping generalizations about the whole category. Hence, in the results below we focus on only one of these subsamples, digestive crackers, and only two brands. One is the private label (PL) and one is the biggest national brand (NB).

Analyzing the information about digestive crackers in table 1 two things come to mind. First, the ratio column, which is the PL-share divided by the NB-share, indicate that it has to be a certain price gap between the PL and the NB for the PL to stand its ground. In the hypermarkets the price gap is larger (≈27%) than in the convenience stores (≈17%). For four of the hypermarkets this price gap is sufficient to make the PL the bigger brand. For the fourth store it is not enough but that store used a different strategy for his PLs. While the other stores often had discounts on their PLs he did not, and that shows in the market shares. For the convenience stores however, the price gap does not seem to be sufficient to make the PL the bigger brand.

	Private label			National brand				
	Share	Sales	Price	Share	Sales	Price	Ratio	Space
Big store 1	3,91%	21 546,44	14,90	1,65%	9 099,10	18,90	2,37	Equal space, bottom shelf.
Big store 2	5,53%	37 415,26	14,90	1,26%	8 527,13	18,90	4,39	Private label double space above national brand at bottom shelf.
Big store 3	3,76%	28 435,15	14,90	1,93%	14 595,97	18,90	1,95	Equal space bottom shelf.
Big store 4	1,63%	7 328,15	14,90	2,11%	9 466,82	18,90	0,77	Equal space bottom shelf.
Small store 1	0,84%	605,20	17,90	2,13%	1 542,10	20,90	0,39	Equal space, fifth shelf.
Small store 2	2,11%	992,26	17,90	2,71%	1 273,19	20,90	0,78	Equal space, PL on third shelf, NB on second.
Small store 3	1,52%	508,53	16,90	3,97%	1 326,78	18,90	0,38	Equal space, third shelf.
Small store 4	0,76%	477,09	16,90	2,02%	1 264,32	18,90	0,38	NB on second shelf with three facings. PL on third shelf with one facing.
Small store 5	1,36%	602,44	17,90	3,37%	1 496,83	19,90	0,40	NB two facings. PL one facing. Both on third shelf.

Table 1. Nine valid stores were included in the analysis of digestive crackers. The first three columns regard the PL. The following three the NB, and the last two compare the two brands. The column "share" equals the sales of the brand divided by the category sales. "Sales" is two months of sales in Swedish Kronor. "Price" is the price per package in Swedish Kronor. "Ratio" is the PL-share/NB-share.

Secondly, in two cases we can see that the stores use space, and not only price, to promote their PLs. That is in Big store 2 and in Small store 2. In both these cases their PLs get a lift that probably is explained by having it positioned in a superior place. In Big store 2 the PL clearly dominates the NB (see image 1) by both having more space and also being put in a better height. From table 1 we can se that the visual impact shown in figure 1 generates a PL/NB-ratio of 4.39 which is approximately the twice as large a ratio as compared to the stores where the PL is not allowed to dominate like that. In Small store 2 it is only the height that differs but as Drèze et al. (1994) argue height is the single most important factor in the shelf. Furthermore, Frank and Massy (1970) found space elasticity to be greater at shelves closer to the heights were it was easier for customers to pick. This too could be reason for the design of the shelf in figure 1.

Figure 1. In Big store 2 the retailer used shelf space as a tool to promote his PL which also showed to be successful.

Yet another interesting finding was that a new product that had been launched only a couple of months prior to our study sold really well if it was put on the top shelf. When it was put on the bottom shelf however, all stores had it on either the top or the bottom shelf; it had a zero in the sales column in all the stores. This is in line with the reasoning of Chandon et al. (2009) were they discuss that the shelf positioning is meta-communicating with the customer and that positions higher up in the shelf could signal something more positive than lower down.

It should be noted that the sensitivity for shelf height that has been reported in both Frank and Massy (1970) and Drèze, Hoch, and Purk (1994) was more obvious for cookies than for crackers. As can be seen in figure 1 above, the best selling crackers were often put a bit lower on the shelf. Cookies, on the other hand, were punished if they were not put above the waist. Perhaps this could be linked to that cookies seem to be more of an impulse product? We will bring that up again below.

Destination products

Moreover, custard was not only a popular product. It also turned out to be very position insensitive. Hence, it sold well no matter where it was put. In some stores it was almost hidden, in other stores it was in a really good position but there were no real differences in how it was selling. Hence, custard could be seen as a typical destination product.

Step two – visual appearance and visual processes

In a second step we analyzed the position of the category in the store layout. We did this both by looking at layouts printed on paper to get an overview, but also by walking around the intended shopper track to see if there were pillars or other diverting stimuli distracting the shoppers from paying attention to the target category. The aim was to see if we could trace the Geist of what made the category appear the way it did. We looked at the angels from which the customers approached the shelves and how the fixtures and the packages appeared from where the majority of the customers were moveing.

