Lost in the supermarket: Studying the effects of familiarity on consumer decision making

Vilse vid yoghurthyllan: Familjaritet och beslut i mataffären

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What are the effects of being familiar with a supermarket? Many of us do most of our shopping in one supermarket. By doing so we memorize the location of products and different categories in the supermarket. By memorizing we are able to reduce the amount of time and effort needed to go grocery shopping.

Participants' eye movements are recorded when shopping three products (pasta, yoghurt and cereal) in their regular supermarket. Then participants are moved to an unfamiliar supermarket within the same chain and asked to shop from the same three categories. This is used to compare how they evaluate and choose products between supermarkets. A control group familiar with the second supermarket is also recruited to determine if the different shelves cause for a difference in grocery shopping.

By measuring the total time, evaluation time, number of products focused on and the amount of return fixations to a product in front of a shelf the study aims to see if familiarity with a supermarket causes participants to be faster and use less effort when choosing a product. It is also investigated whether familiar participants feel more satisficed with their grocery shopping, feel that making a choice was easier and whether they do better choices in a familiar supermarket.

The results indicate that participants did make faster decisions in their familiar supermarket and seemed to use less effort. But the data did not indicate it with a high generalizability.

It would appear that shopping in an unfamiliar supermarket affects the amount of time and effort consumers need to invest in choosing a product but participants do not perceive it as being more difficult or less satisfying. Participants did not report a difference in satisfaction between supermarkets nor did they seem to choose a better product in the familiar supermarket.

1 Introduction

Have you ever wondered what goes through your head when you go grocery shopping? What are the processes that lead up to you choosing a packet of pasta for your Bolognese? Or how you choose what type of jam to have with your pancakes?

Any given product shelf in a supermarket contains a multitude of different brands and products. Every single one calling for your attention, every package containing numerous amounts of information. Imagine trying to find the perfect jam for your pancakes that has the best value for money, is organic and contains the least amount of sugar, on a shelf that contains 90 different kinds of jam with around 250 shelf-facing products. Thinking about it, we seem to make these types of decisions without using any greater cognitive effort.

We usually do not ponder on how or why we select our jam – we just pick one.

Hoyer (1984) reported that we as consumers in general do not have the time or the capacity to do the quite advanced cognitive processes required to compare and select the best out of all the different types of jam. Instead we facilitate our choice process by simplifying it. Some of this facilitation with choosing jam can be explained by supermarket and product familiarity.

Picture the first time ever trying to find this "perfect jam", you would have to spend a lot of time and effort looking, scanning the shelf and comparing different jams to find one that satisfices your preferences. The next time you might feel confident about your choice of jam and only need to search the shelf for the product you choose last. After some time you might already know where it is placed on the shelf and have no apparent difficulties in finding it. If you know that the jam you prefer is on the top shelf and in the middle section you can usually ignore all other parts of the shelf. This is an example of how consumers use their past experiences as grocery shoppers to guide their visual attention to a product, making the task of choosing jam easier.

Unfortunately there is usually no such thing as the one perfect jam, suitable for all your jam requirements. One day you might feel in the mood for raspberry jam the other day another flavor, perhaps blueberry. Similarly, you do not buy the same pasta if you are cooking a bolognese or making lasagna. Our preferences change from time to time and situation to situation. Some product categories seem more stable than others. When was the last time you tried a new brand of milk? In others we are more willing to try out different products. Other factors besides your preferences might also affect your choice, perhaps there is a sale on a certain brand of pasta or you need to make pancakes for a party and need a larger quantity of jam than usual.

More than just learning to find the one perfect jam you learn your supermarket. When you are familiar with buying jam and know what jams there are to choose from you can reduce the effort and time spent on the decision, regardless of whether you are searching for blueberry or raspberry jam. By learning the position of different categories and products, where to find your favorite product or where the cheapest is located, supermarket familiarity seems to aid us as consumers in finding products.

Many of us have a supermarket we prefer. The reason for preferring it may differ. For example, geographical closeness, price worthy products or a preferable range. Regardless of the reason it is a supermarket that we regularly visit – we are familiar with it. But are we also doing our very best shopping in that familiar supermarket?

If our comparison is between two supermarkets of the same supermarket chain the product familiarity will be similar but the supermarkets' layout and shelf organization will be different. Size constraints, different management decisions in how to display products or difference in product range, all supermarkets differ to some extent. In an unfamiliar supermarket your preferred product might be placed on a different shelf or not present at all.

If your preferred jam is not to be found you can, among other options, spend time looking for it or you can start comparing other products and spend more effort and time finding another. Are you going to end up choosing a product less in the line with your preferences?

We intend to investigate what kind of impact supermarket knowledge has on our consumer decision making by comparing consumers shopping in their familiar supermarket with those shopping in an unfamiliar supermarket.

To investigate this impact of supermarket familiarity two actual supermarkets of the same chain will be used. One group of participants (GR1) will have their eye movements recorded when shopping, both in their familiar supermarket and at an unfamiliar supermarket. A second group (GR2) will be recruited at the second supermarket as familiar consumers at this supermarket and used to see whether the difference in shelf organization and layout will have any impact regardless of familiarity with the supermarket.

Participants' visual attention will be used to separate the time in front of a shelf into different stages, this to differentiate the time searching and scanning a shelf and the time evaluating and comparing products. By separating the choice process our method allows us to focus on participants' evaluations and comparisons. It allows us to investigate whether consumers are adding more time to search and orient themselves in an unfamiliar supermarket or whether they also are adding more effort by taking more time comparing products or evaluating more options.

Another interesting comparison is whether participants make worse decisions in an unfamiliar supermarket or if participants will feel less satisficed with their choices in the unfamiliar supermarket. Does familiarity not only reduce the time and effort of shopping but also make the participant choose a *better* product. That is, a product more in line with their preferences.

About decision making

Before we can dive further into what role familiarity plays in consumer decision making we need to discuss decision making in general and how it relates to studies in natural environments.

Decision making can be seen as a process that uses many different parts of cognition and external stimuli. It is usually a mixture of both external and internal information (Bettman, 1979). Remember how we used both the external information from the shelf and the internal information from our memory when we choose jam?

When making decisions people are often required to make a trade-off between *accuracy* and *effort* (Bettman, Luce & Payne, 1998). In some scenarios we want to have a high accuracy, really mull over all alternatives to choose the best possible option. In other scenarios we just want trust our instinct and take the first best option. We generally aim to achieve the best accuracy for the task with minimal cognitive effort (Payne, Bettman & Johnson, 1993, p.2).

Our decision making may also depend on several task factors. Time pressure, how important the decision is, knowledge of the task environment or past experience and memory of the task could all effect the decision making process (Payne, Bettman & Johnson, 1993, p.13). A consumer might, for instance, want a high accuracy and really investigate all options, but only have a limited amount of time for the task. In this case the consumer will have to trade off some accuracy to be able to complete the task in time.

The ability to remove options and use stored information from prior shopping trips can be used to ease the cognitive load of our decisions. People can only keep their attention on a finite amount of information (Baddeley & Hitch, 1974; Miller, 1956). As in our jam example, by reducing the amount of products consumers focus their attention on, they can reduce both the time and the effort of choosing jam. By using previous experiences this stored information eases the cognitive load but the decisions retains a generally good accuracy – now with less effort.

Decision making in a natural environment

A lot of the theory regarding consumer decision making has resulted from studies done in a controlled environment, for instance a lab, a test room with participants sitting in front of a computer screen or in front of a mock-up product shelf. When moving these results into the real world there can be complications.

An excellent example is studies on where participants look on a shelf. Eye tracking studies on mockup shelves on computer screens found that there was a bias towards looking in the center of the shelf. But a study by Gidlöf, Wallin & Holmqvist (2014) found that participants in an actual store do not show this bias. It seems to be an artifact of the controlled setting. Results such as these makes testing theories based on studies in controlled settings all the more important.

When studying decision making in a natural setting it is more difficult to control what factors influence the decision. For instance, controlled studies usually ask participants to make a decision from a relatively small set of products, say 4-20 (Orquin & Moeller Loose, 2013). As seen in our jam example, these options can be far greater in a supermarket. The amount of pasta in the second of our supermarkets consisted of a selection of 8 brands, many with special category specific sub-brands (a separate luxury sub-brand or an organic sub-brand) and in total 117 different types of products. For instance 18 different kinds of spaghetti!

Beside the multitude of options, consumers' preferences may also differ depending on why they are in the supermarket. Depending on the situation consumer's focus on different things, if they are on a diet, or on a budget or what is a popular cooking craze at the moment (Nordfält, 2005, pp.115-6). Depending on the goal of the shopping trip what they end up buying may differ. In a controlled setting this is often not such a big issue since the participants often do not actually purchase the products but only state a preference. They do not need to evaluate what jam is best for pancakes but rather which of the presented jams match what they like in general.

The way information is presented in the supermarket is another factor that makes it different, in the controlled lab setting experimenters usually make sure all information is relatively equal between options. In a natural environment different brands have different strategies on what and how to display their attributes. All information might not be available on all the products. For example, one brand of pasta in the supermarket chain in this study presented its amount of calories as a notable property on the front. On all other brands this information was only presented in the table of content on the back of the products. If you are specifically

interested in the amount of calories this might make you favor that brand.

All this should be kept in mind when doing studies in "the real world". By doing studies in natural environments researchers can not say for sure that they have accounted for all relevant factors of the task at hand. Where a controlled setting tries to keep all things equal or accounted for, a study in a natural environment just has to accept this fact. Often the effects of the factors that the researchers are interested in can be quite small (Nordfält, 2007, p.145). But even with this considered it is worth doing studies in natural environments. It is the best way to ensure that participants are behaving naturally. Even though the effects of the variables we as researchers are investigating might end up a bit small they do say something about our natural behavior that a controlled setting might miss.

Familiarity

Now that we know a little about decision making and some of the difficulties of how the real world affects decision making we can move on to the concept of familiarity.

Alba & Hutchinson (1987) separates *familiarity* and *expertise* to explain consumer knowledge. Familiarity is based on "the number of product related experiences" and expertise the "ability to perform product-related tasks" (Alba & Hutchinson, 1987, p.441).

A high level of familiarity with the information at hand will in general make people more skilled in performing the task (Alba & Hutchinson, 1987). For instance, Wang, Cavanaugh and Green (1994) found that if participants are doing a visual search task and the target stimuli is a familiar one – for instance a letter – they were faster in finding it than if the target stimuli is a squiggle or a rotated letter. Participants also got faster just by doing the task. By repeatedly doing a task our expertise will increase and we will become both faster and better on focusing on what is important (Bettman, 1998).

By doing repeated trials of the same task the amount of time needed to perform it is reduced. A high level of expertise will help focus attention to the important information or to know in what order things should be done. Another example, if you never have changed a car tire it can be a challenge to know where to start. For instance it is a good idea to start by loosening the bolts of the tire before raising the car, but having never changed a tire it could be hard to know that.

Other research on familiarity and expertise has shown similar results. See for instance studies in reading (see Ashby, Rayner & Clifton, 2005), visualization comprehension (Gegenfurtner, Lehtinen & Säljö, 2011) or intentional blindness (Memmert, 2006).

Familiarity has also been shown to affect consumer decision making. Park & Lessig (1981) studied how prior familiarity with microwave ovens affects participants when choosing between microwave ovens. They used participants with different levels of prior knowledge (low, medium, high) with the product to investigate the impact familiarity has when choosing a microwave oven. Participants were asked what oven to buy as a hypothetical question. Participants' reasoning on how they were to choose between ovens was recorded and analysed. Park & Lessig measured familiarity effects on: Time required to make a decision. Amount of focus on different aspects. Focus on non-functional aspects, such as brand or price, and confidence with their choice.

Their results showed that participants were faster, focused on fewer but more relevant, functional information and were more certain of their choice if they had a high level of prior knowledge.

For our purpose Alba & Hutchinson's definition of consumer knowledge needs some adaptation and clarification. For instance, what exactly makes up these "product related experiences"?

To get a better understanding of how familiarity affects our decision making, we will be dividing it into external and internal factors. These factors interact to produce a combined level of familiarity. By separating the different factors we are also able to pin-point what factors of familiarity we are investigating by moving consumers to an unfamiliar supermarket.

