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Are you cheap or climate friendly?
Applying nudge theory to lower meat purchasing in grocery stores

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Abstract

The purpose of this study was to investigate whether consumer behavior in grocery stores could be affected through nudging by rearranging the product placement and putting up suggestive messages to customers. It also investigated whether nudging is more effective when targeting short-term versus long-term consequences of consumer behavior, as their abstract levels are processed differently. It specifically aimed to test if nudging could affect consumer behavior to lower meat consumption.

A nudge experiment was implemented in two grocery stores in Lund, Sweden, using two conditions of suggestive nudge messages, one focusing on economic benefits and the other environmental benefits of lowering one's meat consumption. The results show that meat sales were lower than expected for the period when the nudge was implemented, indicating that the nudge gave the desired effects. Further, the environmental nudge message showed higher impact than the economic nudge message, indicating it was more effective for changing consumer behavior. This result seems to contradict previous research findings within decision making, but it could be argued that the demographic context of where this nudge experiment took place impacted the results in such a way. This study thus suggests that the context is of big importance, and should be considered when designing a nudge.

Key words: nudge theory, System 1 and System 2, consumer behavior, meat consumption, grocery stores.

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1. Introduction

This chapter will introduce the background of the topics that will be the target of the research, it will then present relevant concepts and theories that lie as the foundation for the study. It will then present the research gap in which the study aims to fill and move on to present the purpose and research questions.

1.1 Background

Every day, people are faced with thousands of decisions, estimated to around 35 000, which ultimately determines who you are and will be (Krockow, 2018). Many of these decisions we pay little or no attention to, since it would be practically impossible for the brain to cope with the vast amount of stimuli and inputs we are exposed to on a daily basis. It is only natural that the brain needs to filter out and deal with most of these automatically, or as Kahneman (2012, p.4) puts it; “many decisions and thoughts go on in silence in our minds”. It can seem like not all decisions make a great difference to us or our surroundings, but according to Krockow's (2018) research, even the smallest decisions can have huge implications. In the end, decisions fall into habits which guide the majority of actions one takes, that ultimately transforms into a lifestyle. What we might not consider is that these choices made on an individual level, such as how we choose to live, travel, or consume, not only directly affects ourselves but also our surroundings on both a local and global level (Blanco, Gerlagh, Suh, Barrett, de Coninck, Diaz Morejon, Mathur, Nakicenovic, Ofosu Ahenkora, Pan, Pathak, Rice, Richels, Smith, Stern, Toth & Zhou, 2014).

One area where one is strongly guided by habits is during grocery shopping [source]. At the same time, our dietary consumer behavior has a huge impact on greenhouse gas (GHG) emissions and climate change, 26 % of the global GHG emissions originate from the global food system (Ritchie, 2019). However, the food supply is dictated by consumer food choices and habits according to Vandenbroele, Vermeir, Gehens, Slabnick and Van Kerckhove (2019), thus, in the end, individuals have a strong influence on the food system. In addition to this, the element

of free choice has undeniably been one of the cornerstones of the free market economy, and nothing indicates that this will change. These factors highlight the high importance of both the integrity and the impact of the decisions taken by individuals in the food system and thus, the overarching climate crisis. How can we ensure that the huge amount of decisions taken by individuals everyday are following a sustainable agenda, while still not enforcing them or removing their freedom of choice? Nudge theory might be the answer.

1.1.1 Nudge theory

Nudge theory, or *nudging*, is the idea that through choice architecture be able to alter an individual's behavior in predictable ways without limiting their options or heavily changing their economic incentives. The term nudging was coined by the Nobel laureate Richard Thaler and legal scholar Cass Sunstein (2008) in their book 'Nudge: Improving Decisions About Health, Wealth, and Happiness'. The intervention should be easy and cheap to opt out from, and it should be in the interest of the individual (Thaler, 2015). Examples of nudging would be to automatically enrol in pension plans to save money, default the settings on the computer to ensure adequate cyber-security, or highlight healthier dishes at a restaurant menu.

According to Thaler and Sunstein (2008) people have a tendency to make poor choices that they would not have made if they: were fully informed of the situation and their choice, had unlimited cognitive abilities, paid full attention, or had complete self-control. However, this is not how the mind operates, when people make decisions they use two different systems depending on which type of choice they are making according to decades of work from Kahneman (2012). He refers to these two systems as *System 1 and System 2*; System 1 is used for quick automatic responses and System 2 is used when we make reflective and analytical decisions. The automatic system is also used when we make decisions by habit, which are decisions made with minimal thought and effort and based on previous behavior, such as when we buy groceries (Biel, Dahlstrand & Grankvist, 2005).

It has been shown that these two systems process information differently depending on the level of complexity according to Weber (2006), for example information regarding climate change and climate change. She argues that System 1, needs real world experience as input and elicits emotions during stress that ultimately motivates behavior. Therefore, when information is given regarding risks concerning climate change it is considered to be too abstract and System 1 then fails to send affective signals that elicits motivation to change behavior.

1.1.2 Environmental effects of meat production

One of the most important sectors to combat climate change is within the meat industry. As previously mentioned, the global food industry accounts for 26% of total GHG emissions, and out of this, the meat industry has the highest contribution, totaling to 14.5% of the global GHG emissions (Ritchie, 2019; Gerber, Steinfeld, Henderson, Mottet, Opio, Dijkman, Faluccci & Tempio, 2013). Additionally, meat consumption has also shown detrimental effects on both biodiversity and personal health (FAO, 2019; Battaglia Richi, Baumer, Conrad, Darioli, Schmid, Keller, 2015). Due to this, international organizations and public sectors across the world have made considerable attempts to educate consumers about meat consumption and its effects (WHO, 2018; Willet, 2019).

Despite the negative aspects of meat production and consumption, and several attempts and developed actions made to decrease meat consumption, it is still on the rise globally (Ritchie & Roser, 2019). It is evident that previous efforts have not reached the desired impact, as consumer knowledge of the environmental impact of meat production is still low (Hartmann & Siegrist, 2017). Vandenbroele et al. (2019) argue that informational arguments and campaigns might not be suitable in the dietary context where decisions are made by quick and automatic responses. A potential solution to create a bigger impact could be through the implementation of nudge theory where a vast amount of consumer meat purchases are made, grocery stores.

1.1.3 Nudging in dietary decisions

Several previous studies have been conducted testing the effectiveness of nudging within dietary decisions. For example, nudging has been proven effective to lower meat consumption by rearranging the menu default options in restaurants (Campbell-Arvai, Arvai & Kalof, 2014; Gravert & Kurz, 2017). Further, in a review by Bucher, Collins, Rollo, McCaffrey, Vlieger, Van der Bend, Truby and Perez-Cueto (2016), previous studies of nudge interventions in food positioning have been made and shown that positioning can influence people's food choices for the better. Out of the 18 studies they reviewed, 16 found that the nudge used had a positive effect on food choice, indicating that nudging impacted people's dietary decisions.

Most of the studies mentioned above took place in restaurants or cafeterias, investigating nudging in relation to priming and salience. Yet, there is scarce research investigating the effect of suggestive or prompting written messages apart from verbal prompting. There has been one study conducted by Beteendelabbet in 2016 in this area in grocery stores, however, it did not investigate the effectiveness of different types of messages. Apart from that, there have been few attempts to investigate whether nudging can affect decision making when grocery shopping, and none investigating whether nudging is more effective when targeting short-term or long-term benefit.

1.2 Objectives

The aim of the following study is to investigate whether consumer behavior in grocery stores can be affected through nudging by putting up messages to the customers and rearranging the product placement. Specifically we will investigate if consumers can be nudged to adopt a less meat-intensive diet. Additionally, we will investigate if different types of nudge messages will show any difference in how effective their impact is on consumer behavior. That is, we will compare differences in nudges with short-term consequences, in this case economic benefits, to long-term consequences, in this case environmental benefits, to see which nudge is most effective in changing customer behavior.

1.3 Purpose

The purpose of this study is to gain a deeper understanding of the effects of nudging in terms of decision making, and to provide more empirical data regarding nudge theory. It is relevant to investigate whether nudging is an effective tool in the context of dietary decisions to be able to change people's behavior to become more sustainable, as meat consumption is a big contributor to GHG emissions. Furthermore, it is relevant to investigate how different factors influence people, in order to create effective nudges for future use. Therefore, this study is testing nudge theory to gain more knowledge and see connections between decision making and sustainability.

1.4 Research question

The study aims to answer the following research questions:

- How can nudging affect consumer behavior in grocery stores?
 - Do different types of nudge messages, such as economic benefit or environmental benefit, show different effectiveness in changing behavior?