Using displays as category signs

There were a couple of advertising agencies involved in the project. Their suggestions on how to elevate the category were to draw big arrows on the floor, or to put light bars above the shelves. None of these fit the ideas of the retailer since it is such a small category. However, with our bottom up approach we could detect one store that stood out when it came to its category share and conversion ratio. It was a convenience store that had no specific advantage when it came to other factors such as the surrounding neighborhoods. However, as mentioned above the rest of the stores had category shares of between 0.67 and 0.72, but this store had a category share of 1.96. Immediately upon seeing the department you realized why (see figure 2). There was a sales stand in the middle of the isle with chocolate balls (they are very popular type of cookie in Sweden). This stand was very effective in leading the mind to think about cookies in general and chocolate balls in particular. The department manager said the stand was seen as a fixture that they never moved.

Figure 2. A sales stand with chocolate balls proved to be a very efficient way to inspire and convey the location of the cookies category.

Chevalier (1975a and b) showed how influential special displays can be as category signs. He found that in general the displays did more than just increase the sales of the promoted item. In general they also helped moving the rest of the products in the category.

The importance of being on the right side of the shelf

A second finding from this step of the analysis was that, as briefly mentioned above, cookies were much more sensitive to being out of sight from the shopper track than crackers. The results show that stores that have the cookies on a shelf that the shopper faces while passing by, sell almost twice as much as if the cookies are positioned so that the customer has to turn around to see them. This was not the case for the crackers. In the case of the crackers they only loose around ten percent when they are not immediately visible (without the need to turn around) from the shopper track. Moreover, when the cookies are facing the customers the average shopping basket in the category also goes up. Hence, like in studies of the visual processes the position of the shelf can help the customers to find the products in the orientation stage. Once they are converted into shoppers the analytical processing takes over leading to larger shopping baskets. Similar findings were detected in the basket analysis. Cookies drop more in their conversion ratios when they are put out of sight than crackers do. We also found the variation in the conversion ratios for cookies to be much great than the variation in conversion ratios for crackers. For cookies the difference between the worst and the best performing store was that the best performed 15 times better. For crackers the best was only four times better. This too indicates that cookies are more of an impulse item than crackers are. On a more general level it indicates that the retailer better find out which items are more impulse sensitive and make sure to put them in a position facing the customers as they walk by.

To conclude this methods and result chapter we compared ranking reports and shopping basket data to the visual appearance of the store. We also looked at the positions of the departments and the fixtures in the store as a whole. We believe that our input was very useful to the category management process and both the retailer and the manufacturer expressed their gratitude for the insights that our methods had provided.

Discussion and further research

Perhaps it could be said that the retail literature is incoherent in the sense that the category management literature does not to incorporate several of the findings from other, bottom-up focused retail literature reviewed here. The ambition with this paper is to point to that the way the industry and academia treat these kinds of projects today leave out a lot of what the academia have found to be robust findings about mechanic selling in stores. To prevent a streetlight effect (i.e. looking were it is easy to look instead of where the relevant answer is) we therefore tried a bottom-up kind of complementary study. The contribution of this report therefore lies in compiling several relevant areas of retail research and methods. In the exploratory study we also think that we found some pretty interesting findings from all the three research areas that we incorporated. All of which really could help the category management process become even better.

One finding we found that there were large differences in the performance of the stores that could not be explained by decision trees or other similar theories. All the stores had different top sellers. To fully understand a specific category it could therefore be important to look for in-store marketing tools that seem to be generalizable in a certain category between different stores. This may be harder than it first appears since it often is the manufacturing company that is supposed to deliver the category specific knowledge and they do not control the details about the store execution and performance. As pointed out by Popai (2013), in-store marketing works but there is a wide variation in the results. The same kind of problem has been reported in most field studies (e.g., Curhan 1973). By doing the kind of in-store audit that we did we could find out which of the principles that would apply in this category in these store formats. Obviously the shelf height and the increased numbers of facings worked well for the private label digestive cracker. Moreover the custard was insensitive to where it was put and the newly introduced products had to be put on the top shelf. To find the driving principles in each category should be mandatory for category managers.

Another key finding in the present study that we labeled visual appearance comes from combining space management ideas with more of floor management (the understanding of the positioning, direction, etcetera of fixtures), which is extremely understudied in retail research. Learning about how to work with special displays and the various sides of the isles to interest shoppers passing by and convert them to buyers is highly relevant to practitioners and an area that academics should look further into.