The external factors can be defined as: *how things usually look* and the internal factors are referring to previous knowledge and experience. The internal factors are the information that we as consumers – by repeated shopping trips – learn from the external factors.

The external factors are information on what products look like, how these products are organized on the shelf and where these shelves are located in the supermarket. They are

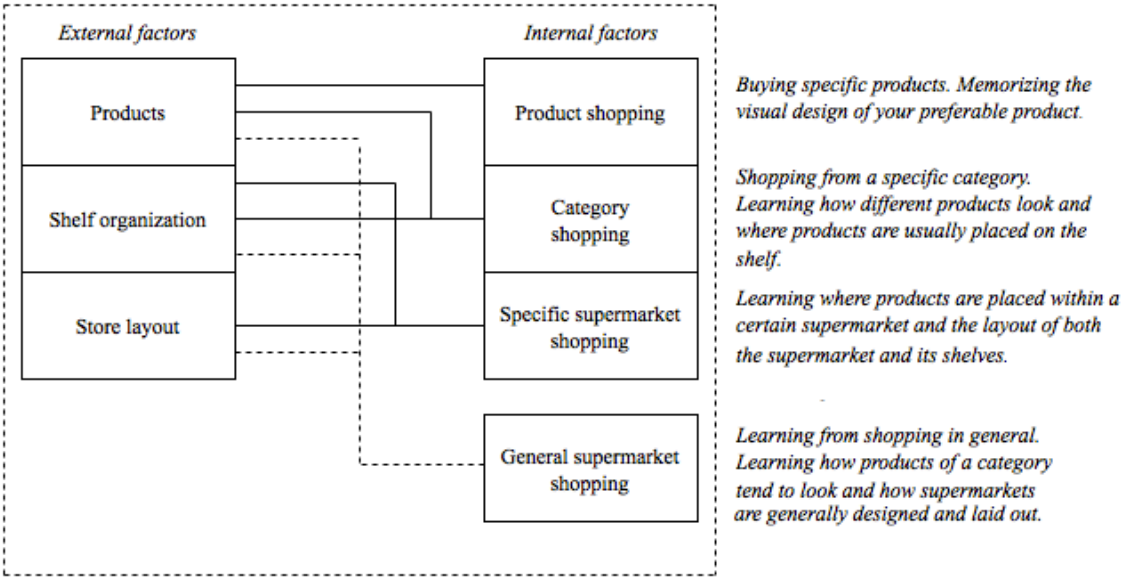

Fig. 1. How the internal and external factors of familiarity can interact.

external in the sense that the consumer does not create them. The manufacturers design products and supermarket chains design supermarkets. It is in their interest to make a product that stands out, gets noticed and is preferable to consumers. By having a memorable visual design or layout, through in- and out of store advertising or having affordable prices supermarkets try to capture consumers' attention (Nordfält, 2007; Buttle, 1987).

Shopping in general – for instance having been shopping in many different supermarkets or supermarket chains – also has an effect on our shopping. If a consumer goes grocery shopping in many different supermarkets there is different information to learn. Instead of specific product knowledge or supermarket layout the consumer learn information corresponding more to the *typical* layout of a supermarket or product; preconceptions of how a supermarket tend to be laid out or where certain products tends to be on a shelf. For example, lower priced products tend to be on the lower shelves regardless of which supermarket you enter and dairy products tend to be furthest away from the entrance of the supermarket. No studies – to my knowledge – have investigated just what kind of impact general shopping experience has on consumer decision making so it is hard to know how much of an influence it has on us as consumers.

Just as in our jam example, by frequently buying from a product category consumers will learn what products or brands there are, which ones they prefer and what they look like. By frequently buying from the same supermarket they will also learn the organization of the shelves. Learning this means that they will need less time and effort to scan the shelf – taking in information – since the information is already in their head.

Another way to decrease time in a supermarket is by learning how to find your way within the supermarket. Similar to knowing where to start when changing a tire consumers will know in which order to do their shopping. Thus they will need to spend less time and effort searching for a shelf or backtracking to find the correct shelf.

By creating a mental map of the supermarket and using that to navigate around consumers are also reducing the time and effort needed for a supermarket visit (Mackay & Olshavsky, 1975).

The major variation in internal familiarity for participants that are moved to an unfamiliar supermarket will be with the layouts of the supermarkets and the organization of the shelves (see table 1). Since it is the same participants in both supermarkets any effect of different familiarity with the product categories will remain constant between both supermarkets. By doing the study with two supermarkets of the same chain both supermarkets will have a more or less equal product range.

We will also recruit another group of participants, one that is familiar with the second supermarket. If this group resembles the first one regarding category and product knowledge we can use it as a control to our participants in the unfamiliar supermarket. This control group (GR2) will be familiar with its layout and shelves. This can be used to see whether the layout of the shelves themselves causes an increase in time and effort regardless of prior knowledge.

This study will, as mentioned, also investigate if shopping in an unfamiliar supermarket not only causes participants to take longer time searching but actually take more time evaluating their options – putting in more cognitive effort. It is unclear how much of an effect familiarity has on this. If it – as this study believes – does have an effect it could be important to include how familiar participants were with the supermarket in further studies on consumer decision making.

Table 1. A summary of the familiarity factors and its relation to the recruited groups of the study. *Assuming that category and product knowledge is normally distributed and our two groups are taken from the same population and large enough.

	Return group, GR1:	Control group, GR2:
Products	Constant	Constant
Shelf organization	**Variant**	Constant
Store layout	**Variant**	Constant
Product shopping	Constant	Constant*
Category shopping	Constant	Constant*
Specific supermarket shopping	**Variant**	**Variant**

Preferences

As we have learned, consumer decision making should be seen as learning what options there are on the shelf and evaluating these against your motivations and goals at the present time (Bettman, 1979, Lynch & Srull, 1982). We have discussed how familiarity affects how consumers learn their options to streamline the task. But how do their goals and motivations – their preferences – fit into the equation? This segment will focus on the result of a process – the product chosen – and its relation to our preferences.

In order to streamline the task at hand consumers might need to ignore alternatives or attributes presented to them (Payne, Bettman & Johnson, 1993, p.248). But by ignoring alternatives they might miss out on a product that better suit their preferences. So are consumers doing their best shopping when they are familiar with the supermarket?

Park, Iyer & Smith (1989) studied the effects of supermarket familiarity on product choices. Participants were recruited to go shopping in a familiar and an unfamiliar supermarket (of the same chain). Some participants were also told that they had had to do their shopping in the unfamiliar supermarket under a given time limit. They were told to think out loud about their choice process in both supermarkets. Park et al. analysed how prior supermarket knowledge affected consumers grocery shopping. They measured both the amount of unplanned purchases and the amount of failures to make intended purchases. They found that participants did more unplanned shopping and were not as able to buy planned products at the unfamiliar supermarket. Even more so when shopping in an unfamiliar supermarket under a time constraint (Park, Iyer & Smith, 1989).

Unplanned purchases happen in familiar stores as well, and consumers do not always enter a store with a pre-planned list of what to get. Therefore, unplanned shopping or ability to stick to a pre-planned shopping list might not be the most effective measurement of our choices in the supermarket.

Orquin, Bagger & Moeller Loose (2013) did an eye tracking study on consumer decision making. They found that participants got faster and better at choosing *the best* product with repeated trials. How good participants were was measured by how consistent participants were in choosing a product.

The study consisted of participants choosing between four kinds of fruit yoghurts – presented on a computer screen. They found that with repeated trials participants got familiar with the task and the presentation form, which in turn reduced time and effort spent on the task. It also increased

the likelihood of choosing the *best* suited yoghurt (Orquin, Bagger & Moeller Loose, 2013). There can be some debate regarding their results that familiarity increases the chance of participants making better choices.
By doing a task repeatedly people get better at it. Similar to how a participant doing repeated visual search tasks gets faster at finding the cue, participants choosing yoghurt would get better in finding the most suited yoghurt. After repeated trials with similar stimuli participants would be rather good at choosing from 4 different yoghurts.

When discussing preferences in a natural setting it is less obvious that shoppers familiar with a product category are good at choosing a product that best suits them.

Gidlöf, Wallin, Holmqvist & Møglevang-Hansen (2013) did a study in which they used participants' stated preferences to construct an *option quality* measurement for the products attended to. Option quality was calculated by having participants fill out a questionnaire of how important each attribute of a product category were for them when choosing a product. By summing up the values each product got an option quality (Gidlöf et al. 2013, p.395). This was then used to see what kind of option quality the products participants focused their visual attention on had.

In this study, supermarket shoppers did not seem to choose or focus on the best suited products. Gidlöf et al. found that participants, when shopping in a natural setting, were *at best* focusing on products that were slightly better than average for them. One reason for this could be time pressure. By streamlining the task, consumers also seem to reduce their accuracy in choosing the best suited product.

Gidlöf et al. found that participants spent a short amount of time in front of the shelf. In general participants only focused on each product for less than a second (Gidlöf et al., 2013, p.399). If we combine time pressure and the fact that many consumer choices are made on the spot – in front of a product shelf (around 74% according to the Point of Purchase Advertising Institute, cited in Chandon et al., 2006), which could account for some of the reasons for why consumers do not pick the most suitable product. In "real life" many want to reduce the time of going shopping as much as possible. This might result in that many attributes that they do find important are ignored. In general, they also end up making many unplanned purchases, products they did not intend to buy before entering the supermarket (Iyer, 1989).

It would seem like many times people have an idea of what to buy, for instance the above mentioned jam for pancakes. But consumers usually do not enter the supermarket with one specific jam in mind. When making a shopping list they usually do not write down a specific brand and type of jam. More likely, they just write down 'jam'. What this means is that consumers do not know beforehand the exact product they are going to choose. It is not until they are in front of the shelf and can evaluate the options that they make their choices. This interplay between their preferences and what is on the shelf, as well as the time pressure of wanting to reduce the time in the supermarket could explain why consumers often miss the best suited products. But will increased time in front of a shelf cause consumers to think about what choices they are making? How will a choice in an unfamiliar supermarket compare to a choice made in a familiar supermarket?

It is unclear to what extent familiarity affects what product consumers end up choosing. Orquin, Bagger & Moeller Loose (2013) state that repeated actions increase the likelihood of making better choices. But when comparing choice and preferences in a supermarket setting consumers do not seem to be that good at it from the start. If participants in a new supermarket take longer time evaluating, as we discussed above, will this longer time also make them choose a product more in line with their preferences? Or will unfamiliarity instead cause participants to choose a worse product?

What this study will do is to use the way Gidlöf et al. (2013) calculated option quality on the chosen product in each supermarket and compare the quality of the chosen product in the familiar and the unfamiliar supermarket.

Consumers' satisfaction with their purchases and reported difficulty with the choice will also be measured. We expect these to correlate. Either participants will have a harder time, make worse choices and feel less satisfied in an unfamiliar supermarket or they will have an easier time, making better choices and feel more satisfied.

Eye tracking as a way of measuring the decision making process.

To capture the decision making process eye tracking will be used to record participants in the supermarket. Eye tracking is a way to measure how the eye moves across a scene and is a popular tool for measuring where people focus their visual attention at a given point in time. It has been used in several areas of research such as linguistics, problem solving, decision making and marketing. The common denominator of these areas of research, and what makes eye tracking such a useful tool is, that they require participants to take in and process visual information. In everyday life people might look at something and have their mind wander, not really focusing their attention on something at all. But research has shown that when making decisions or evaluation options where people look is also where their attention is. For example, Deubel and Schneider (1996) found that to do a letter discrimination task participants had to focus their visual attention on the letter at hand and could not differentiate between letters and mirrored letters if they were forced to move their gaze away from the letter at hand. Attention could not be shifted away from were the gaze was.

Most of what people visually attend to goes through an area in the eye called the fovea. The fovea is a small part of our visual field (Henderson, 2003). It is located in the center of the retina and is an expert in distinguishing contours and shapes (Holmqvist, Nyström, Andersson, Dewhurst, Jarodzka & Van de Weijer, 2011, p.21). The rest of the retina also processes visual information though it is more specialized in colors. To receive information with good sharpness from a visual scene people need to move the focus of the fovea around the scene. To do this our eyes makes very rapid movements called saccades. Saccades are movements between points of interest and while making these movements the eye is more or less blind. At the point of interest the eye stops and fixates, it is at that point were visual information can be taken in (Holmqvist et al., 2001, pp.21-2). If researchers record these fixations and saccades they can with rather good accuracy see where participants visual attention is at any given time frame.

