COPENHAGEN BUSINESS SCHOOL 2017

MASTER'S THESIS

Making Healthy Choices Easier: An Exploratory Study of Nudging Interventions Across Germany and Denmark

CAND.MERC. MSC EBA
INTERNATIONAL MARKETING AND MANAGEMENT

SUPERVISOR: JAN MICHAEL BAUER

AUTHOR: ELENA FAHRLÄNDER

SUBMISSION DATE: 15 MAY 2017

PAGES: 77 (180,775 STU)

Acknowledgements

I would like to thank Assistant Professor Jan Michael Bauer for his time and continuous support and guidance throughout the thesis project. Further, I would like to thank Kristian Roed Nielsen for his aid with implementing technical features of the questionnaire.

Abstract

The rising levels of obesity highlight the need to find efficient ways to tackle this worldwide epidemic. To date, policy interventions have only shown limited success, and new scientific approaches give hope to better understand this disease and to provide effective solutions. Nudging, which aims to steer people in certain directions without limiting their freedom of choice, is one of these promising approaches. Nudging interventions have not received sufficient attention in research so far, especially with regards to cross-country differences and in the growing field of online grocery shops.

With the aim to bridge this gap, the present study explores whether health nudges, in particular labels, positioning and priming, are effective in driving Danish and German consumers' choices towards healthier food in an online grocery shop environment. Further, differences in the effectiveness of these health nudges between Danish and German consumers and potential additional factors influencing the effectiveness of health nudges on food choices are examined.

The research is based on a carefully designed online questionnaire with an integrated choice experiment, including three health nudging interventions (a healthier choice label, product positioning and a priming slogan) in the two product groups breakfast cereals and snacks. The findings indicate that all three interventions are effective in driving respondents towards healthier food choices for cereals products, while only the prime slogan leads to significantly healthier choices in the snacks product group. This illuminates the product group's essential role for the effectiveness of the three nudges. Furthermore, considerable cross-national differences between the success of the nudges for German and Danish respondents could be observed, in that Germans are more easily nudged in the cereals product group. Additional factors, such as health motivation in food choices, education and income, also affect the impact of the nudges on the healthiness of respondents' food choices.

Implications from this pilot study include that the three interventions positively affect people's food choices. However, a one-fits-all approach should be questioned when implementing nudges across countries. More targeted interventions, which also consider factors such as the product group or consumers' education, hold the potential to enhance the effectiveness of the nudges. For this purpose, the online grocery environment offers the ideal arena with its flexibility to implement health nudges as well as possibilities to collect customer data.

Table of Contents

Please note: A list of abbreviations used in this study is presented in Appendix I.

List of Figures

List of Tables

1. Introduction

1.1. Relevance for Public Policy

With food being abundant in developed countries, consumers are constantly faced with the choice of what they eat, how much they eat and when they eat. For this reason, it is a challenge for most people to make healthy choices. Often, unhealthy food is cheap and convenient (Nudge-it., 2017), which is certainly a major driver of the worldwide rising levels of overweight and obesity (WHO, 2014). According to the World Health Organization (WHO), more than 1.9 billion adults were overweight in 2014, with 600 million of them being obese (WHO, 2016). About 3 million people die every year as a consequence of their condition (Bailey & Harper, 2015). Obesity and overweight, which have become a world-wide epidemic (Arno & Thomas, 2016), can be defined as "the abnormal or excessive fat accumulation that may impair health" (WHO, 2016). Overweight adults have a body-mass-index (BMI) greater than or equal to 25 and obese adults' BMI is greater than or equal to 30. A high BMI comes with major risks to people's health, including cardiovascular diseases, musculoskeletal disorders, and even some types of cancer (WHO, 2016). Besides being a major reduction of the quality of life for the individual, obesity causes considerable healthcare expenditures for governments. The estimated costs associated with healthcare for people suffering from obesity is about 50% higher than for individuals who are not obese (Cawley & Hall, 2010). With obesity being both a personal and a public concern, policy makers are looking for effective solutions to increase people's health.

1.2. Interventions to Reduce Obesity

Policies have already tried to tackle obesity through various measures (Rayner, 2007). So far, policy interventions relying on taxes on fat or sugar, banning of advertisements on children's TV (e.g. in Sweden) or extensive health campaigns to promote a healthier lifestyle, have not led to any considerable effects (Reisch, Sunstein, & Gwozdz, 2017). New scientific approaches give hope to better understand the disease and provide effective solutions to reducing obesity. A promising area of research and potential instrument to decrease obesity is a concept called *nudging*. Thaler and Sunstein (2008) promote nudging as the idea that people's choices can be arranged in their own as well as society's overall interest, and that people can be steered in certain directions without limiting their freedom of choice. Examples of nudges are *simplification* (e.g. easy and intuitive forms or websites), *framing* (e.g. different order of questions on a questionnaire might affect people's answers), *priming* (e.g. a slogan that gives people a cue and activates specific attitudes), *default rules* (e.g. organ donation in Austria, where people are donors by

default), *positioning of products* (e.g. placing healthier products at the checkout areas of a canteen) and *labels* (e.g. energy efficiency labels on electronic gadgets) (Sunstein, 2014). The principal advantage of nudges is their potential to deliver prompt results and cost savings, while being highly effective and simultaneously maintaining people's freedom of choice (Sunstein, 2014). Without patronizing people, nudges hold the potential of making people's lives simpler, safer and easier (Sunstein, 2014). As yet, different intervention strategies have shown mixed results (Bailey & Harper, 2015; Capacci et al., 2012; Dobbs et al., 2014; Pérez-Cueto et al., 2012), and this relatively young and emerging field of research has not been exhausted. Experiences and existing studies have found that while a particular nudge seems promising in theory, it might turn out to fail in practice (Sunstein, 2014). Therefore, learning from experiments, continuously improving the nudge in question and trying out variations that might be more effective is key for making advances in this promising arena.

1.3. Relevance for Businesses

Nudges integrated into new health policies might entail considerable consequences for food manufacturers and supermarkets. After all, policy instruments, such as mandatory nutritional labels or favorable positioning for healthier products, have the potential to hold companies liable for fostering unhealthy eating behavior among consumers (Lobstein & Davies, 2009). If a nudge were to alter the choice environment in a way that draws consumers towards healthier products, unhealthy products might experience a decline in sales and food producers might have to adapt their products to stay attractive for consumers (Lobstein & Davies, 2009). If a favorable nutritional label were only placed on products with health benefits, for example, producers would have to assess the nutritional quality of their products and confirm that they comply with the guidelines before applying the label. A clear and reliable method for this assessment would provide food producers with the chance to find areas of improvement (Lobstein & Davies, 2009). Food manufacturers could achieve significant improvements by altering the ingredients of their existing products, and by developing completely novel products. This surely displays an opportunity for first movers to benefit from sales in a new, healthier food segment. Some companies have already started to introduce "healthier" versions of their current products. The German breakfast cereal producer Kölln, for instance, launched several cereal products with reduced sugar or fat content, such as a yoghurt raspberry muesli with 30% less fat (Peter Kölln GmbH & Co. KGaA, n.d.). Overall, nudges could incentivize companies to take responsibility and play an active role in contributing to increase public health. In contrast to actual product bans, consumers are still free in their choices, and food producers would have the chance to adapt their products or assortments to best comply with the incentives the nudge provides.

1.4. Introduction to the Nudge-it Project

As factors that influence people's food choice are poorly understood (Nudge-it., 2017), there is a pressing need to develop a deeper understanding in order to finally gain control over the high social and economic costs caused by the disease. This is where the Nudge-it Project comes in: It is a European Commission-funded initiative devoted to developing and implementing novel scientific approaches to better understand food decision-making and provide evidence-based solutions to reduce obesity (Nudge-it., 2017). Internationally leading experts from various fields are engaged in this project to improve public health policy with combined experiences from neurobiology, neuroimaging, computational modelling, economics and public policy (Nudge-it., 2017). The present study is conducted across two countries, Germany and Denmark, as part of the Nudge-it project and strives to add valuable insights from the behavioral economics and consumer behavior perspectives.

1.5. Research Questions and Underlying Motivations

Past research has contributed to a variety of studies and experiments about nudges, their effectiveness in leading to healthier food choices and their potential integration into public policy. However, to date, little attention has been paid to examining multiple nudges and their effectiveness across countries, which is of high importance with the movement towards more integrated policies on the EU level. Building on existing research, the present study aims to generate further insights and close this important research gap. The additional value the study will provide stems from four main points. A brief motivation for the choice of these four points is given below, while more detailed background for the underlying literature and theory of the research questions is presented in chapter 2.

Firstly, three different nudging interventions (health label, positioning and a prime slogan) are tested in a choice experiment through separate scenarios. While these nudges have already been supported in previous studies, there has not been any research so far which directly compares the three nudging interventions. In doing so, the study at hand enables us to assess the direct impact of every single intervention and can give important indications to decision makers, which intervention to prioritize.

Secondly, this study focuses on nudging interventions in the online grocery store environment and thereby aims at creating a greater understanding of nudging in this underexplored research field. Online grocery shopping is a growing field in today's increasingly online-driven world (Syndy, 2015). The international e-commerce giant Amazon had already been operating its fresh food delivery service in several parts of the US (Amazon, n.d.). Only recently, the company has

announced plans to expand the grocery delivery service to other areas and countries (e.g. Germany). Experts are predicting a rapid growth of the online grocery market (Hubschmid, 2017), which highlights its relevance. In this context, the importance to ensure that new policies are relevant to current developments and suit the habits of the modern consumer, especially younger generations, should not be neglected.

Thirdly, the study is conducted in two countries (Germany and Denmark), with the purpose of adding insights and valuable cues to the international field of nudging. Evidence from international comparison studies is scarce in the field of nudging interventions, where thus far, multiple studies have examined the effectiveness of nudges in a single country, with focus on the United States (US) or the United Kingdom (UK). To introduce a policy which is effective in the EU, it is important to conduct research in this environment. Reisch et al. (2017) explain consumers from different European countries support health nudges and differences across nations can be offset by similarities. Through this bi-country setting, the effect of nudging techniques on consumer behavior and potential differences in consumer's sensitivity to the three nudging techniques across Germany and Denmark, are explored. Therefore, in case consumers react differently to specific nudges across countries, country-specific policy adaptations might be required to better suit the people's receptiveness to certain health nudges.

Finally, potential factors influencing the effectiveness of nudges on healthier food choices, such as product involvement, food choice motivation and demographics are examined. These factors are underrepresented in previous research, and the present study aims to provide more insights on what decision makers should consider when targeting consumers with nudging interventions. This research holds the potential to identify nudges that should receive more attention in future in-depth research and that could eventually be implemented in large-scale policy interventions. Therefore, the study investigates the following three research questions (RQ):

RQ1*: Are health nudges, in particular labels, positioning and priming effective in driving Danish and German consumers' choices towards healthier food in an online grocery shop environment?*

RQ2*: Are there any differences in the effectiveness of these health nudges between Danish and German consumers?*

RQ3*: What are other potential factors influencing the effectiveness of health nudges on food choices?*

1.6. Scope and Delimitations of the Study

The scope and time constraints of this project make it necessary to consider some restrictions. First, the study focuses on nudging interventions in the online environment and does not consider brick and mortar stores. Second, it would exceed the scope of a single study to examine the effectiveness of a large number of nudging interventions and thus, the study focuses on three interventions described in section 2.1.2. Third, this study is conducted under the umbrella of the Nudge-it project and explores the research problem from a behavioral economics point of view, with the goal of providing implications for policy makers, businesses and future research in the field. Detailed legal or financial considerations, however, are outside the scope of this research. Finally, psychological processes, medical analysis and implications on consumer's health as well as possible compensation behavior (e.g. if a consumer first chooses a healthy product but then falls for an unhealthy product at a later point) will not be considered in this study. With these delimitations in mind, the aim of this pilot study is to create a well-designed experiment, which has the potential to serve as a valuable model for replication and further development on a larger scale in the future.

2. Literature Review and Theoretical Considerations

The purpose of this chapter is to introduce relevant theories, concepts and findings from previous research to provide the backbone for the study's design. The chapter is divided into several parts. First, the nudging concept and underlying theories as well as health nudge interventions are outlined and thereafter, the choices of the specific nudging interventions are motivated. Then, relevant concepts from consumer behavior which influence consumers' food choices are discussed. Finally, the online grocery shop environment and comparative cross-cultural consumer research are introduced. Insights gained from this section are applied to develop the framework in section 2.5, which guides the subsequent empirical study.

2.1. Nudging and Underlying Theories

Since the field of nudging is only emerging (Hansen, 2016), not many theories have been developed around the topic. However, nudging is based on theories from behavioral economics and social psychology, which are presented in this chapter. This section first introduces Dual-Process Theory as the foundation underlying the nudge concept. Thereafter, a social marketing

perspective is taken on, which paves the road for gaining deeper insights into nudge theory as well as its related concepts of libertarian paternalism, and choice architecture.

Dual-Process Theory

The growing body of research and insights in behavioral economics have shed light on potential reasons why most policies to promote healthier food choices have had limited impact so far. These learnings might be essential in order to deal effectively with issues such as obesity (Hansen & Jespersen, 2013). A central theory underlying nudging is *Dual-Process Theory* of cognition and information processing (Hansen, 2016). The theory suggests that there are two cognitive modes in which the human brain functions (Kahneman, 2011). It assumes that some processes in the human mind operate in a reflective and rational way and others in an automatic and intuitive manner (Kahneman, 2011). While the first is a cognitive process, the second is rather driven by feelings and fast reactions to environmental cues (Bucher et al., 2016). The attributes that describe each mode of thinking are shown in Table 1. The two modes are conflicting in nature and human behavior is a result of either mode of thinking. An example is the twinkling of our eyelids: To keep our eyes moist, we automatically close them from time to time (automatic mode). However, when we want to sleep or someone tells us to close our eyes, we act in a controlled way and reflect on the action we are taking (reflective mode). It is important to know that automatic thinking operates independently, whereas reflective thinking is dependent on automatic processes (Hansen & Jespersen, 2013).

Table 1: Two Cognitive Modes of Thinking
Source: Thaler & Sunstein, 2008

Automatic thinking	Reflective thinking
Uncontrolled	Controlled
Effortless	Effortful
Associative	Deductive
Fast	Slow
Unconscious	Self-aware
Skilled	Rule following

Each action we take, whether reflective or automatic, will lead to a certain behavior. This behavior is the result of choices (Hansen & Jespersen, 2013). EU healthy eating interventions have been successful in informing consumers to make healthier food choices (Grunert & Wills, 2007). Yet, only modest success could be seen in actually changing people's behavior, as the measured improvements in health and reduction of obesity have not been satisfactory (e.g. Pérez-Cueto et al., 2012). This leads to the assumption that information alone does not affect a significant change in behavior, because the two modes of thinking are in conflict with each other. Insights in behavioral economics and psychology have shown that although people are often well-informed, decision-making contexts possibly lead us to fail in drawing from this information to achieve the goals we prefer (Hansen & Jespersen, 2013). Applied to the nutrition choice context, our automatic mode of thinking might be dominant when deciding on what to buy or eat. Thus, the

paradigm that we make rational and conscious food choices (Riebl et al., 2015) is to be questioned. Nudges can target both systems: Some promote reflection and deliberation (System 2 nudges) and others target more automatic processing (System 1 nudges) (Reisch et al., 2017).

Nudging, Libertarian Paternalism and Choice Architecture

In literature, the three terms nudging, libertarian paternalism and choice architecture are often used interchangeably, which causes some confusion. Thus, clarification will be provided in the following.

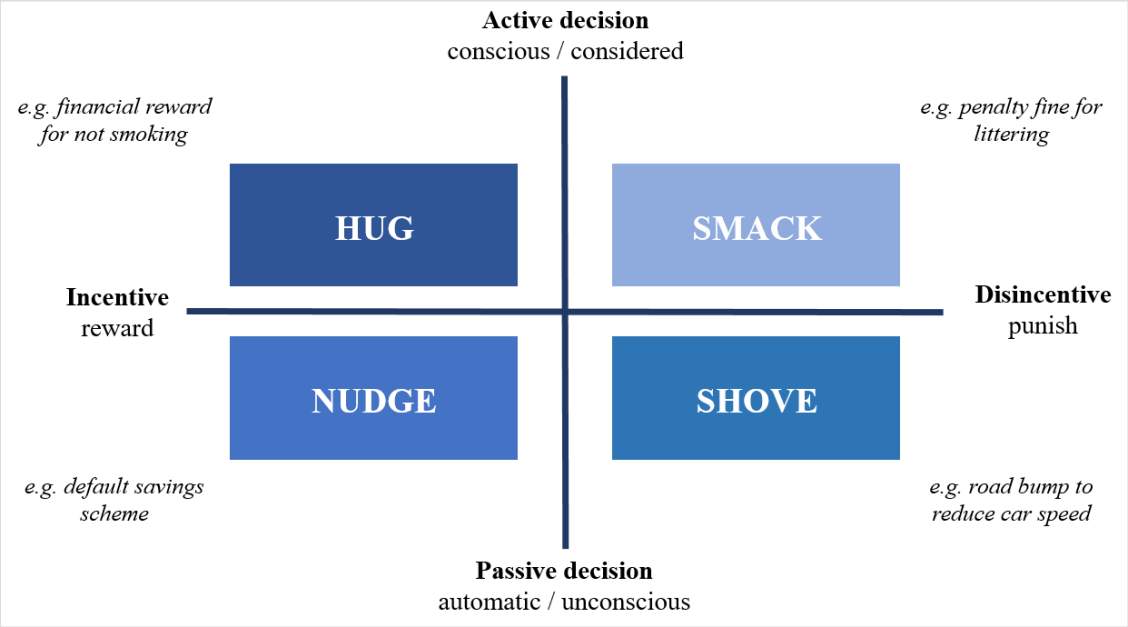
Thaler and Sunstein (2008) describe *libertarian paternalism* as maintaining people's freedom of choice and at the same time helping them to make decisions for themselves. While paternalism consists of the nudge itself, libertarianism is the freedom that little or no cost occur for people who do not "follow" the nudge (Sunstein & Thaler, 2003). Summarizing the concept, Thaler and Sunstein (2008) explain that "libertarian paternalists want to make it easy for people to go their own way; they do not want to burden those who want to exercise their freedom" (p.5). In line with this, the term *choice architecture* refers to the framing or presentation of choice options (Thaler & Sunstein, 2008) and describes behavioral interventions that do not require concrete regulation (Bucher et al., 2016).

Nudging, as the central notion of this study, can be viewed as a sub-concept of choice architecture and libertarian paternalism. It is "any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives" (Thaler & Sunstein, 2008, p.6). Sunstein and Thaler (2003) also emphasize the fact that people often lack clear preferences and their choices are subject to the details of the choice context. Based on the stance that most of our food choices are habitual and defined by the automatic mode of thinking, nudges display a promising area of research to increase public health and attain social benefits (Bucher et al., 2016). They are designed to influence these habitual behaviors, for instance, by altering the presentation of options to consumers (Wilson, Buckley, Buckley, & Bogomolova, 2016). Many governments consider nudging as an approach to develop policies and their tactical implementation (French, 2013).

According to French (2013), nudges do not display the sole form of social intervention. The author has developed a matrix with three additional options to tackle behavioral challenges, namely hug, smack and shove (see Figure 1). All four options are classified on the vertical continuum from active decisions (conscious and considered) to passive decisions (automatic and unconscious) and the horizontal continuum from incentives (rewards) to disincentives (punishments). This matrix helps to draw a distinct line between nudges and other social interventions. In addition, it

illustrates that nudges, such as default saving schemes, are a rather passive, incentive-based option for tackling behavioral challenges. The decision on which of the four forms to use should be based on the effectiveness in the target audience (French, 2013).

