Can a familiar positive sound affect purchase decision on retail environment?

- Nudging for a healthier choice

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Abstract:

In this Thesis a laboratory experiment was organised in Norway to test if familiar positive sounds like eating carrots or a sound of water stream in the nature, could affect the purchase decisions on a retail environment. The test was conducted in Norway with 16 participants that were divided into control and test group. All participants had eye tracking glasses on the experiment and the videos were analysed afterwards to see if there was a change or affect to visual attention when sample sounds were played. Afterwards they were asked what affected their choice of products. Theories from behavioural and environmental psychology as well as Interdisciplinary Retail framework were used to analyse the results and the concept of Richard Thaler's Nudging was highlighted as an approach. The results showed that the test group that were nudged with sounds when they were choosing a snack for example between chocolate or carrots and drinks between water and Pepsi overall went for healthier choices and mentioned the word 'healthy' more times when giving reasons for their choices. Even though results cannot be generalised, the result shows an encouraging result that nudges like this might work in real life grocery store setting as well. More testing is needed with sounds in general as finding positive familiar sounds might prove to be challenging. Healthy choices especially for kids and youth are something that needs to be looked into especially in countries like Norway where consumption for sugary drinks per capita is high. Further research is encouraged in this field.

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FOREWORD

While studying at Arcada University of Applied Sciences I had a great opportunity for exchange studies at Westerdals School of Arts Communication and Technology in Oslo, Norway. I would like to thank all the parties involved in this process and especially Degree Programme Director Carl- Johan Rosenbröijer for the nudge and support.

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1 INTRODUCTION

The topic chosen for the research ended up being a journey that started with two requirements, - it had to preferably relate to marketing in a retail environment and it had to be something new. This was purely a wish as the researcher has been working in retail marketing for several years and as a subject it would combine both professional and personal interests well. An opportunity to collaborate on the research with a Norwegian company Lydbox, who specialises in music and advertising through customer radios in store and shopping malls, - naturally formed the subject to be something to do with sound/music.

Today's shopping environment in any type of retail store is filled with various different things that are trying to influence the consumer to choose products that the retailer or different brands for that matter, would like to sell. These could be point of sale materials, different displays to highlight the products or just offers of some kind. These could also be the layout of the store, packaging, and advertising over the loudspeakers or even the staff could be incentivised to promote certain products or initiatives.

If we now know that music played in store has an effect on shopping behaviour we also know that in some of the studies the participants were not aware of the music played in the background, yet it still had an effect to their behaviour (North et al., 1999). This in turn opens up a new question, if music affects, does a familiar and or relatable sound do the same? Could this be used in a more ethical context than just increasing sales for the big brands?

1.1 Method

The research was conducted as a lab experiment, using eye tracking glasses to collect data on eye movement and participants were also asked two questions after the test. The place for the experiment was Westerdals School of Arts, Communication and Technology in Oslo, Norway and the 16 participants were students from the school.

1.2 Limitations

There is still perhaps certain reluctance in the social sciences towards laboratory evidence and if it can be relied on. Where it is commonly thought that student subject pools are perhaps unrepresentative, there are also common objections regarding the sample sizes being too small and that the lab results would somehow produce unrealistic data (Falck & Heckman, 2009).

While all these can be valid concerns, it is to be noted that lab experiments actually allow decision environments to be controlled very tightly and a controlled environment itself is very much a foundation of empirical scientific knowledge. Lab experiments can also be very powerful for example in studies where behavioural assumptions or models are being tested and controlled variables are important (Falck et al, 2009).

Lab experiment was chosen for this research as the resources for field experiment were not available and lab experiment with a participant pool was readily accessible. It is also worth noting that having tightly controlled variables was considered important in order to produce potentially more valid data. There are not a great amount of experiments that would be been conducted using sound as a nudge and therefore researcher also felt that in the end a lab experiment would more specifically address this need.

1.3 The aim and research question

The aim of the study was to see if a positive familiar sound had an effect to a purchase decision or choice. To outline the purpose of this research is to find out if a familiar positive sound can, the same as music, effect the purchase decision and could it be used as a nudge to guide consumers to choose healthier options when shopping in a grocery store? In this way it can hopefully help retailers and retail marketers to take into account the purpose of sound when planning and designing effective shopping environments in the future.

The research question was looked at from the angle that would there be a possibility for this being used in a more ethical context then just aiding sales for the big brands? The idea behind this is that a familiar sound that is used in advertising, for example the sound of Coca-Cola being poured into a glass that has ice on it, - is widely regarded as a familiar sound as it has been used in their advertising for a long period of time. So would a familiar sound of other kind have the same effect? (Coca-Cola.com, 2017).

In this research it is first briefly explained how music affects consumer behaviour on retail, as there is a great deal of research in this field already. To provide and an angle it is looked at from the point of view where clear results have been achieved with some research in the past and how these could be linked to just sound. Studies for the familiar sounds on their own are limited however, so that is why music is here used as a reference point.

As in this research the sound is used as a nudge to try to get the participants to choose a healthier option, the theoretical framework and literature review will go through the concept of nudging. Nudging is not really a scientific approach but more like a way of thinking or a concept that was brought into the mainstream attention by Thaler & Sunstein in 2008 in their book “Nudge, Improving decisions about health, wealth and happiness”. In short this is an approach where the idea is to steer people to go towards for example a healthier choice, without making a decision on their behalf. The idea is not disrupt, but to perhaps make life a bit easier, safer or enable people to navigate the day

to day life better and the whole time making sure that the freedom of choice applies (Sunstein, 2014).

Here is it also worth mentioning for the background purposes that as the research was conducted in Norway, it is to be highlighted that the consumption of sugary drinks per capita is fairly high and the figures from 2015 say that is in fact 90 litres per head (Drikkeglede, 2017).

As sound exactly like music is considered part of atmosphere of the store and it could be also linked to experience marketing, these are briefly linked to the matter to explain the ecosystem of retail a bit more.

More in detail in this research two different theories and one framework are explained. The framework is in an essence a tool that can be used when different nudges are designed for example for grocery stores. Wansink's Interdisciplinary Retail Framework (2017) is used to illustrate not only how more traditional marketing efforts like signage, service and structure can be used as a nudge, it also gives important insight to consumers that shop for healthy food in grocery stores. The actions in store he calls as interventions.

The scientific theories that are explained in the literature review are Mehrabian and Russell (1974) behavioural environmental psychology and also a variation from that which Donovan and Rossiter (1982) worked on when relating the same theory more to the shopping environment. This has been integral part of the research conducted in how music affects consumer behaviour on retail. The second model comes from behavioural sciences and is called Motivating Operations in Consumer Choice (Fagerstrøm et al. 2010). These two explain the consumer behaviour in different ways from the effects of the environment to behaviour to establishing motivating operators that could reinforce the behaviour in certain situations. These theories and framework are then used to analyse the results of the experiment

1.4 Structure of the Thesis

Firstly the literature is presented regarding how music and sound affect consumer behaviour is, followed by the concept of nudging.

After that the framework and two main theories are explained more in detail to give more information to back up the lab experiment and results.

This is followed by method results, discussion and conclusion, where further research recommendation are given.

2 THEORETICAL FRAMEWORK

The literature review will consist of various different research articles that have been done in regards to music in the retail environment; there is also a breakdown on the main scientific theory regarding the motivational operations in their implications to consumer choice in a behavioural perspective context. Nudging will be outlined as well as Kotler's principles of atmospheric marketing (1973) and an introduction experience marketing (Schmitt, 2010).

2.1 How does music influence consumers?

These would the main areas that the research would be reflecting the results on, the various different studies are not listed in this particular literature review, but a list of some of the ones that are relevant is attached as an appendix.

Different research has been conducted in connection with sound and also other senses combined in relation to purchase behaviour. Morrison, Gan, Dubelaar and Oppewal (2010) did a research regarding how the in-store music and aroma influenced shopper's behaviour and satisfaction. In their tests the variables were music that was either high or low and a scent of vanilla that was either present or not present and their test were done in a retail setting that was aimed at young and fashionable female shoppers. Their findings point out that both; the volume of the music as well the vanilla aroma scent had a great impact on satisfaction and emotion levels of the shoppers. In their further analysis of the findings it was found that the pleasure levels were increased by the arousal that the combination of aroma and music caused was a contributing factor to the positive behaviour of the shoppers that resulted in more time and money spent in store, as well as more satisfied shopper experience. The limitations of their study could be that they only used one store in their test and not different store environments and that they only

tested with the vanilla scent as the retailer felt that it was from their opinion the most suitable for their consumer group and brand image. (Morrison et al, 2010).

Similar congruency study was done by Mattila and Wirtz (2001) where they discovered that when the ambient sound and scent were matched with their congruence it affected positively on how the shoppers would rate the ambience in the store environment and they would also be more encouraged to shop in that setting. They had trialled a different types of scents and music types together in order to find out the congruency effect. (Mattila et al,2001).

If the volume of the music seems to have an effect, then tempo also seems to matter. Study that was done in a restaurant setting discovered that tempo had an effect on how long time did people spend in a restaurant and with slow tempo music they dined longer. There was also difference on how much money was spent depending on the music tempo, with slow music more money was spent in food and drink (Caldwell & Hibbert, 1999). This could mean that depending on how quickly the restaurant wants to turn over their customers they could perhaps alternate the tempo in order to make more revenue on slower days and in turn serve more people when they are busy by playing high tempo music.

On a different study the type of music played in a wine store was tested. In the test classical music was played versus top-forty songs and the findings were that not only did classical music played on the background influence the shoppers to spend more money; it also encouraged them to spend it on more premium products in comparison to top-forty music (Areni & Kim, 1993).

Another wine store example was done by North and Hargreaves (1999) where they wanted to find out if French and German wine purchases were affected when typically French or German music was played in store. The music was played on alternate days and the wines had their similar displays in store. The conclusion was that on the French music days the purchase of French wine increased and German declined and on the German music days the French wines sales declined and German wine purchased in-

creased. When the consumers were asked afterwards, it turned out that they were not aware of the music affecting their purchase choices (North et al, 1999).

There has also been some research more into the type of music played in store, where in a research it was tested if it had an impact to consumers purchase intention if the music played in the background was happy or sad or liked or disliked music. The conclusion was that in this particular case and with the limited study group of women's fashion store customers the best combination to increase purchases was to play happy and liked music. (Broekemeier, Marquardt & Gentry, 2008).