To process an entire scene people need to actively move their focus i.e. their visual attention, across a scene (Hollingworth & Henderson, 2002). In front of a shelf consumers will need to shift their visual attention between different products to scrutinize and evaluate them, they can

not process all products at once. Where they choose to move their visual attention can depend on a few different factors. The two most prominent are often called *bottom up* and *top down* control of attention (Theeuwes, 2010). They can also be named stimulus- and goal driven influences (Orquin & Moeller Loose, 2013). A stimulus driven influence is when something in the visual scene draws our attention. In general people are more prone to focusing on certain objects in a scene, such as visually salient properties like bright colors, contrasts or moving objects such as a waving arm (Henderson, 2003). Stimulus driven attention is largely considered automatic. The shift in attention to visually salient properties happens without an active order or intention to do so (Theeuwes, 2010). An eye tracking study done on in-store marketing at the point of purchase by Chandon et al. (2006) found that – in general – products not visually attended to are also not considered for purchase. This makes visually salient design of products important for manufacturers as: "an unseen product is an unsold product" (p.1).

But people do not solely move their attention to what draws their attention in the visual scene. They can also shift their attention voluntarily. They have their internal set of goals or preferences, which also guide where they move their attention. This goal oriented or top down control also influences where in the scene to shift attention to. For example, if you are interested in organic products these are often only represented by a small non prominent logo somewhere on the package. Finding it requires you to disregard visually prominent stimuli and to actively search for this small logo. Usually these two factors are interacting to help you scan a shelf and find a product (Theeuwes, 2010). For example, if we know that our preferred brand of jam has a red label we shift our attention between the red objects on the shelf, mostly ignoring other visually salient products. By focusing on red products we have effectively reduced the amount of objects to consider. In reducing the amount of objects we are focusing on we have also reduced the time and effort needed to make the decision.

Eye tracking gives researchers the opportunity to study where participants' visual attention is during the decision making process (Russo & Leclerc, 1994; Gidlöf, 2014, pp.19-20). Researchers are able to sum up the fixations and saccades of a participant into the amount of times a participant fixates or re-fixates on an *area of interest* (AOI). AOI's are defined regions within a scene, for example a certain product or a price tag (Holmqvist et al., 2001, p.188). This can then be used as an indicator of whether the product is being considered (Chandon et al., 2006). For instance, studies have shown that there is usually a bias to attend more to the product that consumers eventually end up choosing (see for example Shimojo, Simion, Shimojo & Scheier, 2003) but fixation time spent on other AOI's could indicate whether these products were being considered. Re-fixations to an AOI are also a valuable tool to see if a product is being considered (Russo & Leclerc, 1994). The Chandon et al. (2006) eye tracking study found out that most visual attention during a consumer decision is guided towards internal factors such as preferred brand or brands with a high market share for the product category – brands with a high recognition factor – but that visual salience can cause participants to allocate some visual attention towards products. This was specifically true for participants without greater knowledge of the products in the category i.e. consumers less familiar with a product category (Chandon et al., 2006).

Eye tracking research on the decision making process has found that stimulus driven attention seem to be most prominent early in the process while goal driven influences increases the further the scanning goes (Orquin & Moeller Loose, 2013, Theeuwes, 2010). Payne, Bettman & Johnson stated that a "good deal of prior knowledge" (1993, p.177) would make the selection sturdier and less affected by stimuli driven factors. Russo & Leclerc (1994) investigated consumer's decision making process using eye tracking. One of the factors accounted for were prior knowledge with a product category. Prior knowledge was measured by asking participants how often they bought from a product category. They found that participants with a high purchase frequency – a good deal of prior knowledge – showed a reduction in time spent making a decision. These participants also had fewer fixations on irrelevant products, a fact that I believe could be explained by less focus on stimuli driven influences. The above mentioned Orquin, Bagger & Moeller Loose (2013) study found similar results, that repeated decision making in the same setting reduced the influence of stimulus driven factors. They did their study with participants familiar with the product in three different conditions of visual saliency, one with minimal saliency: an information matrix with text. One with medium: an information matrix with real logos and a third one that resembled real packages. They found that in the condition closest to reality stimulus driven influences were a factor but that its importance decreased with repeated trials (Orquin, Bagger & Moeller Loose, 2013).

When using eye tracking data to evaluate the decision making process of participants standing in front of a shelf we might want to pinpoint the time frame where the more heavy cognitive efforts happens. When do consumers actually start comparing and choosing products? Do they start this as soon as the shelf is visible or do they first do a screening of what is on the shelf before they start comparing? The Russo & Leclerc (1994) study on choice processes main focus was to investigate the different stages of a consumer decision. They divided the process into three stages. The first being *orientation*, where we get an outline of the scene at hand, the second, *evaluation* where we focus on comparing a smaller set of products and a final *verification* stage, where the participants re-inspected the shelf after choosing a product. The upside of distinguishing the process into these stages is that we have the opportunity to separate the heavier cognitive aspects such as evaluation, comparison and choice from screening and orientation (Russo & Leclerc, 1994). The Russo & Leclerc study was done in a controlled setting were they had constructed three product shelves, each with 16 different products of a category (applesauce, ketchup and peanut butter). The shelves were made to resemble real supermarket shelves with actual products and price tags. The evaluation stage was defined as the time frame between the first re-fixation to any product to the last fixation of the chosen product. Any fixations before were considered to be orientation and any after verification. They found that the evaluation stage took the most time and it was the only stage that was ever present for all participants. In the evaluation stage participants focused on a few products and they argued that it was in this stage where most cognitive effort was being used (Russo & Leclerc, 1994).

Gidlöf, Wallin, Dewhurst & Holmqvist (2013) constructed a similar stage division of consumer decision

making. They did their study in a natural environment in which, similar to Russo & Leclerc, participants were to shop from a supermarket shelf (the pasta shelf). Unlike Russo & Leclerc they also recruited a group that were to do a search task on the same shelf. These participants were to search for a certain product with no obligation to buy it. They divided the process into the same three stages. The difference from Russo & Leclerc was that their *natural decision segmentation model* (NDSM) had a more narrowly defined evaluation stage. They also used dwells to define the different stages. A dwell was defined as a collection of fixations staying within a product AOI for at least 120ms (Gidlöf et al., 2013, p.6) and the definition of the evaluation stage used in the Gidlöf et al. study was: the time frame from the first to the last dwell of the chosen product (Gidlöf et al., 2013). This definition allows for re-fixations (re-dwells) in all stages unlike the Russo & Leclerc model. Allowing re-dwells in all stages is important since re-dwells can as mentioned be used as an indication that some evaluation or comparison is being done on the product but a re-dwell might also be because of a need to re-inspect a product to completely process it (Gidlöf et al., 2013). By focusing on re-dwells done in the evaluation stage it is more likely used as evaluation rather than scrutinization or finishing processing a product. The NDSM model also managed to show a difference between stages for participants doing the search task and those doing the decision task. The Russo & Leclerc model could not do this when applied to the Gidlöf et al. data.

In the study described below we used the NDSM model to divide the decision making process of the participants. By doing this we are able to study the effect of familiarity on each stage. For instance, we expected that participants who where unfamiliar with a product shelf would increase the time needed for orientation. By not knowing where to focus their attention they would need to take more time to scrutinize the shelf and get a sense of where everything is located. An interesting factor will be if being unfamiliar with a shelf and a supermarket could affect more than just the orientation stage.

The evaluation stage seems to be generic for all participants. It also gives us the ability to define a smaller time frame where most of the *real work* of decision making is being done. By focusing on the evaluation stage, it hopefully allows for an investigation where we can see how familiarity is affecting the heavier processes of decision making. Could unfamiliarity cause us to spend more time comparing and scrutinizing products? Could it make this comparison be between more products? Or could stimulus driven influences affect us more, making us focus on products we usually do not prefer? By separating the decision making process into stages we have the ability to concentrate on the evaluation stage more in detail

To evaluate the amount of effort in the evaluation stage we will both use total time spent in the evaluation stage and the amount of re-dwells in the evaluation stage. Both have been argued to show us how much effort is being put into the decision at hand. We hypothesize that participants in a familiar supermarket will spend less time in the evaluation stage with fewer re-dwells to products, that familiarity with a supermarket will make the evaluation stage faster and more efficient.

Overview of the study

We have seen that familiarity with the task and task environment reduces time and effort in a controlled setting (Orquin, Bagger & Moeller Loose, 2013) and that prior knowledge with a product category seems to have a similar effect on decision making (Park & Lessig, 1981; Russo & Leclerc, 1994). We will investigate whether this effect is consistent in a natural setting. By moving consumers and having them shop from the same three categories in two supermarkets, one familiar one unfamiliar. By placing participants in an unfamiliar supermarket we believe that participants will, not only take longer because they are unfamiliar with the layout of the shelves, but they will also take more time and focus on more products when evaluating and choosing a product compared to themselves in their regular supermarket.

The control group (GR2) will foremost be used to determine the similarities in decision making process when the external familiarity factors remain constant and the participants differ. Will the external factors affect the participants regardless of their familiarity level? If supermarket familiarity is not an important factor when consumers go shopping we ought to see a result where the process should be similar for the participants that do the task in the unfamiliar supermarket compared to both themselves in the familiar setting and the control group of familiar shoppers.

Eye tracking gives us the possibility to not only focus on the result of the decision, such as on unplanned or new purchases as in the Park, Iyer & Smith study (1989). We might not want these as a dependent variable since they can depend on several other factors, such as the size of the shopping trip (Nordfält, 2005, pp.116-7; Kahn & Schmittlein, 1989) or the time allotted for it (Park, Iyer & Smith, 1989). We opted instead to focus on the decision process and the option quality of the choices.

To investigate the effect of supermarket familiarity on the decision making process, shoppers was recruited outside their regular supermarket. Both groups will be recorded buying three products (yoghurt, pasta and cereal) in that supermarket. The return group, GR1, will also be asked to visit another supermarket that they are not familiar with – the supermarket the control group, GR2, is familiar with – located on the other side of town from the first one.

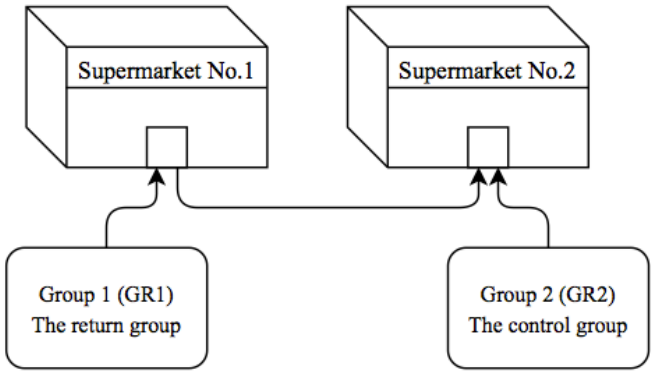

Fig. 2. Where the different groups were recruited. Group 1 visited both supermarket No.1 and No.2. Group 2 only supermarket No.2

GR1 will be recorded buying from the same categories at this unfamiliar supermarket. Our two groups are:

(i) The return group GR1 – where the participants remain constant and the supermarket changes.

(ii) The control group GR2 – where the supermarket remains constant and the participants differ.

Using the same supermarket chain will keep familiarity with individual brands and products constant in both supermarkets. The question we will answer with this study is: How will consumers prior familiarity with the supermarket, i.e. its layout and shelf organization, affect the decision making process?

We will specifically investigate whether moving a consumer to an unfamiliar supermarket will make the consumer take longer time and spend more effort choosing a product. An indication that a participant is spending more effort can be that he or she is focusing on more products when evaluating their options or if he or she has more re-dwells on products. We will also investigate whether it will make consumers feel less satisfied about their choice and if the choice is better or worse than in a familiar supermarket.

By asking participants to estimate their frequency of supermarket visits (For example: "How often do you shop at supermarket No.1", "How often do you go shopping in general?") and more specific, both about how often they shop from the three categories and how often they buy products from the individual categories (For example: "How often do you buy pasta?" and: "How often do you buy the pasta you bought today?") familiarity for all internal factors will be measured.

Supermarket familiarity will be the main explanatory variable but category familiarity – how often participants shop from a product category – will also be used to investigate whether any interaction effects between the two exist.