Moreover the various kinds of visual processes, primarily browsing versus analyzing should be analyzed with sales data from field studies. For instance in Nordfält (2011) it was shown that displays should be organized differently depending on if the consumers saw them in the corner of their eyes or from straight ahead. It is possible that the same is true for shelves. Some planograms may be better at converting visitors to shoppers, while other planograms may be better at converting shoppers to buyers. To uncover more knowledge about these visual processes we need more field studies combining various kinds of observations and sales reports.

A final note regarding the present paper is that in a sense the core of the discussion here mirrors the relation between the sales and the marketing department at a manufacturing company. And just as many of those companies have realized that marketing and sales have to work closer together we claim that a too theoretical category management process has to take the in-store marketing execution into account to maximize the chances of success.

References

Ailawadi, Kusum L., J.P. Beauchamp, Naveen Donthu, Dinesh K. Gauri, and Venkatesh Shankar (2009), “Communication and Promotion Decisions in Retailing, A Review and Directions for Future Research”, Journal of Retailing, 85, 1, 42-55.

Anderson, Evan E. and Henry N. Amato (1973), “A mathematical model for simultaneously determining the optimal brand-collection and display area allocation”, Operations Research, 13–21.

Bayley, Geoff and Clive Nancarrow (1998), "Impulse purchasing: A qualitative explanation of the phenomenon", International Journal of Qualitative Market Research, 1, 2, 99–114.

Bezawada, Ram, S. Balachander, P. K. Kannan, and Venkatesh Shankar (2009), "Cross Category Effects of Aisle and Display Placements: A Spatial Modeling Approach and Insights", Journal of Marketing, 73, May, 99-117.

Broniarczyk, Susan M., Wayne D. Hoyer, and Leigh McAlister (1998), "Consumers' perceptions of the assortment offered in a grocery category: The impact of item reduction", Journal of Marketing Research, 35, May, 166–175.

Bultez, Alain, and Philippe Naert (1988), "S.H.A.R.P.: shelf allocation for retailiers' profit", Marketing Science, 7, 3, 211–231.

Chandon, Pierre, J. Wesley Hutchinson, Eric T. Bradlow, and Scott H. Young (2009), "Does In-Store Marketing Work? Effects of the Number and Position of Shelf Facings on Brand Attention and Evaluation at the Point of Purchase", Journal of Marketing, 73, November, 1-17.

Chevalier, Michel (1975a), "Increase in sales due to in-store display", Journal of Marketing Research, 12, November, 426–431.

Chevalier, Michel (1975b), "Substitution patterns as a result of display in the product category", Journal of Retailing, 51, 4, 65–88.

Corstjens, Marcel, and Peter Doyle (1981), "A model for optimizing retail space allocations", Management Science, 27, 7, 822–833.

Corstjens, Marcel, och Peter Doyle (1983), "A dynamic model for strategically allocating retail space", Journal of Operational Research Society, 34, 10, 943–951.

Cox, Keith (1964), "The responsiveness of food sales to shelf space changes in supermarkets", Journal of Marketing Research, 1, May, 63–67.

Cox, Keith (1970), "The effect of shelf space upon sales of branded products", Journal of Marketing Research, 7, February, 55–58.

Curhan, Ronald C. (1972), "The relationship between shelf space and unit sales in supermarkets", Journal of Marketing Research, 9, November, 406–412.

Curhan, Ronald C. (1973), "Shelf space allocation and profit maximization in mass retailing", Journal of Retailing, 37, July, 54–60.

Curhan, Ronald C. (1974), "The effects of merchandising and temporary promotional activities on the sales of fresh fruits and vegetables in supermarkets", Journal of Marketing Research, 11, August, 286–294.

Desmet, Pierre, och Valérie Renaudin (1998), "Estimation of product category sales responsiveness to allocated shelf space", International Journal of Research in Marketing, 15, 443–457.

Desrochers, Debra M., och Paul Nelson (2006), "Adding consumer behavior insights to category management: Improving item placement decisions", Journal of Retailing, 82, 4, 357–365.

Dhar, Sanjay K., Stephen J. Hoch och Nanda Kumar (2001), "Effective category management depends on the role of the category", Journal of Retailing, 77, 165–184.

Dickson, Peter R., och Alan G. Sawyer (1990), "The price knowledge and search of supermarket shoppers", Journal of Marketing , 54, July, 42–53.

Drèze, Xavier, and Stephen J. Hoch (1998), "Exploiting the installed base using cross-merchandising and category destination programs", International Journal of Research in Marketing, 15, 5, 459–471.

Fader, Peter S., och Leonard M. Lodish (1990), "A cross-category analysis of category structure and promotional activity for grocery products", Journal of Marketing, 54, 52–65.