Figure 1: The Exchange Matrix: Four Forms of Exchange
Source: French (2013)



Nudging is not only viewed positively among scholars and public voices. Major accusations are that, instead of maintaining people's freedom of choice, nudging manipulates people's choices (e.g. Goodwin, 2012; Hansen & Jespersen, 2013). It rather uses human weaknesses to reach a goal, and people are unaware when they are nudged (Hertwig, 2016). Hertwig (2016) also disagrees with the idea of mankind suggested by nudging, namely that humans are too languorous to think for themselves. He even claims that people should be cautious when taking on the naive assumption that the State acts in favor of its citizens. Critics with regard to nudging in the healthy nutrition area point to the fact that nudges focus on changing the individual's behavior, while the more important problem lies with the food environment itself (Schröder & Lyon, 2014).

However, the aforementioned apprehensions can be addressed by avoiding manipulation through transparency with respect to the nudge and its goal and by developing clear guidelines for the choice architect (Sunstein, 2016). When transparency was ensured, nudges have shown effectiveness in various studies (e.g. Loewenstein, Bryce, Hagmann, & Rajpal, 2015). The opinion of individuals on nudges depends on whether they are perceived as well-motivated and go hand in hand with interests and values of those it affects (Reisch & Sunstein, 2016). With

regards to the moral appropriateness of nudging it is crucial to understand the target group and their opinions on being nudged. Junghans, Cheung and De Ridder (2015) conducted in-depth interviews with consumers from the UK and found that although most consumers are not familiar with nudging, a majority approves of it after the nudges have been made transparent. However, this consent is not unconditional. Firstly, consumers think that nudges should be beneficial for individuals and society. Secondly, transparency and comprehension of the decision-making context and the goal of the nudge should be ensured (Junghans et al., 2015). The question arising here is where the boundary between nudging and true manipulation can be drawn. Taking on the stance of Reisch et al. (2017), this boundary is marked by subliminal advertising, which is clearly manipulative and hidden.

As a conclusion, an ethical, transparent approach to nudging is essential to gain trust from relevant stakeholders (Junghans et al., 2015; Reisch et al., 2017). If individuals believe in the legitimacy of a nudge and that it favors the values and interests of the majority, they are likely to support it. Policy makers can draw an important implication from this. In contrast to the critiques from academics or politics, there is less skepticism from individuals who clearly display a majority (Reisch et al., 2017).

2.1.1. Health Nudges

In line with the WHO motto to "make healthier choice the easy choice" (WHO, 1986), the main aim of nudging interventions is to strive for simplifying consumers' choices of healthier food. "Nudging for health" has gained more popularity as an effective, efficient and acceptable tool in health policy (Reisch et al., 2017). During the last years, governments have started to take action and formed various teams or committees in the area of behavioral sciences, such as the UK Behavioral Insights Team, the US Social and Behavioral Sciences Team and other specialist teams in Germany and Austria (Reisch et al., 2017). Health nudges are implemented in many countries to promote healthier food choices and reduce cost related to obesity (Reisch et al., 2017), nevertheless, there is much discussion about which nudges are the most appropriate ones.

Interventions based on nudges in the health area include product placement, labeling, social facilitation, provision of information, changes of default policy, application of social norms and salience (Bucher et al., 2016), some of which have already shown success in improving people's health. For instance, moving healthier sandwiches to the front page of a menu demonstrated to be effective (Downs, Loewenstein, & Wisdom, 2009). Furthermore, health communication can be considerably improved by salience and priming nudges (Wilson et al., 2016). Salience nudges refer to relevant examples or explanations which aim at increasing attention to a particular choice, and priming nudges are subconscious physical, verbal or sensational cues (Blumenthal-Barby &

Burroughs, 2012). In this context, the UK "five-a-day" campaign has been found to improve awareness and understanding of eating fruit and vegetables and has led to an increase in intake of fruit and vegetables (Pérez-Cueto et al., 2012).

The present study adopts the classification of public health nudges into four overall groups by Reisch et al. (2017). The first group compasses different *public education messages* (e.g. primes about healthy nutrition, childhood obesity, campaigns against smoking or for aids prevention), while the second groups' *mandated information nudges* require companies to disclose information about food products (e.g. traffic light labeling in the UK, labeling of calories or disclosure of preservatives and coloring). Thirdly, *default rules and choice architecture*, which require retailers or canteens to support healthy food choices (e.g. smaller portion size or convenient positioning of healthier foods at canteens, sweet free checkout counters) and the fourth group refers to *choice editing* (e.g. meat-free day at cafeterias).

2.1.2. Focus on Three Nudging Interventions

As seen in the previous section, a broad body of research has studied different nudging interventions up to now. The focus of the present study is on nudging interventions from three of the previously mentioned categories. *Labels* (mandated information nudges), *positioning* (default rules & choice architecture) and *health primes* (public education messages) have been chosen. These interventions appear feasible with the overall objective to test nudges in the online grocery shop environment and have also received considerable support so far, which is outlined below.

Labels

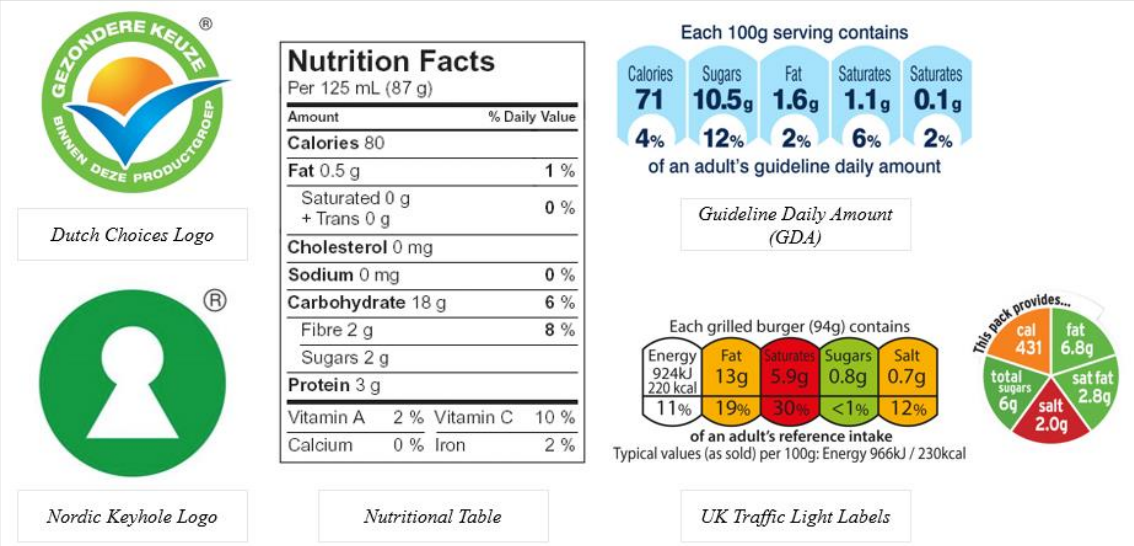
Labeling schemes are among the most widely known nudges to foster healthy nutrition. Yet, there have been some controversies concerning the effectiveness of different labeling schemes, some of which have been examined by previous studies (e.g. Thorndike, Sonnenberg, Riis, Barraclough, & Levy, 2012). Existing labels can be classified into three different groups (van Herpen & Trijp, 2011), which will be illustrated in the following. Figure 2 below depicts a selection of common label schemes.

Firstly, there are **non-directive labels,** which include the nutrition table printed on food and beverage packaging. While these labels communicate actual levels of key nutrients, consumers must evaluate whether the product is healthy or not by themselves (van Herpen & Trijp, 2011). Nutrition tables are initially rated by consumers as the label they are most likely to use when making food choices. However, this contrasts with their actual behavior. In practice, the nutrition table has not been found to enhance healthy choices compared to the other labels (van Herpen & Trijp, 2011).

A second group are **semi-directive** labels, which state the nutrients the respective scheme is based on. The Guideline Daily Amount (GDA) label, for instance, shows the percentages within a group of nutrients the consumer would take in with a portion of food (van Herpen & Trijp, 2011) and multiple-traffic-light (MTL) labels provide evaluation through a color scheme. Still, the overall integration of each partial value must be done by the consumer. A voluntary MTL scheme, which highlights foods as red, amber or green according to how much salt, sugar and fat they contain, has been introduced by the UK Department of Health in 2013. The MTL label appears on about two thirds of products sold in the UK (BBC, 2016). Previous research found that MTL labels enhance the healthiness of consumers' food choices (e.g. Thorndike et al., 2012; van Herpen & Trijp, 2011). Even in the long run, MTL labels have led to positive results, as demonstrated in a traffic-light label intervention at a cafeteria by Thorndike et al. (2014). Despite the political controversy on the EU level, Reisch et al. (2017) found that consumers support traffic light labels. Nonetheless, not always could a positive impact be recorded: In a 10-week MTL label intervention in the online shop environment no effect was found (Sacks, Tikellis, Millar, & Swinburn, 2011). A disadvantage of MTL and GDA labels is that they show multiple signals at once and are unsuitable in cases where a simple "threshold" is required (Lobstein & Davies, 2009). This threshold can be found in simple logos which leads to the next category of labels.

Directive labels, as for instance health logos display the overall healthiness of the product, in a format which can be called the "all-or-nothing format" (van Herpen & Trijp, 2011, p.114). The advantage of these labels is that they require less effort from the consumer. In addition, they have been found to be effective even if consumers are under time pressure. Yet, trust in labels has to be established for it to be effective (van Herpen & Trijp, 2011). A concrete example of a directive label is the Dutch Choices logo, which has been examined by Vyth et al. (2010). The Choices Programme awards the logo to products that contain lower levels of sodium, added sugar, saturated fatty acids, trans fatty acids and energy and increased levels of fiber, compared to similar products within the same product category. The researchers found that participants who purchased more products with the choices logo also scored high on the purchase motives of product information, health and weight control.

Figure 2: Examples of Common Label Schemes
Source: own compilation



Labeling of Food in Germany and Denmark

The two countries under investigation in this study, Denmark and Germany, do not have the same food labeling policies. In Denmark, the Keyhole Label (see Figure 2) has been placed on pre-packaged foods at supermarkets that fulfill certain conditions since 2009, and canteens can apply the label to freshly prepared foods since 2012. To be eligible for the label, a product can only have a limited amount of fat, salt, sugars as well as minimum amounts of dietary fibers and wholegrain (Lassen et al., 2014). In Germany, no comparable label has been implemented so far.

Since December 2013, food producers in EU countries are required to indicate nutritional values on prepackaged foods (BMEL, 2017). This is based on Regulation (EU) No 1169/2011 on the provision of food information to consumers (European Commission, 2017), which also specifies that the same rules apply for prepackaged food that is sold in online shops (VZBV, 2016). Nutritional labeling on the packaging of prepackaged products must include calories, fat, saturated fats, carbohydrates, sugar, protein and salt (see the nutritional table in Figure 2). The values must refer to 100 grams or 100 milliliters of the product. In addition, a voluntary indication of the recommended daily consumption or GDA of the product for an adult consumer can be provided and nutritional values per portion are also allowed (VZBV, 2016).

It is questionable, however, whether consumers read and interpret these nutritional labels correctly. The actual use of nutritional labels appears to be considerably lower than their reported use (Grunert & Wills, 2007). If governments want to capture the potential of nutritional labels,

new formats and different information are needed to make nutritional information accessible and understandable (Campos, Doxey, & Hammond, 2011).

Positioning

Food options are subject to physical or virtual layout at cafeterias, grocery stores and in the online environment. As illustrated by Wansink's review (2004), a large body of literature has examined decision architecture in terms of positioning that influences dietary decisions. The proximity and visibility of food displays a potential driver of its consumption (Wansink, Painter, & Lee, 2006). The rearrangement of food order beginning with the healthiest options has been found to nudge both, unknowing as well as resistant diners toward healthier choices (Wansink & Hanks, 2013). Nudging can be used to decrease accessibility of unhealthier products and increase the availability of healthier products, which is viewed as a critical factor in healthier diets (van Trijp, Brug, & Maas, 2005).

Food position can be manipulated by changing the order or the distance between the food and the consumer, and both can influence food choice (Bucher et al., 2016). Levy, Riis, Sonnenberg, Barraclough, and Thorndike (2012) found that when food and beverages at hospital cafeterias were rearranged by placing healthier items at the eye level (higher visibility and accessibility) and less healthy products below, overall purchases of less healthy food and beverages decreased. In another study at a large hospital cafeteria, Thorndike et al. (2012) discover that the increased visibility and convenience for healthier food enhanced the effectiveness of food labels.

In the context of traditional supermarkets, the impact of shelf display on consumers' purchase decisions has been confirmed (Breugelmans, Campo, & Gijsbrechts, 2007) and pro-health shelf space management has the potential to encourage sustainable healthy food choices. Consumers are more inclined to adopt shelf-based heuristics when they experience difficulty in finding and choosing an item. When products are placed more prominently, there is a higher likelihood that they are chosen (Drèze, Hoch, & Purk, 1994). Considering the absolute position of an item, other factors being equal, products placed at eye or hand level are bought more frequently (e.g. Corstjens & Corstjens, 1995; Pelsmacker, Geuens, & Bergh, 2013). In their investigation whether shelf space management interventions have an effect on calorie turnover at supermarkets, Adam, Jensen, Sommer, and Hansen (2017) found a significant effect for individual products. When stressed for time or in complex shopping situations, consumers are not striving for utility maximization but look for a satisfactory purchase (Hoyer, 1984). In online supermarkets, consumers tend to stay with the default product display on the first page of an online shop, even when they had the possibility of using filters to alter the layout. The likelihood of a product being

chosen by the consumer is considerably higher when it is shown on the first screen (Breugelmans et al., 2007).

Priming

Priming resorts to the principle that humans' actions can be influenced by subconscious cues. These cues can be applied in a strategic way to prime healthy behavior (Blumenthal-Barby & Burroughs, 2012). Current food environments are, however, designed in a way that is conducive to less healthy dietary choices (Wilson et al., 2016). Previous research has found that priming consumers with health-related claims can lead to healthier food choices, though only, when consumers are not depleted yet (Walsh, 2014). Van Herpen and Trijp (2011) discovered that emphasizing a health motivation increased the attention towards nutrition labels, which lead to participants using the labels to make their choice. In accordance with this, another study suggests that priming people with a health goal before they go shopping might lead to healthier product choices (Visschers, Hess, & Siegrist, 2010). The finding that general health goals of the consumers will also increase their healthy choice displays a potential for in-store information, which makes a health goal salient at the point-of-purchase (van Herpen & Trijp, 2011). Furthermore, a review on prime nudges proposes that their combination with accessibility, visibility and availability of products increases the likelihood that the customer selects the product (Wilson et al., 2016).

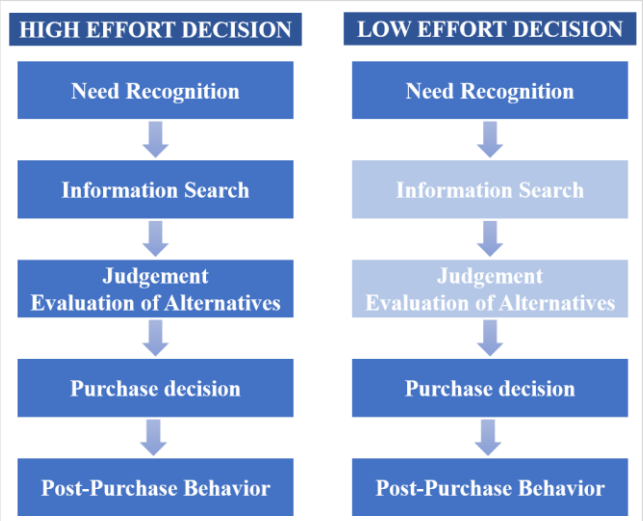
2.2. Determinants of Consumers' Food Choices

Traditional consumer behavior theories suggest that the consumer actively searches for information to make intelligent, rational decisions or to solve problems in a rational way (Zaichkowsky, 1985). An understanding of consumer decision making is essential when aiming at influencing consumers' nutritional decisions, as it is the case for nudging interventions. Therefore, relevant concepts from consumer behavior and behavioral economics, which shed light on the factors that impact the food choices of consumers, are presented in this section. In gaining this understanding, the effect of relevant factors on nudging interventions can be examined and ultimately, effective nudging interventions can be created. First, a brief outline of the buyer decision process and the complexity in decision making is given. This is followed by considerations about consumers' product involvement and food choice motivation.

Buyer-decision process

The buyer-decision process (Figure 3) is essential in understanding where nudges can effectively influence consumers' food choices. Generally, one can distinguish between low and high effort purchase decision processes for products or services (Hoyer & MacInnis, 2010). All purchase decisions commence with the recognition of a need or a problem, whereupon information is gathered and the product or service is purchased. After the purchase, consumers will evaluate the decision. When feeling highly involved with the purchase, buyers will spend much time on seeking information and carefully evaluating alternatives (high effort decision). In contrast, when not as involved in the purchase, consumers will dedicate less time to these two steps (Hoyer & MacInnis, 2010). The majority of consumers view their trip to the supermarket as a chore that needs to be done (Huang & Oppewal, 2006). For grocery items and other fast-moving consumer goods, consumers typically revert to simplified choice heuristics, as for example picking the product they have purchased the time before (repeat purchase) (Breugelmans et al., 2007). Most people aim to take rational choices (e.g. for products that show the best value for money), to keep self-control (e.g. avoid sweets at the checkout counter), or to follow rules (e.g. dietary requirements) (Benn, Webb, Chang, & Reidy, 2015). However, complex shopping environments require cognitive involvement (Baumeister, Sparks, Stillman, & Vohs, 2008). The low-involvement theory with respect to grocery products (Hoyer & MacInnis, 2010) suggests that consumers try to minimize their cognitive efforts when shopping in an attempt to manage more complex processes when making the actual purchase decision for new products. Consumers are frequently faced with unexpected situational factors, such as a price drop of a competitor, a compelling point of sale advertisement or a friend's recommendation. These factors might cause that purchase intentions and preferences do not always lead to actual purchase choices (Kotler, Armstrong, Harris, & Piercy, 2013). Health nudges could take on the role of unexpected situational factors to change consumers' initial purchase intention and could thereby steer them towards a healthier product choice.

Figure 3: The Buyer Decision Process
Source : adapted from Kotler et al. (2013)



Consumers' Product Involvement & Food Choice Motivation

The consumer's involvement with a product or purchase decision might considerably influence the buyer-decision process (Hoyer & MacInnis, 2010; Kotler et al., 2013). Therefore, it should be taken into consideration when implementing marketing measures or nudges to change purchase behavior. Nudging interventions for consumers who show higher involvement with products might have to be designed in a different way than for those who show lower involvement. The involvement of consumers on the same product might vary due to their differences in backgrounds and preferences. Zaichkowsky (1986) conceptualizes involvement and suggests that the consumer's level of involvement may be influenced by personal factors (e.g. needs), object or stimulus factors (e.g. differentiation of alternatives) and situational factors (e.g. purchase or use). In addition to product involvement, people are motivated by many factors to purchase specific products. These aspects underlying the food choice motivation of consumers could be considered when developing measures aimed at preventing unhealthy nutritional decisions. More specifically, Steptoe, Pollard, and Wardle (2013) argue that nine factors capture consumers' main food choice motives. These include health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity and ethical concern. Similar to consumers with different product involvement levels, those with different motivations underlying their nutritional choices might be receptive to different nudging interventions, which displays a gap in current research.