Participants will also be asked factual questions about the layout of the supermarket (For example: "Which of the three categories were closest to the dairy section?"). These factual questions were based on the work on cognitive maps by Mackay & Olshavsky (1975) and the assumption with these were that the more familiar a consumer is with a supermarket the better cognitive map of the layout will the participant have. It is hypothesized that:

H1a. Returning participants in an unfamiliar supermarket will take longer time from start to finish than *the same participants* in a familiar supermarket. Total time will be measured from the first to the last dwell on any product on the shelf.

H1b. Returning participants in an unfamiliar supermarket will take longer time from start to finish than participants familiar with *the same supermarket*. Total time will be measured from the first to the last dwell on any product on the shelf.

H2a. Returning participants in an unfamiliar supermarket will have a longer evaluation stage than *the same participants* in a familiar supermarket. The evaluation stage will be measured from the first to the last dwell on the chosen product.

H2b. Returning participants in an unfamiliar supermarket will have a longer evaluation stage than participants familiar with *the same supermarket.* The evaluation stage will be measured from the first to the last dwell on the chosen product.

H3a. Returning participants in an unfamiliar supermarket will focus on more items and have more re-dwells in the evaluation stage than *the same participants* in a familiar supermarket.

H3b. Returning participants in an unfamiliar supermarket will focus on more items and have more re-dwells in the evaluation stage than participants familiar with *the same supermarket.*

H4. Returning participants in an unfamiliar supermarket will be less satisficed with their supermarket shopping and have a harder time choosing their products than *the same participants* in a familiar supermarket. Satisfaction and difficulty will be measured by a questionnaire asking participants how hard it was to choose their product and satisfaction with their purchases.

H5. Returning participants in an unfamiliar supermarket will make *worse* choices compared to *the same participants* in a familiar supermarket. Worse in the sense of less in line with their stated preferences.

The focus in H4–5 will only be on the returning participants. Will participants be more satisfied with their choices and choose more according to their preferences knowing the supermarket? Orquin, Bagger & Moeller Loose (2013) showed that familiarity with the task environment increases participants ability to choose according to their preferences, is that also true in a natural environment?

2 Method

Participants

50 Participants (18 female, mean age: 21.4, SD: 2.6), with normal or corrected to normal eyesight were recruited outside of supermarket No.1. Out of these 38 returned to the second supermarket (16 female, mean age: 21.5, SD: 2.8). They were asked if they, besides their normal shopping, were willing to buy products from the pasta, yoghurt and cereal shelves as well as be willing to come back after a month to our second supermarket and do the same thing. If they agreed to this they were compensated for their purchase with a voucher that covered the expense of the three products (100 SEK in each store). Besides that they were also given a cinema voucher as a compensation for travelling across town to the second supermarket, after completing the shopping trip.

Table 2. Difference in product range between the two supermarkets. Cereal was not analysed due to time limitations.

	Amount of yoghurt products in each supermarket (amount of front faced products in parenthesis)	Amount of pasta products in each supermarket (amount of front faced products in parenthesis)	Amount of cereal products in each supermarket (amount of front faced products in parenthesis)
Supermarket No.1	82 (161)	82 (211)	–
Supermarket No.2	95 (202)	81 (336)	–

Another 26 participants (13 female, mean age: 22.8, SD: 5.1) were recruited outside the second supermarket. These also had normal or corrected to normal eyesight and were asked to buy from the same three categories apart from their regular shopping. They were compensated with a voucher that would cover the expense of the three products (100 SEK).

Materials

3 different SMI-glasses were used. They all recorded binocular eye movements at a rate of 30Hz. The eye trackers recorded the data on a Lenovo laptop using the SMI Iview ETG recording software. The laptop was placed in a backpack and carried by the participants throughout the entire shopping trip.

The two supermarkets were ICA Kvantum Malmborgs Tuna (Supermarket No.1) and ICA Kvantum Malmborgs Mobilia (Supermarket No.2). Both located in Lund, Sweden, at a distance of around 4km from each other. Both supermarkets were similar in product range being of the same type (Kvantum Malmborgs) though ICA Mobilia was bigger in area size (see table 2). The three product categories were yoghurt in one liter packages, pasta but not spaghetti or lasagna due to those products being located on a different shelf in supermarket No.2 and cereal, not including muesli for the same reason, being located on a different shelf.

The familiarity questionnaire consisted of self-estimation questions such as how often do you shop at supermarket No.1, questions about how satisficed participants were with the choices they made and the factual questions about supermarket layout. All questions were answered either on a graded scale ranging from -5 to 5 where 0 represented no influence (for example when asked to rate how difficult they thought the choice was a positive number indicated an easier time) or self assessment answers (such as how often they visited supermarket No.1).

The preference questionnaire was also on a scale from -5 to 5 and was used to create the option quality for the chosen products. Participants were asked to state how much an attribute, such as fat content, country of origin, price per kilo and calorie content, affected them when choosing a product from three categories.

Procedure

All participants were fitted with eye tracking glasses and a backpack to carry the computer recording the process. A 1 or 3-point calibration was done with all participants before entering the supermarket. A validation of the calibration – having participants focus on a moving target was also done. All participants bought products from the three categories at some point during their shopping trip. There were no limitations to in what order the participants did their shopping and they were to select the products from the categories at any time during their supermarket visit. There were also no time frame instructions given.

Instead participants were asked to shop as if they did their regular shopping. Before removing the eye tracking glasses another validation was done were the participants were told to focus on a moving finger. Directly after participants were done shopping they filled in the familiarity questionnaire and the preference questionnaire.

The procedure was repeated in the second supermarket, with the exception that the return group had a few added questions regarding their previous purchases from the first supermarket included in the familiarity questionnaire. For the new participants requited at supermarket No.2 the procedure was the same as the one described for supermarket No.1. All participants signed a consent form and were, before being fitted with an eye tracker, instructed that they could at any time abandon the study without repercussions.

Analytical plan

In the return group (GR1), only participants that also returned to supermarket No.2 were used in the analysis. 1 participant in GR1 was excluded for not being familiar enough with the first supermarket. 8 participants in the control group (GR2) were also excluded for not qualifying as familiar enough with supermarket No.2. To be considered familiar with a supermarket participants had to do their shopping at least once a month at the supermarket. Familiarity with a product category was defined as shopping from it two or more times a month.

For the yoghurt shelf, 5 participants in GR1 were removed due to loss of eye tracking data. Another 6 participants in this group and 3 in GR2 were eliminated from the same category due to shopping lactose-free yoghurt and as such did their shopping from a different section and chose between a smaller set of products. In total, the return group (GR1) consisted of 26 participants and the control group of 16 participants.

In the pasta category GR1 consisted of 23 analysed participants and GR2 of 12 participants. 8 participants were removed GR1 due to loss of eye tracking data. Another 6 were removed because they choose pasta from a different shelf or from the short-end of an isle and thus did not look at the pasta shelf. 6 participants were removed in GR2 for the same reason.

Due to lack of time, no analysis was made on participants shopping from the cereal shelf in either supermarket.

The collected eye tracking data was manually frame-by-frame analysed, using dynamic gaze mapping to map the collected eye movements to high resolution pictures of the three product shelves in both supermarkets and coded using AOI's in SMI BeGaze™ Eye Tracking Analysis Software by four independent coders. The fixations on AOI's where then

divided into dwells according to the definition stated in Gidlöf et al. (2013, p.6) i.e. all fixations within an AOI for a duration of at least 120msec. To ascertain the span of the evaluation stage the definition in Gidlöf et al. (2013) were used (from the first to the last dwell of the selected product).

Option quality for the selected products was calculated using both participants' stated preferences for each attribute in a product category – on a scale from -5 to 5 – and a normalized multi-attribute model for all attributes of all products in a category.

The model normalized attributes in a product category by converting them to a range between 0 and 1 based on the maximum value for each of the attributes. For example, the *best* priced pasta product – most value for your money – would be normalized to a 1 and the other products would be converted to values between 0 and 1 depending on their price compared to the best priced one. To calculate option quality this value was then multiplied with the participant's stated importance with the attribute. This was repeated for all attributes of the product category. These were then summed together to produce an option quality value for the selected product. Option quality was used to compare the chosen products in supermarket No.1, and supermarket No.2 for the return group (GR1).

Shopping in the three given categories (both in the familiar and unfamiliar setting) were analysed according to the previous stated hypotheses:

H1. Time spent on choosing a product, from start to finish. This was investigated using total time of dwells on AOIs from start to finish in each condition. Any interaction effect with category familiarity was investigated using both the above mentioned definition of category familiarity (at least twice a month) and a scale denominating the amount of purchases from a category on a yearly basis.

H2-3. Time and effort spent in the evaluation stage. This was analysed using total time of dwells in the evaluation stage, amount of re-dwells on any AOI in the evaluation stage as well as the total amount of AOIs fixated on in the evaluation process between each condition. As in H1, any interaction effect on total dwell time in the evaluation stage with category familiarity was investigated using both a the above mentioned definition of familiarity and a scale denominating the amount of purchases from a category on a yearly basis.

H4. The perceived supermarket satisfaction and difficulty of the participant's choices was compared between the two supermarkets in the return group (GR1) condition only. Any interaction effect with category familiarity was investigated using both the above mentioned definitions of familiarity.

H5. The option quality of the choices made in each supermarket was used to compare the product GR1 choose in supermarket No.1 with the product chosen in supermarket No.2. It was calculated using participants' stated preferences taken from the preference questionnaire and a normalized attribute model for all attributes in a product category.

3 Results

Familiarity

Mean average proportion of visits to a supermarket were calculated using the reported number of visits to the supermarket divided by the amount of times grocery shopping in general (see table 3a&b). In the return group (GR1) all but 9 stated that they shopped at supermarket No.1 at least once a week and all but one stated that they did their shopping at supermarket No.1 at least once a month. Out of the 38 returning participants in GR1 14 stated that they had never visited supermarket No.2. The remaining participants stated that they visited it at most a couple of times per year. The proportion of correct answers on the factual supermarket related questions for the return group were 0.45 (SD: 0.50) in supermarket No.1 and 0.30 (SD: 0.46) in supermarket No.2.

In the control group (GR2) 7 stated that they shopped at supermarket No.2 at least once a week. 16 stated that they shopped at supermarket No.2 at least once a month.

The mean average proportion of purchases for each product category was calculated using the stated number of times a participant did a purchase from the product category divided by how many times they go grocery shopping in general. 12 participants analysed in GR1 and 12 in GR2 were defined as being familiar with the yoghurt category. 13 analysed participants in GR1 and 9 in GR2 were defined as being familiar with the pasta category. The requirement being familiar with a product category were purchasing from the product category at least twice a month.

T**able 3a.** The mean average proportions of supermarket visits and category purchases. Supermarket proportion based on amount of visits or to a certain supermarket divided by general visits to any supermarket. Category purchases proportion number of times shopping from a category divided by general supermarket visits.

	Average proportion of visits to supermarket 1 (SD in parenthesis):	**Average proportion of visits to supermarket 2 (SD in parenthesis):**	**Average proportion of purchases of yoghurt (SD in parenthesis):**	**Average proportion of purchases of pasta (SD in parenthesis):**	**Average proportion of purchases of cereal (SD in parenthesis):**
Return (GR1)	0.7 (0.34)	0.05 (0.16)	0.23 (0.29)	0.15 (0.13)	0.08 (0.12)
Control (GR2)	–	0.33 (0.35)	0.30 (0.28)	0.19 (0.13)	0.05 (0.05)

T**able 3b.** The mean average of supermarket visits and category purchases calculated per year.