When flower store was tested by playing romantic music in the background versus pop music or no music at all, the highest purchases happened when the atmosphere that people can associate with romance was created with romantic music (Guéguen, Boulbry and Sami, 2009).

Knoeferle, Knoeferle, Velasco and Spence (2016) conducted research on how the meaning of sounds guides consumer's visual attention where they did five different set up tests. They wanted to establish if sounds like chewing crisps and brand jingles would guide the consumer's visual attention on the supermarket shelve (in this case on a computer screen) when looking for and at products. They used eye-tracking glasses and in a lab environment in order to conduct these test. Conclusions were that these sounds had an effect and they did not necessarily need to be sounds that the participants would have been familiar with beforehand as also sounds that they had come across and learned about in the test also had an effect. (Knoeferle et al, 2016).

Shen and Sengupta (2014) studied the crossmodal effect of attention on preferences and on seeking to predict if an auditory signal would have an effect on visual attention and why, if there were products nearby where the signal was coming from.

2.2 How does sound influence consumers?

In their field experiment in a food retail store in Sweden; Spendrup, Hunter and Isgren (2016) wanted to find out if there was a connection between nature sounds and in this case bird singing background sound, had any effect on consumers' willingness to buy food that was sustainable or in this case organic or climate friendly, as they had labelled them. They discovered that in fact it made no difference in purchase decision to the women that participated in the survey, but there was in fact had an effect on the men that were taking part on the experiment. This was in particular men that had low intentions on buying the sustainable carrots in the first place, as all participants purchase intentions were surveyed as part of the field experiment. (Spendrup et al, 2016.)

The way they explained the difference was that perhaps the nature sound was not one that had appealed to everyone as it could have been associated with having birds in the store and cleanliness. Another explanation was that men perhaps did not feel as connected to the nature as women did and the nature sound worked as a reinforcing factor for that connection. They do highlight in their findings that there was also a difference between organic and climate friendly products in the test, where the organic ones were the ones with highest purchases and this could also be due to the fact that climate friendly as a word is not as commonly used in connection with vegetables as organic is and its benefits can be seen as less obvious. They conclude that the area needs more research and that it challenging to do these studies in a retail environment with so many other factors affecting the experiment, but at the same time, it would be interesting to find out more on the subject. (Spendrup et al, 2016.)

2.3 The Concept of Nudging

The concept of nudging is still new. Many studies are perhaps still in progress and conversation on the matter is ever increasing.

Richard H. Thaler and Cass R Sunstein wrote their bestseller book in 2008 “Nudge, Improving Decisions About Health, Wealth and Happiness” (2009) to explain nudging and to give examples of how it could be used in different situations in life. The term nudge is defined as: “to push, mildly or poke gently in the ribs, especially with the elbow” (Thaler & Sunstein, 2009. pp 4). In order to understand what nudging does or how, they also introduced a term called libertarian paternalism. Here the explanation in short for the two words would be that the word libertarian is a reference to freedom of choice and the word paternalism refers to the aspect of trying to influence or steer choices and choice architecture. So libertarian paternalists in this case are trying to make it easy for people to make their choices and do as they wish and not to limit in any way the freedom of choice for those who want to use it (Thaler & Sunstein, 2009).

When trying to influence people's choices and behaviour is only to make their lives to be healthier, longer and better, if possible. Libertarian paternalism is considered as soft as well as non-intrusive type. It will neither try to stop people doing what they want like eating a lot of candy, nor force them to act in any way. When these actions are done for example by the government or private sector as an attempt to make people's lives better, it is called nudging. Therefore a nudge in this context can be any intervention that is considered as easy or alternatively cheap to avoid. When placing fruit display at eye level in store that is considered as a nudge, where a total ban of fast food would not be one (Thaler & Sunstein, 2009).

Thaler & Sunstein claim that it is a false assumption to think that all people, at all times would be making choices that would be at their best interests or that those choices would be better than choices that someone else would have made for them. If put even in a more general setting the process of how people choose is very much an empirical question and the answers to that are likely to vary depending on the different domains. It could be reasonable to assume that in situations where people have a good information and previous experience and they get speedy feedback on the matter - they will make better choices. The opposite applies to those situations where they are poorly informed, inexperienced and feedback is infrequent or slow. A good example of this could be choice between ice cream and fruit (Thaler & Sunstein, 2009).

What is also a misconception that it would be possible to avoid influencing the choices that people make? There are many situations where like it or not, the organisation or government have to make choices from their part that will effect on how people choose. For example a government has to choose that if they are running the canteens at schools, that what type of food is served and in some countries at least, make sure that in those canteens food is considered healthy. Not making that choice, would be considered as unhelpful. Whether governments or organisations can be trusted to make these decisions is another matter. The thought that where there is paternalism, there is coercion is also not true in this case. Placing fruits and salad in a school canteen, before the desserts is probably not an issue to anyone, if as a result the kids in that school eat more fruit and vegetables. The questions would perhaps be that is the situation different if instead of kids it would be teenagers or adults? Thaler and Sunstein (2009) suggest that as there is no arm-twisting involved in this, perhaps this type of paternalism should be allowed exist (Thaler & Sunstein, 2009).

To give an example, Sunstein (2014) lists 10 important nudges: “

1. Default rules (e.g. automatic enrolment on programs, including education, health, and savings) […]
2. Simplification (in part to promote take-up of exciting programs) […]
3. Uses of social norms (emphasising what most people do, e.g., “most people plan to vote” or “most people pay their taxes on time” or “nine out of ten hotel guests uses their towels”) […]
4. Increases in ease and convenience (e.g. making low-cost options or healthy foods visible) […]
5. Disclosure (for example, the economic or environmental costs associated with energy costs […]) […]
6. Warnings, graphic, or otherwise (as for cigarettes) […]
7. Precommitment strategies (by which people commit to a certain course of action) […]
8. Reminders (for example, by email or text message, as overdue bills and coming obligations or appointments) […]
9. Eliciting implementation intentions (“do you plan to vote?”) […]

10. Informing people of the nature and consequences of their own past choice […] "(Sunstein, 2014 pp 585-587).

Studies that have been conducted in the US regarding food and nudging have had some positive results, for example a study done by Gabrielyan at the Cornell University (2016) was finding out the impacts of smarter lunchroom interventions on vegetable and fruit selection and consumption. In this study they made changes in six schools to have the fruit, vegetable and low-fat milk choices in more prominently displayed in the cafeteria and other six schools made no changes to their cafeteria set up. When the food waste was measured it was found out that the schools that had promoted the healthy options there was significantly less waste on fruit and vegetables. (Gabrielyan, 2016).

On another nudge study by Brand & Wansink (2016) they studied the impact of pictures in the ice cream packaging to the portion sizes served. They measured two situations; one with pictures of recommended portion size and one with the images of the actual ice cream packaging (which were in fact 200% bigger than the actual recommended portion size). In the end where the comparison was done how the pictures affected their serving sizes, the ones that had been given pictures from the ice cream packaging were serving themselves 22.7% bigger portions than the ones that had seen the pictures of the actual recommended portion sizes. They recommended disclaimers on these branded images so that people would be more aware of the portions sizes pictured did not match with the actual recommendations. (Brand et al, 2016).

To summarise, nudging can be used in many settings, it works in many occasions and it does not tamper with freedom of choice.

2.3.1 Background for the research set up

In Norway the yearly soft drinks consumption per capita in 2015 was 90 litres. Even though, there has been a reduction of 15 litres from 2008, this could be still considered

as fairly high. As there has now been more awareness worldwide on the possible dangers of sugar to health, many breweries are trying to reduce the sugar content on their drinks as a result. The ambitious aim by the government in Norway is to reduce sugar content in soft drinks and other sugary drinks by 19% by 2020. (Drikkeglede, 2017)

According to Moodie, Swinburn, Richardson and Somaini (2006) childhood obesity and obesogenic products and their promotion go hand in hand. The promotion of commercial products and energy balance and behaviour related to them is presented by in the table below.

Table I. Key behaviours associated with energy balance and their links to commercial products.

Energy balance	Behaviours	Related commercial products
Positive energy balance from decreased energy expenditure	◦ Car use	◦ Cars, road systems, car-dependent suburban housing
	◦ Occupational physical inactivity	◦ Energy-saving machines for doing work (e.g. factory & farm machines, computers)
	◦ Incidental physical inactivity	◦ Energy-saving devices for daily life (e.g. home appliances, lifts)
	◦ Passive recreation	◦ Programs and technology for TV, DVDs, movies, e-games
Positive energy balance from increased energy intake	◦ Consumption of energy-dense foods (6,7)	◦ Fast food, confectionery, high-fat or high-sugar foods, low water content foods (e.g. cookies, savoury crackers)
	◦ Consumption of high-sugar beverages (8)	◦ Soft drinks, sports drinks, fruit and cordial drinks
	◦ Consumption of low fibre foods (6)	◦ Highly processed foods
	◦ Consumption of large servings (9,10)	◦ Upsized products (larger volume for small extra price), low 'guilt' foods
	◦ Eating outside the home	◦ Fast food outlets, restaurants
	◦ Frequent snacking	◦ Snack foods, vending machines
	◦ Binge eating after diet failure	◦ Commercial diet programs
Negative energy balance from increased energy expenditure	◦ Recreational physical activity	◦ Exercise equipment, sporting club and gym memberships
	◦ Active transport	◦ Private mass transit services, bicycles, skate boards
Negative energy balance from decreased energy intake	◦ Consumption of naturally energy-dilute, fibre-rich foods	◦ Fruits and vegetables
	◦ Consumption of reduced-energy foods, beverages, and meals	◦ Manufactured low-energy foods, beverages and meals
	◦ Other dieting behaviours	◦ Commercial diets, books, meal replacements

Figure 1 *Key behaviours associated with energy balance and their links to commercial products.(Moodie et al 2006 p. 134).*

2.4 Atmosphere and Experience Marketing in Retail

In 1973 Philip Kotler already opened the conversation about atmospheric marketing in retail and since then experiments have been made to try to find the ultimate solution on how to create the most appealing environment in store, - appeal to all senses if possible and encourage purchase behaviour. Fast forward to 2017 and we have stores that play music with the right tempo for their clientele, smells are sprayed to attract the senses and displays are eloquently designed to please the eye. According to many studies in the field of music in store, when this is done correctly it can really affect the purchase decision and aid sell through (Mattila et al., 2001, North et al,1999).