2.3. The Online Grocery Shop Environment

So far, only little research has been conducted on nudges in the online shop environment (e.g. Breugelmans, Campo, & Gijsbrechts, 2007; Demarque, Charalambides, Hilton, & Waroquier, 2015; Sacks, Tikellis, Millar, & Swinburn, 2011). Previous studies have examined behavioral interventions in online supermarkets, such as shelf effects (Breugelmans et al., 2007), or whether nudging with social norms makes people buy more environmentally-friendly products (Demarque et al., 2015). Further, the impact of in-store displays on sales (Breugelmans & Campo, 2011) and the changes of food purchases in response to the introduction of traffic-light nutrition information (Sacks et al., 2011) have been studied in the online environment.

Although the market share of online groceries is rather low at the moment, with about 2% in the US and 6% in European markets, online grocery shopping is on the rise: It has experienced double digit growth in Europe and the US in 2014 and by 2018, it is expected to grow to more than 80 billion euros (Syndy, 2015). About 25% of people with Internet access state that they currently order groceries online, and more than 50% indicate that they consider it in the future (Nielsen, 2015). A driving factor of these developments is the maturation of the "digital natives", which

include Millennials and Generation Z, who grew up with the Internet (Nielsen, 2015) and display a more mobile generation of consumers (Morgan Stanley Research, 2016). Compared to shopping in brick-and-mortar stores, online shopping is time efficient and consumers are increasingly looking for ways to save time. Furthermore, the online environment has the potential to provide more information for product categories with a large number of non-sensory attributes, such as industrial prepackaged products (Degeratu, Rangaswamy, & Wu, 2000).

Although very detailed information on the product can be provided, the verification of the actual quality, especially of fresh products is more difficult in the online environment (Pozzi, 2012). To examine the ingredients of a product or decide between products, consumers usually need to open an additional tab instead of simply looking at the back of the package as in traditional stores (Benn, Webb, Chang, & Reidy, 2015). According to a questionnaire conducted by Morgan Stanley Research (2016), the main reason why consumers avoid buying groceries online is that they prefer to pick the product they want themselves. The fact that consumers often perceive online grocery shopping as highly complex should not be underestimated, as it displays a negative influence on purchase intentions (Hand, Dall'Olmo Riley, Harris, Singh, & Rettie, 2009). This concern might be less of a barrier for younger generations than for older ones. In designing nudging interventions that are sustainable in the future and effective with the younger generation as well, it is indispensable to consider the online grocery environment. Therefore, the present study aims at adding value to this underexplored research field.

2.4. Comparative Cross-Cultural Consumer Research

The widely-known researcher Geert Hofstede explains culture as "the collective programming of the mind which distinguishes the members of one group or category of people form another" (Hofstede, 1991, p.5). Culture can be defined as the values, perceptions, wants and behaviors that are shared among members of a society. These can originate from family and other important institutions (Kotler et al., 2013).

Consumer research aims to provide a deeper understanding of consumer behavior in order to predict the outcomes of initiatives, ranging from consumer information policy to marketing campaigns (Solomon, Bamossy, & Askegaard, 2001). To gain a deeper understanding of consumers, it is essential to study their culture, which is a highly complex concept. Culture has a major impact on buying behavior and varies greatly from country to country. A failure to integrate cultural differences in one's decision making can lead to ineffective marketing or other mistakes (Kotler et al., 2013). Nationality as a criterion for cultural comparison should be used with care in research, as today's nations cannot be viewed as the homogenous, isolated societies that have

been studied by anthropologists (Hofstede, 1991). Yet, nationality often displays the only feasible criterion to clearly classify people, and there is a vast amount of collective properties citizens from the same country share (Hofstede, 1991).

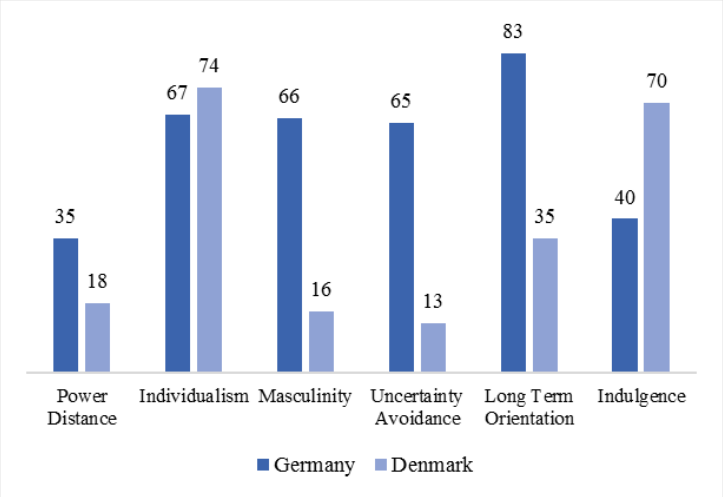
In research on nudging, this classification can be adopted to find out, for instance, if consumers from one country might be more effectively targeted by a certain nudge than consumers from another country due to cultural differences. On the one side, it is expected that the countries relevant to this study, Germany and Denmark, both being developed countries, experience partial cultural convergence (Minkov & Hofstede, 2012). On the other side, important cultural differences between rich countries continue to exist (Minkov & Hofstede, 2012), which shows the relevance of exploring cross-cultural differences in novel research areas, such as nudging.

2.4.1. Danish and German Consumers

The classification of nationality is also applied in the present study, in which cross-national differences in consumer's reaction to health nudges are part of the investigation in Denmark and Germany. Denmark, on the one hand, parades a Nordic welfare state with a long tradition of paternalistic health policies and a public health care system, while Germany, on the other hand, is a social market economy and Germans typically have a strong historically grounded distrust of paternalism (Reisch et al., 2017).

To investigate the cultural similarities and differences of both countries, Hofstede's model of cultural dimensions is applied. In his study, Hofstede analyzed 50 countries based on their scores on six dimensions of national culture, namely *power distance*, *individualism*, *masculinity*, *uncertainty avoidance*, *long-term orientation* and *indulgence* (Hofstede, Hofstede, & Minkov, 2010). The comparison of German and Danish culture along these dimensions is shown in Figure 4. Overall, the two neighboring countries seem to display large cultural differences. The only dimension on which Germany and Denmark are on a very similar level, is that of individualism, which describes the interdependence of a society's members (Hofstede et al., 2010). Germans have a considerably higher level of power distance, defined as the degree to

Figure 4: Hofstede's Model Comparing GER with DK
Source:(Hofstede, 2010)



which unequal power distribution in a country is accepted by less powerful members of institutions and organizations (Hofstede et al., 2010). Furthermore, Denmark exhibits very little masculinity (driven by competition, achievement and success) and low uncertainty avoidance compared to Germany. Germans appear more pragmatic by prioritizing long-term goals over the present or past. The final dimension of indulgence refers to whether people try to control their desires and impulses (Hofstede et al., 2010) and here, the Danish culture seems less restrained in nature.

Hofstede's model shows that although the two countries are geographically neighboring, there are noticeable cultural differences. These dimensions and insights are of great relevance for international projects, such as Nudge-it, especially, as to date, only few studies (e.g. Aschemann-Witzel et al., 2013; Reisch et al., 2017) have considered a comparison of multiple countries in their research when examining the effectiveness of nudges.

2.5. Theoretical Framework and Hypotheses

Among the variety of possible nudging interventions, no consent has been found so far which of the nudges has the greatest impact and whether their effect is the same across countries. To fill this gap, the present research is based on an experiment that tests three different nudging interventions, namely a label, product positioning and a priming slogan in Germany and Denmark. Based on the preceding thorough investigation of existing literature and theories, the three research questions are explored by six hypotheses (sub-hypotheses for the analysis will be presented in section 7.4).

A good foundation of literature indicates that the nudges which are applied in this study lead to healthier food choices. The first research question is examined by H1:

RQ1: *Are health nudges, in particular labels, positioning and priming effective in driving Danish and German consumers' choices towards healthier food in an online grocery shop environment?*

H1: Health nudges (health labels, favorable positioning of healthier products, health slogans) in the online environment lead to healthier food choices.

Based on Hofstede's model of cultural dimensions, which finds considerable differences in culture between the two countries, the second research question is examined by H2:

RQ2: *Are there any differences in the effectiveness of these health nudges between Danish and German consumers?*

H2: There are differences in the impact of health nudges between German and Danish consumers' food choices.

Consumer behavior is not only influenced by culture and subcultures, but also by demographic social and personal factors, such as age, economic situation and lifestyle (Kotler et al., 2013). With different grocery products typically serving different purposes for consumers, the product category might have an influence on the effectiveness of health nudges. Within the scope of the third research question, the role of product involvement, food choice motivation, demographic segments and product category on the effectiveness of health nudges are explored by H3-H6:

RQ3: *What are potential factors influencing the effectiveness of health nudges on food choices?*

H3: Differences in product involvement (higher vs. lower) have an impact on the effectiveness of health nudges.

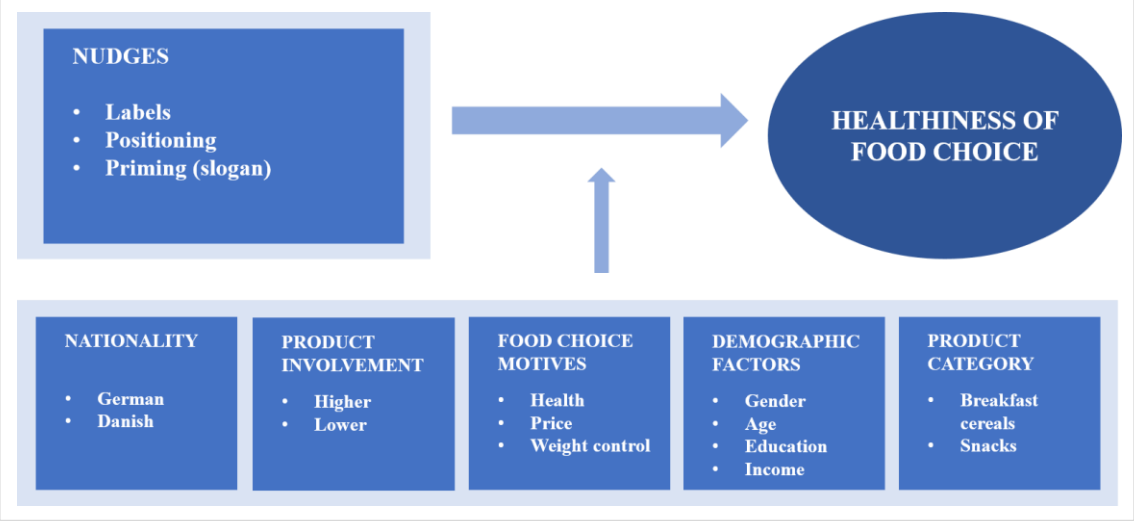
H4: Differences in food choice motivation (health, price, weight control) have an impact on the effectiveness health nudges.

H5: Demographic factors (gender, age, education, income) have an impact on the effectiveness of health nudges.

H6: Differences in product category (cereals and snacks) have an impact on the effectiveness of health nudges.

The framework below (Figure 5) summarizes the research construct of the present study.

Figure 5: Research Framework
Source: own compilation



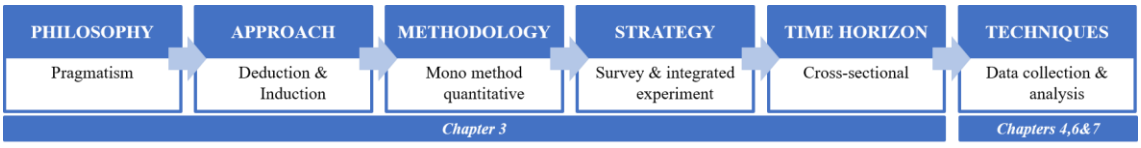
3. Research Methodology and Design

The present study is of exploratory nature, since the topic at hand is relatively new (Cooper & Schindler, 2008) and to the author's knowledge different health nudging approaches have not been compared across Germany and Denmark yet. Exploration is used to develop more clarity in the research area that is investigated, to define priorities and improve the final research design (Cooper & Schindler, 2008). This study is conducted as a pilot research to provide insights on cross-country comparison and effectiveness of different nudges. Further, it is intended to test whether the developed research design is feasible for further, more sophisticated studies on a large scale (e.g. across multiple EU countries).

The purpose of this chapter is to provide the overall frame and foundation of this exploratory study. Therefore, insights are given into the research methodology and design which have been applied to answer the study's three research questions in the most appropriate way. First, the underlying research philosophy and approach to theory development are outlined, and second, the research design including methodological choice, strategy as well as the study's time horizon are presented.

Research design, which forms the overall plan of the research, including its strategies, choices of methodology and time horizon (Saunders et al., 2015), is part of this chapter, while research tactics, which include the detailed data collection and analysis techniques and procedures, are part of chapters 4, 6&7 (see Figure 6 for an overview).

Figure 6: Research Frame of the Study
Source: own compilation, adapted from (Saunders et al., 2015)



3.1. Choice of Research Philosophy and Approach

Research philosophy is defined as "the system of beliefs and assumptions about the development of knowledge" (Saunders et al., 2015, p.124), which shapes the assumptions of the whole research project. For this study, a pragmatic research paradigm is adopted, which links the choice of approach directly to the nature and purpose of the research question (Creswell, 2014; Tashakkori & Teddlie, 2010). Its focus lies within the problem to be researched and the implications of the

research (Tashakkori & Teddlie, 2010), the main aim being to contribute with practical solutions to existing problems (Saunders et al., 2015). In pragmatism, unpredictable human actions require researchers to have an open mind towards unexpected data (Feilzer, 2009).

The present research has been carried out based on a review of relevant literature and latest findings in the field. Especially since the research area is relatively new, inductive and deductive approaches are pursued at the same time (Saunders et al., 2015), which is also in accordance with the pragmatic research paradigm. On the one hand, theories and the derived hypotheses are tested (deductive approach). On the other hand, based on empirical data, the study intends to discover patterns in consumers' behavior when they are exposed to nudging interventions (inductive approach) (Saunders et al., 2015).

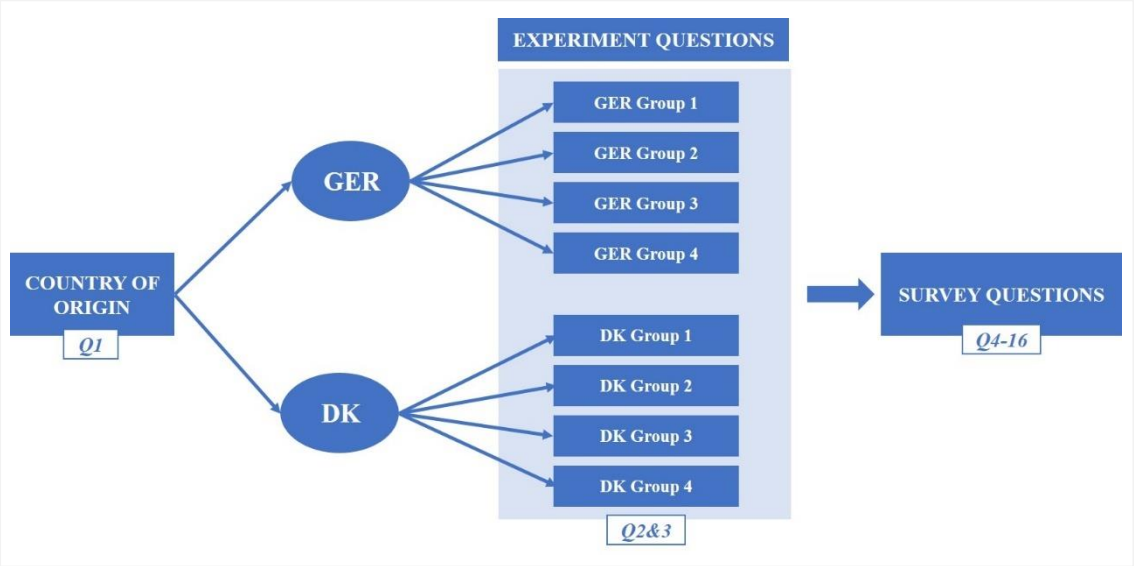
3.2. Choice of Research Design

In this section, the development of a research design, which includes methodological choices, research strategy and the study's time horizon (Saunders et al., 2015) are presented. Careful choice of the type of research design is important, since it forms the foundation for successfully answering the formulated research questions (Saunders et al., 2015). In terms of overall methodology, a mono-method quantitative study was chosen, which only applies a single data collection technique (questionnaire with integrated experiment). Research questions for quantitative studies can either refer to relationships among variables or comparisons among groups (Tashakkori & Teddlie, 2010). Both are relevant for the present study as the relationship between nudges and consumers' food choices as well as different group's reactions to nudging are examined.

3.2.1. Choice of Strategy

In terms of strategy, a combination of a questionnaire and experimental design is employed, where the experimental part is integrated into the questionnaire. The questionnaire strategy enables the researcher to collect data for quantitative analysis and the experiment serves the purpose of studying causal links (Saunders et al., 2015). In the present case, the experiment tests whether altering the independent variable (the three different nudging interventions) leads to a change in the dependent variable (food choice). The combination of a questionnaire and experiment was chosen to syndicate insights from the experiment (Q2&3), with the gathered information about the participants' consumption preferences, habits and demographics (Q1, 4-16). An illustration of the overall design is presented in Figure 7.

Figure 7: Questionnaire and Experiment Design
Source: own compilation

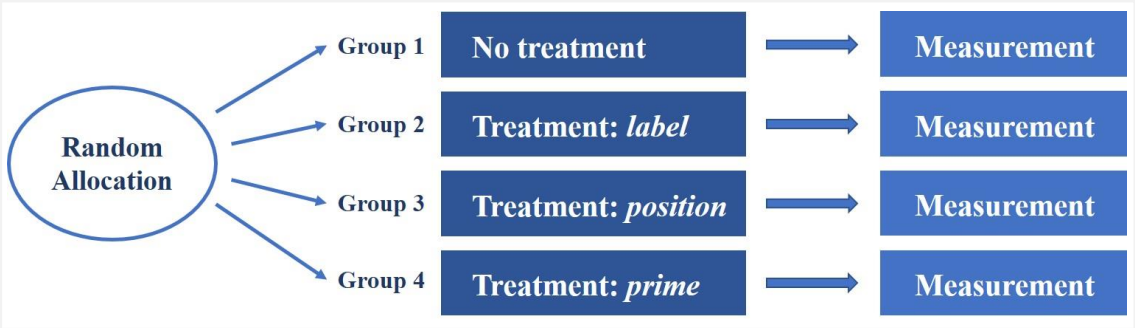


The classic experimental part of the questionnaire consists of two overall groups, the experimental or treatment group depicting the dependent variable, and the control group, which constitutes the independent variable of the experiment (Bryman & Bell, 2015). Subjects are assigned randomly to the respective groups, which allows the researcher to attribute differences between the two groups (control and treatment) to the manipulation of the independent variable (Bryman & Bell, 2015). In this study, the control scenario, where no nudge is implemented, is tested against the three treatment groups with one nudge applied to each. The subjects (or participants) are randomly assigned in equal proportions to each of the four groups (control group and three treatment groups) at the beginning of the questionnaire. After the experimental part, all participants answer the same regular questionnaire questions.

A between groups design, also called independent measures design has been chosen, in which groups of participants are allocated to the four different conditions of the present experiment, and each participant only participates once (Field & Hole, 2003). More specifically, the design of the experimental part of the study is called post-test / control group design (depicted in Figure 8), which measures behavior after the intervention and includes a control group (Field & Hole, 2003). This design makes counterbalancing unnecessary and minimizes practice and fatigue effects, since each participant only takes part once in one treatment arm (Field & Hole, 2003). This is crucial in the present study because if each participant were exposed to multiple experimental conditions, a bias in his or her reaction to the different conditions would be likely. For instance, if a participant were first shown a scenario with labeled products and hereafter the control

scenario, his or her decision for a product in the first scenario, which was potentially influenced by the nudging intervention, might be transferred to the second one.