1.5 Delimitations

This study is raising the aspects of nudging in relation to the immediate economic effects and the long-term environmental effects regarding adopting a less meat intensive diet. It does not consider other topics surrounding meat consumptions, such as health aspects or ethics and morals of animal welfare.

1.6 Outline

The thesis is divided into six main chapters. Chapter 2 presents the existing literature and research within the fields of human decision making with System 1 and System 2, followed by how they relate to climate change and consumer behavior. The section also presents nudge theory and previous research within the area as well as critique raised against the method. Lastly, the chapter presents the empirical context and the environmental impact of meat production and

how the meat consumption has started to change. In Chapter 3 follows the research theory and methodology, this section presents the research design and how the data analysis is conducted. This is followed by the experimental design and the research results in Chapter 4. In Chapter 5 we analyze and discuss our findings from the study and discuss potential explanations for the results and the connection to previous research. Lastly, in Chapter 6 we will draw conclusions from the study and suggest managerial implications as well as further research in nudging.

2. Literature review

The following section will present the theories which the study is based on, such as how we make decisions with System 1 and System 2 and how these process information regarding climate change and habits in consumer behavior. This is followed by presenting nudge theory as well as relevant research done within the field. Lastly, the section will present the empirical context, that is, the issues regarding meat consumption, its impact on the environment and what has been changing the last few years.

2.1 How we make decisions, System 1 and System 2

In order to understand how decisions are made, we need to understand how the brain works. The scientific field covering this topic, called *cognitive science*, is a highly interdisciplinary field covering psychology, neuroscience, anthropology, and philosophy just to name a few (Thagard, 2019). The field explores how intelligence and the mind works and much research have been conducted within these topics, one of which includes decision making.

The Nobel laureate Kahneman (2012) describes in his prominent book ‘Thinking, fast and slow’ our brain working in two different modes, *System 1* and *System 2*. The book is the result of decades of research. These different modes are responsible for tasks with different levels of required concentration. System 1 operates automatically and swiftly, with close to zero effort or deliberate thought, while System 2 is activated when more mental effort is required, often recognized with a higher level of complexity. Examples of activities where the systems are operating can be seen below in table 1:

Table 1: Examples of activities where System 1 and System 2 are operating.

System 1	System 2
Automatic, quick, effortless	Thoughtful, slow, analytical, effortful
<ul style="list-style-type: none"> - Answer 1+3 - Detect the movement of a thrown ball - Complete the phrase “friend or ...” - Orientate the direction of a sound source 	<ul style="list-style-type: none"> - Calculate $15 * 31$ - Search for a friend in a crowded area - Finding a specific book in a library - Solve complex computations

These two systems are at play for every decision we make. Some decisions are made with heavy effort and conscious thought by System 2, such as deciding what future career path you wish to pursue. However, the vast majority of decisions are taken by System 1, automatically and with low effort (Kahneman, 2012). This implies that most of our decisions are made without deliberate thought, and how we act and react with our surroundings is mainly based on intuitions and systematic/inherent biases. These intuitions are the basis of habitual responses, which lay the foundation of lifestyles. However crucially, System 2 has the possibility to break free from these habitual responses when it is activated. System 1 can also be trained by using adequate deliberate actions from System 2, creating new habitual responses and intuitions.

2.1.1 How System 1 and 2 connect to climate change

Weber (2006) has argued how System 1 (which she calls the associative system) and System 2 (which she relates to as the reflective system) relate to our perception of urgency and risk in relation to climate change. She suggests that System 1 represents risk as a feeling and needs real world experience as input. Further, the two systems operate in parallel but the system for reflective reasoning, System 2, has to be assisted by affect and emotion according to her research. She claims that analytical reasoning cannot be effective unless it is guided by affect and emotion. However, she also argues that when the two processing systems disagree, System 1 normally predominates System 2.

In terms of climate change, Weber (2006) argues the two systems disagree and that System 2 is aware of the risks and consequences of climate change but System 1 fails to send affective warning signals. She argues that the affective warning signals motivate action, in particular negative affect, and would give an urge to remove ourselves from the dangerous situation of climate change, or, motivate us to change our behavior towards it. Yet, this is not the case since System 1 mainly needs real world experience as input, and the consequences of climate change is not that prevalent yet and are mere abstract descriptions for many and the author claims that affective responses mainly occur when there is concrete representation of consequences. Further, she also argues that mitigating behavior against climate change requires sacrifice of concrete and immediate benefits for the sake of abstract and distant goals. Therefore, the absence of worry caused by negative affect, due to abstract and distant consequences of climate change, tends to cause bad consumption decisions and actions according to her research.

2.1.2 Consumer behavior and habits

To purchase everyday products, such as when grocery shopping, is of habitual character according to Biel, Dahlstrand and Grankvist (2005). What people regularly eat for dinner can therefore be considered to be their dietary habits. When performing habits, people fall back on routines and make decisions without much or any reflection (Biel, Dahlstrand & Grankvist 2005). Habits require minimal awareness and are efficient in that habitual actions can be performed in parallel with other behaviors and without effort so people do not have to attend to what they are doing as they are repeating prior behavior (Verplanken & Wood, 2006). Thus, consumers who are used to buying and cooking meat, will likely easily fall into buying similar foods repeatedly, since they do not have to deliberately come up with alternative recipes to cook which they are unfamiliar with. This suggests that one is much more likely to use System 1 when making habitual decisions.

Further, Biel, Dahlstrand and Grankvist (2005) argue that behavior can be guided through both habits and values, and when guided by values it is regarded as involving a more deliberate thought process. However, their research also shows that there is a tradeoff between habits and

values. They claim that when habit is strong, the behavior-attitude relationship is weak and vice versa. Therefore, according to the authors, behavior based on strong habits is not easily influenced or overcome by external information.

Changing habits and behavior require a lot of effort from individuals when they make choices and even if there is an intention of acting a certain way, such as eating vegetarian food, it can be hard to follow through with that intention (Thaler & Sunstein, 2008). This is also suggested by Verplanken and Wood (2006), that claims when habits are strong, intentions have little effect on behavior. This implies that even if people have the intention to make more climate conscious decisions, habits tend to overrule these intentions, and their original behavior is sustained. Similarly, people are present-biased and do less well when they make decisions where feedback is slow or infrequent (Thaler & Sunstein, 2008; Thaler, 2018). It could therefore be suggested that making pro environmental decisions when consuming is more difficult as the feedback from making such decisions will not be immediately noticed, or noticed for many years. Neither has the population faced climatic changes to this extent before and cannot grasp its propensity despite our knowledge and reading about its consequences (Blanco et al. 2014). Nevertheless, even small everyday changes can make a big impact and difference for the environment, such as recycling and dietary choices (Campbell-Arvai, Arvai, & Kalof, 2014).

Further, according to Donati, Menozzi, Zighetti, Rosi, Zinetti and Scazzina (2016), people choose economic benefits over environmental benefits. They claim that unless sustainable options become more affordable, people will continue to disregard making environmental considerations when purchasing food. This is also the case in Sweden, where according to Food & Friends trendspotting report (2020), the second most important factor when buying groceries is the price.

2.2 Nudging

According to Thaler and Sunstein (2008), nudging is based on two core principles: *libertarian paternalism* and *choice architecture*. Their idea of liberal paternalism refers to helping people make choices they would select if they were fully informed and unaffected by temptation and arousal, and choice architecture is the environment in which decisions are being made, e.g., menus at restaurants. By *libertarian*, Thaler and Sunstein argue that people are free to do what they like, whether it is to cancel newsletters or opt out of memberships. By *paternalism*, they state that choice architects (someone who arranges the context in which decisions are being made) should be able to influence people's choices and behaviors, simply by steering them to make better decisions for themselves. *Choice architecture* implies organizing the context in which people make choices, thus, the person responsible for arranging the context is referred to as choice architect (Thaler & Sunstein, 2008).

A nudge can appear in many different forms, from default subscriptions to newsletters, GPS suggested routes, to automatic settings at our computer or phone suggests Thaler and Sunstein (2008). However, to count as mere nudge, they argue it has to be an intervention that is easy and cheap to avoid. It also has to preserve the full freedom of choice (Sunstein, 2014). By placing healthy foods at eye level in a cafeteria counts as a nudge, but banning unhealthy foods or enforcing a special 'tax' for unhealthy foods does not (Ly, Mazar, Zhao & Soman, 2013).

2.2.1 Previous research in nudging

Nudging has been proven to be effective in several cases and situations. One example of this, according to Hammond, Keeney and Raiffa (2006), was when two neighbouring states in the United States wanted to lower their car insurance costs and therefore made changes in their regulations. They stated that car drivers were given the option of a lower insurance premium but with a limited right to sue, however, the two states framed the option differently. In one state, they automatically got a lower premium with a limited right to sue unless specified otherwise, whereas in the other state, they had to actively choose a lower premium with a limited right to

sue. According to the authors, the results showed a 200 million dollar difference in insurance costs between the two states, because people have a tendency to stick to the status quo. Another well known nudge is the automatic enrolment into retirement savings plans upon employment. Thaler and Sunstein (2008), claim that automatic enrollment has shown to increase retirement savings directly upon employment with 70% in the United States.