Experience marketing was a term introduced by Bernd Schmitt (2010) and it follows on from Kotler's atmosphere thoughts. Without going to too much details on the philosophical aspects of an experience, it is worth mentioning that for example philosopher Søren Kierkegaard was one of the first ones to link experiences and emotions together. Still today it appears on recent marketing research that it is considered that emotions and affect would be important in guiding the decisions that consumers make. He has also highlighted the subjectivity of experiences and how that can have an impact. (Schmitt,2010). The key concepts in experience marketing are suggested to be the value in the experience, the different types that are consumer experiences and if they in fact are extraordinary experiences or just ordinary and lastly the different touchpoints in experiences. To define the value could be a way of seeing that the consumption of the product is not only bringing the possible value; it could also be the perceived experience of the consumption that has an effect. Describing the type of experience, sensory marketing comes into the context (Schmitt, 2010).

Kotler emphasises that the place in the marketing mix has more meaning, and in that way the atmosphere where the product has been bought at, can have an effect or may even become the product itself. No longer is product bought on its own, it now comes with other things like packaging, servicing, advertising and other by-products that can enhance the value of the product in consumers eyes (Kotler, 1973). Here is where sensory marketing is also discussed, and this would be because atmosphere can be seen,

smelt, heard and felt and not so much tasted, although taste associations can also be possible. It is also noted that there are differences on how people perceive atmosphere and how it may have been intended to be. It seems that how people react on it can be something that at least partly has been learned and therefore reactions to atmosphere can vary.

2.5 An Interdisciplinary Retail Framework

Brian Wansink (2017) in his article discusses the different types of interventions available for grocery stores to promote the sales of healthy foods. In his review a lot of recent research has been used to create a retail framework that he claims combines nutrition, psychology, marketing, public health as well as behavioural economics. His findings touch interesting matters that also can be related to this study, like concept that our grocery store habits are the base for our worst and best eating habits and that retailers are perhaps more motivated to sell healthy and profitable food than we think, they just have not got the tools and the knowhow on how to do it (Wansink, 2017).

If the trend with grocery retailers is currently to try different types of interventions only in one or two test stores, they do not often get used on a more bigger scale, as there the problem can also be that too many things are tested at the same time, for example loyalty, sales, satisfaction or even eye tracking. This can mean that results can therefore easily become inconclusive as there are so many outcomes (Wansink, 2017).

Wansink (2017) highlights also the fact that not all the shoppers have the same behaviour. Where a health food enthusiastic shopper is very much aware of all the products, - a mother shopping with her kids or someone on a low budget, might have very different view of looking at the same selection in store. This also reflects on the results on the research that has been done on this field. How to know if the same results are applicable to pensioners as to young people? Here Wansink (2017) suggest a solution that is to

look at the shoppers in categories that he suggests in a Hierarchy of Health Predisposition.

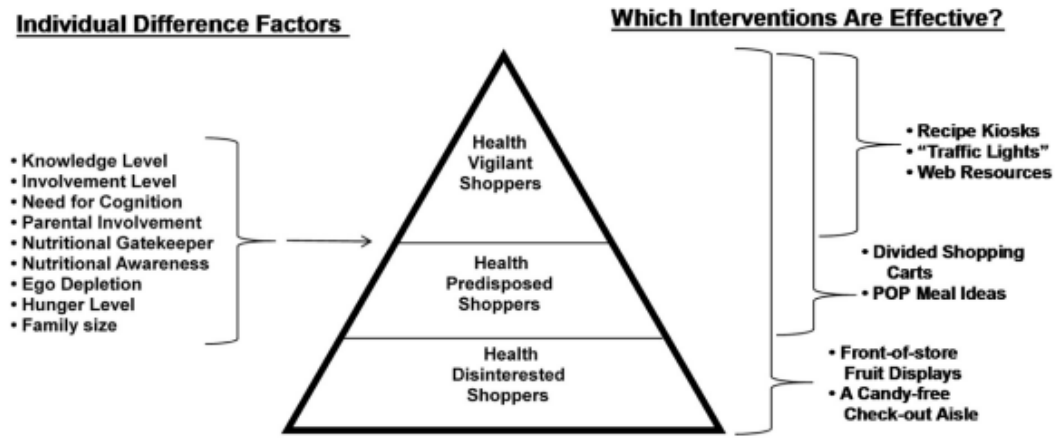

Fig. 2. The hierarchy of health predisposition.

Figure 2 *The hierarchy of health predisposition. (Wansink. 2017 pp 67.)*

The figure above explains the categories as well as the possible interventions that could according to the studies be made to work for each type of shopper groups.
Already many countries like Norway, has retailers that promote having "healthy check-outs" meaning that instead of chocolate, healthy snacks like fruit and nuts are available at the checkout point. With this type of intervention even the passive shoppers can be influenced as the healthy choices are readily available, therefore convenient and normal to choose in comparison to chocolates for example (Wansink, 2017).

CAN approach is also presented as a way of altering behaviour; it is short of words convenient, attractive and normal. By making things more convenient to buy, more attractive to buy and more normal to buy, is a way that healthy shopping can be promoted in more simple terms (Wansink, 2017).

In the retail intervention matrix the three categories; signage, structure and service have been researched to certain extend. There have been studies that have used for example visual tools in order to quantify to the shopper how much fruit and vegetable is needed

for the shop to be called a healthy food shop. Here tools like Half-Plate healthy where half of the dinner plate needs to be fruit and vegetables or a Half-Cart, where half of the shopping trolley is sectioned for the vegetables and greens have worked in some studies positively on healthy food choices (Wansink, 2017).

Structure and service in turn would describe in the matrix how to position the healthy foods in store, for example closest to the front door, promoted with other products and preferably at an eye level. Service side of things includes the cleanliness of the store, staff helpfulness and possible prompts like digital marketing efforts that can promote the healthy options before the shoppers enter the store (Wansink, 2017).
The table below shows how these different interventions could be used in a retail grocery store setting.

Table 1
How sample findings fit into the retail intervention matrix.

	More convenient to purchase	More attractive to purchase	More normal to purchase
Signage	• Floor decal arrow stickers asking people to follow the arrows to eat more nutritiously led to a nine percent increase in produce sales (Payne et al. 2014) • Joint efforts to provide fish dinner recipe cards and grilling instruction brochures were part of a larger campaign that increased fish sales by over 28% (Karevold, Tran, and Wansink 2017)	• New recipe ideas, co-promotions, and end-of-aisle displays increased canned fish sales by eighteen percent (Toft et al. in preparation) • Starring items as more healthy decreased the purchase of unstarred (less healthy foods) by two percent (Cawley et al. 2015)	• Signage stating that garbonzo beans (chick peas) were the most popular beans, increased preference by fourteen percent (Bhana 2017) • Shopping cart signs stating that the average shopper purchased at least five fruits and vegetables increased produce sales by ten percent (Payne et al. 2014)
Structure	• Healthy displays near the cash register increased sales 35%, even when product was not discounted (van Kleef, Often, and van Tripj 2012) • Items (including produce) that were within 12-in. of a shopper's eye-level comprised over 43% of all sales (Stein 2018)	• Fruit samples provided to consumers upon entering the store increased sales fruit sales by seven percent (Tal and Wansink 2015) • People were sixteen percent more likely to purchase a product from the first aisle they entered than any subsequent aisle (Stein 2017)	• Visually dividing a shopping cart in half and suggesting that half should be used for fruits and vegetables, increased their sales (Wansink and Herbst 2017; Wansink, Soman, and Herbst 2017;) • Using more islands than aisles in produce sections increased shopping time and items purchased (Mukund, Atakan, and Wansink 2018)
Service	• Healthy "Grab and Go" lines in in-store cafeterias led to a 82% increase in healthy food sales (Hanks et al. 2012) • Mobil apps that indicated what percent of your food is healthy and which were missing, was rated as being most useful to in-store consumers (Mao and Velez 2017)	• In-store suggestions by staff contributed to increased fish sales (Karevold, Tran, and Wansink 2017) • One loyalty program rewarded fruit and vegetable purchases by providing a scaled discount based on how much was purchased[a]	• A "Half-Plate Healthy" on-line planner, led to higher produce sales and more balanced meals[a] • Shopping receipt "scorecards" showed consumers how the percentage of fruits and vegetables purchased in this trip compared with past trips (based on loyalty card data)[a]

[a] Unpublished findings based on proprietary studies.

***Figure 3**. How sample findings fit into the retail intervention matrix. (Wansink, 2017. pp 70.)*

It is worth noting that the consumer is not likely to respond to endless amount of nudges in the grocery store setting and therefore the matrix the actions need to be designed according to that. According to the studies there is also expectation that if an intervention study for fruit and vegetables would last one week, there is a possibility for high percentage growth in sales. It is however likely that increase in sales of in the long term would only be moderate single digit percentage growth and that would be considered sustainable (Wansink, 2017).

Healthy food interventions have a tendency to fail when they are moved from lab to the field. This can be easily frustrating and often the retailers would get the blame here for having poorly implemented the study. Wansink (2017) suggests though that instead of doing that, perhaps instead the right people should be analysed and also at the right days during the week. It is likely that the time of the year also matters in healthy food interventions. Mid-January might well be more effective time to test them, rather than December, as people would be more likely to choose healthier options after Christmas period for example. Regarding weekdays the same principle could apply, after the weekend of indulging a Monday as a day for nudging in store, might well be more effective than a Friday. As it can be said that different interventions will work for different segments, therefore designing the study with a particular segment in mind would be likely to make it easier to analyse the results and determine if they worked the way they were supposed to work (Wansink, 2017).

To see how the retail intervention matrix works, a Scandinavian retailer tried it to see if they could grow their market share and market themselves as environmentally sustainable retailer in Norway. The table below shows the actions taken in store as per the matrix and the results were measured in stores that over a two year period used either traditional marketing mix method to increase the sales of fish, or the retail intervention matrix. Here the average growth in sales for the stores that had used the marketing mix was 9 percent and the stores that in the same time period had the matrix in use the results were 28% growth in sales (Wansink, 2017).