Figure 8: Post-test / Control Group Design
Source: adapted from (Field & Hole, 2003)



It is important to note that randomization displays an essential consideration of this experimental design. Random allocation to groups ensures that systematic effects on the participants' behaviors, except for those effects of the independent variable, are eliminated (Field & Hole, 2003). The absence of randomization would likely lead to flawed and uninterpretable results (Field & Hole, 2003). In the present study, the questionnaire tool "Qualtrics" ensures an even and random allocation of respondents to the *control* and the three treatment arms (*label*, *position* and *prime*). Through this random allocation, it is assumed that other potentially unsystematic influences on participants' behavior, such as their product preferences, food allergies, brand loyalty are controlled for. A drawback of randomization is the difficulty to find out whether the randomly composed groups are actually equivalent, therefore, in chapter 7.2, groups will be compared concerning their demographic differences.

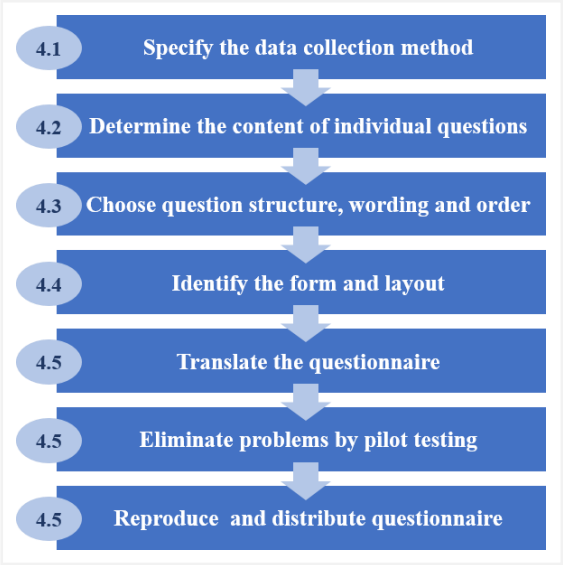
3.2.2. Choice of Time Horizon

As the questionnaire and experiment are conducted at a single point in time, the time dimension of the present study is a cross-sectional one (Saunders et al., 2015). Two reasons motivate the choice to adopt a cross-sectional instead of a longitudinal design: one being budgetary restrictions as well as the limited time frame of the project itself (Rindfleisch, Malter, Ganesan, & Moorman, 2008), the other being the goal of the study to make a snapshot of the effectiveness of nudges at a single point in time and deliver results promptly.

4. Primary Data Collection

Data collection displays one of the most essential parts of any research project (Bryman & Bell, 2015). In this study, primary data are collected with the purpose of diminishing a research gap by exploring three different nudging interventions in the online environment from a bi-national perspective. The primary data of this study are of quantitative nature and are collected with an online questionnaire, which displays a structured instrument of primary data collection (Bryman & Bell, 2015). Questionnaires are not only a standardized instrument to gather comparable data, but also a fast and accurate method (Malhotra, Birks, & Wills, 2012). A special aspect of the questionnaire of the present study is its incorporated choice experiment, which facilitates the testing of different nudging interventions in product choice scenarios. A structured questionnaire design process suggested by Malhotra et al. (2012) is adapted to the unique characteristics of the present study (Figure 9). The three overarching goals of a questionnaire are to create clear and understandable questions, motivate respondents to answer these and avoid response errors (Malhotra et al., 2012). The questionnaire for this research (Appendix II) has been created with these three objectives as well as the overall goal of the project to explore the effectiveness of nudges in leading to healthier food choices in mind. In the following, a detailed description of the questionnaire and experiment design is presented.

Figure 9: Questionnaire Design Process
Source: adapted from Malhotra et al. (2012)



4.1. The Online Questionnaire

A self-administered online questionnaire has been chosen as a method to collect primary data for several reasons (Malhotra et al., 2012). First, it is possible to integrate both, the study's choice experiment as well as regular questionnaire questions in the questionnaire. Second, an online questionnaire promises a high speed of distribution and cost efficiency. Third, self-administered questionnaires ensure anonymity and high flexibility, which is important to achieve a high response rate. Fourth, the online tool is optimal to achieve high data quality, since logic and validity checks can be integrated. Finally, the attractive and modern design of the questionnaire

and the possibility to implement high resolution images raises respondents' motivation to complete it.

Despite the online questionnaire's advantages, there are also disadvantages connected to this data collection method. With access to the Internet being a prerequisite for the completion of the questionnaire, people who are not connected to the Internet or do not feel comfortable using it are excluded from the study. However, the study's target group of Danish and German consumers exhibit a high share of Internet users, with 97% in Denmark and 89% in Germany (Statista, 2017). A second drawback are potential technical issues. To mitigate this risk, the questionnaire has been implemented using Qualtrics, a widely known and tested tool with high user-friendliness. Neither during careful testing on multiple devices with different browsers, nor during the actual questionnaire process did any problems occur that the researcher knows of.

4.2. Question Content and Experiment

The majority of questions relates directly to the three overarching research questions of the project. Some additional questions are included to explore consumers' behavior, habits or knowledge (e.g. their frequency of cereal or snack consumption and the labels or products they know). These might deliver valuable insights to interpret the results and conduct future research on the topic.

In this section, an outline of each question's content and its role in the project is given in the order of appearance in the questionnaire. The questionnaire can be found in Appendix II in English, as well as the original languages German and Danish. It comprises sixteen questions and is structured into four sections (see Appendix III). The first section includes an introduction and the elimination question about the respondents' nationality (Q1). This is followed by the experimental part (Q2&3) and a section on consumer behavior (Q4-11). The demographic question block (Q12-16) concludes the questionnaire. To operationalize the hypotheses, independent as well as dependent variables from the different questions have been allocated to each hypothesis. A brief explanation is given throughout this section and an overview of the operationalization of hypotheses can be found in Appendix IV.

Elimination Question and Introduction

The first question is asked in English and inquires about the respondents' country of origin, with the three choice alternatives being "Germany", "Denmark" and "other countries". It provides the basis for separating participants into two country groups and for analyzing cross-country differences (**H2**: "There are differences in the impact of health nudges between German and

Danish consumers' food choices"). Further, the question eliminates respondents from other countries because the research is solely targeted at Germans and Danes. Based on the first question, the questionnaire is split into two question arms in Danish and German language. Both arms consist of identical questions with adaptations to local conditions, including products, education and income levels. Following this, respondents are briefly introduced to the questionnaire procedure, the possibility to participate in a raffle and they are informed about data confidentiality.

The Experiment

The experiment section is made up of two choice questions (Q2&3), with four experiment arms testing either a control scenario or one of the three different nudging scenarios (label, positioning and prime intervention). The first choice question consist of fifteen breakfast cereal products, and the second displays six sweet snack products. A respondent is faced with the same nudging intervention in Q2 and Q3 (e.g. labeled cereals and labeled snacks) to avoid biases that could stem from the exposure to two different nudges (e.g. first label and then positioning). Screenshots of different product choice scenarios can be found in the questionnaire in Appendix II, d.

The choice of the two product groups **breakfast cereals** and **snacks** is based on multiple reasons. Cereals are usually consumed as a main meal (breakfast), while snacks are mostly eaten as in-between meals. Several nudge or consumer behavior and nudge studies have used the breakfast cereals product category (e.g. Breugelmans, Campo, & Gijsbrechts, 2007; Pozzi, 2012; Sacks, Tikellis, Millar, & Swinburn, 2011; van Herpen & Trijp, 2011; Visschers, Hess, & Siegrist, 2010). Pozzi (2012) points out that breakfast cereals are a highly concentrated, popular product category and are frequently purchased by consumers. Nearly every consumer has bought and consumed breakfast cereals, and there are very big differences in healthiness between cereal products. Similar to cereals, snacks offer a large variation of brands and a wide spread of healthfulness (Aschemann-Witzel et al., 2013), e.g. muesli bars vs. chocolate cookies, while they still serve the same purpose for the consumer. A high variety in amount and types of ingredients of different snack products is likely to lead to confusion among consumers, a situation in which nudges, such as nutrition labels might be especially effective (Aschemann-Witzel et al., 2013). In addition, the availability of comparable or even identical brands and products at supermarkets across Germany and Denmark make the two product groups a feasible choice in this study. This also implies that a realistic, comparable choice scenario could be created in the experiment across the two countries. Based on an intensive research (online and offline) at supermarkets in Germany and Denmark, a list of the 21 products in each country has been created, which reflects a selection of healthier and unhealthier options (see Appendix V, a-d). The data gathered from the two different

product scenarios will be used to evaluate **H6** ("Differences in product category have an impact on the effectiveness of health nudges.").

A "**healthiness score**" was applied to determine the comparative healthiness of each product. The nutritional information of each product was obtained through online grocery shop websites or from in-store research in both countries. The overall healthiness of each product was assessed with the help of the SSAg/1 nutrient profiling system, which displays a simple scoring system per 100g on four dimensions: energy in kJ, the nutrients saturated fat (in g), NMES (in g) and sodium (in mg) (Mike Rayner, Scarborough, & Stockley, 2004). A detailed overview of the scores of each product on the different dimensions is also found in the product lists in Appendix V, a-d. The SSAg/1 score has been chosen because it evaluates the relative healthfulness of a product based on information that is usually available on FOP (front of pack) nutrition labels (Aschemann-Witzel et al., 2013) and that is also required to be disclosed in online shops according to EU regulation (BMEL, 2017). Initially allowable thresholds are defined in the scoring model, and the food product receives one point for each 10% GDA bandwidth of each nutrient above this (Appendix V, e). The final score is derived from the sum of the four individual nutrient scores, with the higher the score, the less healthy a product (Aschemann-Witzel et al., 2013). Special attention was paid to selecting products for each country, which do not differ on their healthiness score to ensure an optimal base for comparison across the two countries. The healthiness score of the respondents' product choices in the experiment will be applied (as dependent variable) to evaluate all hypotheses of the study. It provides a measure for assessing the effectiveness of the different nudging interventions. For **H1** ("Health nudges in the online environment lead to healthier food choices."), this score also displays the independent variable.

In the following, the three different nudging scenarios and the motivation for their choice are described in detail.

Figure 10: Healthier Choice Labels GER & DK

For the first nudging scenario, a directive **"healthier choice" label** (Figure 10) was placed on one of the relatively healthier products from each of the two categories. The decision for a directive label is based on the finding that logos positively influence consumers' choices towards healthier food (e.g. van Herpen & Trijp, 2011). One third of the displayed products was labeled with the "healthier choice" label, a proportion similar to the one found in other research studying the effect of labels (Aschemann-Witzel et al., 2013; van Herpen & Trijp, 2011). Further, it is backed by a rough count made by the researcher of rather healthy versus unhealthy products at

supermarkets in Germany and Denmark. The five healthier products from the breakfast cereal category as well as the two healthier snack options were labelled at a consistent position. The label's simple wording ensures that consumers can easily understand its meaning without much explanation. Thus, educational campaigns would be less complex compared to semi-directive and non-directive labels. There is some evidence that obesity displays a higher problem among less educated people (Devaux, Sassi, Church, Cecchini, & Borgonovi, 2011), which renders it even more important to implement measures that are appropriate for people from all educational backgrounds.

Since no comparable label exists in both countries, a new label was developed for this study, based on inspiration from existing food labels. To ensure the label's comprehensibility and visual attractiveness, a test group of fifteen people from both countries have been asked for their preference between six different variations of the label, and the version preferred by the majority has been used in the present study. The tick symbol and green color evoke positive signals in consumers. Furthermore, green color is commonly associated with healthiness. A short sentence explaining that the label is awarded to products which display healthier options within a particular product category is included underneath the respective question text (see Q2b&Q3b in Appendix II, a).

The second nudge scenario is a **positioning** intervention, in which a product's position on the page (modeling an online shop interface) is determined based on its relative healthiness compared to other products. Similar to Breugelmans et al. (2007), the present study assumes that products, which are seen earlier by the consumer, will benefit from more attention (primacy effect), and the likelihood is higher that they are chosen. Consequently, products are ranked from the top left to the bottom right of the screen according to their healthfulness, following the consumer's natural direction of reading.

Since there is only limited research on **health primes** in the online environment, the effectiveness of such a cue will be investigated by the third nudge scenario in the present study. For this, a health slogan similar to the goal manipulation slogan found effective by van Herpen and Trijp (2011) is tested. Consumers are asked to "buy a breakfast cereal that will give you a healthy start in the day" in the breakfast cereals category and subsequently to "buy a snack for a healthy diet" in the snacks category.

Consumer Behavior Section

It is assumed that nudging works mainly through the automatic system and affects all individuals likewise. Nonetheless, clarification is needed whether and how factors such as habits, health

consciousness, or strong product preferences interact with the effects of nudges (Bucher et al., 2016). To make advancements in this area, the consumer behavior section of the questionnaire investigates some of these aspects. Q4 - 7 & 11 inquire about respondents' familiarity with the products from the experiment (Q4), whether they have used the nutritional tables for their decision (Q5), how often they consume breakfast cereals and snacks (Q6&7), and which of the displayed nutritional labels the respondent knows (Q11). Although these questions are not directly linked to any hypothesis, they serve the purpose of gaining additional insights into consumers' behavior and consumption habits and might be helpful in explaining the results of the statistical tests. Additionally, these insights might be of great value to make adaptations to the design of future studies (e.g. for choosing product categories, implementation of nutritional tables).

Product Involvement

Q8 and Q9 focus on the consumer's product involvement for breakfast cereals and snacks respectively. Various ways to assess product involvement have been developed, such as a general scale to measure consumers' involvement in products developed by Traylor and Joseph (1984) or the Personal Involvement Inventory (PII) scale to measure the "Involvement Contruct" by Zaichkowsky (1985). Instead of using the resulting behavior as a measure of involvement, Zaichkowsky's bipolar adjective scale consisting of 20 items (the PII) directly captures a consumer's involvement with advertisements, products or purchase decisions. A shortened version of the PII scale (Zaichkowsky, 1994) with 10 items is integrated in the present study as a method to obtain insights into consumers' involvement with the two product categories, breakfast cereals and snacks. This context-free scale displays a widely-used tool in consumer research and is context-free in a sense that it aims to measure the state of involvement rather than involvement as a stable trait, as involvement can change over time. Another important reason for the choice of the PII scale is that its items appear to be less abstract for typically low involvement grocery products than other scales involvement items. The data collected with this question is later used to test **H3** ("Differences in product involvement have an impact on the effectiveness of health nudges").

Food Choice Motivation

In Q10, the food choice motivation of participants is assessed. Respondents are asked to indicate whether the twelve statements they are presented with are important for them in their nutrition on a usual day. Saunders et al. (2015) recommend to adopt existing scales if they measure what the researcher is interested in, if they are empirically tested and validated, and if they are created for a similar group of respondents. In line with all these requirements, the present study's question

on food choice motivation is based on Steptoe, Pollard, and Wardle's (2013) "Food Choice Questionnaire" (FCQ), which provides a measure of the motives underlying the selection of food. The FCQ aims to systematically measure health- and non-health-related factors (Steptoe et al., 2013) and comprises nine factors (health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity and ethical concern) with a total of 36 items. Since this exceeds the scope of the present study, the three most relevant factors – price (three sub-questions), health (six sub-questions) and weight control (three sub-questions), totaling twelve items have been selected. With the price being one of the most important choice criterions for many people in food choice decisions, different price motivations might impact the effectiveness of nudges in food choice situations. Further, as this study strives to contribute to insights into public health, consumers' motivations related to health and weight control display interesting factors to consider. In the analysis, the individual scores for the scale items of each of the three factors are combined and a health, price and weight control score is created. This data will be used to test **H4** ("Differences in food choice motivation have an impact on the effectiveness of health nudges").

Demographic Section

The final section comprises five demographic questions, including gender (Q12), age (Q13), education (Q14), monthly net income (Q15) and how many people depend on this income (Q16). Data collected from this question delivers essential insights to compare the two country samples' as well as demographics of the treatment group. Further, the data will be used to test **H5** ("Demographic factors have an impact on the effectiveness of health nudges").

Two of the demographic questions, education and income, had to be adapted to country-specific conditions. For education, a comparable classification was developed based on the International Standard Classification of Education (ISCED) (UNESCO, 2013). Levels 2 to 8 of the ISCED have been included in the questionnaire for each country (see classification overview in Appendix V, f). The assignment of different educational paths in each country to the standardized scheme is based on thorough Internet research as well as detailed discussions with Danes and Germans.

When comparing data such as income across countries, it is important to find a comparable measure from one data source. The income groups presented in Q15 have been developed with figures from Eurostat (2017), the statistics portal of the European Commission. Data on the median equivalized net income has been used to create 7 different income categories, with the median income in each country falling into category 4, while the lowest income category is capped by 0.6-times the median and the highest category starts at 2.5-times the median income. The lower category displays the poverty line for individuals. In Germany, the median monthly net income in 2015 was at around 1,828€, while in Denmark it was at 2,515€ (Eurostat, 2017).

The median is used in the present study because the income distribution of most countries is characterized by many recipients of lower or medium income, and rather few recipients of very high incomes. Thus, the arithmetical mean does not display an optimal basis to find the center of a country's income distribution, and the median is frequently used when analyzing income distribution (DIW, 2012). A table showing the income groups for both countries can be found in Appendix V, g. The file including detailed calculations is available from the author on request.

The final question aims to find out if other people depend on the income. This gives a better idea of how much income is actually disposable. In addition, standards of living between households of different sizes and compositions can be compared more easily (INSEE, 2016). A measurement of income corrected by consumption units (CU) can be applied. According to the OECD scale, a weighting of 1 CU for the first adult in the household, 0.5 CU for other persons aged 14 years or older and 0.3 CU for children under 14 years can be applied (INSEE, 2016). Therefore, this question is separated in these three categories. The questionnaire is closed by a short thank-you note for respondents and they could indicate their e-mail address to take part in a raffle.

4.3. Question Structure, Wording and Order

After the content of the questions has been outlined in the previous section, this section addresses the more technical, but equally important aspects of the questionnaire design including the structure of the individual questions in terms of rating and measurement scales, as well as the considerations for choosing the right wording and order of the questions. For reference, an overview of the structure of the questionnaire and its questions can be found in Appendix III.

Question Structure

In this structured questionnaire, the majority of questions is of closed nature, a format which suggest a set of response alternatives. The questionnaire also comprises four open questions. Respondents can fill in their exact age (in Q13), and Q11 leaves an open field for additional labels the respondent might know. Questionnaire participants are also given the opportunity to indicate other education (in Q14), and an open field is left for the number of people depending on the income (in Q16). These free-response questions serve as sub-questions to gain a deeper knowledge of the respective factors and make the questions all-encompassing (e.g. in case the respondents' educational level is not among the suggested response alternatives). Especially in exploratory research, open fields are a good solution if the researcher is unsure about appropriate response alternatives, such as in Q11 (Saunders et al., 2015).

Further, different **rating scales** are applied in this questionnaire: multiple-choice - single response scales, multiple choice - multiple response scales, the Likert scale and the semantic differential scale. Respondents can choose either single or multiple answers, depending on the nature of the question. A single answer is applicable, either when the preferred option should be chosen (Q2&3), or when answer possibilities are mutually exclusive in multiple choice questions (Q1, 4-7, 12, 14). Multiple answers can be selected when options potentially occur simultaneously (Q11).