According to Sunstein (2014), people are more likely to do something if someone elicits their implementation intentions, for example through a nudge suggesting them to perform a certain behavior. To make people eat more healthily or sustainably, several nudging implementations have been studied to see whether nudging can be an effective method to change people's dietary habits. Donati et al. (2016), identified which type of diet had the minimum cost, which diet had minimum environmental impact and which diet that minimizes both consumer expenditure and environmental impact. The study found that meat consumption is not included in any of the three alternatives due to both high economic and environmental costs.

2.2.1.1 Nudging in restaurants

Nudging has also been tested in the context of restaurants. Gravert and Kurz (2017) found that restaurant customers consumed less meat when they rearranged the menu to present a vegetarian dish as the default option instead of a meat dish. Similar results were found in a study by Campbell-Arvai, Arvai, and Kalof (2014), where students in a cafeteria showed to be more likely to choose meat-free food options when the meat-free options were presented as defaults. The menu rearrangement was a simple and inexpensive change, and with this, the authors show that nudging is a very effective tool to decrease carbon emissions from the food industry.

A research review by Wilson, Buckley, Buckley & Bogomolova (2016) looked at different nudging studies and the impact on dietary choices. According to the research, the different methods used involved priming, where availability and product order had been changed, such as in salad bars and cafeterias in hospitals and universities. Other methods also included showing the amount of calories in the meal, having separated menus in restaurants for healthier and

unhealthier choices, the studies showed mixed results, participants tended to compensate their healthier choices with unhealthy sides in some cases. However, the review also described another study where staff in a restaurant had asked the customers whether they wanted to decrease their portion size. The study showed an overall decrease in calorie intake in customers and without immediate compensatory effects. These research showed various results, but overall they suggest that nudging interventions are effective when it comes to influencing dietary choices. Nevertheless, the authors also highlight that there are considerably few studies of nudging in combination with dietary choices and the majority use priming or salience nudging.

2.2.1.2 Nudging in grocery stores

In a review by Vandenbroele et al. (2019), they found that verbal prompting was an effective nudge when grocery shopping. The research showed an effect of increased sales in eco-labeled bananas when customers were questioned whether they would buy that instead of regular bananas. Further, they also found that customers attach social belief in how products are placed in stores, for example, a product in-between two other products of the same category appears to be more popular because of its middle position.

Lastly, a study in 2016 by Beteendelabbet, which is the foundation of our study, conducted a nudging experiment using suggestive messages. In their study, 26 grocery stores in Stockholm participated during seven weeks. During the experiment, 13 of these stores had beans and carrots moved to the taco shelf, and to the minced meat shelf respectively. At these stores they also added messages, suggesting the customers to use either beans or carrots in their dishes, and also used green footsteps on the floor leading to the products. The other 13 stores were unchanged and used as a control group. They found that, during the seven week period, the 13 changed stores sold 917kg less minced meat in total, and the sales of beans and carrots increased by 956kg in total. This suggests that their nudge experiment had an effect on the customers and their consumer habits.

2.2.2 Criticism against nudging

While nudging has been proven to be useful and effective, criticism has simultaneously been raised towards the method. Bucher et al. (2016), argues that a nudge can show an effect some time after its implication, but after a while, people return to their previous habits if the nudge has been removed. This suggests that nudging is an effective tool to make people take sustainable decisions but that it needs to be a long-term alternative. Either to form new habits, or to keep the nudge in place on a regular basis. This could be a good idea since people are, according to Thaler (2018), present-biased.

As previously mentioned, to count as a nudge it does not only need to be easy and cheap to avoid and opt out of, but also have good intentions. Otherwise it is considered phishing and a way for organisations to exploit customers to their benefit, something that is an occurring problem according to Thaler (2015). He states that the nudge also has to be transparent, despite that, there are companies hiding their conditions in the fine print to make customers pay more than necessary for services such as flight tickets and insurances. Further, making it difficult for customers to opt out of the nudge has also become a problem. For example when companies require customers to end subscriptions through the phone instead of just cancelling online through a simple click. Thaler (2015) also argues that phishing is especially dangerous if governments use it. On the other hand, when used in the private sector it can be encouraged due to competition as opposed to government policies that can be voted out of office in a democracy. Nevertheless, it is important to keep in mind that not all nudges are used to make people make better decisions for themselves and that there can be a thin line between nudging and phishing.

2.3 Empirical context

This section provides the empirical context our nudge experiment is placed in. It lifts the Swedish meat production contributions to national GHG emissions, contemporary dietary habits and trends in Sweden, and current movements to reduce meat consumption.

2.3.1 Emissions from the Swedish food industry

Following the sustainability goals developed by the UN, Sweden has established national sustainability goals with the aim to reach zero-net-emissions by 2045 (Sveriges Miljömål, 2020). In this initiative, the agriculture sector is highlighted as one of three main sectors contributing to GHG emissions. A report from the Swedish Environmental Protection Agency states that the agriculture sector in Sweden corresponds to approximately 13% of the total national GHG emissions (Al-Hanbali, 2019). Further, it is estimated that half of the emissions are connected to animal products, such as meat production and dairy. Swedish meat consumption is thus a major contributor to the national GHG emissions.

2.3.2 Dietary habits and trends in Sweden

In Sweden, 50-55 kgs of meat per capita per year is consumed according to the Swedish Board of Agriculture (Jordbruksverket, 2019). This is more than 20 kg above the national recommendations given by the same governmental agency, which recommends a maximum intake of 500 grams per person per week. A survey conducted by Food & Friends (2019), listed the ten most popular dishes in Sweden, both regarding dishes cooked for weekdays and weekends. According to the report, Swedes' favourite dishes were meat sauce during the weekdays and tacos was listed in third place during the weekends. These two dishes were the most popular when using minced meat.

According to Statistics Sweden (Statistiska Centralbyrån), the meat consumption in Sweden increased with 31% from 1980 to 2018 but peaked in 2016, and has since then declined (Lind, 2019). This decline in meat consumption is the result of consumers taking more environmentally

conscious decisions and an increase in availability of meat substitutes. (Omni, 2019). The article states that sales of meat substitutes reached 667 million Swedish crowns (SEK) in 2018 which is an increase of 10% during 2019 and an increase of 17,5% during the past two years. Based on our personal experience, there is a big variety of plant-based options in the stores, such as jackfruit, tofu, and soy meat, to only name a few, and the options are constantly increasing in variety.

2.3.3 Towards changing meat consumption

There are several initiatives to reduce meat consumption in Sweden. For example, the National Food Agency suggests to decrease one's meat consumption to smaller portions or following a vegetarian diet a few days per week, which can make a big difference for the environment (Livsmedelsverket, 2019). Further, the Swedish government is working towards increasing sustainability in society and a motion that aims to decrease meat consumption by 25% by 2025 has been filed (Riksdagsförvaltningen, 2019). The parliament has agreed to several suggestions in the motion, such as aiming to lower the meat consumption by 25% by 2025, working towards phasing out environmentally harmful subsidies that supports meat production, creating a national action plan for how to minimize environmental impact caused by the food supply chain, and finally, agreeing that the Swedish government should encourage people to choose more plant-based food options (Riksdagsförvaltningen, 2019). As of writing this, these changes are currently under process to be decided upon by the government, however, they have made the decision to refuse phasing out subsidies that support meat production.

3. Method

This section will outline the philosophical and methodological approach, as well as the chosen research strategy. It will explain how the study was constructed and the theoretical framework that lies as a foundation for the study. Then the chosen method for data analysis will be presented followed by research reliability and validity as well as research limitations.

3.1 Choice of theory

When designing the experiment, the purpose is to target the automatic and habitual decisions made by people. These are processed through System 1 and are given minimal attention and conscious awareness, therefore, the choice architecture needs to be constructed in a way to make it easy for the consumers to choose vegetarian products. Thus, the concept of nudging, which is inspired by System 1 and System 2 is the foundation of this study.

3.2 Research philosophy and approach

All research is based on beliefs of the world we live in, and different researchers have different ideas about issues like these according to Sekaran and Bougie (2016). Epistemology, or, the theory of knowledge, can be viewed from various perspectives, one of which is a pragmatic viewpoint where they claim that knowledge is not something stable but rather changes over time. This is the standpoint from which we view this and previous experiments about nudging, the findings are not consistent through time and place and is a subject of change and different outcomes depending on context.