Table 2
A Retail Intervention Matrix of how Scandinavian retailers doubled the sales of frozen fish.

Mix element	More convenient to purchase	More attractive to purchase	More normal to purchase
Signage	• Created recipe cards titled "Fish in 15" (min) • Offered a "Grill Tips" flier for the grilling salmon	• Co-promoted the fish with vegetables (suck as leeks and broccoli) • Descriptively named select fish and included a map showing the part of the world where it was caught	• Created "Native Norway" logos to promote fish as local • Used "Local Favorite" and "Managers Special" stickers
Structure	• Utilized vertical display cases; moved fish to eye level and processed foods to the bottom shelves	• Moved fish displays immediately after vegetables • Included a buffer of frozen vegetables between the fish and the beef so people would not make an unfair sensory comparison with beef	• Placed the single servings of fish and some of the lower priced "sales specials" near the highest traffic edges of the displays
Service	• Offered frozen freezer packages to keep fish frozen until home • Offered plastic bags to put shrink-wrapped fish in for extra separation protection from other foods in the basket	• Offered smaller, one-portion servings • Put markings on the wrapper to show how much to prepare for one, two, three, or four persons • Email promotions were sent to loyalty card holders, with recipe ideas and web-links to downloadable coupons	• Employees were instructed to suggest the two best selling types of fish and the two most common items with which they were prepared (e.g., rice pilaf and broccoli) • Employees were trained to suggest additional items commonly bought along with specific types of fish

Figure 4 *A Retail Intervention Matrix of how Scandinavian retailers doubled the sales of frozen fish. (Wansink, 2017. pp 74.)*

2.6 Mehrabian- Russell model

Many studies relating to how music affects consumers in stores are using a theory from environmental psychology that was already introduced in the seventies. Mehrabian and Russell's model was then trialled later by Donovan and Rossiter in the retail setting.

Mehrabian and Russell (1974) presented a framework model that could assist when studying environmental psychology and the variables that were present in many cases. They proposed that social or physical stimuli in the environment that could directly affect person's emotional responses might for that reason have an influence their behaviour. The primary emotional responses in this model are pleasure, arousal and dominance which in turn affect the behavioural responses that called approach and avoidance.

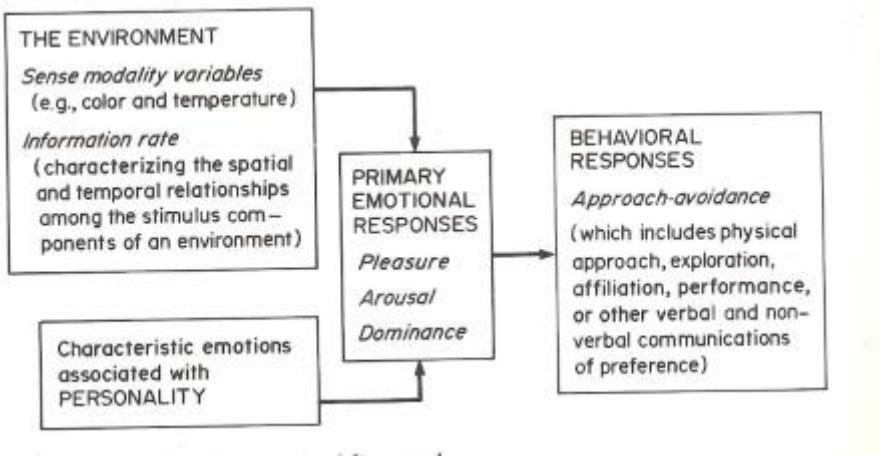

Figure 5 *Approach-avoidance model. (Mehrabian & Russell, 1974. Pp. 8).*

In the search of framework on how to conduct research in retail environment Donovan & Rossiter (1982) went through different research that had been conducted in regards to retail atmosphere. They noticed that it was very often that the concept of atmosphere in retail setting was related to other physical variables in store for example to things like how bright the store was, what was the aisle width or how many people were in the store. It was also often assumed that the atmosphere of the store could be described as bad or good, but not taken into the account that perhaps there could more dimensions to that. It was also apparent to them that there had been mainly studies in regards to atmosphere and how it would affect a decision to visit a particular store for example, rather than the actual behaviour like for example purchase decision process (Donovan et al, 1982).

If asked from the retailers, they have very much been reporting themselves how atmosphere in the store matters despite researchers at the time having trouble to prove it. The effect of the atmosphere is related emotional states which could be challenging to put it into words and verbalise or they can be so short lived that they are not easy to recall and perhaps lastly they can influence the behaviour in-store.

Most research that has been conducted regarding how music affects consumers in an in-store environment uses the Mehrabian-Russell model as the theoretical framework. Donovan and Rossiter (1982) summarise the work from Mehrabian and Russell in a figure below.

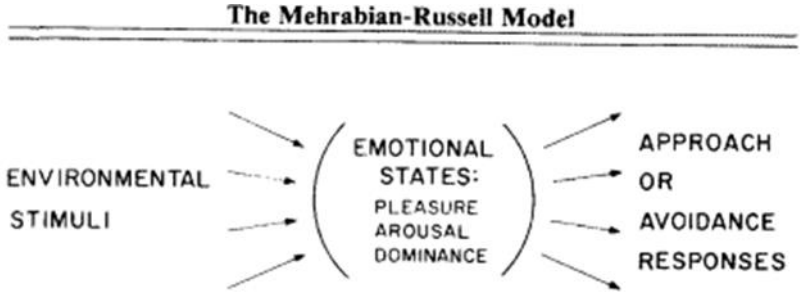

Figure 6 *The Mehrabian-Russell Model. (Donovan & Rossiter, 1982 pp. 42).*

Relating to the environmental psychology the model from Mehrabian and Russell was considered by Donovan & Rossiter (1982) to be perhaps a suitable theoretical model that could be used when studying the store atmosphere or the shopping behaviour. This model is "using a Stimulus – Organism- Response (S-O-R) paradigm" (Donovan et al, 1982 pp 36) with it they offer restrained description variables that can intervene, environment descriptions and behaviour that can have a relevance to the retail setting. "An adequate S-O-R model has the following requisites: a stimulus taxonomy, a set of intervening, and response variables should be conceptually clear, comprehensive yet parsimonious, and operationally measurable." (Donovan et al, 1982 pp 36). According to them this model from Mehrabian and Russell could be considered strong in regards to the response areas and intervening variable, but maybe problematic by leaving the stimulus taxonomy unhandled.

The four aspects of approach-avoidance behaviours are: "

1. A desire physically to stay in (approach) or to get out of (avoid) the environment)
2. A desire to or willingness to look around and to explore the environment (approach) versus a tendency to avoid moving through or interacting with the environment or a tendency to remain inanimate in the environment (avoidance)
3. A desire or willingness to communicate with others in the environment (approach) as opposed to a tendency to avoid interacting with others or to ignore communication attempts from others (avoidance)
4. The degree of enhancement (approach) or hindrance (avoidance) of performance and satisfaction with task performances. " (Donovan et al, 1982 pp 37).

These types of behaviours could be suitable for the retail environment behaviour as well. (1) the physical avoidance or approach could be relating to the intentions that the consumers in store would have while (2) could relate to the offering on retail or the search in-store depending on how narrow or broad the offering is in store. Approach and avoidance in regards to communication (3) could be to do with the interaction with the staff working in the store. Lastly (4) the performance and satisfaction approach and avoidance could be in relation to the money spent in store as well as reinforcement of time and repeated frequency of shopping (Donovan et al, 1982 pp 37).

The Mehrabian and Russell model also discuss about three basic emotional states relating to the behaviour in approach-avoidance instances. They are known by an acronym PAD and are: "
Pleasure – Displeasure
Arousal – Nonarousal
Dominance – Submissiveness" (Donovan et al. 1982, pp 38).

With this model a retail store environment could be like any environment, where pleasure-displeasure would be to indicate if the person is happy, feeling good or satisfied with the situation. Arousal- nonarousal would explain how alert, stimulated or excited the person is in the situation and dominance-submissiveness describes the extent that the person might feel free to act in or being in control of a situation. The assumption regarding the stimulus factors is that in an environment that is for example a high load envi-

ronment it is affecting the person's arousal level and this could be a situation that is somehow new, crowded or surprising and therefore would make the person to be more on alert, excited or stimulated. Alternatively the low load setting would have the opposite effect and could result to relaxed and calm feelings as well as potentially sleepiness (Donovan et al, 1982).

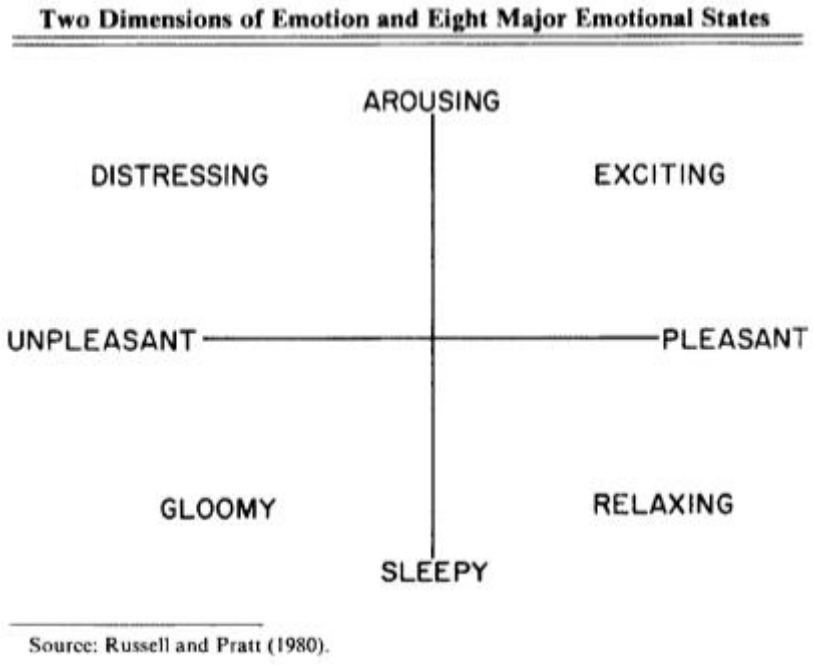

Figure 7 *Two dimensions of Emotion and Eight Major Emotional States. (Donovan et al, 1982, pp 39).*

To summarise the model, it could be said that according to Mehrabian and Russell behaviour that people show towards their environment could be called avoidance or approach behaviour. The main emotional states would be according to them arousal and pleasure and they are there to emphasise and interact with the approach and avoidance behaviour, although the rest of the emotional states can also be present with the main behaviour (Donovan et al, 1982).