For Q10, a Likert scale rating question is applied to collect opinion data on the respondents' food choice motivation. The twelve items are rated on a 5-point Likert scale from "strongly agree" to "strongly disagree". The Likert scale has been chosen for its advantage of providing a more differentiated picture of the respondent's opinion than a simple yes/no statement. Furthermore, three different scores on subsets (health, price, weight control motivation) of the question's items can be created. Not at last, Likert scale questions are easy to understand and simple to administer (Malhotra et al., 2012). The long completion time and slightly higher effort to reflect on the question, which might encourage respondents to opt for the neutral point or even discourage them from completing the questionnaire surely displays a downside of this question type. As a measure to avoid this, no more than twelve Likert scale statements of this question type are included in the questionnaire, and the statements are formulated in a brief way.

Another rating question type, the semantic differential rating question, is often used in consumer research for the purpose of determining underlying attitudes (Saunders et al., 2015). In the present study, it is chosen for Q8 and Q9, where respondents are asked to rate their attitude towards breakfast cereals and snacks on a bipolar scale with a pair of opposite adjectives. The position of positive and negative adjectives are varied from left to right, which diminishes the respondents' tendency to consider only one side of the scale (Blumberg, Cooper, & Schindler, 2014).

In addition to rating scales, there are four widely used **measurement scales,** which allow to quantify variables. These scales are named nominal, ordinal, interval and ratio (Cooper & Schindler, 2008). The choice of scale is decisive for the information acquired from a question as well as the calculations (Blumberg et al., 2014). In the present study's questionnaire, all four types of scales are applied. A nominal scale, which consists of answer alternatives that are collectively exhaustive is applied to Q1-5, Q12 and Q14. An ordinal scale, which includes an indication of order of the answer possibilities is used for Q6, Q7 and Q15. Further, Q8, Q9 and Q10 are presented in the questionnaire on interval scales, and finally Q13 has a ratio scale, which disposes of an absolute zero and presents the actual amount of the variable age. The higher the scale, the more information can normally be derived from the variable. Information from higher levels can

always be converted, rescaled, or reduced to arrive at a lower level (Cooper & Schindler, 2008), which is shown in the study's data processing in chapter 6.

Random positioning of answer possibilities was adopted for questions Q2 and Q3 (except for the positioning scenario), Q10 and Q11. Thereby, order or position bias is avoided, where respondents make their choice not based on their true answer but due to the item's position (Malhotra et al., 2012). For Q8 and Q9, no random positioning was implemented as no indication for this is given by Zaichkowsky (1994) who developed the original PII scale.

The option to make all questions mandatory (forced-choice questions) was chosen and ensures that questions are not left unanswered by mistake. At the same time, this measure leads to the acquisition of a more complete data set. A downside of the mandatory nature of questions is that respondents might opt out before they have completed the questionnaire when being faced with a question they are unwilling or unable to answer.

Question Wording

Close attention needs to be paid to the wording of a research questionnaire (Malhotra et al., 2012). In the present study, a professional, polite tone is used in formulating the questions to gain credibility with respondents. As the questionnaire aims at a broad target group, it is indispensable that the wording is clear and understandable, with no room for ambiguity, so people from different backgrounds and educational levels can answer the questions in an appropriate way. In order to avoid leading or biasing respondents by wording, Malhotra et al. (2012) suggest two-sided questions for positive or negative statements, such as in Q10. However, the researcher decided against this measure in an attempt not to prolong the questionnaire.

Question Order

The question order can be essential to keep participants motivated (Malhotra et al., 2012). This is a principal consideration in the present study, where the number of respondents displays an important factor for the power of the data analysis. After the elimination question, the presumably more interesting product choice questions of the experimental part (Q2&3) are placed at the beginning to gain the respondents' confidence and motivation. Then, more complex questions such as the Likert scale matrix of Q10, or the rather sensitive question on income (Q15) are found in the later part of the questionnaire. To keep up the motivation of respondents, a short note before Q12 marks the beginning of the final part of the questionnaire. A last consideration regarding the question order is the avoidance of biases through a logical flow of questions. For instance, Q11 on familiarity with food labels is placed after the experimental part, so respondents are not biased to pay special attention to nutritional labels during the experiment.

4.4. Questionnaire Layout

The visual presentation to respondents should be attractive to encourage respondents to fill in and return the questionnaire (Saunders et al., 2015). Layout-related considerations of online questionnaires differ substantially from paper versions (Malhotra et al., 2012). With Qualtrics, a professional tool has been chosen, which facilitated the customization of a modern design in terms of layout and colors. This is especially relevant for the experiment part, where a close reproduction of a real online shop design could be created. Here, the clean arrangement of high resolution product images in a list made the choice layout similar to an online shop. Inspiration for the design was found in online grocery shops, e.g. REWE in Germany (https://shop.rewe.de/) or Coop Mad and Nemlig in Denmark (https://mad.coop.dk/; https://www.nemlig.com/). While a simple click on the product title permitted the respondent to select the product, clicking on the product image opened a pop-up window with a nutritional table of the product (see Appendix II, d). This reflects a realistic online shop setting where usually at least one additional click is needed to access nutritional information. The pop-up window was embedded using a HTML code, and separate HTML sites for each product's nutritional tables were created.

Furthermore, questions were divided into separate pages, which guarantees more overview and avoids overwhelming respondents with too much content being displayed at once. Coding or numbering of questions and question items was not included in the participant's questionnaire view, as this information is irrelevant to the respondents. There is a widespread view that longer questionnaires reduce response rates, however, no one-fits-all approach can be taken to restrict the length of a questionnaire. Therefore, the present study follows the advice by De Vaus (2014) and Saunders et al. (2015), who suggest that a questionnaire should not be longer than absolutely necessary to meet the research's questions and objectives. Furthermore, Q8, Q9 and Q10 are arranged in a matrix format, which enables the researcher to record multiple responses to similar questions at the same time, enhances the overview of the questionnaire and saves time for respondents (Saunders et al., 2015). Several test-runs by the researcher and pilot group participants assess the time to complete the questionnaire between four and six minutes, which the researcher considers reasonable for the present study.

Overall, it is of high importance to consider how to overcome participants' inability and unwillingness to answer. The lack of information, the difficulty to remember a specific context, and the inability to articulate responses are amongst the most prominent reasons for participants to drop out of a questionnaire (Malhotra et al., 2012; Saunders et al., 2015). As explained in the previous sections, this is avoided by providing a clear introduction to the questionnaire including information on data protection, the researcher's full name and contact details. The majority of

consumers are presumably familiar with the context of grocery shopping and product choice, and they are therefore not faced with any abstract or complex tasks. Further, low effort is required to answer the questionnaire questions since most questions suggest response alternatives and only few open questions are asked. Finally, the researcher avoided including sensitive questions, which would be likely to cause high drop-out rates, although information such as the participant's BMI would have been of interest to the study.

4.5. Additional Considerations

Translation

There are several important considerations for a cross-country study when designing a questionnaire. Besides the difficulty of product choice for the experiment part and the additional effort to develop comparable demographic questions for each country, the questionnaire had to be translated from English to German and Danish. The translation of questions and questionnaire instructions displays an important consideration for cross-country studies like the present one (Saunders et al., 2015). Although English literacy is high in both countries, the decision to translate the questionnaire into each country's official language has been taken to avoid excluding respondents from the questionnaire because they do not understand or do not feel comfortable with the English language. In addition, it is essential for the quality of results that the instructions are well-understood, especially in the experiment. The approach of a back-translation has been chosen, which comes with the advantage of uncovering most language-related problems in the questionnaire. After the initial translation of the English source questionnaire by native speakers into Danish and German, these target questionnaires have been back-translated to ensure a high quality of translation before they were distributed to respondents (Saunders et al., 2015; Usunier, 1998).

Pilot Testing

In accordance with Malhotra et al. (2012), a pilot test of the questionnaire is performed to eliminate potential problems. A pilot sample consisting of ten respondents from different age groups, backgrounds and German and Danish nationality was kindly asked to provide their feedback on clarity of questions, content, technical functionality or any other suggestions. Thereby some content-related and technical issues could be solved and additional suggestions were integrated before distributing the questionnaire to a substantially larger sample.

Reproduction and Distribution

In line with the purpose of the research to gain insights on the effectiveness of nudging interventions in the online grocery shop setting, the primary data collection exclusively took place on the Internet. This also ensures that respondents of the study are Internet users and would at least technically be able to buy groceries online. The online questionnaire tool Qualtrics allowed for a smooth creation and distribution of the questionnaire. The hyperlink to the questionnaire was distributed via instant messaging and posting on social media and professional networks. In addition, the link was sent to e-mail contacts, who were kindly asked to share the questionnaire link with their networks, encouraging a snowball effect. To guarantee consistency when contacting potential respondents, short teaser texts in German and Danish were formulated to be posted or sent via e-mail or instant message. The study was published in March 2017 and was available for a period of three weeks. This period gave respondents sufficient time to complete the questionnaire and the potential to benefit from the snowball effect. A raffle is provided as an incentive for people to take part in the questionnaire. Participants who finished the questionnaire had the chance of winning a 25€ voucher for the muesli store MyMuesli in Germany and a surprise superfoods package worth 180dkk in Denmark.

4.6. Population and Sample

The target population for the primary data collection consists of all German and Danish consumers with Internet access. However, this large target makes it impossible for the researcher to survey the entire population and sample must be chosen from the population, which in the case of the present study is a non-probability sample. Despite its limited generalizability, this is the only feasible sampling design, as it is time saving, inexpensive and convenient (M. R. Solomon, 2009). When using a non-probability sample, it is not possible to make statistical inferences about the relevant population. However, the researcher might still be able to generalize about the population, just not with statistical arguments (Saunders et al., 2015). Given the project's limited financial resources, the researcher selected respondents that are easiest to obtain, which is also called convenience sampling (Saunders et al., 2015). Although prone to bias and other undesirable influences, a convenience sample can be a useful pilot for future studies, which will use more structured samples (Saunders et al., 2015).

The issue of sample size in non-probability sampling is rather ambiguous, no clear rules are found and it strongly depends on what the researcher wants to find out and what the available sources can offer (Saunders et al., 2015). Therefore, the researcher defined the goal to reach at least 100 usable, complete questionnaire responses in each of the two countries, which would ensure 25

observations for each of the four treatment arms (groups) of the experiment. The researcher assessed this targeted sample size as sufficient in the present study to generate indicative results from statistical analysis, however being fully aware that no sophisticated statistical inferences can be made.

5. Critical Reflections

In this chapter, the principal criteria when evaluating quantitative research, *reliability*, *replicability* and *validity*, are critically reflected on. This is important, especially when bearing in mind that this project is conducted as a pilot and could serve as a model for future, large scale studies. At the end of the chapter, biases that need to be considered for the present study will be discussed.

5.1. Reliability and Replicability

Reliability "is concerned with the question of whether the results of a study are repeatable" (Bryman & Bell, 2015, p.49). While *internal reliability* refers to the consistency of a measure within itself, *external reliability*, also called stability, addresses whether a measure is stable over time (Bryman & Bell, 2015). To ensure internal reliability, the questionnaire items first have been discussed with other researchers, which minimizes error in measurement consistency. Second, instead of using yes/no answers, graduated answer alternatives have been applied, so that respondents could pick the appropriate answer alternative. Third, the items and scales for multiple indicator measures were adopted from previous studies that have developed and tested the internal reliability of the measures (Steptoe et al., 2013; Zaichkowsky, 1994). Concerning external reliability, the study's non-probability sample bears the risk that if the study were replicated with a different sample, it might not yield the same results. Often, a re-test of the questionnaire with the same sample at a later point in time is recommended to test the stability of a measure (Bryman & Bell, 2015). However, besides the limited time frame of this project, respondents are likely to be influenced by their experience from the first test and thus, the re-test has not been considered to be reasonable.

A concept closely linked to reliability in a research context is the *replicability* of a study (Bryman & Bell, 2015). According to Flick (2014), a study will be more reliable and replicable if well-documented and therefore, the methodology section of this study contains a detailed documentation of the steps taken in designing, implementing and analyzing the research.

5.2. Validity

Validity "is concerned with the integrity of the conclusions that are generated from a piece of research" (Bryman & Bell, 2015, p.50). Validity presumes reliability, which means that if a measure is not reliable, it cannot be valid (Saunders et al., 2015). Further, Bryman and Bell (2015) distinguish between *internal validity*, which relates to whether the findings of the research accurately represent the causal relationship between variables, and *external validity*, which is the generalizability of the results beyond a specific research context. In the present study, the presence of a control group in which the independent variable is not manipulated, and the random assignment of participants to either the control or experimental groups contributes to internal validity. Thus, if one can see a change in the dependent variable, it is likely to be caused by the manipulation of the independent variable. Especially in experiments, samples are often small and atypical due to complexity and high costs (Saunders et al., 2015). The present study's non-representative sample displays a limit to the external validity of the present study (Bryman & Bell, 2015). This also implies that no direct transfer of findings to other contexts should be made but only indications for other contexts are possible from this pilot study.

5.3. Biases

Biases can occur on multiple occasions throughout a research project and should be considered by every researcher. A distinction is made between biases originating from the researcher, the sampling frame and biases originating from respondents.

To avoid biases stemming from the researchers' values and expectations, which are often focused on the hypotheses which are prone to ignore alternatives (Bryman & Bell, 2015), a variety of sources with different viewpoints has been consulted and compared. Further, discussions and knowledge exchange with the project supervisor raise the objectivity of the research.

A second type of bias in this research might emerge from the convenience sample which suggests a self-selection bias (Malhotra et al., 2012). Only respondents who showed interested in the topic and had the time to fill out the questionnaire participated in the study. The bias of non-response is avoided in the online questionnaire because questions were made mandatory. This entails the risk that respondents choose an inaccurate answer in case they cannot or do not want to respond to a question. To address this, high attention was paid to formulating unambiguous questions and clear answer possibilities that covered the whole spectrum of possible answers.

Randomization of answer alternatives in the questionnaire mitigates an order or position bias in which respondents only choose the answer according to its position instead of the true answer they would select (Malhotra et al., 2012). Furthermore, to prevent biases from the respondents

being aware of the purpose of the study, neither the questionnaire teaser nor the introduction text included the precise purpose of the study but rather generalized on "consumer behavior" or "food choices". In addition, a response bias, which can occur if respondents felt the need to respond either to please the researcher or to conform to social norms is rather unlikely in the present study's self-administered questionnaire, which is carried out anonymously (Saunders et al., 2015). However, a potential bias cannot be totally excluded because the rather sensitive topics, such as health or weight control motives when choosing products might lead respondents to overstate their health or weight control motivation when making food choices.

6. Data Processing

This chapter addresses techniques and procedures for data processing that are applied. These include the software used, data coding and cleaning steps as well as the creation of variables from the original data set.

Software: Stata and Excel

To process and analyze the collected data, the commonly used statistical analysis software Stata is utilized, which incorporates all the necessary features for the analysis of the study's data. The questionnaire data collected with Qualtrics could be easily transferred to Stata in an Excel file. Excel was also used to support the Stata analysis for specific questions (e.g. Q11, familiarity with labels) and to create the diagrams illustrating the results. The Excel dataset and the two Stata do-files for data cleaning and analysis are available from the researcher upon request.

Data Coding

During the questionnaire development process, the answer possibilities of both countries' questionnaire arms were backed with equivalent numerical codes to ensure consistent results. For the limited amount of open questions, no codes could be assigned prior to collecting the data. Number entries for Q13 (age) and Q16 (dependency on income) could be processed without special coding. For Q11's text entry of additional labels the respondent might know, a content analysis was performed and the answers were grouped into six different label groups (displayed in Appendix IX, f).

A flaw in design has been discovered for Q16, as the destined calculation of CUs is impossible without exact income data from each respondent. With income data being rather sensitive, respondents could only choose from income categories in Q15, but not indicate their exact

income. Consequently, data from Q16 is excluded from subsequent data analysis, implying that net income will not be adjusted by children or other people in the household who depend on the respondent's income.

Data Cleaning

Before the collected data could be analyzed, the dataset had to be carefully investigated and cleaned. The original dataset consisted of 542 observations. In a first step, all string variables were converted into numerical variables. Thereafter, a four-stage data cleaning aims to provide for high-quality data, which are the basis for the subsequent analysis.

First, the 32 respondents who were not from the two relevant countries were eliminated from the dataset. Second, the removal of incomplete observations ensures a consistent data analysis across questions. Participants who quit the questionnaire might not have been committed to giving careful consideration when answering the questions, therefore the elimination of their responses also displays a measure to ensure a high quality of responses. In a third step, respondents who took less than 150 seconds to answer the questionnaire were excluded from the analysis. This cut-off line at 150 seconds was determined through a test run conducted with eight students, four of which were instructed to carefully fill out the questionnaire, while the other four received the instruction to work through the questionnaire quickly. The first group needed 247 seconds on average, whereas the second group finished after about 152 seconds. Consequently, the cutoff point was set at 150 seconds. In the fourth step, some respondents' answers had to be adjusted, as for instance mistyped letters were deleted from the age fill-in, or some observations were dropped because their responses indicated low quality (e.g. "I don't understand this language"). After this cleaning process, the data analysis is performed with 362 complete observations.

Variable Creation

In a next step, for each question where the respondent could only choose one option, one variable was created in Stata. For multiple response options (Q8, 9, 10), variables for each question item were created. Additionally, new variables and categories were added to group variables in a meaningful way for the subsequent data analysis.

The demographic variables *age*, *income* and *education* were regrouped into new categories. For *age*, respondents were clustered into two groups: Respondents under 30 years form the *younger* group while those from 30 years are classified as *older*. The rationale behind this classification is that generally, people older than 30 years can be viewed as in a different, more settled life phase (Die Zeit, 2014), where topics like starting a family and advancing in one's career become more relevant. The average age of the mother when giving birth to her first child in 2015 was 29.6 years

in Germany (Statistisches Bundesamt, 2017) and 29.1 years in Denmark (Danmarks Statistik, 2017). Based on this, it can be assumed that peoples' precedencies change around the chosen age threshold of 30 years.

In the variable *education*, two categories were created, these being *lower education*, including lower and upper secondary education, and *higher education* with the remaining educational levels above secondary education (see Appendix V, f). The few respondents who indicated *other education* could be assigned to the existing categories by the researcher. For the variable *income*, four categories were formed out of the initial eight answer possibilities to allow for a more powerful analysis with a higher number of respondents in each group. The four categories termed *lower*, *medium* and *higher income* as well as *no answer* (see Appendix V, g).

The variable *group* is created to differentiate between respondents from the different treatment groups (1-control, 2-label, 3-position, 4-prime) for both product choice scenarios. In addition, variables indicating the healthiness of the chosen product are created for each product group (*cereals score*, *snacks score*). This product healthiness score's value is derived from the SSAg/1 score, which the variables take on for the products that the participants select. For instance, if a participant chooses oats (DE: Haferflocken / DK: Havregryn) from the cereals product selection, his or her value of the *cereals score* variable would take on 1, and in the snacks product selection a choice of Oreo cookies would correspond to a product healthiness score of 12 (for a complete overview of the products' healthiness scores, please refer to Appendix V, a-d).

Further, variables for food choice motivation as well as product involvement are created in order to perform statistical analyses. *Food choice motivation* is contained in three dimensions, namely health, price, and weight control motivation when choosing products. Each of these are measured on a 5-point Likert scale by multiple sub-questions of Q10 and an average score is created from the sub-questions. For the analysis, the score of each dimension is categorized into *high* and *low* by the median, which is 3.8 for health, 3.7 for price and 3.3 for weight control. The median has been chosen as a natural dividing point to create groups of approximately equal size.