	Mean average of visits to supermarket 1 per year (SD)	**Mean average of visits to supermarket 2 per year (SD)**	**Mean average of purchases of yoghurt per year (SD)**	**Mean average of purchases of pasta per year (SD)**	**Mean average purchases of cereal per year (SD)**
Return (GR1)	160 (115)	7 (4)	40 (49)	26 (22)	16 (25)
Control (GR2)	–	54 (49)	48 (42)	35 (29)	9 (9)

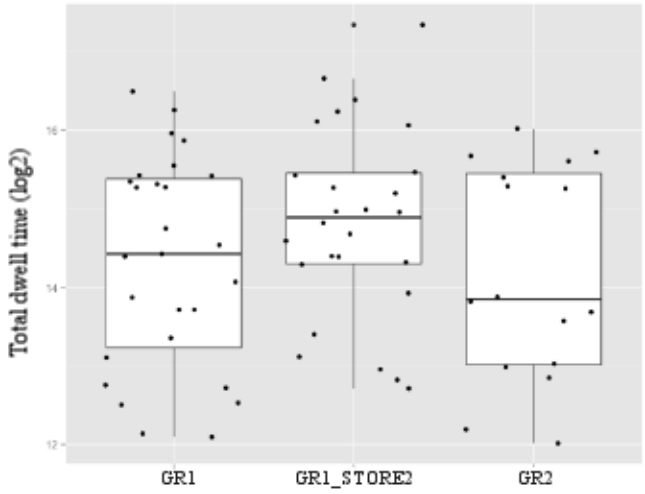

Fig. 3a. Boxplot showing total dwell time (on a logarithmic scale; $\log_2$) on the yoghurt shelf in all three conditions. Left: GR1 in supermarket No.1. Middle: GR1 in supermarket No.2. Right GR2 in supermarket No.2.

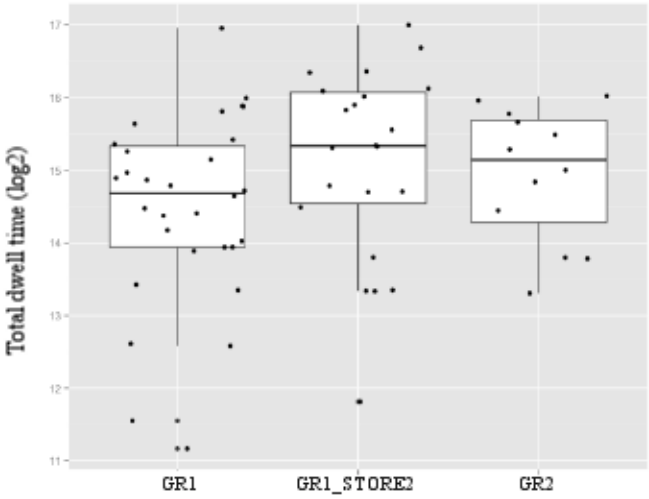

Fig. 3b. Boxplot showing total dwell time (on a logarithmic scale; $\log_2$) on the pasta shelf in all three conditions. Left: GR1 in supermarket No.1. Middle: GR1 in supermarket No.2. Right GR2 in supermarket No.2.

Total dwell time in front of the shelf

A logarithmic scale was applied to both the total dwell time and the evaluation dwell time. This since there was a skewedness in the data with a few large outliers. In all figures regarding total- or evaluation dwell time the value on the y-axis shows an doubling of the actual value for each step in the scale, $y = \log_2(n)$. All analyses in text or in tables will use milliseconds or both milliseconds and $\log_2$ values to be easier to understand.

Total dwell time was calculated from the first dwell on any AOI to the last dwell on any AOI on the product shelf. Fig. 3a&b shows boxplots of the total dwell time for the yoghurt and the pasta shelf in all three conditions: The return group (GR1) in supermarket No.1 and GR1 in Supermarket No.2 and the control group (GR2) in supermarket No.2.

The return group. A paired t-test on GR1 suggests an increase in total time between GR1 in supermarket No.1 and in supermarket No.2. Yoghurt showed a mean increase of 10974 msec when GR1 were moved to supermarket No.2 ($t(22) = 1.689$, $p = 0.10$); for pasta a 19266 msec increase ($t(19) = 3.657$, $p = 0.0017$).

The control group. A t-test comparison between GR1 in supermarket No.2 and GR2 in supermarket No.2 showed no apparent difference between groups in total dwell time (yoghurt, $t(47) = 0.306$, $p = 0.76$; pasta, $t(32) = 1.169$, $p = 0.25$).

A bootstrapped (1000 repetitions) calculation of the mean averages of total dwell time (see fig. 4a&b) indicates an increase in mean total time for GR1 in supermarket No.2 compared to GR1 in supermarket No.1 for both pasta and yoghurt. The control group comparison between GR1 in supermarket No.2 and GR2 in supermarket No.2 shows a tendency for GR2 to be somewhat faster. Table 4 shows the 90% confidence interval for the bootstrapped mean values for total dwell time in all these three conditions for both pasta and yoghurt.

Table 4. Bootstrapped total mean dwell time as well as a 90% CI for the yoghurt and pasta category in all conditions (values in msec).

Yoghurt:	Mean	[5% – 95%]
GR1 in supermarket No.1	29419	22485 – 36857
GR1 in supermarket No.2	40216	29528 – 52131
GR2 in supermarket No.2	31552	24112 – 39171
Pasta:		
GR1 in supermarket No.1	28646	21982 – 35558
GR1 in supermarket No.2	48213	37383 – 59441
GR2 in supermarket No.2	37241	28291 – 45270

[Total dwell time ~ supermarket familiarity * product category familiarity] for the return group. Two fitted linear models (table 5a&b) were applied to the yoghurt category for the return group (GR1) in both supermarkets. They were used to analyse any interaction effects on total dwell time by using both category familiarity and supermarket familiarity as explaining variables (see fig. 5a&b). The first model (table 5a) used the pre-defined requirements for being familiar with a product category (shopping from it more than once a month) and the second model (table 5b) used the number of purchases from a category in a year. Neither model showed any definite interaction effects on the total dwell time in front of a category shelf.

In the pre-defined unfamiliarity model (table 5a), unfamiliarity with a category pointed to a longer total dwell time in supermarket No.1 compared to participants familiar with the product category (+14083 msec). But when moved to the unfamiliar supermarket these participants unfamiliar with the category showed a tendency to be faster – have a shorter total dwell time – in supermarket No.2 than the participants familiar with the category (in total 10243 msec faster). Total estimated times for participants familiar with the category in supermarket No.2 (38463msec) and participants unfamiliar with the category (28220msec) suggest an increase in total dwell time regardless of category familiarity when moved from supermarket No.1 to supermarket No.2. But without any strong generalizability.

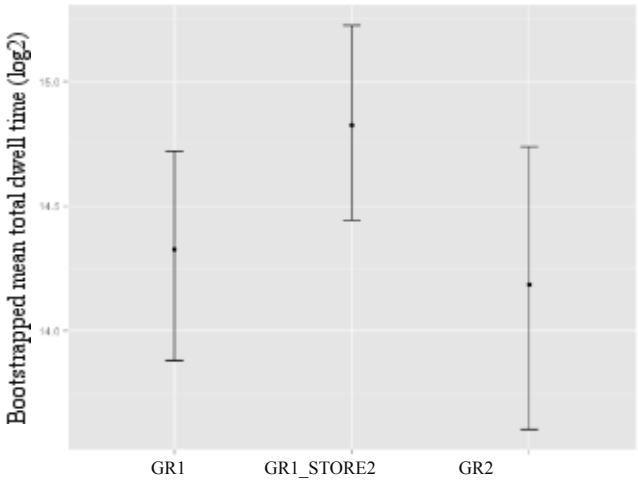

Fig. 4a. Bootstrapped 90% confidence interval of the mean total dwell time (on $\log_2$ scale) on the yoghurt shelf for all three conditions. Left: GR1 in supermarket No.1. Middle: GR1 in supermarket No.2. Right GR2 in supermarket No.2.

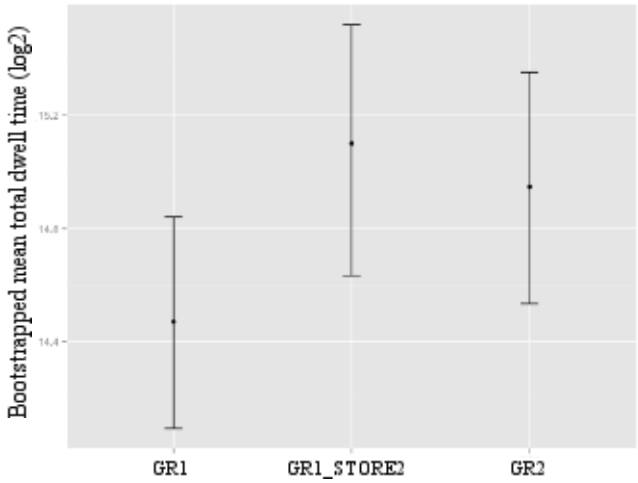

Fig. 4b. Bootstrapped 90% confidence interval of the mean total dwell time (on $\log_2$ scale) on the pasta shelf for all three conditions. Left: GR1 in supermarket No.1. Middle: GR1 in supermarket No.2. Right GR2 in supermarket No.2.

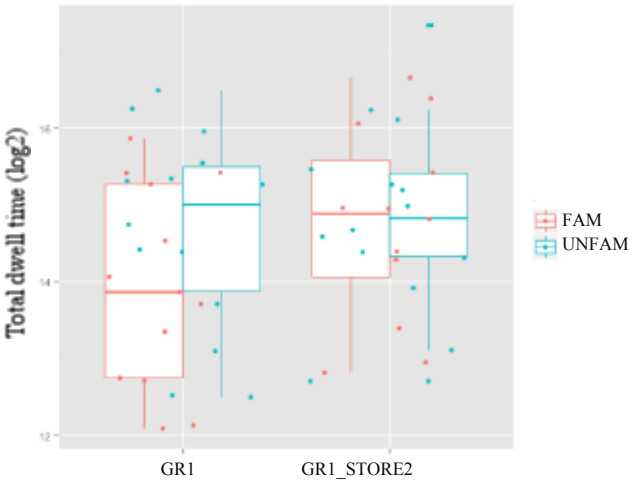

Fig. 5a. Boxplot showing total dwell time (on a logarithmic scale; $\log_2$) on the yoghurt shelf divided into familiar (left boxplot) and unfamiliar (right boxplot) with the category. Left pair: GR1 in supermarket No.1, right pair: GR1 in supermarket No.2.

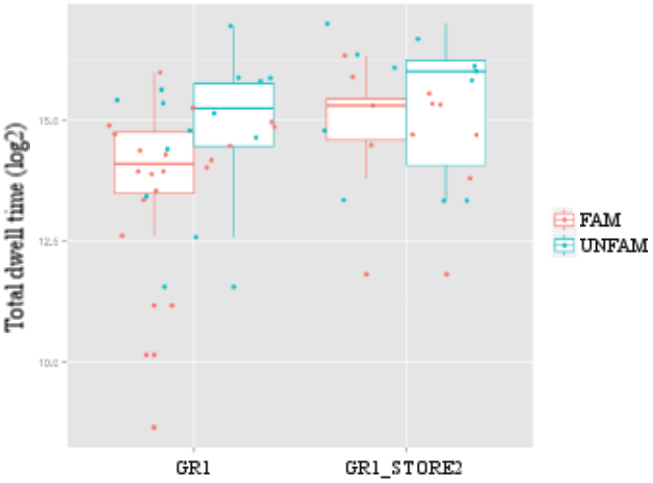

Fig. 5b. Boxplot showing total dwell time (on a logarithmic scale; $\log_2$) on the pasta shelf divided into familiar (left boxplot) and unfamiliar (right boxplot) with the category. Left pair: GR1 in supermarket No.1, right pair: GR1 in supermarket No.2.

Table 5a. Showing a linear model correlating interaction with category familiarity on the total dwell time on the yoghurt shelf when category familiarity is pre-defined to more than once a month: [Total dwell time ~ supermarket familiarity * product category familiarity] (estimates in $\log_2$ and msec).

	Estimate (msec)	Std. error	t value	Pr(>|t|)
Total dwell time on yoghurt at supermarket No.1	13.940 (22254)	0.354	39.420	–
Increase of total dwell time in supermarket No.2	0.821 (16209)	0.510	1.608	0.114
Effect if unfamiliar with yoghurt in Supermarket No.1	0.745 (14083)	0.491	1.517	0.136
Interaction effect if unfamiliar with yoghurt and in supermarket No.2	-0.626 (-10243)	0.702	-0.891	0.377

Table 5b. Showing a linear model correlating interaction with product familiarity on the total dwell time on the yoghurt shelf when familiarity is the amount of product purchases/year: [Total dwell time ~ supermarket familiarity * product category purchases] (estimates in $\log_2$ and msec).