When Donovan et al (1982) further tested the model and its suitability to study the behaviours in retail setting; they found it suitable for the purpose. Some of their concerns were cognitive aspects and how they could be taken into account as well as individual

differences that should also perhaps be taken into account. In their study they were also able to make conclusions like that the intentions for shopping were increased in a situation where the store was pleasant and also arousing. Things like upbeat music and bright lights were found to contribute towards an increased arousal level in pleasant shopping atmosphere and that in turn could make the customer stay longer and perhaps spend more (Donovan et al., 1982).

2.7 Motivating Operations in Consumer Choice

Looking at consumer choices from the behavioural sciences point of of view there are more aspects that need to be taken into account. The study by Fagerstrøm et al. looks at that more in detail.

In their article "Implications of Motivating Operations for the functional Analysis of Consumer Choice " Fagerstrøm, Foxall and Arntzen (2010) discuss how Motivating Operation (MO) or more in fact the concept of MO links to consumer choices. They also go through what the function of MO concept in relation Behavioural Perspective Model (BPM). In the consumer behavioural setting the concept of MO can be a factor that helps to determine between past discriminative and motivational functions, while also taking into account motivating effects that are both learned and unlearned in regards to behaviour. They also argue that there could also be rules of some type that could be considered as MOs (Fagerstrøm et al., 2010).

The term motivating operation (MO) is used in the context of behavioural analysis and the definition for it defined as: "an environmental event that first establishes (or abolishes) the reinforcing or punishing effect of another event and second, evokes (or abates) behaviours related with that event" (Fagerstrøm et al., 2010, pp 111). To explain the two main effects that MO has, firstly the establishing or abolishing the reinforcing (or punishing) effect that of another event (can be seen here as the value altering effect) and secondly it evokes (or abates) behaviours that are related to that event (here can been seen as the behaviour-altering effect). Establishing operation (EO) is a term that is being used to refer to those MOs that are there to increase the reinforcing or the effec-

tiveness of punishing effects of these other events. When the MOs are causing the reverse effect to EOs term abolishing operation (AO) is being used to reference (Fagerstrøm et al.2010).

In their article Fagestrøm et al. (2010) discuss how the concept of MO can be linked with a model called Behavioural Perspective Model (BPM) and functional analysis of consumption as it has not yet been included into the explanation and understanding of consumer choice. To explain BPM is a model that is used in the studies of consumer behaviour and it uses functional analytical methods. In addition to that they have also looked at three other aspects which would be: " (a) the distinction between discriminative stimuli (SDs) and MOs in the consumer behaviour setting, (b) the value-altering effect and behaviour-altering effect of MOs and (c) unconditioned and conditioned MO's. " (Fagerstrøm et al. 2010, pp 112).

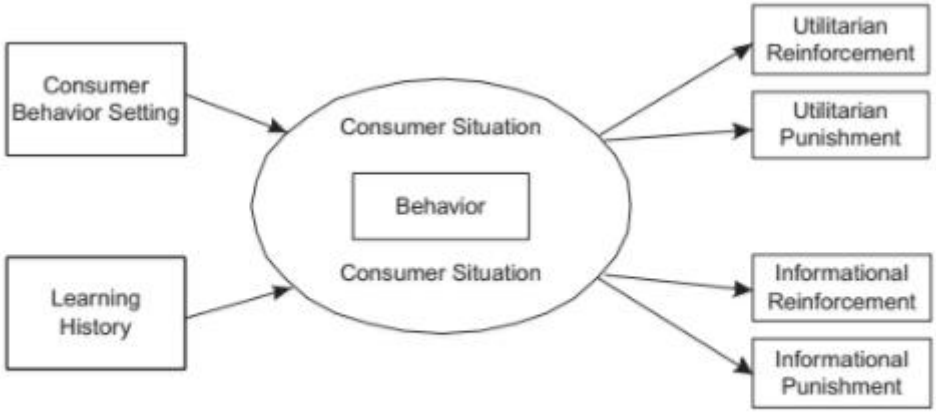

FIGURE 1 The Behavioral Perspective Model.

Figure 8 *The Behavioural Perspective Model. (Fagerstrøm et al. 2010, pp 113.)*

BPM framework pictured above equals that behaviour produces consequences and the model, looking at things in a consumer behavioural context is describing those conse-

quences as either utilitarian (reinforcing or punishing) or informational (reinforcing or punishing). Informational reinforcement is something that is socially and personally mediated and related to feedback on performance for example how well person is doing as a consumer. Utilitarian punishment in turn is related to the cost of consuming; for example when shopping on the internet, it would be the registration that is most time consuming (Fagerstrøm et al. 2010).

There are different stimulus in the consumer behaviour setting which could be things like (a) physical (relating to things like promotion or point of sale material in store) (b) social that would be for example the sales associate or a fellow customer (c)temporal (for example Easter or the opening hours of the shop) or (d) regulatory that would be for example rules from self or other. The BPM model also has taken account the consumer's learning history and sights that things that have been learned prior to the event will establish what in the end will act as an SD (Fagerstrøm et al. 2010).

To describe how the motivation operations could fit into the behavioural perspective model in non-behavioural terms would so that MO is the one that would designate how much is that the consumer would want something and the SD is there to signal the availability for the matter.

Motivating operators have two effects one is value altering and the other behaviour altering. Below table from Fagerstrøm et al (2010, pp 117.) describes the value altering effects of MOs.

TABLE 1 Example of Eight Value-Altering Effects of Motivating Operations (MOs) in Different Consumer Contexts

	Value-altering effects of MOs	
Consequences of consumption	Establishing operations	Abolishing operations
Utilitarian reinforcement	A bad headache has an establishing effect on the reinforcing consequence of buying and taking aspirin.	Food satiation has an abolishing effect on the reinforcing consequence of buying and eating food.
Utilitarian punishment	A limited amount of money may have an establishing effect on the punishing consequence of relinquishing money in a purchasing situation.	An unlimited amount of money may have an abolishing effect on the punishing consequence of relinquishing money in a purchasing situation.
Informational reinforcement	The Christmas season might have an establishing effect on the reinforcing consequences of buying presents.	When more consumers own an exclusive Porsche(tm) it may have an abolishing effect on the reinforcing consequences of buying that car.
Informational punishment	Public attention to global warming may have an establishing effect on the punishing consequences of buying and using a motor car that produces high levels of CO^2	Halloween (October 31) has an abolishing effect on the punishing consequences of buying and wearing costumes to scare other people.

Figure 9 *Example of Eight Value-Altering Effects of Motivating Operations (Mos) in Different Consumer Contexts.(Fagerstrøm et al. 2010, pp 117).*

There are two behaviour altering effects of MOs that are called evocative effect and abative effect. To describe them in short, the evocative effect is representing an increase when it comes to consumer responses while the abative effect in there to represent a decrease (Fagerstrøm et al. 2010).

To conclude; the concept of MOs is there to identify the prior motivating events that perhaps have not been so present in the BPM previously. The evocative and abative effects of MOs are important when talking about consumer choice. The analysis becomes more comprehensive when it is possible to both understand and identify those different MOs that can possibly increase the responses of a consumer or decrease them.

3 METHOD

Method in this research was a lab experiment that was conducted at the Westerdals School of Arts, Communication and Technology in Oslo, Norway. The 16 participants were measured by using eye tracking glasses and they were asked 3 to 4 short questions after they had made choices of food and drink.

Before the final experiment, there was a plan to first try to conduct a field experiment at a grocery store in the suburbs of Oslo, but that had to be cancelled due to lack of participants and reluctance of the store management to co-operate at the last minute. After that a lab experiment was trialled at Westerdals with 12 participants but the equipment did not work perfectly on the day and on this experiment, there was an issue that was only detected by the researcher at the time of the analysing the videos, where a river could be seen from the window that was behind the desk where the drinks and snacks were. As this resulted in one participant looking at the river directly when the sound of water was played and also due to some eye tracking recordings not being complete, the researcher decided to do the experiment again and trying to control these variables better. So the results from this second experiment were deemed not valid for the research.

3.1 Participants

The final lab experiment had 16 participants. It was arranged at the Westerdals School of Communication and participants were recruited by asking Bachelor and Master level students in the nearby classrooms to participate on their break. In total 11 men and five women participated, they were between 22-31 years old, with an average age of 25,6 years. All participants apart from two were Norwegian nationality and the other two were from Austria and Finland. Time of experiment was on the day between 11am and 2pm 3rd of May 2017.

3.2 Apparatus

In this study eye tracking glasses were used as a method to detect if the positive familiar sound will have any effect to the visual attention. In this lab experiment, the Tobii Pro 2 eye tracking glasses were used to analyse the eye movement of the participants.

***Figure 10**. Tobii Pro 2 Eye tracking glasses (http://www.tobiipro.com/product-listing/tobii-pro-glasses-2/ (accessed 17.4.17).*

With eye tracking technology the idea is to record the movement of the eye with the Tobii Pro 2 glasses and analyse the data afterwards. There is a possibility that by tracking the eye movement it could be possible to discover the where the participant will focus their attention, albeit briefly, and map the region or object that they have been looking at. This in turn could give insight to understand more what the participant might have found interesting, perhaps how the perceived the area they were looking at and what was affecting their interest (Duchowski, 2007).

In a study conducted by Huddleston, Behe, Minhan and Fernandez (2015) eye tracking was used to understand the effectiveness of in store displays. According to Huddleston et al (2015) eye tracking can provide insight into how the consumers look at the dis-

plays in store and what is it that engages their attention, also if this could be a useful way for marketers to improve retail displays in the future.

Set up also included a small wireless speaker with Bluetooth that was controlled from a mobile phone by the researcher. The mobile phone had two 15 sec sound clips stored where the first one had a sound of a water stream in the nature and second had a recording of carrots being eaten.

Lastly a short questionnaire on paper was filled by the researcher after the recording on the eye tracking glasses had been finished.