A similar approach has been taken for *product involvement*. The ten adjective pairs were rated on a 7-point semantic scale. The lowest rating is coded with 1 point, while the highest receives 7 points, so the overall involvement scores from each respondent could range between 10 and 70. For this, six of the ten items' scales had to be reversed to obtain an accurate score of the respondent's product involvement for each of the two product categories. A two-group classification into relatively lower and higher product involvement was adopted from Zaichkowsky (1985) by using the mean as a break point for the two groups (44 for the involvement with cereals and 42 for snacks). Thereby, groups of approximately equal size are

created, and the deviation from the theoretical mean of 35 accounts for the product-dependent nature of the distribution (Zaichkowsky, 1985).

7. Data Analysis

After thorough cleaning and preparation of the data, this chapter first presents the country samples and the four experiment groups, and then motivates the choice of statistical test and their results. When stating the word *people* in the analysis, the researcher does not want to generalize but refers to questionnaire respondents. Similarly, when referring to *Germans* and *Danes*, German and Danish questionnaire respondents are addressed.

7.1. Presentation of the German and Danish Samples

An overview of the characteristics of the country samples and experiment group is displayed in Table 2, at the end of section 7.2. Graphs supporting the demographics of this section are presented in Appendix VI.

The sample comprises of 220 German respondents (60.8%) and 142 respondents from Denmark (39.2%). The gender distribution is 69.6% women and 30.4% men, with the Danish percentage of women being slightly higher (76.1%) than the German one (65.4%). As can be seen in Appendix VI, the average age does not diverge much between the countries, with 30.4 years in Germany and 31.1 years in Denmark. Overall, respondents under 30 years (the *younger* group) make up 72.7% of the sample (GER: 75.0%, DK: 69.0%), which is also shown by the rather young median age of 25 years for Germans and 26 years for Danes. The age span of the sample is rather wide, with German respondents' ages ranging from 18 to 77 years and Danes from 17 to 77 years. The dominance of younger respondents is most likely an effect of the convenience sampling procedure, through which the questionnaire was mainly distributed among University students.

A great share of Danish respondents (81.0%) belongs to the higher education group, and this share is slightly lower for Germans (72.7%). The distribution of income is comparable for German and Danish respondents, with a majority belonging to the lower income group (GER: 53.2%, DK: 62.0%), about a quarter to the medium income group (GER: 26.8%, DK: 21.1%) and a small share to the higher income group (GER: 6.8%, DK: 9.9%). This big share of lower income respondents could be explained by the young sample: In the lower income group across countries, the average age is only 25 years, compared to 36 and 43 years in the medium and higher income groups, respectively.

Concerning product involvement, German and Danish respondents display the same level of involvement with cereals (μ=43.3 out of 100) and a similar involvement level with snacks (GER: μ=41.3, DK: μ=43.2). When looking at the food choice motivation of the two samples, the motivation score of Danish respondents is slightly higher on all three motives (health, price and weight control) compared to the Germans' (see Table 2).

Overall, the two country's samples can be assessed as comparable with both having a rather young, mostly female respondent group with lower than average income and a higher educational level. The levels of product involvement and food choice motivation do not diverge considerably either.

7.2. Presentation of the Four Experiment Groups

The four experiment groups for each country are compared to examine whether the randomization worked well, and if there are substantial differences, which might have implications for the analysis of the experiment results. Graphs supporting the demographics of this section are presented in Appendix VII, b.

Even after the elimination of observations during the cleaning process, the sample is relatively evenly distributed to the groups (see Appendix VII, a). For the German sample (n=220), there are between 48 and 60 respondents per group and between 32 and 42 respondents for the Danish sample (n=142). The **gender distribution** in the country samples across the groups is very diverse. For the German sample, it ranges from a female share of 53.3% (control group) to 77.1% (prime group), and a similarly large spread is found within the Danish sample, with a range from 64.3% (position group) to 87.5% (label group). In contrast to the gender distribution, the mean age across experiment groups stays relatively constant in both samples, ranging from 29.5 years (position group) to 32.1 years (control group) for Germans and from 31.2 years (control and label groups) to 34.4 years (prime group) for Danes.

When looking at the German sample's **education distribution** across experiment groups, only the prime group displays a clearly higher share of respondents with higher education (81.3%). In the Danish sample, a large dispersion is visible across all groups. The position group, for instance, consists nearly exclusively of respondents with higher education (92.9%), while a considerably smaller share (68.8%) of the label groups' members are highly educated. Finally, the income distribution across the experiment groups is relatively consistent for the German sample across the four experiment groups, with a slightly elevated share (61.1%) of respondents with lower income in the position group, compared to 48.3% in the label group. In the Danish sample, differences are more apparent, with only 44.4% of respondents from the prime treatment

belonging to the lower income group, as opposed to more than 60% in the other three nudge groups. This large difference might be explained by the clearly higher mean age (34.4 years) of respondents in the prime group, who are more likely to dispose of a higher income.

Looking at the different experiment groups' **product involvement** scores, a relatively even distribution can be observed across all groups, ranging from 41.9 to 45.3 with cereals and from 40.5 to 44.2 with snacks. For food choice motivation, the largest difference between groups can be observed within the German weight control score, in which the position nudge group displays the lowest mean motivation of 2.99, while the prime nudge group is considerably more motivated with a mean score of 3.37. Overall, there are some large differences between the experiment groups, however less striking for the German sample. This might be explained by the considerably larger German sample size, for which randomization effects could have functioned better.

Table 2: Overview of Country Samples and Experiment Groups

Please note: values are in percent, except for mean values for age, product involvement and food choice motivation scores

Demographic Indicator		GER	control	label	position	prime	DK	control	label	position	prime	Total Sample
Gender	*male*	34.6	46.7	36.2	29.6	22.9	23.9	18.8	12.5	35.7	25.0	30.4
	female	65.4	53.3	63.8	70.4	77.1	76.1	81.3	87.5	64.3	75.0	69.6
Age	*mean (in years)*	30.5	32.1	30.0	29.5	30.7	32.2	31.2	31.2	31.9	34.4	31.1
	younger	75.0	70.0	74.1	75.9	81.2	69.0	75.0	71.9	69.0	61.1	72.7
	older	25.0	30.0	25.9	24.1	18.8	31.0	25.0	28.1	31.0	38.9	27.4
Education	*lower*	27.3	71.7	69.0	70.4	81.3	19.0	71.9	68.8	92.9	86.1	24.0
	higher	72.7	28.3	31.0	29.6	18.8	81.0	28.1	31.3	7.1	13.9	76.0
Income	*lower*	53.2	50.0	48.3	61.1	54.2	62.0	68.8	75.0	61.9	44.4	56.6
	medium	26.8	25.0	34.5	20.4	27.1	21.1	15.6	18.8	16.7	33.3	24.6
	higher	6.8	8.3	5.2	9.3	4.2	9.9	9.4	3.1	11.9	13.9	8.0
	n.a.	13.2	16.7	12.1	9.3	14.6	7.0	6.3	3.1	9.5	8.3	10.8
Product Involvement	*cereals μ score*	43.3	42.9	42.0	44.4	44.2	43.3	43.8	45.3	41.9	42.5	43.3
	snacks μ score	41.3	43.1	40.8	40.5	40.5	43.2	42.8	43.4	42.6	44.2	42.0
Food Choice Motivaton	*health μ score*	3.75	3.66	3.86	3.72	3.76	3.82	3.72	3.88	3.82	3.86	3.78
	price μ score	3.48	3.33	3.52	3.50	3.59	3.73	3.86	3.74	3.77	3.57	3.58
	weight c. μ score	3.11	3.01	3.14	2.99	3.37	3.28	3.13	3.31	3.34	3.32	3.18

7.3. Choice of Statistical Tests

Appropriate statistical tests must be selected to examine the study's six hypotheses. At a first glance, the Independent T-test and the Two-Way Independent ANOVA seem to be intuitive choices, with the former comparing means of two different groups (in this case the control group and each treatment group), and the latter measuring two independent variables and their interaction across various groups (in this case the interaction effect of additional factors that might influence the effectiveness of the health nudges). However, these parametric tests are constrained by specific assumptions of parametric data (Field & Hole, 2003). The first assumption is the

normal distribution of the outcome measures. This is tested for the cereals and snacks scores through the Shapiro-Wilk test. The test's null hypothesis that the variables are normally distributed is rejected for both outcome measures (*p=0.00*, see the output in Appendix VIII, a) and the non-normal distribution of the scores is visualized in the histograms in Appendix VIII, b. Second, the assumption of *homogeneity of variance* (equal variances) across groups is tested by the Levene's test and the null hypothesis that the variances are equal is rejected for the snacks healthiness score (*p=0.00*), while it cannot be rejected for the cereals healthiness score (see output in Appendix VIII, c).

The Mann-Whitney U Test

As a consequence of the aforementioned violations of assumptions for parametric tests, the nonparametric Mann-Whitney U test has been selected as the primary means to evaluate the study's hypotheses. This test can be justified for the present study's nonparametric data concerning the assumptions it makes (Acock, 2006). Being the non-parametric equivalent of the Independent T-test, the Mann-Whitney U test is "used for testing differences between groups where there are two conditions and different participants have been used in each condition" (Field & Hole, 2003, p.235). It looks for differences in ranked positions of scores in the two relevant conditions. While means of a T-test are biased by outliers, ranks are not (Field & Hole, 2003). Further, the Mann-Whitney U test is likely to be more powerful than the T-test when the assumptions of the T-test are not met (Berenson, Levine, & Szabat, 2015). However, researchers have to be aware of an increased likelihood of a Type II error, implying a higher chance to accept that there is no difference between groups when there is a difference in reality (Field & Hole, 2003). For the present data, the Mann-Whitney U test is specifically used to test whether significant differences are found between the control group and one treatment group at a time (e.g. label). These results are then compared to the differences observed in another group (e.g. positioning).

The ANOVA

While the results of the Mann-Whitney U test can show whether there are significant differences between the effectiveness of different nudge treatments for a single group of respondents (e.g. Germans), it fails to measure whether there is a joint effect of factors on the dependent measure (Stevens, 1999). More specifically, it tests whether the difference in healthiness score caused by the nudge in one group (e.g. German respondents) is significantly different from the difference in healthiness score of the other group (e.g. Danish respondents). In building on the Mann-Whitney U test results, the ANOVA is conducted as an additional analysis to examine whether these

significant "differences of differences" exist for the variables country, product involvement, food choice motivation and demographics.

The results of the parametric ANOVA analysis should be regarded with care in this study due to the violations of assumptions for parametric tests: If the measurement variable is not normally distributed, it is more likely to erroneously assume a positive result of the test (Type I error). However, a simulation study by Harwell, Rubinstein, Hayes, and Olds (1992) suggests that the violation of assumptions does not considerably affect the Type I error rate. In a first step, the dependent variables for the cereals and snacks healthiness score are log transformed to obtain a more normal distribution (McDonald, 2014). Although the Sharpio Wilk test still does not confirm a normal distribution of the variables after the transformation (Appendix VIII, d), the log improves the distribution and leads to a smaller spread of the variables, which is visualized in the box plots in Appendix VIII, e. Thus, the ANOVA is conducted with the log-transformed variables.

In addition to the Mann-Whitney U test and the ANOVA, the effect size, which is the difference between the mean values in two different intervention groups (Sullivan & Feinn, 2012), is used as an insight throughout the analysis.

7.4. Results of the Mann-Whitney U Test and ANOVA

This section will first evaluate the study's hypotheses with the Mann-Whitney U test, and the ANOVA is conducted as an additional analysis. At the end of the section, the implications for the hypotheses are summarized in Table 5. Additional insights from the questionnaire data, including product choice, familiarity with the products, consumption frequency, use of nutritional tables and familiarity with labels are presented in Appendix IX. It is important to note that the product healthiness scores as outcome measures are reported on a scale from 1 to 10 for cereals and 7 to 14 for snacks: The lower the score, the healthier the product choice. Due to the relatively small sample size, the p-values are reported on a $\alpha=0.05$ (**) up to $\alpha=0.10$ (*) significance level. Since the sample size is relatively small and the statistical power is affected by the sample size, the German and Danish samples are only examined separately for H2, but for the other five hypotheses, the two country samples are combined.

First, the Mann-Whitney U test is conducted for each hypothesis, and an overview of the p-values of the test are displayed at the end of the section in Table 3. Detailed tables for the hypotheses including sample size (n), mean (μ), median (M) and p-value (p) are found in Appendix VIII, f-j. Furthermore, the ANOVA is conducted to find out whether any significant interactions can be observed. The significant interactions are elaborated on throughout the following section. A summary of the p-values is presented in Table 4 at the end of the section.

Hypothesis 1

H1: Health nudges in the online environment lead to healthier food choices.

H1 has been divided into separate sub-hypotheses (H1a-c) for each of the experiment's three nudging interventions.

H1a: Healthier choice labels in the online environment lead to healthier food choices.

For the breakfast cereals product category, the Mann-Whitney U test reveals significant differences between the healthiness scores of the respondents' product choice in the control condition (μ=3.92, n=92) and the label treatment group (μ=3.34, n=90), *p=0.03*. For the snacks product category, no significant difference can be reported between control group (μ=10.5, n=92) and label treatment (μ=10.18, n=90), *p=0.61*. Therefore, H1a is supported for cereals but not for snacks.

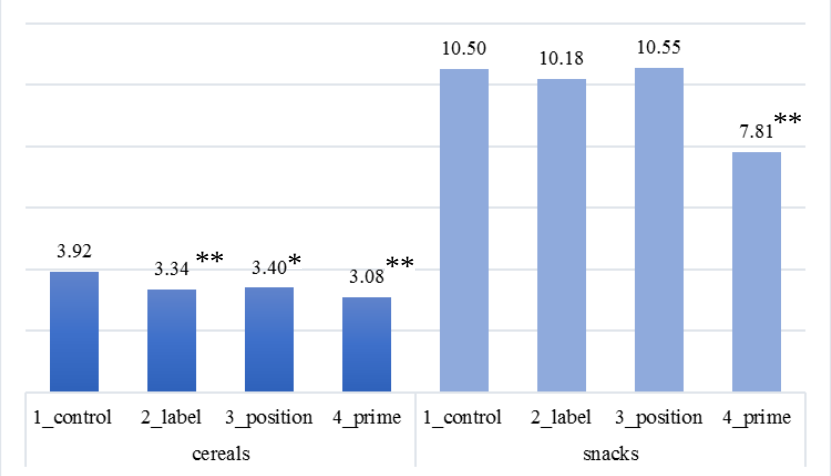
H1b: Favorable positioning of healthier products in the online environment leads to healthier food choices.

In the cereal product category, significant differences are found between the control condition (μ=3.92, n=92) and position treatment (μ=3.40, n=96, *p=0.06*). However, for snacks, no significant difference can be reported between control (μ=10.50, n=92) and the position treatment (μ=10.55, n=96, *p=0.72*). Thus, H1b is supported for cereals but not for snacks.

H1c: Health slogans (prime) in the online environment lead to healthier food choices.

Looking at the Mann-Whitney U test results in the cereals product category, significant differences between the control condition (μ=3.92, n=92) and prime treatment (μ=3.08, n=84, *p=0.00*) are revealed. The test finds similar results for the snacks product group between the control condition (μ=10.50, n=92) and prime treatment (μ=7.81, n=84, *p=0.00*). Consequently, H1c is accepted for both product groups. Overall, the healthiness of respondents' food choices improves (scores decrease) in all nudge conditions compared to the control conditions (see Figure 11), except for the position treatment in the snacks product category.

Figure 11: Mean Healthiness Scores for Product Groups



Please note for all graphs in this section:
1-control, 2-label, 3-position, 4-prime
*** (significant at α=0.05)* *** (significant at α=0.10)*

Hypothesis 2

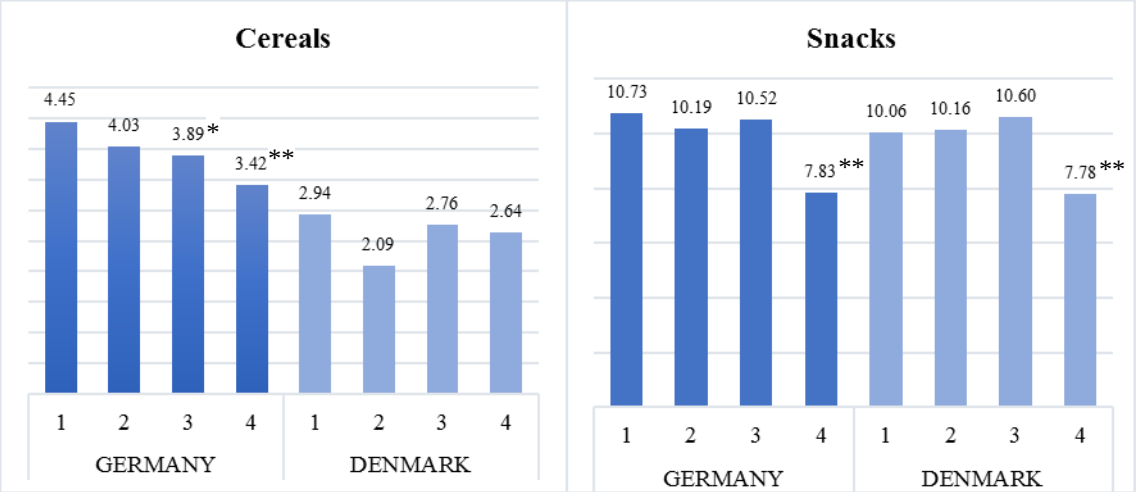
H2: There are differences in the impact of health nudges between German and Danish consumers' food choices.

For the German sample's choice of cereal products, the Mann-Whitney U test reveals significant differences between the control condition (μ=4.45, n=60) and the position (μ=3.89, n=54, *p=0.09*) as well as the prime treatments (μ=3.42, n=48, *p=0.01*). Only the test for differences between the control condition and label treatment is insignificant (label: μ=4.03, n=58, *p=0.11*). In contrast, for the Danish sample's choice of cereal products, no significant differences between the control (μ=2.94, n=32) and the three nudges are revealed (label: μ=2.09, n=32, *p=0.20*; position: μ=2.76, n=42, *p=0.85*; prime: μ=2.64, n=36, *p=0.82*). In the snacks product choice, significant differences are only found between the control scenario (GER: μ=10.73, n=60; DK: μ=10.06, n=32) and the prime intervention of each country (GER: μ=7.83, n=48, *p=0.00*; DK: μ=7.78, n=36, *p=0.00*). In the cereals scenario, clear differences could be observed between the two country samples, while in the snacks scenario the differences are not as apparent. Based on this, H2 is supported for cereals, but not for snacks.

The ANOVA finds a significant interaction between the prime nudge and the respondents' country in the cereal product group (*p=0.08*). This implies that the effectiveness of the prime nudge depends on which country the respondents comes from, which is in support of H2 for cereals. In line with the Mann-Whitney U test results, German respondents, who are exposed to the prime nudge show a healthiness score, which is 26.2% lower than the control group, while the

reduction for Danes is only 3%. The healthiness of cereal choices improves (μ score decreases) in all three nudging interventions and across countries (see Figure 12). Although not significant in the tests (possibly due to the small sample size), Danish respondents exposed to the label nudge display a 28.9% decrease in score compared to the control condition, while German respondents only yield a decrease of 9.4%. In the snacks choice, Danish respondents exposed to the label nudge and position nudges even show slightly unhealthier choices (scores increase by 1.0% and 5.4%, respectively), whereas German respondents chose slightly healthier snacks (scores decrease by 5.2% and 2.0% respectively).