	Estimate (msec)	Std. error	t value	Pr(>|t|)
Total dwell time on yoghurt at supermarket No.1	14.526 (35015)	0.323	44.916	–
Increase of total dwell time in supermarket No.2	0.457 (9501)	0.460	0.993	0.326
Effect of amount of yoghurt purchases	-0.005 (-138)	0.005	-0.961	0.341
Interaction effect between amount of yoghurt purchases and supermarket	0.001 (38)	0.007	0.145	0.885

Similar tendencies could be seen in the second model, which used the number of category purchases in a year instead of the pre-defined category familiarity condition. This model suggests that an increase in category purchases leads to a decrease in the total dwell time while at supermarket No.1. When moved to supermarket No.2 purchase frequency did not seem to affect the total dwell time. The model showed no convincing interaction effects. Due to time limitations these models were not applied to the pasta data but by comparing fig. 5b with fig. 5a it seem to show a similar tendency if applied.

Dwell time, products focused on and amount of re-dwells in the evaluation stage

The evaluation stage was defined as the first to the final dwell on the product chosen in each product category. Re-dwells are the amount of returns to any AOI within the evaluation stage. All figures have time on the $\log_2$ scale on the y-axis.

The return group. A paired t-test on the total length of the evaluation stage for GR1 in both supermarkets suggest that participants took a longer time in the evaluation stage while in supermarket No.2 (see fig. 6a&b.) For yoghurt a mean increase of 13946 msec ($t(22) = 1.846$, $p = 0.078$); pasta an increase of 11971 msec ($t(15) = 1.876$, $p = 0.08$).

The control group. A t-test on the length of the evaluation stage between GR1 in supermarket No.2 and GR2 in supermarket No.2 points to a difference in time between these groups on the yoghurt data. (Yoghurt, $t(35)=1.859$, $p=0.072$; pasta, $t(32) = 1.374$, $p = 0.18$).

A bootstrapped (1000 repetitions) mean for total length of the evaluation stage (see fig. 7a&b) indicated that GR1 in supermarket No.2 took on average 14000 msec longer time in the evaluation stage on the yoghurt shelf compared to both themselves in supermarket No.1 as well as the control group in supermarket No.2, see table 6 for means and 90% CI. More exactly, a mean average of 13999 msec longer between GR1 in supermarket No. 1 and No.2 and a mean average of 13551 msec longer between GR1 in supermarket No.2 and GR2 in supermarket No.2. The pasta data showed a similar tendency. GR1 in supermarket No.2 had an mean average increase of 12056 msec compared to themselves in supermarket No.1 and 10528 msec compared to GR2 in supermarket No.2 for the pasta shelf.

Table 6. Bootstrapped mean evaluation dwell time. As well as a 90% CI for the yoghurt and pasta category in all conditions (values in Msec).

Yoghurt:	Mean	[5% – 95%]
GR1 in supermarket No.1	15644	10144 – 21685
GR1 in supermarket No.2	29643	19665 – 40504
GR2 in supermarket No.2	16092	11422 – 20962
Pasta:		
GR1 in supermarket No.1	20127	13549 – 27233
GR1 in supermarket No.2	32192	22665 – 43039
GR2 in supermarket No.2	21664	14964 – 28252

[Total evaluation time ~ supermarket familiarity * product familiarity] for the return group. As in total dwell time, the return group (GR1) was fitted to two linear models to investigate any interaction effect between supermarket familiarity and product familiarity (see fig. 8a&b). Both linear models were fitted to the yoghurt data and suggest that participants unfamiliar with product category had an increased evaluation time in supermarket No.1 compared to participants familiar with a product category. The models were not applied to the pasta data but a comparison between fig. 8a and fig. 8b suggest a similar tendency for both categories.

In the pre-defined familiarity condition (shopping for the product category at least twice a month) there was an estimated increase in evaluation time for both familiarity levels when shopping in supermarket No.2 compared to supermarket No.1. Total evaluation time: 25692 msec if familiar with the yoghurt category and 32735 msec if unfamiliar (see table 7a). The second model, where number of purchases from a category was used as category familiarity, the effect of amount of purchases did not indicate a likely decrease in evaluation time (see table 7b). No model showed a convincing interaction effect on evaluation time.

Amount of products focused on in the evaluation stage. When comparing the amount of products focused on in the evaluation stage for both the pasta and the yoghurt data, we did not find any increase for the return group (GR1) in supermarket No.2 compared to themselves in supermarket No.1. A paired test on the amount of products focused on in both supermarkets showed no indication of participants focusing on more products while in supermarket No.2 (yoghurt, $t(17)=0.248$, $p=0.807$; pasta $t(15) = 0.191$, $p = 0.851$).

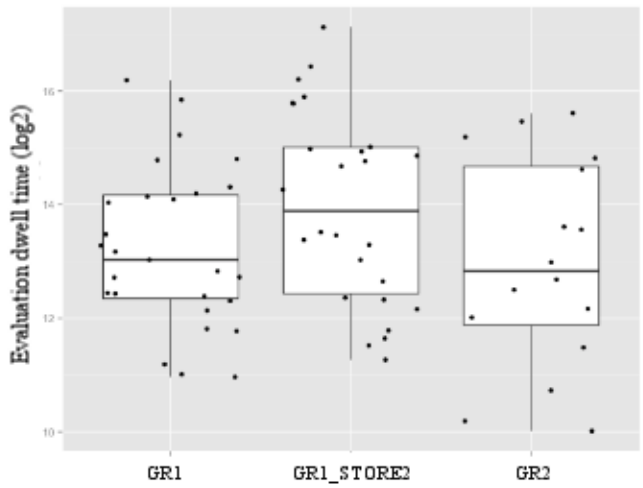

Fig. 6a. Boxplot showing evaluation dwell time (on a logarithmic scale; $\log_2$) on the yoghurt shelf in all three conditions. Left: GR1 in supermarket No.1. Middle: GR1 in supermarket No.2. Right GR2 in supermarket No.2

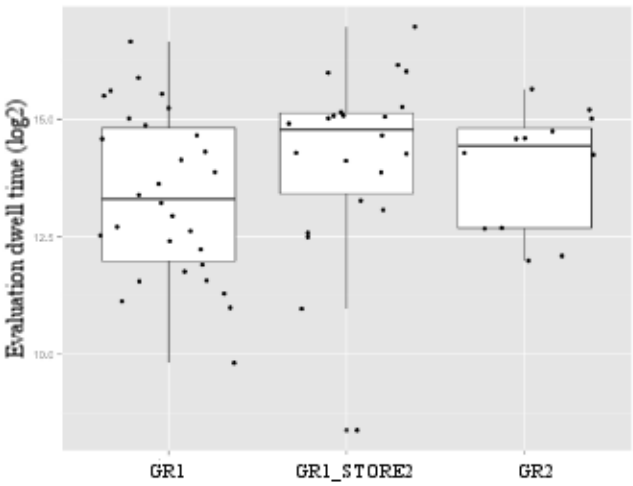

Fig. 6b. Boxplot showing evaluation dwell time (on a logarithmic scale; $\log_2$) on the pasta shelf in all three conditions. Left: GR1 in supermarket No.1. Middle: GR1 in supermarket No.2. Right GR2 in supermarket No.2

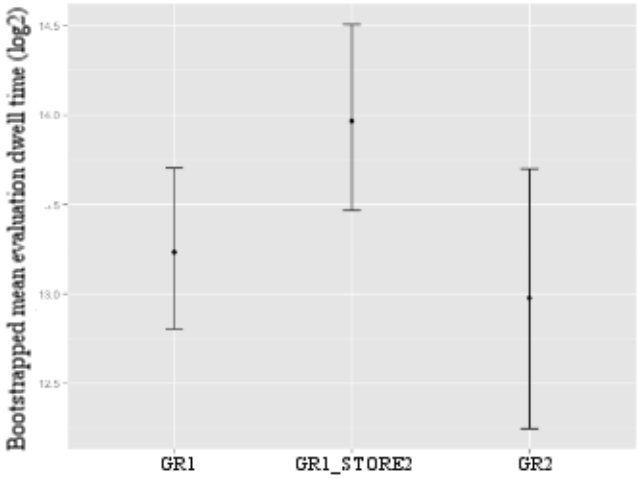

Fig. 7a. Bootstrapped 90% confidence interval of the mean evaluation dwell time (on $\log_2$ scale) for the yoghurt shelf for all three conditions. Left: GR1 in supermarket No.1. Middle: GR1 in supermarket No.2. Right GR2 in supermarket No.2.

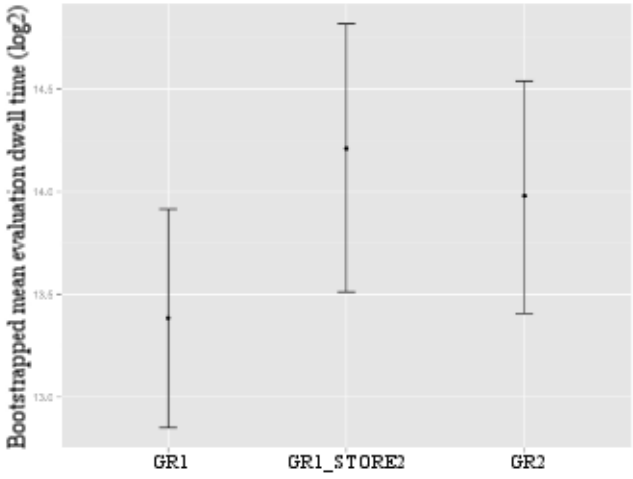

Fig. 7b. Bootstrapped 90% confidence interval of the mean evaluation dwell time (on $\log_2$ scale) for the pasta shelf for all three conditions. Left: GR1 in supermarket No.1. Middle: GR1 in supermarket No.2. Right GR2 in supermarket No.2.

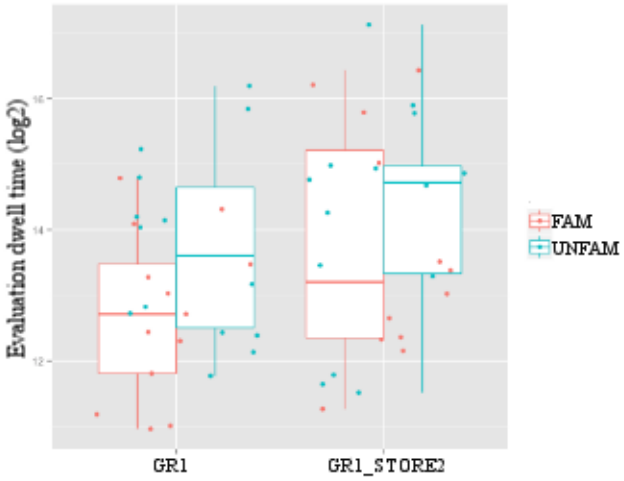

Fig. 8a. Boxplot showing evaluation dwell time (on a logarithmic scale; $\log_2$) on the yoghurt shelf divided into familiar (left boxplot) and unfamiliar (right boxplot) with the category for GR1. Left pair: GR1 in supermarket No.1; right pair: GR1 in supermarket No.2.

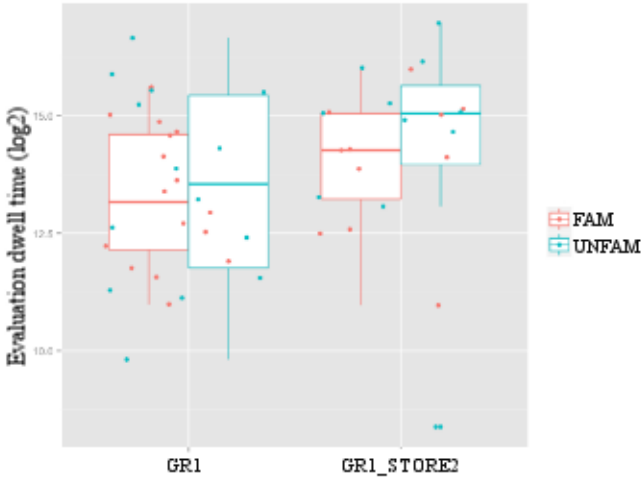

Fig. 8b. Boxplot showing evaluation dwell time (on a logarithmic scale; $\log_2$) on the pasta shelf divided into familiar (left boxplot) and unfamiliar (right boxplot) with the category for GR1. Left pair: GR1 in supermarket No.1; right pair: GR1 in supermarket No.2.