Further, our approach is based on deductive reasoning where a theory is tested (Sekaran & Bougie, 2016). This approach and reasoning is used as the conducted study is based on theory and using explanatory research to explain causality of a certain behavior (Horváth, 2016). That is, the theory used will explain the effect of choice architecture and nudging on decision making.

3.3 Research strategy

The study is a quasi field- experimental study, which applies observational and intervention methods in a naturally occurring environment, in order to empirically examine manipulations in the real world (Horváth, 2016). Also, since the customers in the stores have not been actively randomly allocated but rather assigned to each store when they shop by forces beyond our control, such as depending on where they live or if they pass by a certain store they normally do not go to, it is considered a quasi-experiment according to Cash, Stanković and Štorga (2016). However, a quasi-experiment does not draw any comparisons between groups nor measure the status of the dependent variable prior to the experiment (Sekaran & Bougie, 2016). This is done in this experiment through comparing nudge sales statistics with different sales periods and a control store, both without a nudge installed. It is therefore a stronger study than a real quasi-experiment, but we cannot control for random allocation in this case.

3.4 Choice of empirical data

3.4.1 Selection of stores

When doing the selection of stores, we contacted all nine ICA stores in the Lund area. All stores but two were contacted in person, the remaining two were contacted by email. Two of the stores we visited in person had no manager available on site, therefore, they were later contacted by an email and the remaining two stores not visited were contacted by the same email (see appendix A). After the initial contact was made, all store managers received an email with more information about the study and its purpose (see appendix B) from which they could base their decision as to whether they wanted to participate or not. Two ICA Nära stores decided to participate and a third store participated as a control group for measurement and reference purposes.

3.4.2 Selection of products

The selection of products was made by replicating the same products used in a previous study by Beteendelabbet (2016). These products are based on the diet statistics shown in Chapter 2.3.2, targeting the minced meat used in both meat sauce and tacos. The non-meat products were chosen to fit into the recipes to either use as a compliment to meat or substitute for meat. Carrots, for example, are often included when cooking meat sauce and were therefore selected as a suggestion to use in that dish as well as placed in between the different types of minced meat. Similarly, beans can be used when cooking tacos as either a substitute for meat, due to its consistency, or a complement to mix into the meat. Therefore, these products were considered fit to be used for the research purpose. We chose to use only ICA's own brands of both beans and carrots due to practicalities in stock availability and product placement.

3.5 Data analysis

This section will describe how the data is handled and analyzed. Firstly, it covers from what periods data was gathered, and how data was categorized. Then, it continues by presenting what types of analysis and time period comparisons that will be conducted. Within this, how the nudge effect is calculated is presented.

3.5.1 Data description

The three stores were asked to provide sales data for four different time periods. One of these periods covers the period when the nudge was implemented, and the three other periods were gathered for comparison purposes. One of these periods covers the immediate weeks before the nudge was implemented, while the two other cover the same periods but for the previous year (2019). To simplify, we refer to these periods as;

- Period 1 = Period before the nudge was implemented
- Period 2 = Period during the nudge was implemented

We have thus four periods in total, Period 1 and 2 from both 2019 and 2020.

The different time periods each provide different analysis purposes which is further discussed below in Chapter 3.5.2. The sales numbers from the specific products were organized by store, period and product and analyzed with descriptive statistics. Promotion weeks were found to have a substantial impact so they were ruled out as outliers and therefore they were excluded from the analysis and results. Since there was an unequal amount of promotion weeks between the different products, stores, and periods, the unit of measurement used for the analysis was average kilos (kg) sold per week, rather than total kilos sold for the whole period.

Due to the stores having different sizes, types, and brands of the products in their product range, we categorized the products into three different main categories: ‘meat’, ‘carrots’, and ‘beans’. In these categories, we summed up the total sales from the different sizes, types, and brands. The specific products used can be found in Chapter 4.1. All raw sales data can be found in appendix C. The control store was used to identify seasonal and yearly sales changes, and from that give comparison data to the stores where the nudge was implemented.

3.5.2 Time period comparisons

To see the potential effect of the implemented nudge, comparisons between sales before the nudge (Period 1) and during the nudge (Period 2) of 2020 will be conducted. However, the potential changes of sales before and during the nudge will not solely depend on the nudge, as there can be several other factors involved. To find a more accurate impact of the implemented nudge, potential effects due to seasonal sales changes must be identified. Additionally, yearly sales changes will be identified to compare similarities in growth of the different stores. Each product category will be analysed individually, and if any of these factors are found to have a significant impact on the sales, it will be accounted for when determining the impact of the nudge.

3.5.2.1 Yearly sales changes

Yearly sales changes refers to how sales might naturally change between years due to dietary or societal trends. To identify this, comparisons between Period 1 of 2019 and 2020 will be conducted to measure the same period over two sequential years. Furthermore, the control group will be used for both Period 1 and 2 to identify any potential yearly sales changes. Yearly sales changes will only be identified and not further used for the analysis due to lack of data and levels of uncertainty.

3.5.2.2 Seasonal sales changes

Seasonal sales changes refers to how sales might naturally change between the periods, whether or not the nudge was implemented. This will be identified by comparing Period 1 2019 with Period 2 2019 to see potential changes between different months during the same year. Furthermore, the control store will be used for both 2019 and 2020 to identify any potential natural seasonal sales changes. The seasonal sales changes from the stores with the nudge installed will be used in the analysis due to their high relevance in this study.

3.5.2.3 Calculating the nudge effect

When analyzing the nudge results, we will firstly calculate the seasonal sales changes between Period 1 and Period 2 from 2019 within each store and product category. We will then calculate the expected sales for each product for when the nudge was installed (Period 2, 2020) based on the seasonal changes from 2019, and on the sales from Period 1 2020. We will then compare the expected sales for each product with the actual sales to see whether there is a difference. Thus, the final comparisons we present will be the difference in expected sales and actual sales during the time of the nudge, which should illustrate the effect of the nudge. This calculation is illustrated in the figure 1 below.

To further strengthen the analysis, the same analysis and calculations will be made for the control store. These numbers will then be compared to see if they show any similarities. Similarities between the numbers might give light on other, non-accounted for, factors that

affected all stores. Ideally, the actual sales from the control store should not differ from the expected sales, since there was no nudge installed.

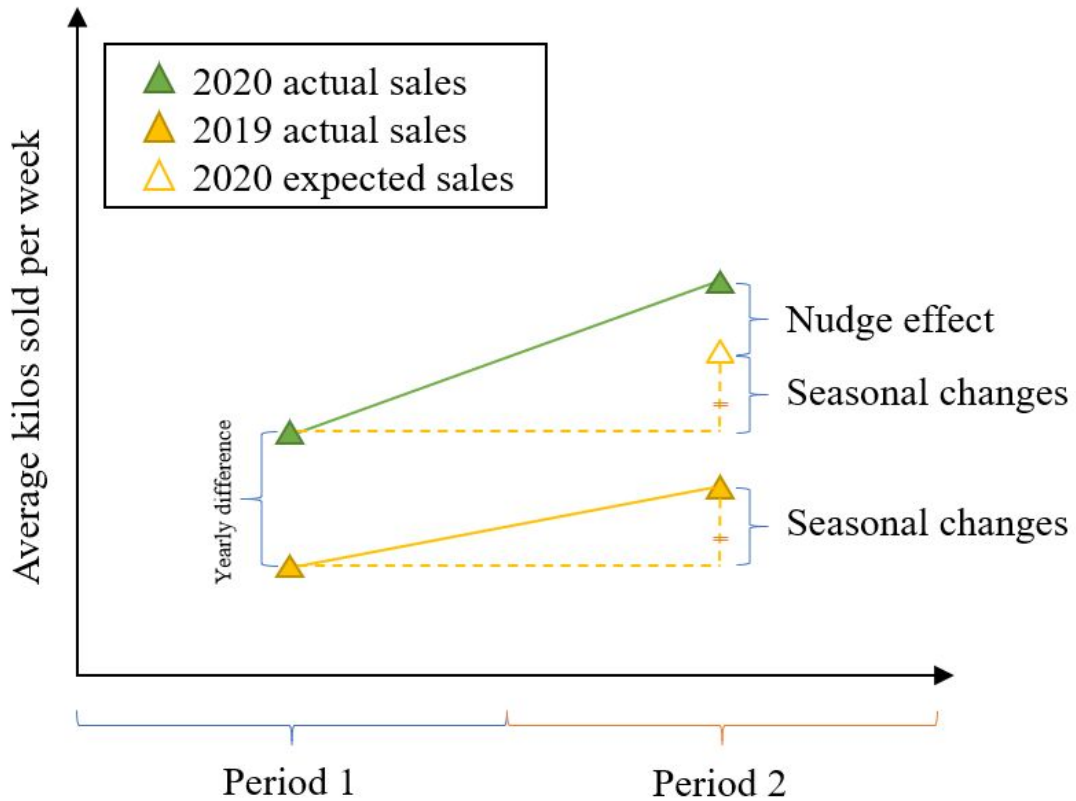


Figure 1. Illustration of the calculated nudge effect gained by subtracting seasonal changes to only show the difference between actual sales and expected sales.