Figure 12: Mean Healthiness Scores for GER & DK



1-control, 2-label, 3-position, 4-prime

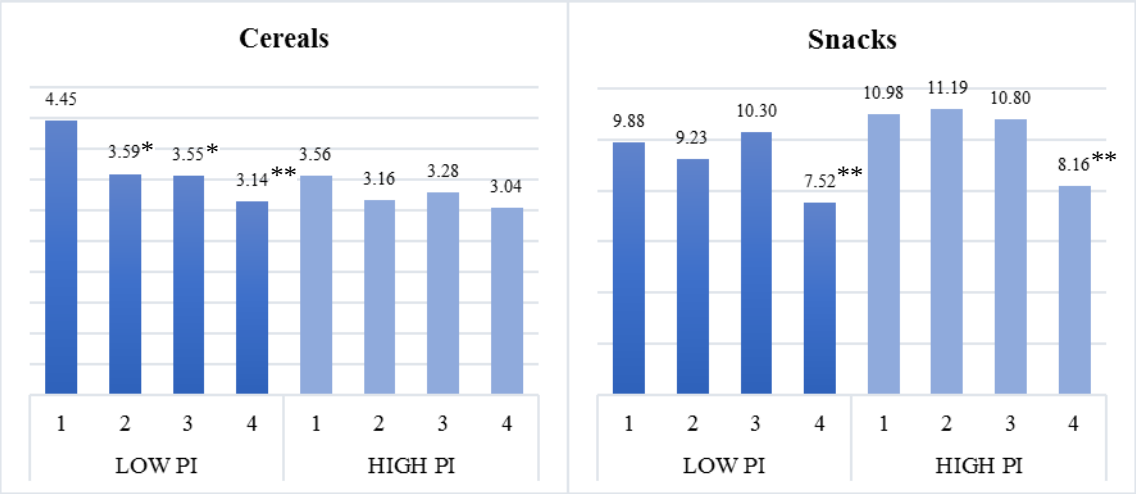
Hypothesis 3

H3: Differences in product involvement (higher vs. lower) have an impact on the effectiveness of health nudges.

For the group of respondents displaying lower involvement with cereals (n=154), the Mann-Whitney U test reveals significant differences between the control group (μ=4.45, n=38) and all three nudging interventions (label: μ=3.59, n=39, *p=0.05*; position: μ=3.55, n=42, *p=0.05*; prime: μ=3.14, n=35, *p=0.00*). On the contrary, for respondents with higher involvement with cereals (n=208), no significant differences are found. For the snacks product scenario, the test reveals significant differences for respondents with lower involvement (n=180) between the control group (μ=9.88, n=40) and prime treatment (μ=7.52, n=84, *p=0.00*), and similarly for those with higher involvement (n=182) between the control group (μ=10.98, n=52) and prime treatment (μ=8.16, n=38, *p=0.00*).

Although for labels no significant difference is found by the Mann-Whitney U test in the snacks scenario, people with lower involvement exposed to the label display a decrease of 6.6% in mean healthiness score, while for people with high involvement, the healthiness score becomes slightly worse with a 1.91% increase (see Figure 13). Considering the results of the Mann-Whitney U test, H3 is supported for cereals but not for snacks.

Figure 13: Mean Healthiness Scores for Low & High Product Involvement (PI)



1-control, 2-label, 3-position, 4-prime

Hypothesis 4

H4: Differences in food choice motivation (health, price, weight control) have an impact on the effectiveness of health nudges.

H4 is examined by three sub-hypotheses (H4a-c) for the health, price and weight control motive of respondents when they make food choices. The sample's health motivation is highest (μ=3.78), followed by the price (μ=3.57) and weight control motivation (μ=3.18).

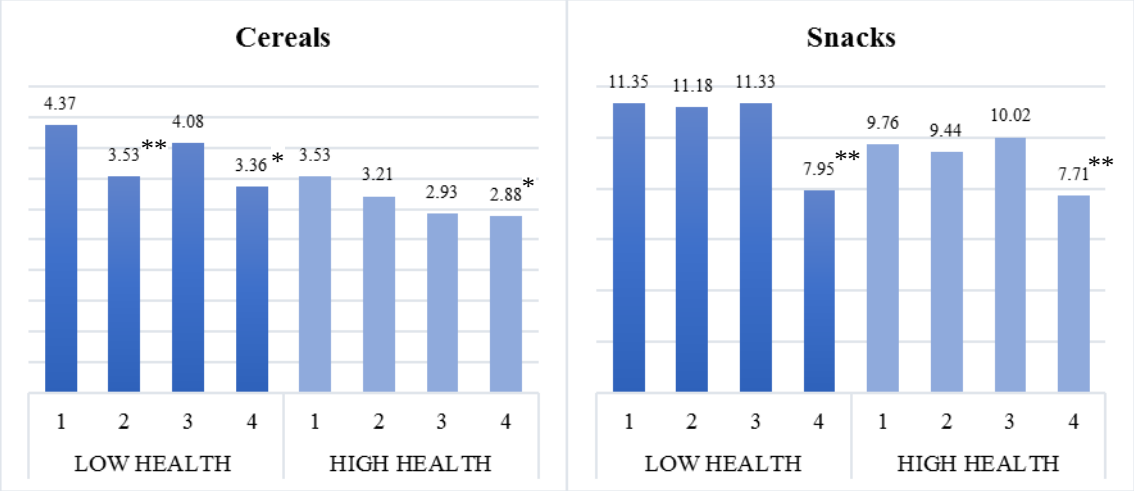
H4a: Differences in health motivation (higher vs. lower) have an impact on the effectiveness of health nudges.

For the cereal product group, the Mann-Whitney U test reveals significant differences in the healthiness scores of people with lower health food choice motivation between the control group (μ=4.37, n=43) and the label treatment (μ=3.53, n=38, *p=0.04*) as well as the prime treatment (μ=3.36, n=36, *p=0,08*). For people with higher health motivation, there are significant differences in healthiness scores between the control group (μ=3.53, n=49) and the prime treatment only (μ=2.88, n=48, *p=0.08*). In the snacks product group, differences between control and prime treatment are significant for both, lower (control: μ=11.35, n=43; prime: μ=7.95, n=36,

p=0.00) and higher (control: μ=9.76, n=49; prime: μ=7.71, n=48, *p=0.00*) levels of health food choice motivation. Given the differences in effectiveness of the health nudges for lower and higher health motivation in the cereal choice scenario only, H4a is supported for cereals, but not for snacks.

The ANOVA finds a significant interaction between the prime nudge and respondents' health motivation in food choice for the snacks product group (*p=0.04*). This implies that there is a significant difference in effectiveness of the prime nudge depending on the respondents' health motivation, which supports H4a for snacks. From the Mann-Whitney U test results, no apparent difference for the prime nudge between people with lower and higher health motivation can be observed in the snacks choice. Both groups showed a significantly lower score compared to the control group. However, when looking at the effect size, respondents with lower health motivation exposed to the prime nudge display a healthiness score being 30.0% lower than the control score. This is a significantly larger reduction compared to the reduction of 21.0% for people with higher health motivation (see Figure 14).

Figure 14: Mean Healthiness Scores for Low & High Health Motivation



1-control, 2-label, 3-position, 4-prime

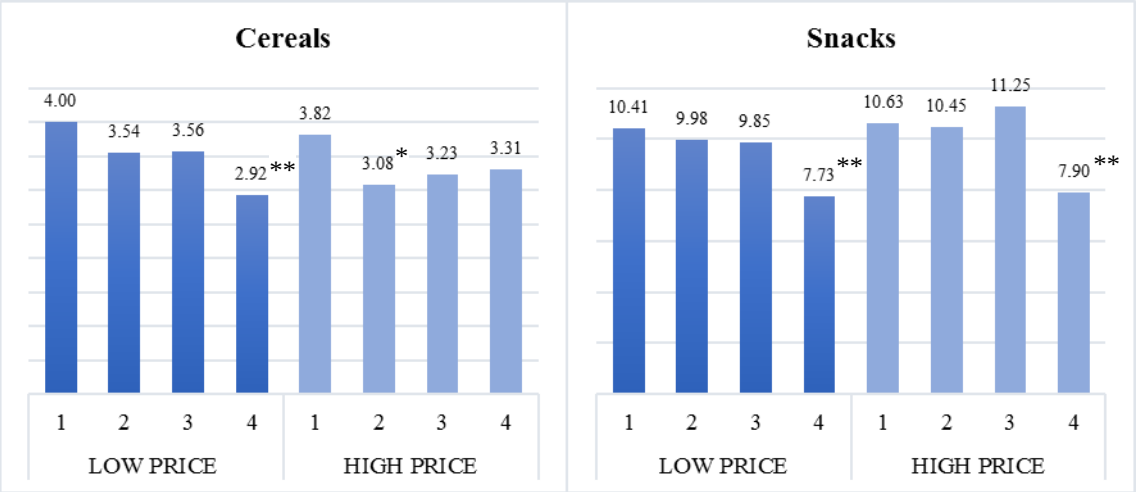
H4b: Differences in price motivation (higher vs. lower) have an impact on the effectiveness of health nudges.

In the cereals choice scenario, the Mann-Whitney U test reveals significant differences in healthiness scores of people with lower price motivation between the control group (μ=4.00, n=54) and prime treatment (μ=2.92, n=49, *p=0.01*). In contrast, for people with higher price motivation, significant differences are found between the control group (μ=3.82, n=38) and the label treatment (μ=3.08, n=38, *p=0.07)*. In the snacks product category, people with lower and

higher levels of price motivation both only display significant differences between the control group and the prime treatment (lower: control: μ=10.41, n=54; prime: μ=7.73, n=49, *p=0.00*; higher: control: μ=10.63, n=38; prime: μ=7.90, n=35, *p=0.00*). These results again lead to support H4b for cereals but not for snacks. Differences in effectiveness of the interventions between higher and lower price motivation can only be observed in the cereals product group.

Interestingly, with exception of the prime treatment, people with low price motivation generally made slightly unhealthier cereals choices compared to those with high price motivation (see Figure 15). For snacks, however, the healthiness score of people with higher price motivation increases in all four groups, with the largest increase being 5.8% between the control group and the position treatment. On the contrary, for respondents with low price motivation the score decreases by 5.4%.

Figure 15: Mean Healthiness Scores for Low & High Price Motivation



1-control, 2-label, 3-position, 4-prime

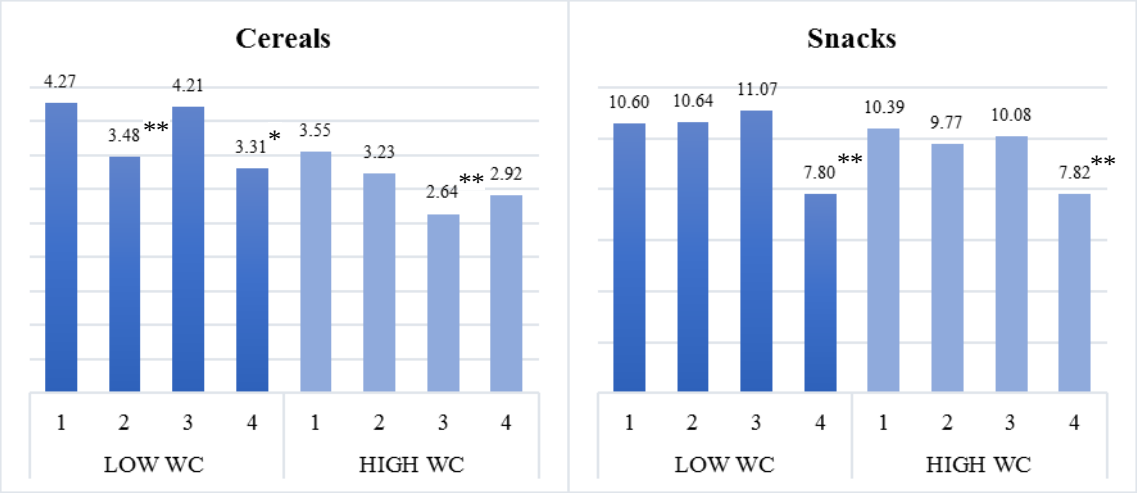
H4c: Differences in weight control motivation (higher vs. lower) have an impact on the effectiveness of health nudges.

In the cereals choice group, the Mann-Whitney U test reveals significant differences between the healthiness scores of the food choice of people with lower weight control motivation in the control group (μ=4.27, n=48) and the label (μ=3.48, n=42, *p=0.04*) as well as the prime intervention (μ=3.31, n=35, *p=0.06*). For respondents with high weight control motivation, significant differences are revealed between the control group (μ=3.55, n=44) the position nudge (μ=2.64, n=50, *p=0.02*).

As in the previous two food choice motives, for the snacks product group, only differences between control group and prime intervention were significant for lower (control: μ=10.60, n=48; prime: μ=7.80, n=35, *p=0.00*) and higher (control: μ=10.39, n=44; prime: μ=7.82, n=49, *p=0.00*) levels of weight control motivation. Thus, no significant differences between the weight control motivation levels for food choices can be observed. Similar to the previous two hypotheses, H4c is partly supported by the findings, as only the cereals product group reveals considerable differences in effectiveness of health nudges for higher or lower weight control motivation.

Looking at Figure 16, the largest difference is apparent in the cereals position treatment, where the score of respondents with low weight control motivation only decreases by 1.4%, compared to the control group. For people with a higher weight control motivation, the effect is substantially greater, with a decrease of 25.6%.

Figure 16: Mean Healthiness Scores for Low & High Weight Control (WC) Motivation



1-control, 2-label, 3-position, 4-prime

Hypothesis 5

H5: Demographic factors have an impact on the effectiveness of health nudges.

H5 has been divided into sub-hypotheses for the demographic factors gender (H5a), age (H5b), education (H5c) and income (H5d).

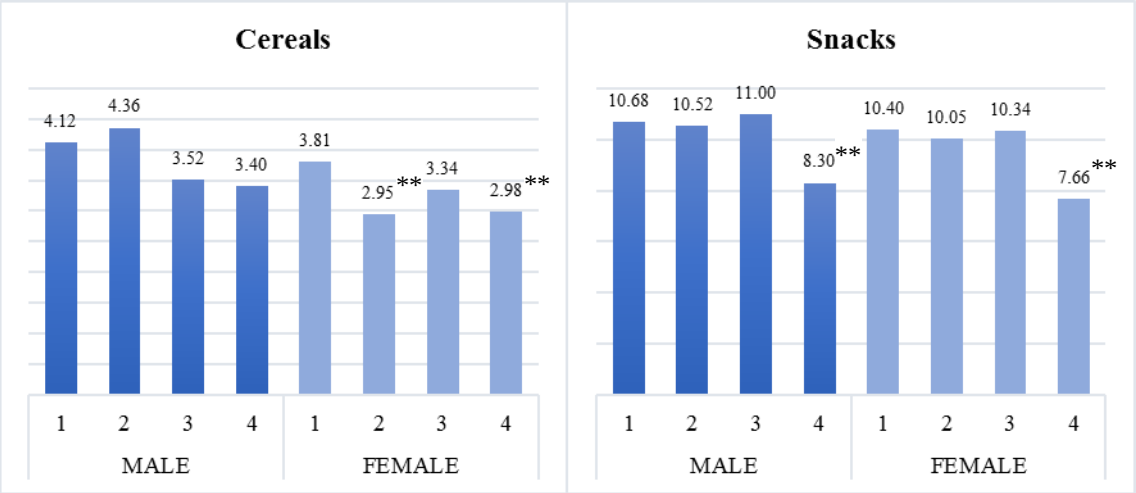
H5a: Gender has an impact on the effectiveness of health nudges.

For males, the Mann-Whitney U test only reveals significant differences in healthiness of snacks between the control group (μ=10.68, n=34) and prime group (μ=8.30, n=20, *p=0.00*). For females, not only significant differences are found between control and prime treatment for the snacks choice (control: μ=10.40, n=58; prime: μ=7.66, n=64, *p=0.00*). In addition, in the cereals choice,

the label and prime treatment groups are significantly different from the control group (control: μ=3.81, n=58, *p=0.01*; label: μ=2.95, n=65; prime: μ=2.98, n=64, *p=0.01)*. Overall, the findings lead to support H5a for cereals but not for snacks.

Generally, men display higher mean scores in all experiment groups compared to women (Figure 17). While women always make healthier choices in the nudge treatments compared to the control group, men do not appear receptive to neither the label nudge for cereals nor the position nudge for snacks, where their mean scores even increases by 5.8% and 3.0% respectively, compared to the control value.

Figure 17: Mean Healthiness Scores for Gender



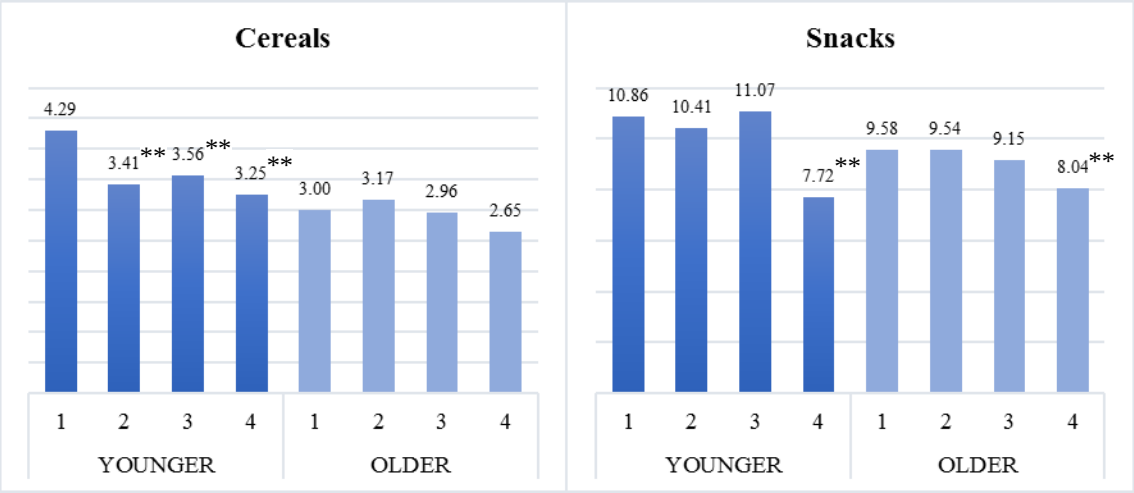
1-control, 2-label, 3-position, 4-prime

H5b: Age has an impact on the effectiveness of health nudges.

This hypothesis has been tested for a younger (30 years or younger) and older (older than 30 years) age group. The Mann-Whitney U test reveals significant differences regarding the healthiness scores of the chosen cereal products for younger respondents between the control group (μ=4.29, n=66) and all three treatment groups (label: μ=3.41, n=66, *p=0.00*; position: μ=3.56, n=70, *p=0.03*; prime: μ=3.25, n=61, *p=0.00*). In the older group, none of the nudging interventions are significantly different from the control condition in the cereals choice. For the snacks choice, there are significant differences between the control (younger: μ=10.86, n=66; older: μ=9.58, n=26) and prime condition for both age groups (younger: μ=7.72, n=61, *p=0.00*; older: μ=8.04, n=23, *p=0.04*). Given the clearly different results for the two age groups in the cereals product choice, but rather similar results for younger and older respondents in the snacks choice, H5b is only supported for cereals.

Looking at Figure 18, the mean score of younger respondents is significantly lower for all three nudge groups compared to the control group, whereas older respondents even display slightly unhealthier choices in the label nudge group compared to the control group. For snacks, younger respondents seem reluctant to the position nudge with a slight increase (1.93%) in mean score compared to the control group, while older respondent's score decreases by 4.49%.