Table 7a. Showing a linear model investigating interaction with product familiarity and the evaluation dwell time on the yoghurt shelf when product familiarity is pre-defined to more than once a month: [Total evaluation time ~ supermarket familiarity * product familiarity] (estimates in $\log_2$ and msec).

	Estimate (msec)	Std. error	t value	Pr(>|t|)
Dwell time in evaluation stage at supermarket No.1	12.725 (9468)	0.427	29.826	–
Increase of dwell time in supermarket No.2	0.953 (16224)	0.616	1.547	0.128
Effect if participants were unfamiliar with yoghurt	0.982 (11706)	0.593	1.658	0.104
Interaction effect if unfamiliar with yoghurt and in supermarket No.2	-0.446 (-4663)	0.847	-0.527	0.600

Table 7b. Showing a linear model investigating interaction with product familiarity on evaluation dwell time on the yoghurt shelf when familiarity is the amount of product purchases/year: [Total evaluation time ~ supermarket familiarity * product purchases] (estimates in $\log_2$ and msec).

	Estimate (msec)	Std. error	t value	Pr(>|t|)
Dwell time in evaluation stage at supermarket No.1	13.494 (19417)	0.391	34.524	–
Increase of dwell time in supermarket No.2	0.769 (14210)	0.556	1.384	0.173
Effect of amount of yoghurt purchases	-0.007 (-98)	0.006	-1.034	0.306
Interaction effect between yoghurt familiarity and supermarket	-0.0009 (-6)	0.009	-0.101	0.920

The control group t-test comparison did indicate a difference in amount between GR1 in supermarket No.2 and GR2 in supermarket No.2 for yoghurt (yoghurt, t(38)=2.427, p=0.019) but not for pasta (t(27) = 0.827, p = 0.42) . A bootstrap (1000 repetitions) on the mean amount of products focused in the evaluation stage on for both pasta and yoghurt can be seen in table 8.

Table 8. Bootstrapped mean amount of products focused on in the evaluation stage with a 90% confidence interval.

Yoghurt:	Mean	[5% – 95%]
GR1 in supermarket No.1	12.01	8.85 – 15.70
GR1 in supermarket No.2	17.80	12.73 – 23.15
GR2 in supermarket No.2	7.16	3.94 – 11.13
Pasta:		
GR1 in supermarket No.1	16.99	12.33 – 22.10
GR1 in supermarket No.2	18.44	13.09 – 24.05
GR2 in supermarket No.2	14.13	8.42 – 20.08

Amount of re-dwells in the evaluation stage. A paired t-test on the amount of re-dwells did not indicate an increase in the amount of re-dwells for participants in GR1 when moved to supermarket No.2 with any strong generalizability. Neither for yoghurt (t(22)= 1.338, p= 0.195); nor for pasta (t(15) = 0.876, p = 0.39).

A control group t-test indicated that the amount of re-dwells for GR1 in supermarket No.2 was different from the amount of re-dwells GR2 in supermarket No.2 did on the yoghurt shelf, but not on the pasta shelf. Both shelves had an increase of around 10 re-dwells for GR1 in supermarket No.2 compared to GR2 in supermarket No.2 (mean increase of 10.6 for pasta and 11.6 for yoghurt) (t(41)=2.034, p=0.048; pasta t(31) = 0.986, p = 0.33). A bootstrap (1000 repetitions) on the mean amount of re-dwells can be seen on table 9, it suggests an increase in re-dwells for GR1 in supermarket No.2 compared to both other conditions for the yoghurt shelf but not on the pasta shelf.

Table 9. Bootstrapped mean amount of re-dwells in the evaluation time. As well as a 90% CI for the yoghurt and pasta category in all conditions

Yoghurt:	Mean	[5% –95%]
GR1 in supermarket No.1	15.8	10.2 –21.8
GR1 in supermarket No.2	24.2	16.7 – 32.5
GR2 in supermarket No.2	12.9	8.3 – 18.0
Pasta:		
GR1 in supermarket No.1	26.9	17.1 – 37.3
GR1 in supermarket No.2	27.3	17.0 – 39.8
GR2 in supermarket No.2	21.2	13.7 – 29.1

Supermarket satisfaction and difficulty with product choice

Satisfaction. There was no indication that moving to an unfamiliar supermarket affected the reported satisfaction with the shopping session. A paired t-test on all returning participants (GR1) indicated no difference between supermarkets (t(37)=0.836, p=0.409).

Stated choice difficulty. How difficult it was to choose a product was stated on a 10 degree scale (from -5 to 5). Only participants in the return group were analysed. The analysis regarding the choice in the yoghurt category pointed to a difference in difficulty between supermarkets but without any strong generalization. From a mean average of 1.63 in supermarket No.1 to 2.35 in supermarket No.2 (paired t-test yoghurt t(44.4)= 1.119, p=0.269).

A fitted linear model on the yoghurt shelf investigated difficulty of the choice depending on both supermarket familiarity and the pre-defined product category familiarity. It pointed to that participants unfamiliar with purchasing yoghurt also found it harder – at supermarket No.1 – to choose a product (by 1.901 points) see table 10 for details. As seen in fig. 9a – participants unfamiliar with purchasing yoghurt experienced the choice as easier when moved to supermarket No.2. In the fitted model participants familiar with purchasing yoghurt showed no difference between supermarket No.1 and No.2.

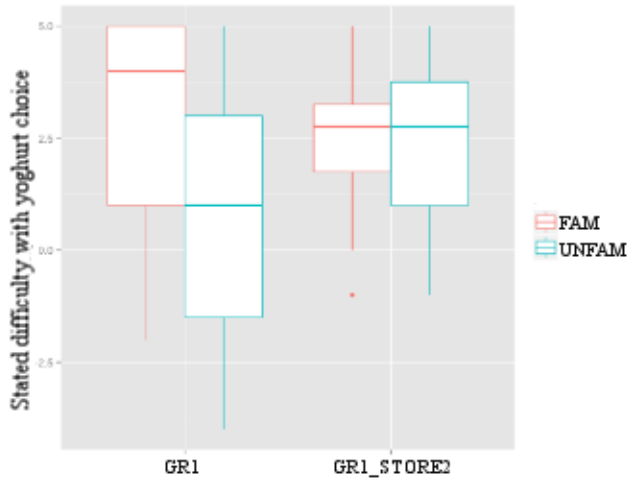

Fig. 9a. Boxplot of the reported difficulty with the yoghurt choice for GR1. Left boxplot pair, GR1 in supermarket No.1. Right boxplot pair GR1 in supermarket No.2. Unfamiliar with product category on right boxplot in each boxplot pair.

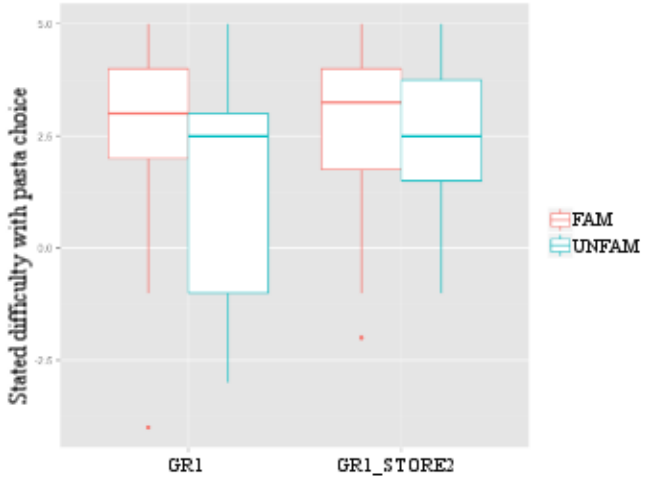

Fig. 9b. Boxplot of the reported difficulty with the pasta choice for GR1. Left boxplot pair, GR1 in supermarket No.1. Right boxplot pair GR1 in supermarket No.2. Unfamiliar with product category on right boxplot in each boxplot pair.

The same model was fitted on the pasta choice (see fig. 9b). It suggests that participants unfamiliar with purchasing pasta a have a slight difference between supermarket No.1 to supermarket No.2 (from 2.11 to 2.45 points) while participants familiar with pasta showed no difference between supermarkets (t-test pasta, $t(50) = 0.583$, $p = 0.59$). The difference of the difficulty of choice between supermarkets seems to mainly be from the participants unfamiliar with the product category.

Table 10. Table showing estimate of difficulty with choosing yoghurt depending on which supermarket and level of yoghurt familiarity as well as any interaction effect them between.

	Estimate	Std. error	t value	Pr(>|t|)
How difficult choice in supermarket No.1	2.6154	2.615	4.117	–
Decrease in difficulty in supermarket No.2	-0.157	0.917	-0.171	0.865
Effect if participants were unfamiliar with yoghurt	-1.901	0.882	-2.155	0.036
Interaction effect if unfamiliar with yoghurt and in supermarket No.2	1.693	1.261	1.342	0.186

Option quality for the chosen product

Option quality was calculated using participants stated preference towards an attribute in the product category and a normalized model for each attribute and all products in each category. The preferences and the normalized model were used to get a number of how much the chosen product matched participants' stated preferences. The option quality of the chosen product was analysed on all participants in the return group (GR1) that returned to supermarket No.2 and did a purchase from the product category.

Option quality of the yoghurt choice. In total, 27 different attributes in supermarket No.1 and 35 in supermarket No.2 were used to calculate the option quality for the selected yoghurt products. The option quality values were normalized to be able to be comparable between supermarkets. The average mean option quality for GR1 in Supermarket No.1 was 0.47 (SD: 0.28) and the average mean for GR1 in Supermarket No.2 was 0.41 (SD: 0.20). The mean average difference was -0.035 (SD: 0.282). A paired t-test for the control group could not differentiate the difference with any generalizability ($t(28) = 0.662$, $p = 0.51$).

Option quality of the pasta choice. The pasta category was calculated on 45 attributes in supermarket No.1 and 48 in supermarket No.2. The results of the option quality were normalized to compare between supermarkets. In supermarket No.1 GR1 had an average option quality of 0.25 (SD: 0.18) and 0.28 (SD: 0.15) in supermarket No.2. The mean average difference between the supermarkets was 0.063 (SD: 0.119). A paired t-test showed a difference between the products chosen in supermarket No.1 and No.2 ($t(27) = -2.78$, $p = 0.01$).

4 Discussion

Moving participants to an unfamiliar supermarket did not only seem to make them spend longer time in general in front of a shelf but it also seemed to make them take longer time and spend more effort evaluating their options and choosing a product. This both compared to themselves in their familiar supermarket and to a control group of participants that was familiar with the second supermarket. Though the results did not indicate a strong statistical generalization. Most effect could be seen on the amount of time spent in the evaluation stage, where both the analysed yoghurt and the analysed pasta data where close to statistical generalizability ($p \approx 0.08$ for both pasta and yoghurt when doing a paired t-test on the return group, GR1).

The move between supermarkets did not produce an increase in the amount of products focused on in the evaluation stage. The amount of re-dwells pointed to an increase for GR1 in supermarket No.2 both compared to themselves in supermarket No.1 and to the control group (GR2) in supermarket No.2. A more solid correlation could have been used as an argument for that more effort was being spent evaluating the options at hand.

Participants unfamiliar with a product category took in general longer time when evaluating and choosing a product. When analysing any interaction effects, familiarity with a product category did not seem to affect the amount of time spent in the evaluation stage in supermarket No.2. Both participants familiar and unfamiliar with a product category appeared to have an increase in time when moved to an unfamiliar supermarket.

The amount of participants in the control group makes the comparison between the returning participants in the unfamiliar supermarket No.2 and the control participants familiar with supermarket No.2 less strong than intended. But it suggests that the amount of time spent in the evaluation stage was not because of the organization of shelves in supermarket No.2. The participants familiar with the second supermarket were on average faster in the evaluation stage, indicating that the increased amount of shelf faced products did not seem to affect the familiar participants in the same amount as it did the unfamiliar.

When analysing reported difficulty with choosing a product participants unfamiliar with a product category found it in general harder in the familiar supermarket than in the unfamiliar supermarket. Participants familiar with a product category reported no difference in difficulty between supermarkets. When analysing the chosen products' option quality the differences between supermarkets were minute and inconclusive. Even though a paired comparison of the pasta choice did show an increase in option quality from supermarket No.1 to supermarket No.2. the actual value of the difference between supermarkets was small and the option quality of the yoghurt choice showed no such increase when compared between supermarkets. No difference in satisfaction with purchases was found between supermarkets.