3.3 Procedure

There was a scenario that was given to all participants before the lab experiment. They were asked to think about a choice of a light snack and drink for themselves from the selection that was available to them.

The participants were given a choice between four different snacks and four different drinks and they were asked to choose one from each category based on how they were feeling at that moment. The selection of snacks that was available for them was a bag of readymade popcorn that had the calorie content marked on the bag clearly to 149 calories, a blueberry snack box that was about 200g of fresh blueberries and displayed in plastic see through packaging. They also had an option of a small milk chocolate bar and a snack size bag of carrots to choose from. The selection of drinks was a bottle (0,33l) of Pepsi cola (normal), bottle of Vitamin Well Free water that had a taste of pineapple and grapefruit, included caffeine, but no sugar (450ml), also a plain water option was available from Imsdal (0,33l) as well as a blueberry and strawberry smoothie (250ml). All were on a table next to each other and a small wireless speaker was in the middle of the display.

Test group heard the sounds of carrots being chewed (15 seconds) at the time of choosing a snack and a sound of water stream from the nature, when they chose a drink from the selection. After they had made their choices they were asked two questions 1) Did you hear the sounds played and 2) What affected your choice of products today? The control group which was half of the participants did not have any sounds played to them and they were only asked question number two. The participant's age and gender was also recorded.

The reason for asking the question regarding what affected their choice of products today was that it was felt important by the researcher to find out whether the participant would verbally confirm that the sound had guided their choice in any way. It was also there to try to get information relating to the control group that did not have any nudges to guide their choices.

Table where the drinks and snack were presented was facing a white wall and there was no direct view through the window as the curtains were down. All the recordings were carefully monitored by the researcher in order to make sure that the equipment was working.

After the participants looked at both displays wearing eye tracking glasses they were asked to give the glasses back and they were asked four questions: age, gender, what affected their purchase choices today and if they heard any sounds and or music during the experiment; this was a yes or no answer and only asked if they were part of the test group.

Figure 11. *Picture from the actual experiment (author)*

Figure 12 *Picture from the actual experiment (author)*

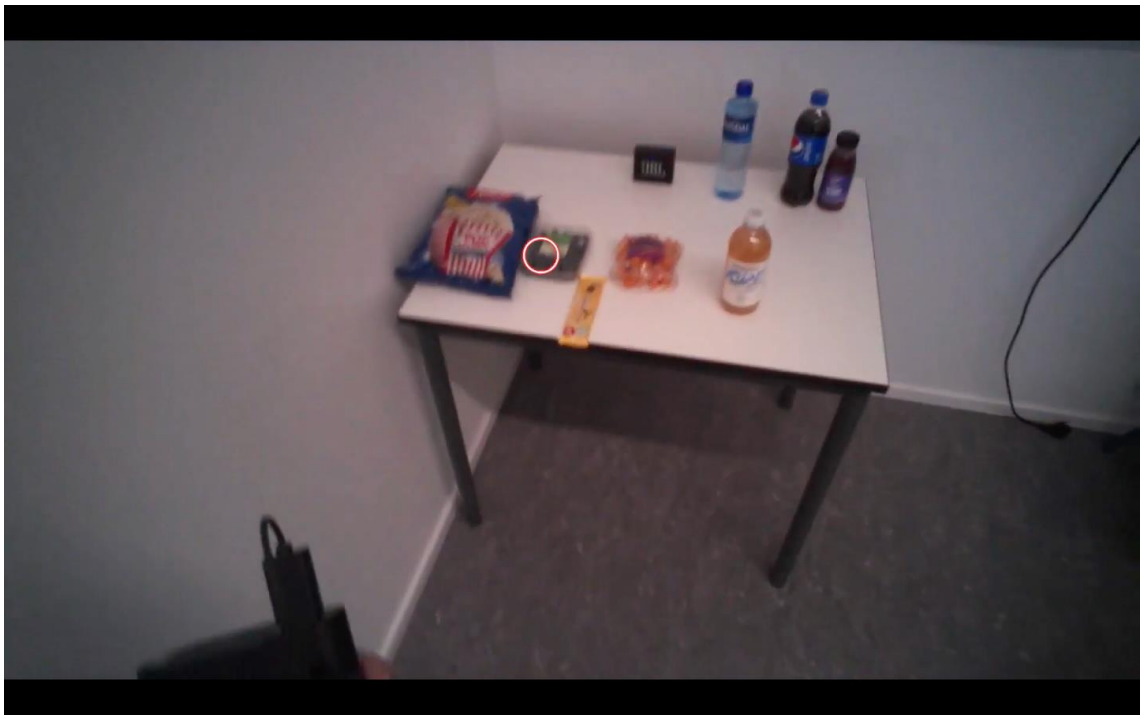

Figure 13 *Picture from Eye tracking recordings (author)*

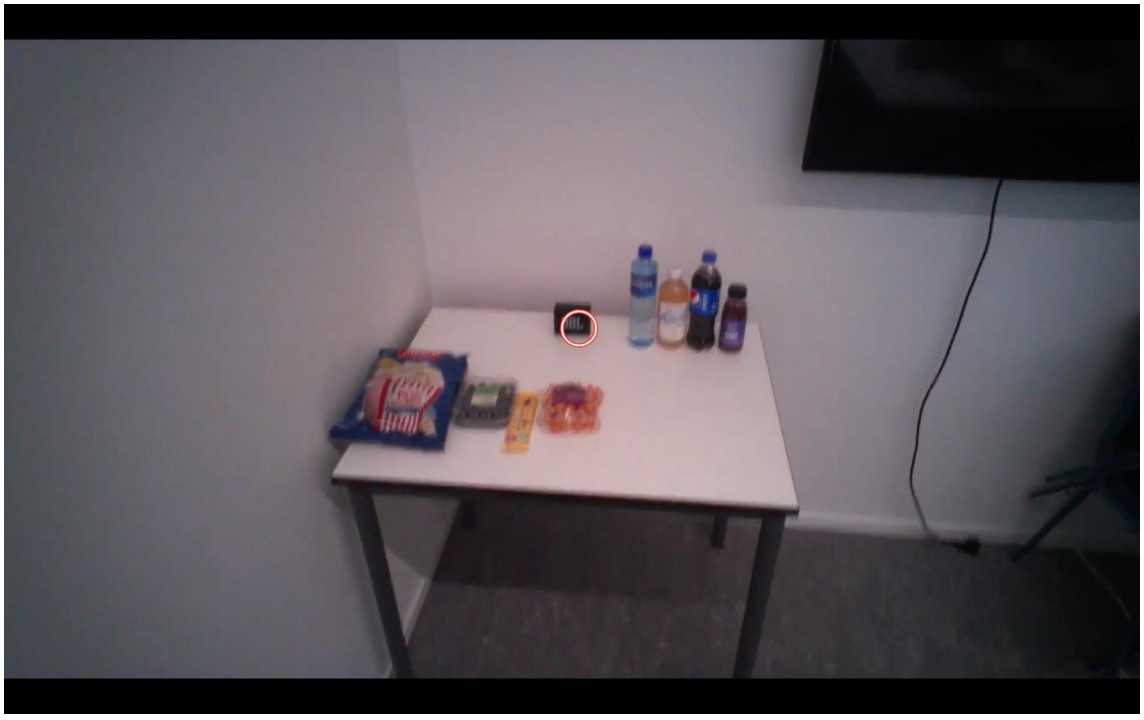

Figure 14*. Picture from Eye tracking recordings(author)*

3.4 Analysis

Analysis was done by using computer program designed for Tobii eye tracking glasses. Every video was also manually inspected as the sounds needed to be timed with the gaze. The eye movement was inspected in regards to the products chosen, for example when they were part of the test group; it was inspected if at any moment when the sounds was played, the participant looked at the product that the sound was relating to. It was also analysed in which order they looked at things, for example if they chose water, did they look at the water before looking at the other options.

As there was no standard way of analysing the results of the experiment, researcher compiled an excel sheet with all possible results that were apparent on the test, so that possible conclusions could be drawn from it. This data can be found on appendix.

4 RESULTS

The lab experiment was in the end successful and all participants results were counted towards the final results and none needed to be disqualified.

Table 1 below displays how many times each item was chosen by the participants in both test and control group. Table 2 gives a number of how many times certain combinations were chosen.

Chosen items	Control Group	Test Group	Total
	Snacks		
Popcorn	0	0	0
Blueberries	4	2	6
Chocolate	3	2	5
Carrots	1	4	5
	Drinks		
Water	1	5	6
Vitamin Well Water	2	2	4
Pepsi	3	0	3
Smoothie	1	1	2
Total amount of participants	**8**	**8**	**16**

Table 1 *Individual items table*

The differences in the results between the control group and the test group can be seen in some of the items in particular. When analysing the choices of snacks in the control group the number one choice were blueberries which was chosen 4 out of 8 times and

second most popular snack was chocolate that was chosen 3 out of 8 participants. Carrots were chosen by only one participant in the control group.

The snack choices for the test group, who were nudged with a sound of carrots being eaten, were different as 4 out of 8 participants chose carrots as their snack. The rest of the test group participants were divided between blueberries (2 out of 8) and chocolate (2 out of 8).

Drinks on the other hand seem to have even more differences in choices between the groups. The most popular drink in the control group was Pepsi that was chosen by 3 out of 8 participants, followed by Vitamin Well Water that was the choice for 2 participants. Only 1 participant chose normal water as a drink.

Test group's most popular choice was water which 5 out of 8 participants selected. The second most popular was Vitamin Well Water with the same amount as the control group, 2 out of 8. Notable difference here being that no participant in the test group that heard the sound of water stream, chose Pepsi as their drink. On both groups only one participant chose a smoothie.

To get a better understanding of the choices, the combinations were also recorded as per the table below.

Chosen combinations	Control Group	Test Group	Total
Carrots & water	0	3	3
Carrots & Vitamin Well Water	1	1	2
Blueberries & water	1	1	2
Blueberries & Pepsi	2	0	2
Blueberries & smoothie	1	0	1
Blueberries & Vitamin Well Water	0	1	1
Chocolate & water	0	1	1
Chocolate & Vitamin Well Water	2	0	2
Chocolate & Pepsi	1	0	1
Chocolate & smoothie	0	1	1

Table 2 *Combinations table*

The combinations that were most popular in the control group were Blueberries and Pepsi and Vitamin Well Water and chocolate these both were chosen by 2 out of 8 participants.