3.5.3 Data analysis summary

With the collected data, we are able to identify both natural yearly and seasonal changes in addition to the effects from the nudge. The seasonal changes will be included for analysing the results in order to reach a more accurate measure of the nudge effect. The control store will be used for comparison purposes. Below in figure 2 is a visual summary of the mentioned time period comparisons for the stores with the implemented nudge, together with the desired results.

	Period 1	Period 2		
2019	No nudge	No nudge	→ Seasonal changes	→ Subtract ↓
2020	No nudge	Nudge installed	→ Nudge effect + seasonal changes	Nudge effect only
	↓ Yearly changes			

Figure 2. Visual summary of the mentioned time period comparisons. The arrows indicate what elements are to be compared, with the desired results from that comparison.

3.6 Validity and reliability

Validity indicates to what extent the experiment is accurately measuring the behavior in which one is interested (Sekaran & Bougie, 2016). Since we are analyzing consumer behavior in relation to certain products, their sales statistics will be measured to observe consumer behavior. As the study is conducted in a real world setting, the external validity is therefore higher, as opposed to a lab experiment according to Sekaran and Bougie (2016).

There is usually a tradeoff between internal and external validity according to Sekaran and Bougie (2016), the study might therefore suffer a lower internal validity due to confounding variables causing false positives in the study. Such a confounding variable is history effects, since other factors in the environment at the same time as the experiment, which we cannot control for, can impact the relationship between the dependent and independent variables (Sekaran & Bougie, 2016). Such an effect can, for example, be caused by the COVID-19 pandemic, since that caused higher sales in beans two weeks prior to the experiment.

Reliability, on the other hand, refers to whether the measurements of a variable are consistent according to Sekaran and Bougie (2016). To account for this in the data analysis, we have also analyzed data from another store to use as a control group, as well as analyzed data from the

different time periods without any nudge installed. By doing this, the internal reliability increases, as it can ensure consistency in the statistics and thereby identify whether the experiment had an effect or if differences were caused by chance or confounding variables (Sekaran & Bougie, 2016).

3.7 Discussion of method

In this study, we have chosen to use written suggestive messages and change the product placement as the nudge. There are various possible nudge methods to use, such as verbal prompting, product placement alone, price changes and so on. However, we have not been able to find studies using this type of messaging with two different focuses and time-delay; economic nudge or environmental nudge, which is the reason for the chosen nudge method.

This study would show different outcomes depending on when and where it is conducted. We have chosen to do the experiment in Lund, a small but well-educated city. Thus, findings from the experiment in this location could differ from other places where the population demographics are not the same as in Lund. We can therefore assume that these values are a possible contributing factor when analyzing the results.

3.8 Method limitations

Due to the current global outbreak of COVID-19, not more than three stores could participate in the study. The intention was to perform the experiment in all ICA-stores in the Lund area to be able to see more clear patterns and draw conclusions within the city, but the interest was low due to stores being busy coping with the pandemic. Further, the nudge was installed in one of the stores on Monday week 13, whereas it was installed two days later in the other store, Wednesday week 13. The first week, the two stores had different brands of carrots in stock, one of them had ICA's regular 'Nyskördade morötter' (Newly harvested carrots) 1 kg, whereas the other store had "Ica I love eco" 1 kg. Despite this, we chose to use the "Ica love eco" carrots in one store to begin with and the following week we used the same carrots in both stores. Ideally, we would have preferred to use the exact same products during the entire study.

Lastly, we had no control over promotion weeks during the periods included in the study and week 14, the second week of the study, ICA had promotions on the carrots included in the study. Similarly, there was a promotion on both beans and minced meat the period prior to the experiment as well as the previous year (2019). This could contribute to a potential false positive in the statistics due to confounding variables, this has however been taken into account in the analysis and promotional weeks have therefore been discarded. Lastly, the stock of beans were empty and also out of stock at the supplier at the beginning of the experiment, which could result in a false negative.

4. Empirical research and results

In the following section, we will present the experiment in detail and how it was conducted. This will be followed by the results. Firstly the overall sales changes will be shown, with yearly and seasonal sales change. This is followed by the cumulative nudge results from both nudge stores compared to the control store. Lastly, we will present the results from the different nudge conditions.

4.1 The nudge experiment

The nudge was active for four weeks in total, between week 13-16 of 2020 at two ICA Nära stores in Lund. Weekly sales numbers of the products were gathered for a total of four different time periods á four weeks, totaling 16 weeks from each store; week 9-12 2019, week 13-16 2019, week 9-12 2020, and week 13-16 2020. The same data was gathered from the control store without the nudge. We have chosen to refer to these four weeks as time periods, where:

- Period 1 = week 9-12
- Period 2 = week 13-16

Following the description mentioned in Chapter 3.4.2, the following products were used in the experiment:

- Kidney beans 380 grams, ICA
- Large white beans 380 grams, ICA
- Mixed minced meat 500 grams, ICA
- Mixed minced meat 800 grams, ICA
- Mixed minced meat 1000 grams, ICA
- Minced beef 1000 grams, ICA
- Carrots 1000 grams, ICA
- Carrots 'I Love Eco' 1000 grams, ICA
- Newly harvested carrots 1000 grams, ICA

In both stores, kidney beans and white beans were placed in the middle of the top shelf in the taco aisle, and carrots were placed between the two types of minced meat, see figure 3. At both the taco aisle and meat aisle, a sign was placed next to the proposed products, suggesting to customers that they could add beans or carrots to their dishes. Beans were recommended by the taco aisle, while carrots were recommended by the meat aisle. The signs can be found in appendix D.

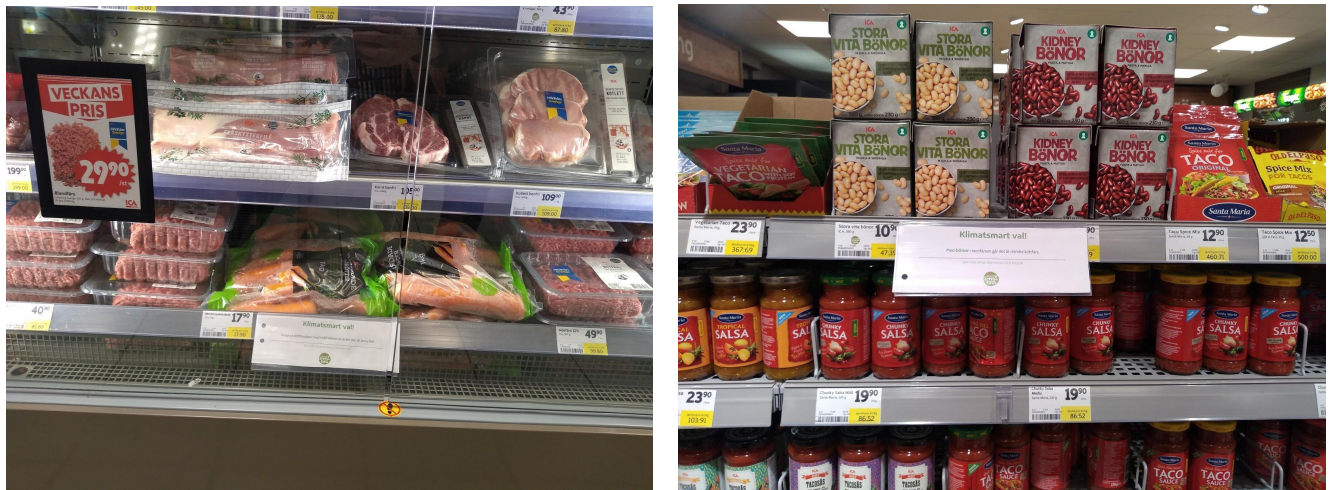


Figure 3. Pictures from one of the stores where the nudge was implemented. To the left, carrots placed in the middle of the minced meat packages, with a nudge message in front of it. To the right, white beans and kidney beans were placed in the middle of the taco shelf with a nudge message in front of them.

Both stores had identical messages except that one was highlighting the environmental benefit and the other highlighted the economic benefit. Both the beans and the carrots still also remained at their usual shelf spot, but without any message. All products kept their regular prices, unless they were part of ICA's weekly promotions.

4.2 Results

This section presents the findings from this study. It will start by addressing observed overall sales changes, such as yearly and seasonal changes, and then continue to show if the implemented nudge had any effect on the sales. Lastly, this section will show the results from the two nudge-stores individually to highlight results from the different types of messages.