The benefits of regularly purchasing from a category seem to be limited to at what supermarket it is being purchased. This study suggested that familiarity with a product category – similar to the Russo & Leclerc (1994) study – decreased time and effort for participants in the familiar supermarket. But when these participants familiar with the product category were moved to the unfamiliar supermarket, category familiarity did not seem to be an interacting factor.

By being familiar with a product category in a task environment – consumers' local supermarket – they can decrease the time and effort *in that environment*. These effects seem to vanish or at least be reduced when we are moved to an unfamiliar supermarket.

When investigating reported difficulty, participants with less familiarity with the product category indicated that when moved to an unfamiliar supermarket the task got easier. I would speculate that the explanation could be that these participants did not bring as much prior knowledge into the decision making task and as such were less affected by the change in task environment. Instead they were using the category knowledge from the familiar supermarket to reduce the difficulty in the unfamiliar supermarket.

The results of the option quality indicated that participants' choices got a bit better in the pasta category but not in the yoghurt category in supermarket No.2. In both categories the actual differences where small.

The analysis done on option quality only compares the chosen products in each supermarket, it would be interesting to also see how good their chosen product was compared to all available products in the category. Maybe their choices in either supermarket did not compare very good to their stated preferences to start with, so any difference in option quality is negligible compared to the whole range.

Defining familiarity

Park and Lessig stated in their 1981 study that there seem to be no consensus in what denominates familiarity (Park & Lessig, 1981, p.229) and it seems to be a valid point to this day. There are a few options on how to distinguish familiar participants from unfamiliar. For instance, Mackay and Olshavsky (1975) based familiarity on that the supermarket had to be the participant's main store for grocery shopping (p.199). We opted not to use this requirement since supermarket familiarity need not only be with one supermarket. Another way could be to use the amount of visits to a specific supermarket. This could have been used but instead we opted on using a measurement based on the regularity of supermarket visits.

The cut-off for being familiar with a supermarket used – at least once a month – was based on an educated guess as to how much time in a supermarket is needed to be familiar with it. Similarly the Orquin, Bagger and Moeller Loose (2013) study used purchasing fruit-yoghurt at least once a month as a requirement for participating in their study. The product category familiarity definition used was stricter than the one used in Orquin, Bagger & Moeller Loose – more than once a month. By defining it as at least twice a month we got two groups that was fairly even. For example, 12 analysed participants in GR1 where considered familiar and 14 unfamiliar with yoghurt. Participants categorized as familiar with a product category also would have purchased from the category more frequently than from the time from the first session in the familiar supermarket to the second session in the unfamiliar supermarket, which were one month apart.

Product category familiarity was also analysed by the amount of purchases from a category per year. A scale similar to the scale used in the Russo and Leclerc (1994) study. Both definitions of product category familiarity were used to investigate interaction effects. We used both to see how much of an impact the way familiarity is defined matters when analysing data. Both definitions indicated the same tendencies but the pre-defined showed a tendency to be stronger for statistical generalization.

Using regularity of supermarket visits as a way to define familiarity meant that the control group was not as familiar as the return group in their respective familiar supermarkets. 8 participants from the control group had to be removed to get an equal comparison, which made the control group quite small (only 12 analysed participants in the pasta category, 16 in the yoghurt category). The less frequent shopping by the control group in supermarket No.2 could be because supermarket No.2 seem more suitable for larger shopping trips – Supermarket No. 2 being larger in area size. Larger shopping trips are often done less frequently. Participants removed in GR2 might have been equally familiar with the layout of the supermarket as Gr1 in supermarket No.1. By having regularity with supermarket visits as a requirement we had to exclude them to ensure that the two groups were similarly familiar.

The intention of the factual questions about the layout of the supermarket was to be used as another way to measure supermarket familiarity. A measurement that was not based on amount of visits but instead of how good of a mental map participants had of the supermarket. Unfortunately the questions difficulty level was not enough to differentiate participants' mental maps between supermarkets. More time ought to have been spent constructing the questions. Especially in supermarket No.2, were the intention was that the return group would have little to no knowledge. But some of questions were too easy –everyone answered correctly – and had to be removed from the analysis. It could be worth re-doing in another study just to try an find a value for familiarity that is not based on supermarket visits but on knowledge with the layout.

Measuring eye movements

What is the best measurement to use when analysing eye tracking data? Eye tracking data can be used in many ways. See table 11 for three different ways to sum up the total time in front of the yoghurt shelf in this study.

It exemplifies three ways of measuring total time in front of a shelf. The first column is total time from first focus on a shelf to the last. It includes all time in between i.e. not only dwells on products. In many cases participants focused outside the shelf, on their phone or on their basket with

Table 11. Summary of the mean average times in three different scales in msec of the total session infront of the yoghurt shelf.

	Total average time in front of shelf in msec:	**Total average time in front of shelf on AOI's in msec:**	**Total average dwell (>120msec) time on AOI's in msec:**
GR1 in supermarket 1	48392.15	33040.29	29556.3
GR1 in supermarket 2	55247.42	43466.04	40530.56
GR2 in supermarket 2	39793.55	33897.36	32848.23

groceries. It could be that some form of evaluation was being done at these times that this study has failed to pick up. The second column is similar to what we ended up using, but without the exclusion of dwells below 120msec. Many smaller dwells ought to be considered saccades between two products – which is the reason one would remove them – but a different cut-off might also have affected the results of our data. The cut-off of 120msec for a dwell was based on the definition in Gidlöf et al. (2013) but one could argue that a 100msec dwell also could be considered a fixation or that we need an even higher dwell threshold. 120msec is the time we need to focus on a word (Gidlöf et al., 2013) but in other research a fixation may have a different threshold (Holmqvist et al., 2011, p.155). Our way of dividing our eye tracking data into dwells on AOI's does in other words not capture all data in front of a shelf. Hopefully it does capture all relevant data, which is what is important.

Task factors

The two visits were placed at the same dates one month apart to minimize any economic factors – such as visits before and after payday – which otherwise might have had an effect on the general attitude of the participants in both supermarkets. Even though participants were compensated for their purchases in the three categories visits before and after payday could have affected the way they approached a shelf. Similarly the time period – afternoon – were the same in both supermarkets, this to also minimize any social aspects such as more grocery shoppers in the supermarket adding stress or time pressure (Nordfält, 2007: 222). In general, participants got used to the eye tracking glasses relatively quick. Wearing the eye trackers and the backpack did not seem to affect their behavior when looking through the analysed material.

The three product categories were chosen to be products that would be consumed from the first to the second supermarket visit. This to minimize any effect of still having and using the choice in supermarket No.1 when making a choice in supermarket No.2. They were also chosen to be products were consumers might not prefer one single product or brand but are likely to change depending on their preferences at the time.

The difficulty of choosing a product or the importance of choosing *the best* product could have been different for the two analysed categories – even though participants' stated difficulty with the task did not indicate any difference.

Participants did more re-dwells in all three conditions for pasta than for yoghurt. Both the amount of re-dwells on the pasta shelf for GR1 in supermarket No.1 and in supermarket No.2 was higher than the amount of re-dwells for GR1 in supermarket No.2 for yoghurt. That could indicate that choosing pasta were either a more difficult choice or more important choice to start with. That could be why it did not show an increase in the amount of re-dwells similar to the amount of re-dwells for the yoghurt shelf. The increase in option quality for pasta but not for yoghurt might indicate that the pasta choice was more important than the yoghurt choice. Participants spent more effort and got somewhat better since it was a more important choice.

The preference questionnaire used is by no means the perfect way of measuring preferences. For instance, we are often affected by what we chose and by having the preference questionnaire after the shopping session the choice they made in the supermarket might have an unjust amount of value (Payne, Bettman & Schkade, 1999). This could be the explanation for why the difference between supermarkets was minute. Preferably the participants' preferences ought to have been recorded on a third occasion to minimize this effect. But to get participants to return a third time might have been a little too much to ask for.

Time factors

There was no time frame specified to any participant. Instead they were told to shop as they would on a normal shopping trip. Hopefully that was the case as well. There could have been an effect on participants in the return group (GR1) in supermarket No.2. When recruited they were on they way to make a regular shopping trip in supermarket No.1 but in supermarket No.2 they were part of a study, having been instructed to be at supermarket No.2 at a certain day and time period. This could have affected them to have a more of a "controlled setting attitude" – to take their time, evaluate their options. Hopefully though any effect of this is negligent and negated by the fact that they could take as much or little time as they wanted.

Implications and future research

By shopping in your local supermarket you do seem to reduce the time and effort of your grocery shopping. Even though the product range and shelf organization for the three product categories investigated were mostly the same in both supermarkets, it would appear that grocery shopping in a familiar supermarket is faster and less cognitively taxing than in another supermarket – even within the same chain.

A constant layout and product range seem to aid consumers learning the layout and product range to be efficient shoppers. Narrowing down time in the supermarket and in front of the shelves. But seeing it from another angle, a supermarket chain would probably prefer if we spent more time and money in their supermarkets.

From a supermarket's perspective making consumers spend more time in a supermarket might increase their profit. There is for instance research done as well as rules of thumb on how to get the best costumer flow or where to place different product categories to get consumers to spend more time in the supermarket without it having a negative impact on their shopping experience (see Buttle, 1984; Donovan & Rossiter, 1982). By moving around more consumers seem to be more susceptible to in-store marketing, making them buy more (Inman, Winer & Ferraro, 2009). Re-designing supermarkets or re-localizing categories within stores have also shown to increase sales (see Dagger & Danaher, 2014). A fair amount of research has also been done around the organization of shelves. Mostly with the intention to get the most exposure for as many products as possible (see Nordfält, 2007 for a review of some of this research).

By making consumers search more or move around more stores are working against consumers' supermarket familiarity, making it harder for the consumer to use previous experiences to streamline the task. But this might also turn away costumers. There seem to be a small clash here between keeping customers efficient and happy, returning regularly and a supermarket wanting to increase its profit.

A trade-off that hopefully would keep customers happy and returning and keeping supermarkets profit increasing would be to change the product range slightly from time to time. New information is best ingested in small portions. By

keeping consumers interested with new products but not too much to overwhelm them supermarkets could maybe keep an increased exposure to more products, which in turn would increase profit without consumers feeling overwhelmed.

Moving forward, finishing analysing the third category could strengthen the statements presented above. If the cereal category also points to a similar tendency the increase in time and effort seem to be something more general and not category dependent. I could be the basis for further studies using different product categories and using different supermarket chains.

By increasing the number of participants we would hope to see more solid correlations between supermarket familiarity and amount of time and effort for the choice task. The t-test correlations were in most comparisons above the threshold for what is considered statistical significance but the bootstrap analysis pointed to that a more generalizable difference, foremost between GR1 in both supermarkets, could be found with additional participants.

Conclusion

It would appear that consumers *do not feel* that moving to an unfamiliar supermarket affects them that much, their satisfaction with their purchases was similar and they did not feel that it was a more difficult task. But when analysing the decision making process it does suggest that they did take more time both in general and, more interestingly, in evaluating their options and choosing a product in an unfamiliar supermarket. This increased time in the evaluation stage did not increase the amount of products that participants focused on. Which suggest that more effort was spent on evaluating a similar amount of products in the unfamiliar supermarket. It also indicates that the increase in time was not an effect of more front facing products on the shelves in supermarket No.2. Something the control group comparison also indicated.

The amount of return fixations to a product were inconclusive and could not strengthen the speculation that increased time also meant increased effort. But a new study with more participants might. Moving participants did not seem to make participants choose a better or worse products, the option quality data were contradictory. It suggested that the pasta choice got better but not the yoghurt choice. Without an comparison on how their choices compared to the rest of the product range it would be too much to say anything general about if participants did a better or similarly good choice in supermarket no.2.

In sum, consumers might do their very best shopping in their regular supermarket. It would at least seem that they do their shopping faster and more effortlessly. Hopefully this study has shown that the effect of familiarity is not simply an artifact of a controlled setting but visible in everyday life. Supermarket familiarity does indeed affect us as consumers. Where you do your grocery shopping matter. If you want to reduce the time and effort of shopping it seems best to stick to a supermarket you know.

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