In the test group the most chosen combination was carrots and water that was chosen by three participants. All the other choices listed were chosen by one participants.

All the participants that were in the test group also had their eye movements analysed from the videos. The idea was to see if the eye movement was guided by the sounds that were played to them, for example when they heard the sound of carrots being eaten, did they look at the carrots? On the snack selection, 7 out of the 8 participants in the test group first looked at carrots when the sound was played and one participant did not look at carrots at all despite the sound.

When it comes to drinks the results were not as clear as that. Only 4 out of 8 participants looked at clearly water first when the sound was played and then other options after that. However, only 2 of these participants chose water as their drink. Three participants looked at Vitamin Well Water first when they heard the sound but all of them made a choice of water as their drink. One participant did not look at the water at all when they heard the sound and chose a smoothie as their drink.

All participants answered the question "What influenced your choice of products today?" verbally. There were themes like the words 'healthy', 'fresh', 'sugar' and whether the participant was hungry or not. In the comparison group half of the participants mentioned the word healthy in a context of "trying to be healthy" like one participant that commented "I am trying to be healthy, but I do not want to" and interestingly enough that participant chose Pepsi and chocolate.

In test group 5 out of 8 mentioned the word 'healthy' and most importantly three other people confirmed that the sounds had influenced their choice of products which were in all of those cases carrots and water. Some participants also commented on liking some brands more, preference of colour on the products as a reason to choose or packaging being appealing. All of the answers of the participants are listed in the appendix.

5 DISCUSSIONS

In this lab experiment the results could be considered indicating that sound does affect when it is related to the exact things in front of the participant and having a small selection of things makes perhaps the choosing process even simpler. When choice is limited, it is therefore maybe easier to make and does not necessarily need so much consideration. This is all hypothetical, as it was not asked from the participants if the choice was easy to make, some of them just chose to elaborate their choices more than others.

Participants were all similar age, students; it was spring time, after lunch break and just before summer holidays when the test was done. Whether there was an expectation from students to know about healthy eating, whether summer holiday was the motivation to think healthy options can be all speculated that it could have had an effect on the final result. Wansink's (2017) retail framework and studies done relating to that confirmed that time of the day made difference as well as all the other aspects listed above.

When looking at the results from this test in the light of nudging, one thing is clear: test group was nudged to choose healthier options and test group did overall (if looking at purely the sugar content of the snack and drinks) choose healthier options. The nudges were the sounds and three people from the test group verbally confirmed that it influenced their choices. Thaler and Sunstein (2009) did indicate that nudging was not supposed to do any arm twisting and not affect free choice. Here the sound merely nudged people that perhaps were undecided at the time of choosing by giving an example of what it sounds like when you eat carrots or how does it sound in the nature when water runs in a stream. These sounds were also tailored to encourage a healthy choice. Therefore the answer to the research question: "can a familiar positive sound affect the purchase decision on retail environment? - nudging for a healthier choice" - has been answered with a positive result in this particular test with this particular set up.

In some responses however, the participants mentioned things like colour and packaging and branding. This is such a vast area of different things that can affect the consumer's attention and their choice as well, so in a lab experiment it was narrowed to down to just packaging, but even food colour seemed to be something to base their choice on. Perhaps in a real life setting this area would have been a lot bigger distraction along with price information.

Wansink's interdisciplinary retail framework studies support this argument about visual tools that can be used to guide the consumer towards a healthier choice and at the same Kotler's 4 P's that are basic marketing tools, come into the picture too by packaging being one of the key marketing tools in that theory. There could have been guidance for the participants like signage to claim that carrots and water had been the most popular choice this week, making it 'normal' for the participants to choose and the products could have been presented in a more attractive and appealing way, the convenience from the Wanskink's CAN approach most likely being the only one that actually applied in the situation presented. By doing those actions together with marketing tools like point of sale that would give a little extra information on each product, the choices could have been influenced on a different level.

The theory from environmental psychology from Mehrabian and Russell (1974 & Donovan and Rossiter, 1980) regarding the store environment and how that can affect the purchase decision is widely used in the studies that have explored how music influences shoppers, but as Donovan and Rossiter (1980) mention in their study this theory is not easy to apply in a situation of a real life experiment where there are so many different stimuli and variables present. Especially if the research is trying to study intervening variables, which in this case the sounds could be classified as. Perhaps if the research would have been conducted in a real life store setting, this theory about the effects of shopping environment would have been even more applicable.

It is possible however that the laboratory environment and food and drinks not being in their natural setting in the store could have affected the participants. Sounds could have been too loud for them, lighting not good enough or they might have been missing a recommendation from a shop assistant on what was the best choice for today. The prod-

ucts could have been not so appealing when taken out of the setting of a grocery store. All these environmental stimuli in that case also the sounds could have been resulting in some type of emotional states like pleasure, arousal or dominance and created an approach or avoidance response towards the situation.

It also needs to be noted that the eye movement does not necessarily indicate much more than the attention, - if that. The actual decision and the choice could be something that has very little to do with the visual attention. It could also be seen in some of the recordings that the products chosen by the participants got very little "eye attention". This could be due to the fact that they spent more time looking at the items they are perhaps more unfamiliar with (like in this test Vitamin Well Water) and the items that they were already very familiar with, did not for this reason need any visual attention. Again this is speculation, because in this experiment the participants were not asked why they looked at the items that they did.

When analysing the results, the verbal question about "what affected your choice of products today?" had one topic that came up in many of the answers. It was the thought/feeling of pressure of having to choose a healthy option, even though they did perhaps not feeling like it at all. It could well be that this type of behaviour in this experiment does tell something about learned behaviour, participants knowing what the so called healthy option in this situation would be and then having the actual situation affect their decision making process.

Reflecting this in the light of the theories in this thesis, the motivating operations (MOs) from Fagerstrøm et al (2010) seem to fit the situation well. Here the sound could be working as an evocative effect for the MO when the participant hears a familiar sound of water for example and that reinforces the perhaps pre-learned behaviour of water being a "good and a healthy" option. The sound tries to get the participant to choose the predetermined "healthy" option by reinforcing this perhaps learned idea of water stream making you want to drink water far more than for example a Pepsi, like in this case. Here, it is to be taken into consideration that in order for the sound to be reinforcing effect it perhaps needs to be a positive sound in a way or another.

Choosing positive sounds that are experienced by everyone ‘as positive sounds’, can be very difficult. Even in this experiment a personal preference of not liking carrots or being for example allergic to carrots could very well affect so that the sound is not positive for that participant. The difficulty is also with sounds that related to food, there are not that many clear food related sounds for example for vegetables. Even the professionally made sound clip for carrots being eaten in a different setting with different products around could be confused to for example eating crisps or something similar, as discovered at the time of recording the clips for the research. Perhaps the sound clips could be pre-tested with a focus group to see if the majority will find the sounds familiar and or positive, before further research. It could also be that having this pleasant and positive sound environment in store, could make the shopping situation be more of an experience where sounds make vegetable department for example feel like people would like to purchase fresh and healthy food that is connected to the nature. Including sound to the design of the environment and not making them too overpowering could make this an experience marketing journey.

The choices overall in the group that the sounds were played to were healthier choices, even if they did not all choose carrots and water. This is a positive sign, even if the choices were water and chocolate that would still mean considerably less sugar consumption for the person that would have without being nudged perhaps chosen the Pepsi to go with the chocolate. The main thing would in any case be with experiments like this that it would “make people think” perhaps challenge their thought process for a few seconds. How ethical is it to intervene that thought process from a commercial point of view is another questions.

If however, childhood obesity is an ever growing issue in the world perhaps playing sound of water stream to those young shoppers when they come and purchase their daily dose of sugary drinks during school breaks or straight after school, is not the most unethical way of tackling something like that.

6 CONCLUSIONS

To conclude: in a lab environment with a limited choice and limited amount of variables, sound does seem to affect the purchase decision. However because of the limited choices and limited variables, the results cannot be generalised.

Further research on the subject would be however very welcome, especially when retailers will constantly up their efforts on the sensory marketing and sound being one of them, the effects should be well researched. This is before the non-scientific approaches to these will be taken to the hands of brands and retailers and we will all be unconsciously made to buy things we either do not need or want.

A real life field experiment would be recommended, purely to see if the thousands of different stimuli, together with the store environment will lessen the effect of the sound, or enhance it perhaps, with some other tools included or will those sounds just disappear into the general noise of environment. Here the importance of something like Wansink's interdisciplinary framework would be a tool to trial. Trying to single out in a field setting if sound on its own would have enough effect could be a bigger task than combining a few different sense marketing related nudges together and testing an overall impact over a longer period of time.

With sounds like the ones used in this research, the shopping environment would have also been specifically a grocery store. Perhaps at the same time there would have been other things from the behavioural and/or environmental psychology point of view that should also be looked into at the same time. Is a grocery store environment considered a pleasant shopping environment in general? Perhaps in Norway this is not the case, but somewhere like France the environment would be considered very pleasant. Also, perhaps the age of the shopper very much matters to the reaction to the sound. Is it likely that a mother shopping with their young children will have less attention to anything else but getting through their shopping list as quickly as possible? as it was suggested

by Wansink. How about a young professional in their twenties who is shopping for a household of one with good amount of disposable income, will they actually have time to be influenced by intervening variables? Are they one of the health conscious shoppers that know what they should be buying and why?

It should also be looked into when further research is done, if the loudness of the sounds played to the shoppers needs to be a particular one. There are recommendations for the sound level in decibels on the studies done with music, but will the same apply for sounds? Also, as music is mostly played on the background, should the sounds be specifically aimed to reach the shopper only at those very specific points where the item related to the sound is, and would that make a difference?

Regarding the concept of nudging, the conclusion would be that the conversation around that theme and ethics of it perhaps will continue to evolve. If anything that can be done towards a matter of health and especially health of younger generations who are perhaps not yet exposed to all the information and education about healthier choices in their everyday life - maybe this could be something that the governments should address instead? Perhaps the schools, nurseries and even the Universities that are government funded in any way could be there to support healthier choices regards to food and drinks. These could be the places safe from sugar advertising and have the sounds of water streams played on the breaks so that everyone would remember to drink more water in order to stay awake on their classes instead of aiming for the sugar high in the afternoons?