As mentioned in Chapter 3.5.1, we have excluded the promotional weeks and the results presented below will show average kilos sold per week for each product. Since the stores had different sizes and brands for some of the products, the cumulative sales were calculated and presented into the categories: 'beans', 'meat' and 'carrots'. The numbers presented below are rounded to the closest tenth decimal. Raw sales data can be found in appendix C.

4.2.1 Overall sales changes

The overall sales trends found for the specific products combined for our study was that sales increased between 2019 and 2020, while sales decreased between Period 1 and Period 2. This was true for all three stores. The yearly increase ranged between 4.5-20.7%, and the seasonal decrease ranged between 3-24%, for the three stores.

4.2.1.1 Yearly sales changes

For the specific products in our study, we could find an overall increase of sales between 2019 and 2020 in all three stores, ranging from 4.5-20.7%. Period 2 was excluded in stores where the nudge was installed to avoid interference from the nudge. The cumulative sales for all products can be found below in table 2, product specific results can be found in appendix C.

Table 2. Cumulative yearly sales changes from Period 1 of the products for the three stores.

Store	2019 [kg/week]	2020 [kg/week]	Difference [%]
Climate nudge store	83.6	93.2	+ 11.5
Economic nudge store	161.4	168.7	+ 4.5
Control store	1117.4	1348.7	+ 20.7

4.2.1.2 Seasonal sales changes

For the specific products in our study, we could find an overall decrease of sales between Period 1 and Period 2 in all three stores, ranging from (-) 3.3-24.0%. 2020 was excluded in stores where the nudge was installed to avoid interference from the nudge. The cumulative sales for all products can be found below in table 3, product specific results can be found in appendix C.

Table 3. Cumulative seasonal sales changes 2019 of the products for the three stores.

Store	Period 1 [kg/week]	Period 2 [kg/week]	Difference [%]
Climate nudge store	83.6	80.8	- 3.3
Economic nudge store	161.4	153.0	- 5.2
Control store	1401.3	1064.8	- 24.0

4.2.2 Nudge results

4.2.2.1 Did the nudge affect consumer behavior?

To investigate whether the installed nudge had any effect on the sales, analysis as described in Chapter 3.5.2.3 was performed. In this first table, table 4, we show the cumulative results from the two stores where the nudge was implemented. The column on the far right, highlighted in green, shows the difference of the expected sales compared to the actual sales, which we use as a

measurement of the nudge effect. The factors to calculate the expected sales are found in appendix C.

Table 4. Cumulative sales for each product category per period and calculated nudge effect from the two nudge stores.

Product	Period 1 [kg/week]	Period 2 expected [kg/week]	Period 2 actual [kg/week]	Difference, expected vs actual [%]
Beans	31.7	28.6	35.0	+ 22.4
Carrots	158.9	137.8	150.3	+ 9.1
Meat	119.5	126.6	92.0	- 27.3

The same analysis was conducted for the control store, seen below in table 5. The control store did not exhibit similar results as the stores with the nudge. The sales of beans were lower than expected, the sales of carrots were similar to expected, and sales of meat were higher than expected, highlighted in light green.

Table 5. Cumulative sales from each product category and period for the control store.

Product	Period 1 [kg/week]	Period 2 expected [kg/week]	Period 2 actual [kg/week]	Difference, actual vs expected [%]
Beans	77.0	62.0	23.2	- 62.6
Carrots	333.5	294.7	324.5	+ 10.1
Meat	317.3	174.0	271.3	+ 55.9

The results from the nudge stores show that sales of beans and carrots were higher than expected, while sales of meat were lower than expected. Compared to the results from the control store, our findings seem to support that nudge theory had a distinct impact on the sales, and that it affected consumer behavior of the customers.

4.2.2.2 Results from the different nudge messages

In this section, we have separated the two nudge stores to investigate whether the different types of nudge messages showed different effects. The analysis was conducted in the same manner as above, according to Chapter 3.5.2.3. In the first table, table 6, we show the results from the store with environmental nudge messages. In the second table, table 7, we show the results from the store with economic nudge messages.

Table 6. Results from the store with environmental nudge messages

Product	Period 1 [kg/week]	Period 2 expected [kg/week]	Period 2 actual [kg/week]	Difference, actual vs expected [%]
Beans	9.1	8.5	15.9	+ 87.6
Carrots	33.3	29.5	33.3	+ 13.0
Meat	50.7	54.0	37.8	- 30.0

Table 7. Results from the store with economic nudge messages

Product	Period 1 [kg/week]	Period 2 expected [kg/week]	Period 2 actual [kg/week]	Difference, actual vs expected [%]
Beans	22.5	20.1	19.1	- 5.0
Carrots	125.6	108.3	117.0	+ 8.0
Meat	68.8	72.6	54.3	- 25.3

The results show that the two nudges had similar effect on the carrot and meat sales in both nudge stores, while the bean sales do not show the same similarities. In general, the environmental nudge showed to have a bigger effect on the sales for all product categories compared to the economic nudge, with an approximate 5% stronger nudge effect on both carrot and meat sales, and over a 90% stronger nudge effect on the bean sales.

5. Discussion

The aim of the study was to answer how nudging affects consumer behavior in grocery stores and whether different types of messages, such as economic benefit or environmental benefit show different effectiveness in changing behavior. Specifically, we wanted to investigate if it was possible to nudge people to adopt a less meat-intensive diet. This section aims to analyze the findings of our study, discuss their significance and relevance, and draw connections between the results and previous research in the topic of nudging.

5.1 How nudging affects consumer behavior in grocery stores

5.1.1 The nudge effect

According to the findings, there is an indication that the nudge implementation had an effect in both conditions, economic benefit as well as climatic benefit. Sales of meat were lower than expected, while sales of carrots and beans were higher than expected. This suggests that the results are consistent with previous findings of being able to affect people's behavior through nudging. The main finding was the consistent decrease in meat sales in the study where both stores showed a decrease of -30% (table 6) and -25% (table 7) respectively. This further strengthens Kahneman's (2012) arguments that most decisions are made without deliberate thought and that it is possible to influence automatic decisions made by System 1. As Verplanken and Wood (2006) claim, despite intentions to change, behavior is often sustained because intentions have little effect when habits are strong. Therefore, people might need help to make better decisions, which can be done through nudging. As Sunstein (2014) also argues, a nudge can help people elicit their implementation intentions, which is shown in both previous studies and this one.

While the total meat sales decreased by 27% in the two nudge stores (table 4), we did not see the same level of increase of sales for carrots nor beans. A possible explanation for this could be that people chose to buy other vegetables or meat substitutes, such as soy meat or tofu, instead of the

suggested beans and/or carrots to fill out their dishes. As mentioned previously, sales of meat substitutes have increased with 17.5% in the past two years according to Omni (2019) as there is an increasing trend of making more sustainable and conscious consumer decisions. Thus, once aware of the idea of lowering one's meat consumption, customers might have chosen to use substitutes instead of beans and carrots.

5.1.2 Reliability and confounding variables

One factor we identified but decided not to add for the analysis procedure was the yearly sales changes. As shown in the results, we could see that the sales between 2019 and 2020 increased in all three stores by 5-20%. It is good that the three stores showed similar increases, as it confirms that all the stores behaved similarly over 2019 and 2020. However, we could hypothetically have used these numbers further to more accurately calculate the nudge effect by, for example, assume that the rise of sales occurred linearly throughout the year. But since we did not gather data from all throughout the year, we could not be certain that this was the case, and thus, we chose to not incorporate this factor in the analysis. We do however acknowledge that sales in Period 2 could have naturally increased by a low percentage due to the yearly increase of sales.

Another potential risk in our analysis is that it is heavily based on the sales numbers from 2019. If the sales from 2019, in either Period 1 or Period 2, acted unnaturally for any reason, this would translate over to our calculated nudge effects. If this was the case, our calculated nudge results would not have accurately presented the nudge effect. A more accurate result of the nudge effect could have been gained if data from more than just one previous year was gathered. However, we cannot identify any particular abnormal behavior from the sales of 2019, and thus, we judge that the risk of any major contaminants in the results from this is low.

Moreover, a factor that cannot be overlooked for this study is the effects of the COVID-19 outbreak, which was named a global pandemic by The World Health Organization (WHO) Wednesday the 11th of March this year 2020, which has had substantial effects on the entire world (WHO, 2020). As the outbreak officially became a pandemic, people's consumer behavior

changed and they started to buy more of certain products to build a stock at home, in case of getting ill and being unable to go to the grocery store. According to a national survey conducted by Orbe (2020), 18% of the Swedish population prepared for potential quarantine by stocking food. Store managers have also identified specific products that customers stocked during the pandemic, these were mainly toilet paper, pasta, and canned food with long durability, such as beans (Sandin & Norrlund, 2020).