Frank, Ronald E., and William F. Massy (1970), "Shelf position and space effects on sales", Journal of Marketing Research, 7, February, 59–66.

Gidlöf, Kerstin, Annika Wallin, Richard Dewhurst, and Kenneth Holmqvist (2013), "Using Eye Tracking to Trace a Cognitive Process: Gaze Behaviour During Decision Making in a Natural Environment," Journal of Eye Movement Research 6 (1): 3, 1-14

Gil, Jorge, Eime Tobari, Maia Lemlij, Anna Rose, and Alan Penn (2009), "The differentiating behavior of shoppers: Clustering of individual movement traces in a supermarket", Proceedings of the 7th International Space Syntax Symposium, Stockholm, Sweden.

Grewal, Dhruv, Anne L. Roggeveen, and Jens Nordfält (2014) "Shopper Marketing and the Role of In-Store Marketing" Review of Marketing Research, vol. 11 Emerald Group Publishing Limited, UK.

Hall, Joseph M., Praven K. Kopalle, and Aradhna Krishna (2010), "Retailer Dynamic Pricing and Ordering Decisions: Category Management versus Brand-by-Brand Approaches", Journal of Retailing, 86, 2, 172-83.

Hoch, Stephen J., Eric T. Bradlow and Brian Wansink (1999), "The variety of an assortment", Marketing Science, 18, 4, 527–546.

Hoyer, Wayne D. (1984), "An examination of consumer decision making for a common repeat purchase product", Journal of Consumer Research, 11, December, 822–829.

Kahn, Barbara E., Evan Weingarten and Claudia Townsend (2013) "Assortment variety: Too much of a good thing?," Review of Marketing Research, vol. 10 Emerald Group Publishing Limited, UK.

Kahn, Barbara E. & David C. Schmittlein (1992) "The Relationship between Purchases made on Promotion and Shopping Trip Behavior," Journal of Retailing, 68, 3, 294-315.

Kahn, Barbara E., and Brian Wansink (2004), "The influence of assortment structure on perceived variety and consumption quantities", Journal of Consumer Research, 30, March, 519–533.

Lim, Andrew, Brian Rodriguez, and Zingwen Zang (2004), "Metaheuristics with local search techniques for retail shelfspace optimization", Management Science, 50, 1, 117–131.

Lynch, J. G. Jr,, and T. K. Srull (1982), "Memory and attentional factors in consumer choice: Concepts and research methods", Journal of Consumer Research, 9, June, 18–37.

Murray, Chase C., Debabrata Talukdar, and Abhijit Gosavi (2010), "Joint optimization of Product Price, Display Orientation and Shelf-Space Allocation in Retail Category Management", Journal of Retailing, 86, 2, 125-36.

Nordfält, Jens (2011), "Improving the attention-capturing ability of special displays with the combination effect and the design effect", Journal of Retailing and Consumer Services, 18, 169-173.

Nordfält, Jens, Dhruv Grewal, Anne L. Roggeveen, and Krista M. Hill (2014)," Insights from In-Store Marketing Experiments," Review of Marketing Research, vol. 11. Emerald Group Publishing Limited, UK.

Popai (2013) Marketing At Retail: Understanding, Influencing, & Winning Today's Shopper

Redden, Joseph P., and Stephen J. Hoch (2009), "The Presence of Variety Reduces Perceived Quantity," Journal of Consumer Research, 36, 406-417.

Russo, Edward J., and France Leclerc (1994), "An eye-fixation analysis of choice processes for consumer nondurables", Journal of Consumer Research, 21, September, 274–290.

Sorensen, Herb (2009), "The In-Store Audience", Journal of Advertising Research, 49, June, 176-9.

Spence, Charles, Nancy M. Puccinelli, Dhruv Grewal, and Anne L. Roggeveen (2014), "Store Atmospherics: A Multisensory Perspective," Psychology & Marketing Special Issue: Retail Atmospherics and In-Store Nonverbal Cues Volume 31, Issue 7, pages 472–488, July 2014

Stilley, Karen M., J. Jeffrey Inman, and Kirk L. Wakefield (2010), "Planning to make unplanned purchases? The role of in-store slack in budget deviation", Journal of Consumer Research, 37, August, 264-78.

Wilkinson, J. B., Christie H. Paksoy, and J. Barry Mason (1981), "A demand analysis of newspaper advertising and changes in space allocation", Journal of Retailing, 57, 2, 30–48.

Wilkinson, J. B., Christie H. Paksoy, and J. Barry Mason (1982), "Assessing the impact of short-term supermarket strategy variables", Journal of Marketing Research, 19, February, 72–86.

Yang, Ming-Hsien, and Wen-Sher Chen (1999), "A study on shelf space allocation and management", International Journal of Production Economics, 60–61, 309–317.