Further studies with sounds should therefore be extended to different environments, made to different age groups of participants and be as impartial as possible. This way we can understand what works and what does not and perhaps if needed - make legislations against the “wrong” type influencing with sound that has harmful effects on behaviour as evidently there could always be misuse like in any type of advertising or promotion.

Lastly - how about noise? When do sounds become annoying, when is some sound too much and becomes a noise? Are we losing our hearing for particular sounds when there

is so much generic “noise” around us in an everyday life? Why do we already pay money to sit in silence in small rooms across the world? Is there a good sound and a bad sound? Are all our personal sound environments the same? If you do not have the ability to hear, then the other senses perhaps are heightened instead? Is it ever just about the sound?

REFERENCES

Areni, C.S., Kim, D. 1993. "The influence of background music on shopping behavior: classical versus top-forty music in a wine store." *NA-Advances in Consumer Research* Volume 20 (1993).

Brand, J and Wansink B. 2016. “Depicted Versus Stated Serving Sizes: Exaggerated Servings on Packaging Encourage Overeating”. *Journal of Nutrition Education and Behavior* Volume 48, Number 7S, 2016 s91

Broekemier, G., Marquardt R., Gentry J.W, 2008 "An exploration of happy/sad and liked/disliked music effects on shopping intentions in a women's clothing store service setting", *Journal of Services Marketing*, Vol. 22 Iss: 1, pp.59 – 67

Caldwell, C., Hibbert S.A. 2002. "The influence of music tempo and musical preference on restaurant patrons' behavior." *Psychology & Marketing 19*, no. 11 (2002): pp. 895-917.

Coca-cola.com http://www.coca-colacompany.com/ (accessed 30.01.2017)

Duchowski, A.T. cop. 2007, Eye tracking methodology: theory and practice, 2nd ed. edn, Springer, London.

Donovan, R., Rossiter J., 1982. Store atmosphere: an environmental psychology approach. *Journal of Retailing*, 58(1), pp.34-57.

DrikkeGlede.no http://drikkeglede.no/aktueltsaker/19-prosent-mindre-sukker-fra-brus-foer-2020-article3726-262.html (accessed 30.01.2017)

Fagerstrøm, A., Foxall, G.R. and Arntzen, E., 2010. Implications of motivating operations for the functional analysis of consumer choice. *Journal of Organizational Behavior Management, 30(2)*, pp.110-126.

Falk A, Heckman J A , Lab Experiments are a major Source of Knowledge in the Social Sciences. *Science 23* Oct 2009: Vol. 326, Issue 5952, pp. 535-538

Gabrielyian G, et al. 2016. "The Impact of Smarter Lunchroom Interventions on Vegetable and Fruit Selection and Consumption in Middle School Cafeterias". *Journal of Nutrition Education and Behavior* Volume 48, Number 7S, 2016 s93

Guéguen, N., Boulbry, G. and Sami, S., 2009. 'Love is in the air': congruence between background music and goods in a florist. *The International Review of Retail, Distribution and Consumer Research, 19(1)*, pp.75-79.

Huddleston, P., Behe, B.K., Minahan, S. and Fernandez, R.T., 2015. Seeking attention: an eye tracking study of in-store merchandise displays. *International Journal of Retail & Distribution Management*, 43(6), pp.561-574.

Knoeferle, K.M., Knoeferle, P., Velasco, C. and Spence, C., 2016. Multisensory brand search: How the meaning of sounds guides consumers' visual attention. *Journal of experimental psychology*: applied, 22(2), p.196.

Kotler, Philip. 1973. "Atmospherics as a marketing tool." *Journal of Retailing 49*, no. 4 (1973): 48-64.

Mattila, A.S., and Wirtz J. 2001. "Congruency of scent and music as a driver of in-store evaluations and behavior." *Journal of Retailing 77*, no. 2 (2001): 273-289.

Mehrabian, A. and Russell, J.A., 1974. An approach to environmental psychology. the MIT Press.

Moodie, R., Swinburn, B., Richardson, J. and Somaini, B., 2006. Childhood obesity–a sign of commercial success, but a market failure. *Pediatric Obesity*, 1(3), pp.133-138.

Morrison, M., Gan, S., Dubelaar, C. and Oppewal, H., 2011. In-store music and aroma influences on shopper behavior and satisfaction. *Journal of Business Research, 64(6*), pp.558-564.

North, A.C., Hargreaves D.J., and McKendrick J. 1999. "The influence of in-store music on wine selections." *Journal of Applied Psychology 84*, no. 2 : 271.

Sabrina, E.B., 2014. The Influence of the Store Atmosphere on the Consumer Behavior. *Mediterranean Journal of Social Sciences*, 5(8), p.229.

Schmitt, Bernd. 2011. Experience marketing: Concepts, frameworks and consumer insights. Now Publishers Inc, 2011.

Shen, Hao, and Sengupta J. 2014 "The Crossmodal Effect of Attention on Preferences: Facilitation versus Impairment." *Journal of Consumer Research 40*, no. 5: 885-903.

Spendrup, S., Hunter, E. and Isgren, E., 2016. Exploring the relationship between nature sounds, connectedness to nature, mood and willingness to buy sustainable food: A retail field experiment. *Appetite*, 100, pp.133-141.

Sunstein, C.R.2014. "Nudging: a very short guide." *Journal of Consumer Policy 37*, no. 4 (2014): 583-588.

Thaler, Richard E, Sunstein Cass R. 2009. "Nudge, Improving Decisions About Health, Wealth and Happiness".

Wansink, B. 2017. "Healthy Profits: An Interdisciplinary Retail Framework that Increases the Sales of Healthy Foods" *Journal of Retailing 93*, no 1 (2017): 65-78

APPENDICES

Participant number	Q1. What is your age	Q2. Gender f/m	Q3. What influenced your choice of products today?	Q4. Did you hear any sounds and or music? y/n	items chosen	eye movement sound reaction carrots	eye movement sound reaction water
1	24	f	not had lunch yet, sugar needed. Likes vitamin well	n	chocolate and vitamin well	n/a	n/a
2	25	f	trying to be healthy, wanted something fresh like the colour blue, like vitamin well	y	blueberries, vitamin well	first looked at carrots when sound played	first glanced at water but concentrated on vitamin well
3	26	m	wanted to have a pepsi, wanted chocolate but took blueberries to be healthy	n	blueberries, pepsi	n/a	n/a
4	23	m	sound influenced, already have a unhealthy snack waiting downstairs	y	carrots, water	first looked at carrots when sound played	first glanced at water but looked at other drinks and returned to water
5	25	m	trying to stay healthy but do not want to	n	pepsi, chocolate	n/a	n/a
6	26	m	don't like any other drinks. Chose chocolate carrots do not look that healthy	y	water, chocolate	did not looked at carrots	looked at water as a secondary object
7	22	m	early in the morning, so no chocolate	n	carrots, vitamin well	n/a	n/a
8	31	m	just had food, no sweets rather healthy option. Do not drink sugary drinks, carrots you get more stuff. People would judge me less vitamin well has vitamins, not familiar with the brand	y	carrots, vitamin well	first looked at carrots when sound played	Looked at water first and stayed on it when the sound kept on
9	26	m	healthy thinking, value of popcorns	n	blueberries, water	n/a	n/a
10	26	f	going to the beach, healthy choice, always drinking water anyway	y	blueberries, water	looked at carrots very briefly	looked at vitamin well first and then water second and went for the water
11	26	m	do not like carrots. So chocolate is the only one. Water is boring	n	chocolate and vitamin well	n/a	n/a
12	25	m	sound influenced	y	carrots, water	first looked at carrots when sound played	Looked at water first and stayed on it when the sound kept on
13	25	m	feel like being healthy. Pepsi max would have been ace	n	pepsi, blueberries	n/a	n/a
14	25	m	sound influenced. Not hungry, water sounded fresh	y	carrots, water	first looked at carrots when sound played	looked at vitamin well first and then water second and went for the water
15	29	f	wanted something fruity, just had food	n	blueberries, smoothie	n/a	n/a
16	25	f	chocolate is my favourite, to be healthy	y	chocolate, smoothie	first looked at carrots when sound played	did not look at water, looked at vitamin well instead
17	25.5625						

Male Participants	Female participants
11	5

Total amount of items chosen by all participants

Snacks

Popcorn	Blueberries	Carrots	Chocolate
0	**6** (37,5%)	**5** (31.2%)	**5** (31.2%)

Drinks

Water	Vitamin well water	Pepsi	Smoothie
6 (37,5%)	**5** (31.2%)	**3** (18.8%)	**2** (12.5%)

Total amount of combinations by all participants

Carrots and water	Blueberries and water	pepsi and blueberries	chocolate and vitamin well	Blueberries and smoothie	chocolate and smoothie	Chocolate and water	Carrots and vitamin well	Chocolate and Pepsi	Blueberries and vitamin well
3	2	2	2	1	1	1	2	1	1

Test Group (sound group) items chosen listed individually

Snacks

Popcorn	Blueberries	Carrots	Chocolate
0	**2** (25%)	**4** (50%)	**2** (25%)

Drinks

Water	Vitamin well water	Pepsi	Smoothie
5 (62.5%)	**2** (25%)	0	**1** (12.5%)

Test Group (sound group) combinations chosen

Carrots and water	Blueberries and water	pepsi and blueberries	chocolate and vitamin well	Blueberries and smoothie	chocolate and smoothie	Chocolate and water	Carrots and vitamin well	Chocolate and Pepsi	Blueberries and vitamin well
3	1	0	0	0	1	1	1	0	1

Comparison Group items chosen listed individually

Snacks

Popcorn	Blueberries	Carrots	Chocolate
0	**4** (50%)	**1** (12.5%)	**3** (37.5%)

Drinks

Water	Vitamin well water	Pepsi	Smoothie
1 (12.5%)	**3** (37.5%)	**3** (37.5%)	**1** (12.5%)

Comparison group (no sounds) combinations

Carrots and water	Blueberries and water	pepsi and blueberries	chocolate and vitamin well	Blueberries and smoothie	chocolate and smoothie	Chocolate and water	Carrots and vitamin well	Chocolate and Pepsi	Blueberries and vitamin well
0	1	2	2	1	0	0	1	1	0