In the raw data of sales statistics, we could see the same behavior as described by the store managers. There was a clear spike in bean sales during week 11, the same week the COVID-19 outbreak was pronounced a global pandemic by the WHO. Additionally, this occurred simultaneously as the nudge stores had promotion on beans, and thus, this spike in sales was excluded from the analysis and final results according to our chosen methodology. This might have caused the inconsistency in bean sales observed between the two nudge stores, since big parts of our dataset were removed. Further, it is not unreasonable to assume that consumers already had a stock of beans at home from week 11, and therefore did not need to buy more during upcoming weeks into Period 2. We could also observe how the suppliers were unable to respond to the sudden increase of bean sales, which resulted in the nudge stores being out of stock during the first week of Period 2. Due to these reasons, beans show lower reliability than the two other product categories, meat and carrots, to determine the nudge effect. However, when comparing the bean sales from the nudge stores with the control store, it still seems like the nudge was effective since bean sales were comparatively higher than the expected sales, which can be seen in table 5. Thus, one can speculate whether the results would have been more precise in the absence of the COVID-19 pandemic.

5.1.3 Findings in relation to previous research

Findings by Vandebroele et al. (2019) have suggested that verbal prompting in stores can affect customers into buying sustainable products, such as eco-labelled bananas instead of regular bananas due to social norms. It has not been as widely researched whether prompting customers through written messages is similarly effective but based on our results, this seems to be the case.

This is also in line with findings by Beteendelabbet (2016). They also implemented nudge messages and rearranged product placements in grocery stores, which resulted in a decrease in meat sales as well as an increase in sales of beans and carrots.

Our study showed opposing results to claims by Biel, Dahlstrand and Grankvist (2005), who argued that behavior based on strong habits is not easily influenced by external information. They concluded that since habits are hard-wired, one does not actively think of or notice external information that could alter the behavior. Our study seems to show, however, that behavior can be influenced by external information, such as suggestive messages, which has also been shown previously by other nudges.

On the other hand, it can be argued that informational campaigns might not show the same effectiveness as nudging in dietary context, since people in general are not aware of the negative aspects of meat consumption and consume more than recommended. It can therefore be beneficial to target the behavior in the context and moment of the decision making, with the implementation of nudging. If applied to stores nationwide, this approach might be a more efficient way of reaching the National Food Agency's recommendations to consume a maximum of 500 grams of red meat per week per capita. Further, this might assist Sweden in reaching its sustainability goals to have net-zero emissions by 2045.

5.2 Effectiveness in economic benefit versus environmental benefit

The second research question the study aimed to answer was: do different types of nudge messages, such as economic benefit or environmental benefit, show different effectiveness in changing behavior? The results show similar effects, but a higher impact of the environmental nudge message, which is contradicting patterns to what Weber (2006) claims in her research. She argues that people need concrete descriptions to motivate behavior as it elicits affect that motivates action, as opposed to abstract descriptions. Thus, the economic nudge messages should have been more effective than the environmental nudge messages since the consequences from spending money will appear instantly, whereas consequences from climatic change will not be as

apparent in many years. This also seems to refute the claims made by Thaler (2018), that people are present-biased.

5.2.1 Demographic differences

Weber (2006) argues that using System 2 more frequently can be taught, and therefore she suggests that System 2 is used to a greater extent in people with higher education and technical expertise. This could be the case in this context since Lund is a city with a high average of educational level and people are, in general, very environmentally conscious (SCB, 2019; Valmyndigheten, 2018). This would also be similar to claims by Verplanken and Wood (2006), who found that behavior is usually guided by either habits or values and that when values are strong, behavior is guided by a more deliberate thought process, such as when using System 2. This suggests that people in Lund would generally be more positive to buy environmentally friendly food.

The demographics of Lund might explain the opposing results of our study in comparison to previous studies regarding being able to process distant abstract consequences less effectively. A similar study might therefore show different results if conducted elsewhere or in another demographic context. This might highlight the importance of context when designing nudges, which is an important insight gained from this study.

5.3 Main findings

The key findings from our study were that it seems that nudging, by rearranging product placement and adding suggestive nudge messages, is an effective tool in order to change consumer behavior in the context of grocery shopping. Meat sales were lower than expected for the period when the nudge was implemented, which seems to indicate that the nudge had the desired effect. Additionally, both carrot and bean sales were higher than expected when compared to the control store.

Surprisingly, the environmental nudge message seems to have had a bigger effect than the economic nudge message, which is contradicting previous research by Weber (2006). However, it can be argued that demographic context plays an important factor and that the population of Lund values the environment more highly than the national average, and is therefore more positive to buy environmentally friendly food. Thus, a similar study might have shown different results elsewhere.

6. Conclusion

Our study seems to show that nudging is an effective tool to change consumer behavior in grocery stores. This appears to confirm previous research in nudging, which has shown successful results within several different areas. The key finding was that meat sales were lower than expected when the nudge was implemented, which suggests that the nudge had the desired effect. Our research can show that actors within the food and health industry can implement simple and cheap interventions that can contribute to healthier and more sustainable dietary behavior.

Environmental nudge messages seem to have had a bigger effect than economic nudge messages, which contradicts previous findings by Weber (2006), who argued that delayed consequences cause people to make decisions with short-term consequences as they are more concrete than, for example, information and consequences regarding climatic change. However, Lund is a well-educated city and presumably more environmentally aware than the national average, which could be an explanation for our results. This seems to show the relevance and importance of context when both designing and implementing a nudge, since this study might yield a different outcome in another demographic context.

6.1 Managerial implications

Based on our findings, nudging can be an effective and simple tool to influence behavior and decision making. Furthermore, it can also be very inexpensive and require little effort to deploy (Thaler & Sunstein, 2008). It is therefore both valuable and desirable for businesses to use for their operations. Some areas where we see that nudging can be a good alternative is within marketing, streamlining internal operations, and developing fruitful customer relations. The possibilities are endless.

However, our findings also show that it is important to be aware that different nudges can show different results depending on context. Thus, businesses and managers who wish to use nudging either on their clients and customers or their workforce should be wary of this and might need to adapt their nudge thereafter. Nevertheless, as a business manager it is vital to keep in mind that nudging should be used to make people make better decisions for themselves and avoid phishing (Thaler, 2015). Nudge for good and nudge for better.

6.2 Further research

We suggest that further research should examine to what extent habits can be influenced by external information to change behavior. Previous research has indicated various results, Biel, Dahlstrand and Grankvist (2005) argued that they cannot, while several nudge studies have been able to change people's behavior previously, which also seems to be the case in this study. Thus, it would be interesting to establish whether nudging is an exception to their findings.

Additionally, we suggest further research to investigate the potential long lasting effects of nudging to see whether nudging can change behavior long-term to form new habits. This is a relevant topic as there is, to our knowledge, no clear answer to how long a nudge effect lasts once the nudge has been removed. This would also facilitate gaining a greater understanding regarding which areas nudging is an effective tool. Furthermore, it would be beneficial to conduct more research regarding the effectiveness of different nudges targeting different long and short-term consequences, such as in this study. Specifically, research including a larger data-set to enable higher generalizability from the result.

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Appendix A. Mail to ICA managers who we did not reach in person

Hej!

Är du nyfiken på hur kunders köpbeteende kan påverkas av olika budskap uppsatta i butik?

Vi är två masterstudenter på Ekonomihögskolan här i Lund och vi undrar om ni är intresserade av att samarbeta tillsammans med oss under vår masteruppsats. Vi försökte komma i kontakt med er förra veckan, och blev hänvisade att ta kontakt med er via mail.

Vi planerar att replikera en studie som gjordes med ett antal ica-butiker i Stockholm (länkad nedan) och rikta oss mot de två största kötträtterna: tacos och köttfärsås, och föreslå för kunderna att de kan välja att fylla ut eller byta ut köttet mot bönor eller rotfrukter. Tanken är att vi vill sätta bönor (t.ex. kidney och svarta bönor) i tacohyllan med en skylt som meddelar om fördelen med att välja veg, såsom i studien. Vid köttfärsen skulle vi gärna hänvisa till fördelen med rotfrukter och om möjligt sätta t.ex. morötter i anslutning (om möjligt) till köttfärsen. Sedan vill vi jämföra två olika budskap som sätts upp vid varorna; en angående personlig ekonomisk vinning och en riktad mot att det är klimatsmart att välja veg. Vi vill kolla om de olika budskapen har olika effekt på kundbeteende.

Vi bokar gärna in ett möte med er där vi kan berätta mer om vår studie. Hoppas det låter intressant, hör gärna av er om ni har några frågor!

Länk till studien: <https://beteendelabbet.se/cases/ica-butiken>

Med vänlig hälsning,

Sofia Fredholm och Erik Karlsson, studenter vid Ekonomihögskolan vid Lunds Universitet

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Uppgifter Erik: 0703566861, erikkarlsson@live.com

Appendix B. Follow-up mail to ICA managers who we met in person

Hej,

Stort tack för visat intresse för vår kommande uppsats! Här kommer en liten beskrivning av hur vi ser på upplägget och tidsplan, sedan går detta självklart alltid att justera så att det passar er, vi vill ju såklart att detta ska gå att genomföra så smidigt som möjligt för alla parter.

Studiens syfte är att undersöka en "nudge" riktat mot konsumenter för att se om det går att påverka dem till att välja mer vegetariska alternativ.

Vi tänkte replikera en studie som gjordes med ett antal ica-butiker i Stockholm (länkad nedan) och rikta oss mot de två största kötträtterna: tacos och köttfärsås, och föreslå för kunderna att de kan välja att fylla ut eller byta ut köttet mot bönor eller rotfrukter. Tanken är att vi vill sätta bönor (t.ex. kidney och svarta bönor) i tacohyllan med en skylt som meddelar om fördelen med att välja veg, såsom i studien. Vid köttfärsen skulle vi gärna hänvisa till fördelen med rotfrukter och om möjligt sätta t.ex. morötter i anslutning (om möjligt) till köttfärsen.

Vi har varit i kontakt med flera ica-butiker i Lund och hittills fått visat intresse av 4 st. Vårt mål med studien är att undersöka om det finns någon skillnad i resultat beroende på hur kommunikationen om vegoalternativet sker; nämligen från två perspektiv, klimatsmart och ekonomiskt, Dvs, att 2 butiker i så fall har ett budskap och 2 butiker har ett annat. För att det ska ge ett så bra resultat som möjligt uppskattar vi att skyltningen behöver sitta i ca 3-4 veckor i följd, men vi är flexibla utefter era möjligheter. Vi börjar gärna så tidigt som möjligt, samtidigt har vi såklart förståelse för att det ska passa er. Vi föreslår preliminärt vecka 13-16.

Det vi skulle behöva av er på Ica:

- Skyltar i enlighet med Icas grafiska profil, såsom ni skyltar i vanliga fall men med detta specifika meddelande
- Tillåtelse att sätta dessa varor (bönor och alternativt morötter) vid respektive plats i butiken
- Statistik kring försäljningen av dessa varor (bönor, morötter, köttfärs) både innan och under perioden studien genomförs för att kunna jämföra eventuella förändringar

Det vi erbjuder:

- Analys kring era konsumenters beteende och hur detta kan påverkas
- Hjälpa till med skyltning och utplacering av varor

Länk till studien:

<https://eur02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fbeteendelabbet.se%2Fcases%2Fica-butiken&data=02%7C01%7C0la.hollerup%40kvantum.ica.se%7C31e61dc5c3aa46cd939308d7c9b55253%7C176bdcf02ce34610962ad59c1f5ce9f6%7C0%7C0%7C63719965>

[3629568772& sdata=IZY8kr8HsfTQ%2BGnQhnbPNAKusO1g7PBeNmKG45u%2FOoo%3D&reserved=0](https://www.google.com/search?q=3629568772&sdata=IZY8kr8HsfTQ%2BGnQhnbPNAKusO1g7PBeNmKG45u%2FOoo%3D&reserved=0)

Hör gärna av er om eventuella frågor! Det vore superroligt och vi vore väldigt tacksamma om detta gick att genomföra!

Med vänlig hälsning,

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Appendix C. Raw sales data and calculated expected sales factors

Table 8. Sales data from climate nudge message store. The numbers refer to the number of units sold that week. Promotion weeks are marked in orange, they were discarded for the analysis of this study according to the chosen methodology.

		Kidney beans	White beans	Minced beef	Minced mixed meat	Carrots
	Product weight [g]	380	380	500	500	1000
	2019 v9	6	18	52	109	49
	2019 v10	5	4	56	23	40
	2019 v11	8	7	32	51	41
	2019 v12	2	5	10	36	35
	2019 v13	4	8	36	34	46
	2019 v14	6	13	50	36	35
	2019 v15	3	6	57	49	38
	2019 v16	2	9	24	30	27
	2020 v9	12	12	65	49	37
	2020 v10	12	18	42	42	177
	2020 v11	151	88	55	108	32
	2020 v12	10	8	49	55	31
	2020 v13	2	12	49	50	40
	2020 v14	65	12	43	147	191
	2020 v15	31	2	35	30	21
	2020 v16	31	12	30	29	39

Table 9. Sales data from economic nudge message store. The numbers refer to the number of units sold that week. Promotion weeks are marked in orange, they were discarded for the analysis of this study. Weeks where the product was not sold in the store are marked in bright red. For Period 2 2020 we could only obtain the cumulative data for the Carrots ILE, marked in blue. This does however not affect the result as there was no promotion on this product for that period. The cumulative sales are spread out over four weeks in the table below.

		Kidney beans	White beans	Minced mixed meat	Minced mixed meat	Minced mixed meat	Carrots	Carrots ILE
	Product weight [g]	380	380	800	1000	500	1000	1000
	2019 v9	21	26	36		185	58	
	2019 v10	22	14	51		65	81	
	2019 v11	17	10	43		54	76	
	2019 v12	19	9	233		93	98	
	2019 v13	21	19	79		39	79	
	2019 v14	15	6	72		55	72	
	2019 v15	26	12	69		173	69	
	2019 v16	15	9	50		25	50	
	2020 v9	27	36		47	50	89	52
	2020 v10	21	34		41	51	34	44
	2020 v11	153	154		41	233	30	64
	2020 v12	30	30		49	45	113	33
	2020 v13	16	12		45	43	84	54
	2020 v14	29	27		31	189	23	54
	2020 v15	22	23		27	38	53	54
	2020 v16	31	41		36	36	92	54

Table 10. Sales from the control store. The numbers refer to the number of units sold that week. Promotion weeks are marked in orange, they were discarded for the analysis of this study. Weeks where the product was not sold in the store are marked in bright red.

		Kidney beans	White beans	Minced beef	Minced beef	Minced beef	Minced mixed meat	Minced mixed meat	Minced mixed meat	Carrots freshly harvested
	Product weight	380	380	500	800	1000	500	800	1000	1000
	2019 v9	60	26	75	85		111	213		221
	2019 v10	62	43	68	106		89	89		201
	2019 v11	52	42	85	100		122	113		217
	2019 v12	73	33	53	391		83	487		184
	2019 v13	84	24	39	84		85	255		196
	2019 v14	48	24	53	76		80	82		208
	2019 v15	125	61	53	89		91	100		200
	2019 v16	28	28	32	54		49	443		119
	2020 v9	184	118	76		90	98		101	214
	2020 v10	97	74	57		92	87		531	199
	2020 v11	226	129	87		142	123		139	690
	2020 v12	50	32	84		123	96		111	239
	2020 v13	95	16	213		106	101		95	258
	2020 v14	22	23	105		108	94		112	622
	2020 v15	21	11	55		71	89		88	204
	2020 v16	60	46	56		100	96		104	214

Table 11. Calculated expected sales factors used in the analysis. The calculations are made according to Chapter 3.5.2.3, and written mathematically below.

Store	Beans [%]	Carrots [%]	Meat [%]
Climate nudge store	- 7.3	- 11.5	+ 6.5
Economic nudge store	- 10.9	- 13.7	+ 5.5
Control store	- 53.5	- 6.7	- 32.1

$P1 = \text{Period } 1, P2 = \text{Period } 2$

$$\text{Expected Sales Factor} = \text{ESF} = \frac{\text{Sales}(P2) - \text{Sales}(P1)}{\text{Sales}(P1)}$$

$$\text{Expected sales} = \text{Sales}(P1 \text{ 2020}) + (\text{Sales}(P1 \text{ 2020}) \times \text{ESF}(2019))$$

Appendix D. Nudge messages in stores

Environmental nudge messages

Klimatsmart val!

Med **bönor** i tacofärsen går det åt mindre köttfärs.

BRA FÖR DIN HÄLSA, DJUREN OCH MILJÖN



Klimatsmart val!

Dryga ut köttfärssåsen med **rotfrukter** så räcker den till ännu fler!

BRA FÖR DIN HÄLSA, DJUREN OCH MILJÖN



Billigare val!

Med **bönor** i tacofärsen går det åt mindre köttfärs.

BRA FÖR DIN HÄLSA, DJUREN OCH MILJÖN



Billigare val!

Dryga ut köttfärssåsen med **rotfrukter** så räcker den till ännu fler!

BRA FÖR DIN HÄLSA, DJUREN OCH MILJÖN