Figure 18: Mean Healthiness Scores for Age Groups



1-control, 2-label, 3-position, 4-prime

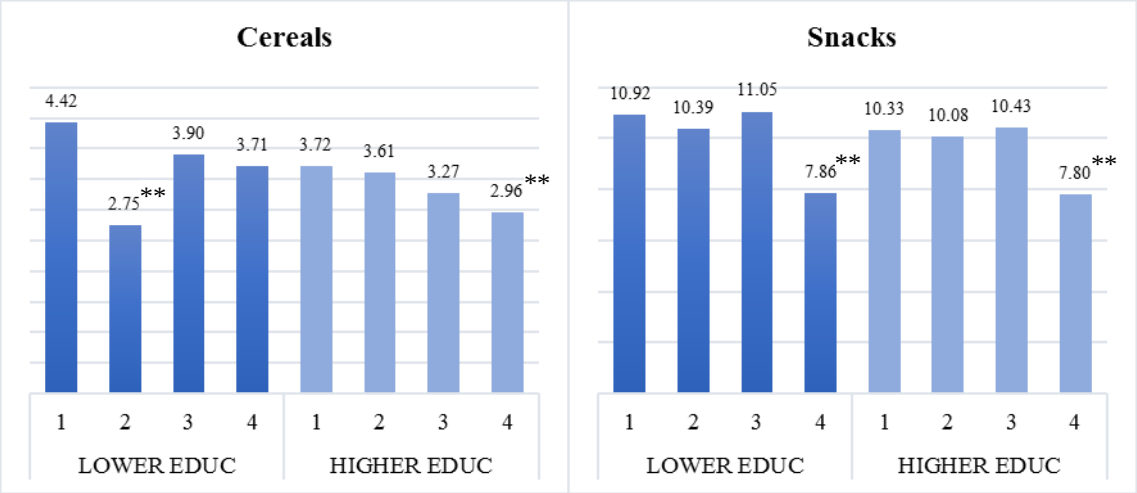
H5c: Education has an impact on the effectiveness of health nudges.

To test this hypothesis, two groups with lower and higher education are formed. For the lower educated group, Whitney-Mann U test reveals significant differences between the product healthiness scores of the control group (μ=4.42, n=26) and the ones exposed to labeled products (μ=2.75, n=28, *p=0.00*). For respondents with higher education, there is a significant difference between the control group (μ=3.72, n=66) and the priming health slogan (μ=2.96, n=70, *p=0.02*). Here again, for snacks, both education groups' prime scores (lower: μ=7.86, n=14; higher: μ=7.80, n=70) are significantly different from the control group scores (lower: μ=13, n=26; higher: μ=11,5, n=66), with *p=0.00*. Given the different results for the two education groups in the cereals product choice, but not in the snacks choice, H5c is supported for cereals but not for snacks.

The ANOVA finds a significant interaction between the label nudge and education for the cereals product group (*p=0.05*). This implies that there is a significant difference between the effectiveness of the health label nudge depending on the educational level of the respondents. This is in support of H5c for cereals. As shown by the significant results of the Mann-Whitney U test, respondents from the lower education group exposed to the label show a healthiness score,

which is 46.6% lower than in the control group, compared to the small reduction of 3.0% for respondents who have higher education. In the snacks product choice, mean scores of both groups are very similar (Figure 19) and no large differences in effectiveness of the nudges between the groups become apparent. It can be observed, however, that respondents with higher education generally choose healthier items in all experiment groups, except for the cereals label nudge, where differences between the education groups in the mean healthiness score are largest.

Figure 19: Mean Healthiness Scores for Education Groups



1-control, 2-label, 3-position, 4-prime

H5d: Income has an impact on the effectiveness of health nudges.

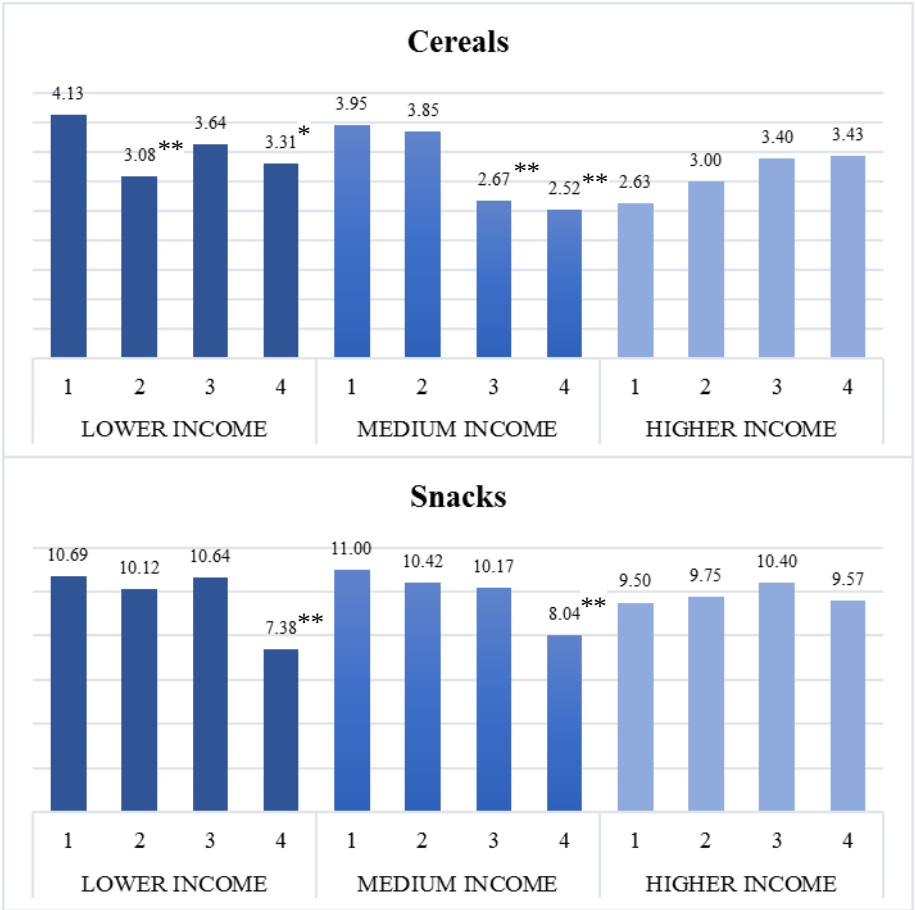
People who preferred not to give any indication of their income (n=39) were excluded from this hypothesis test. Thus, the Mann-Whitney U test is performed with n=323 and three income groups (lower, medium, and higher income).

For the cereals product choice, the Mann-Whitney U test reveals significant differences in the lower income group between the control group (μ=4.13, n=52) and the label as well as prime group (label: μ=3.08, n=52, *p=0.00*; prime: μ=3.31, n=42, *p=0.05*). In the medium income group, there are significant differences between the healthiness score of the control group (μ=3.95, n=20) and the position (μ=2.67, n=18, *p=0.02*) as well as prime scores (μ=2.52, n=25, *p=0.02*). For the higher income group, no significant differences are identified. In the snacks choice, significant differences between the control and prime groups of lower (control: μ=10.69, n=52; prime: μ=7.38, n=42) and medium income respondents (control: μ=11.00, n=20; prime: μ=8.04, n=7) are found (all at *p=0.00*). In contrast, for the higher income group, there are no significant differences. From the results, it can be concluded that there are differences in both product groups for respondents with various income levels, thus H5d can be supported.

The ANOVA finds a significant interaction effect between the prime nudge and respondents' income for the cereals product group ($p=0.03$), suggesting that there is a significant difference in effectiveness of the prime nudge depending on income. This supports H5d for snacks. In line with the Mann-Whitney U test results, respondents with lower and medium income exposed to the prime nudge display a significant reduction in healthiness score (by 36.6% and 31.1%, respectively) compared to respondents with higher education, who only show a 0.7% lower score. Looking at the mean values in Figure 20, higher income respondents display unhealthier food choices in all nudge treatments, while lower and medium income respondents take at least slightly healthier choices in the nudge scenarios compared to the control group.

It must be noted that the sample size for some of the experiment groups with medium and higher income was relatively small. This might lead to the previously described type II error, which possibly explains the lack of significance in the higher income group's differences. These results should be regarded with caution because causalities, such as that most respondents with lower education are from the younger age segment, are not considered in the analysis.

Figure 20: Mean Healthiness Scores for Income Groups



1-control, 2-label, 3-position, 4-prime

Hypothesis 6

H6: Differences in product category (cereals and snacks) have an impact on the effectiveness of health nudges.

This hypothesis is examined by looking at the Mann-Whitney U tests for H1, which have been conducted within each product category. These results are compared across the two product categories. In the cereals choice experiment, significant differences in healthiness scores are found between the control group and all three nudge groups (control: μ=3.92, n=92; label: μ=3.34, n=90, *p=0.03*; position: μ=3.40, n=96, *p=0.06*; prime: μ=3.08, n=84, *p=0.01*). For the snacks choice experiment, only the prime condition exhibits a significant difference in healthiness score compared to the control condition (control: μ=10.5, n=92; prime: μ=7.81, n=84, *p=0.00*). Given these clear differences in effectiveness of the nudges between the two product groups, H6 can be supported.

Concerning this hypothesis, a limitation to be considered is the different set-up of the two choice settings (fifteen cereal products, six snack products), which confines the direct comparison of the two product categories. Thus, the observed results might not only stem from the different product category, but also from the different number of products.

Table 3: Results Mann-Whitney U Test (p-values)

HYPOTHESIS		VARIABLE		2_LABEL	3_POSITION	4_PRIME
H1&H6	**product category**		cereals	*0.03***	*0.06**	*0.01***
			snacks	*0.61*	*0.72*	*0.00***
H2	**country**	cereals	Germany	*0.11*	*0.09**	*0.01***
			Denmark	*0.20*	*0.85*	*0.82*
		snacks	Germany	*0.35*	*0.91*	*0.00***
			Denmark	*0.71*	*0.46*	*0.00***
H3	**product involvement**	cereals	low	*0.05**	*0.05**	*0.00***
			high	*0.26*	*0.38*	*0.26*
		snacks	low	*0.31*	*0.74*	*0.00***
			high	*0.45*	*0.99*	*0.00***
H4	**food choice motivation**	cereals	low health	*0.04***	*0.45*	*0.08**
			high health	*0.37*	*0.10*	*0.08**
		snacks	low health	*0.79*	*0.51*	*0.00***
			high health	*0.59*	*0.65*	*0.00***
		cereals	low price	*0.21*	*0.24*	*0.01***
			high price	*0.07**	*0.17*	*0.31*
		snacks	low price	*0.49*	*0.46*	*0.00***
			high price	*0.94*	*0.32*	*0.00***
		cereals	low weight control	*0.04***	*0.90*	*0.06**
			low weight control	*0.31*	*0.02***	*0.11*
		snacks	low weight control	*0.66*	*0.18*	*0.00***
			high weight control	*0.38*	*0.54*	*0.00***
H5	**gender**	cereals	male	*0.82*	*0.26*	*0.35*
			female	*0.01***	*0.13*	*0.01***
		snacks	male	*0.91*	*0.36*	*0.00***
			female	*0.65*	*0.87*	*0.00***
	age	cereals	younger	*0.00***	*0.03***	*0.00***
			older	*0.80*	*0.84*	*0.58*
		snacks	younger	*0.53*	*0.50*	*0.00***
			older	*0.97*	*0.61*	*0.04***
	education	cereals	lower	*0.00***	*0.41*	*0.33*
			higher	*0.48*	*0.12*	*0.02***
		snacks	lower	*0.64*	*0.87*	*0.00***
			higher	*0.72*	*0.63*	*0.00***
	income	cereals	lower	*0.00***	*0.18*	*0.05**
			medium	*0.55*	*0.02***	*0.02***
			higher	*0.65*	*0.43*	*0.40*
		snacks	lower	*0.52*	*0.87*	*0.00***
			medium	*0.62*	*0.85*	*0.00***
			higher	*0.93*	*0.40*	*0.90*

***significant compared to control group at α=0.05 significance level*
**significant compared to control group at α=0.10 significance level*

Table 4: Results ANOVA (interaction p-values)

HYPOTHESIS		PRODUCT GROUP	2_LABEL	3_POSITION	4_PRIME
H2	country	cereals	*0.71*	*0.37*	***0.08****
		snacks	*0.53*	*0.35*	*0.45*
H3	product involvement	cereals	*0.64*	*0.43*	*0.91*
		snacks	*0.23*	*0.73*	*0.56*
H4	health motivation	cereals	*0.28*	*0.45*	*0.71*
		snacks	*0.60*	*0.71*	***0.04****
	price motivation	cereals	*0.63*	*0.93*	*0.54*
		snacks	*0.58*	*0.20*	*0.85*
	weight c. motivation	cereals	*0.51*	*0.20*	*0.62*
		snacks	*0.74*	*0.82*	*0.18*
H5	gender	cereals	*0.10*	*0.88*	*0.72*
		snacks	*0.84*	*0.74*	*0.65*
	age	cereals	*0.73*	*0.10*	*0.96*
		snacks	*0.76*	*0.62*	*0.54*
	education	cereals	***0.05****	*0.61*	*0.77*
		snacks	*0.38*	*0.58*	*0.94*
	income	cereals	*0.35*	*0.73*	*0.38*
		snacks	*0.38*	*0.37*	***0.03****

***interaction significant at α=0.05 significance level*
** interaction significant at α=0.10 significance level*

7.4.1. Summary of the Results

The following tables summarize the hypotheses tests' results that were derived from the Mann-Whitney U test and the ANOVA. While support was found for all hypotheses in the cereals product category, the majority of hypotheses was rejected for the snacks product category. A blue box indicates that the ANOVA interaction term was found to be significant.

Table 5: Overview Hypothesis Test Results

HYPOTHESIS		CEREALS	SNACKS
H1	**Health nudges in the online environment lead to healthier food choices.**		
H1a	Healthier choice labels in the online environment lead to healthier food choices.	✓	✖
H1b	Favorable positioning of healthier products in the online environment leads to healthier food choices.	✓	✖
H1c	Health slogans (prime) in the online environment lead to healthier food choices.	✓	✓
H2	**There are differences in the impact of health nudges between GER and DK consumers' food choices.**	✓	✖
H3	**Differences in product involvement have an impact on the effectiveness of health nudges.**	✓	✖
H4	**Differences in food choice motivation have an impact on the effectiveness of health nudges.**		
H4a	Differences in health motivation have an impact on the effectiveness of health nudges.	✓	✓
H4b	Differences in price motivation have an impact on the effectiveness of health nudges.	✓	✖
H4c	Differences in weight control motivation have an impact on the effectiveness of health nudges.	✓	✖
H5	**Demographic factors have an impact on the effectiveness of health nudges.**		
H5a	Gender has an impact on the effectiveness of health nudges.	✓	✖
H5b	Age has an impact on the effectiveness of health nudges.	✓	✖
H5c	Education has an impact on the effectiveness of health nudges.	✓	✖
H5d	Income has an impact on the effectiveness of health nudges.	✓	✓
H6	**Differences in product category (cereals and snacks) have an impact on the effectiveness of health nudges.**	✓	

✓ *supported* ✖ *rejected*

8. Discussion

The aim of this chapter is to discuss the most important findings, relate them to existing knowledge and thereby answer the study's RQs. This chapter follows the logic of the RQs by moving from a discussion of the overall effectiveness of the three health nudging interventions: health labels, product positioning and a prime slogan (RQ1) to country differences in the effectiveness (RQ2), and finally to the role of additional factors (RQ3). It also gives indications for the proposed framework (section 2.5).

8.1. Effectiveness of the Nudges

In answering RQ1, mixed results are found for H1 with regards to the effectiveness of nudges in the online environment. The three nudging interventions are discussed in order of their impact in the following.

The **prime** slogan shows the largest effects in both product groups and across countries. The potential of health primes discussed in previous research (Blumenthal-Barby & Burroughs, 2012; van Herpen & Trijp, 2011; Visschers et al., 2010) could also be confirmed by the study's findings for the online environment. In addition, the intervention shows that the majority of participants was able to distinguish between healthier and unhealthier products**.** Nonetheless, the findings should be viewed with caution for two reasons: Firstly, the slogans' wording (Q2d & Q3d: see Appendix II, a) might have been perceived more as an instruction than a subconscious cue by some respondents. Secondly, the long-term sustainability of this nudge should be considered, as people might be receptive to the prime message when being exposed to it for the first time, but once the message is no longer new to them or they are depleted, the nudge might not be as effective as before (Visschers et al., 2010). In order to continuously catch consumers' attention, wording, design and the product group should be adapted on an ongoing basis. Furthermore, potential implementation of primes in the form of popup windows or advertising banners on the product page could be examined.

Although not as salient as the results for the prime nudge, the **label** nudge yields significant improvements in respondents' cereals choices and a slight improvement in the healthiness score for snack products can be observed. These findings are in line with research conducted by van Herpen and Trijp (2011), who found that consumers require directive information to improve their food choices. Labels**,** like the one applied in this study**,** provide the consumer with objective information on the relative healthiness of the product. As Campos et al. (2011) highlight, for a label to be effective, it should be easy and understandable. Furthermore, it should enable people

without much nutritional knowledge to take healthy food choices, which can be assumed for this study's label based on the positive results. Since respondents were not familiar with the "healthier choice label" prior to the study and they did not receive any extensive introduction to its background, participants have most likely not established much trust in it. Trust is of utmost importance for a label's effectiveness (van Herpen & Trijp, 2011). Thus, it might appear surprising that the nudge has still shown considerable improvements in healthiness of food choices. Since in the actual shopping environment, consumers are often confused by the variety of labels (Grunert & Wills, 2007), a well-designed informational campaign which creates trust would be needed. This way, a label, such as the one applied in this study, could potentially create even more favorable outcomes.

Positive results found by previous studies on **positioning** of products in the offline and online environment (Breugelmans et al., 2007; Levy et al., 2012) can likewise be confirmed for the cereals product group in the present study. Consumers show rather low involvement when purchasing grocery products, rendering shelf effects especially relevant (Breugelmans et al., 2007). Despite the fact that the position nudge creates an improvement in the cereals category, it displays the weakest effect on the mean healthiness score, compared to the other nudges. For snacks, even a slight increase in making unhealthier choices was observable, possibly since most screens have likely shown all six products at once. Overall, the results are in line with Adam et al.'s (2017), who only found effects of positioning for individual products. The discovery that products on the first screen are more likely to be chosen (Breugelmans et al., 2007) can further be defined by this study's indications that positioning even on the first page shows effectiveness for certain product groups. Positioning certainly displays the most subconscious cue and might be applied for relevant product categories in combination with other nudges, for example primes, which is suggested by Wilson et al. (2016). Further, it would be interesting to know whether users have used their mobile devices or a computer/laptop for the experiment, since the effect of positioning might be different on the small mobile screen.

8.2. Comparison of German and Danish Consumers

As demonstrated in section 2.4, there are considerable differences in culture between Danes and Germans. This might well translate to differences in consumer behavior and people's perception of nudges. In answering RQ2, the findings suggest that the effectiveness of nudges differs noticeably between Danish and German consumers. Germans are more receptive to position and prime nudges in the cereals category, while for Danish respondents, the label nudge leads to a bigger change in mean healthiness score. The great difference in effectiveness of the health label might stem from the historical distrust of Germans in paternalism, which is less present in Danish

culture (Reisch et al., 2017). This distrust might make Germans more repellent towards following the pre-defined path and choosing products with a health label. In addition, Danes are already accustomed to the Keyhole Label as a sign of a healthy choice (Lassen et al., 2014), and a vast majority of respondents indicated to be familiar with the label (see Appendix IX, e). This may have transferred their knowledge of the Keyhole Label to this study's healthier choice label.

Although differences between the two nationalities are overall not as apparent in the snacks category, Danish respondents revert to slightly unhealthier snack choices in the label and position intervention, compared to the control group. Only the prime nudge leads to a significant improvement of the snack choices for both nationalities. The higher level of indulgence**,** as described by Hofstede's (2010) country-comparison model, suggests that Danes might be less controlling of their desires and impulses, which could explain why they would choose unhealthy snacks (often associated with indulgence), even if exposed to health nudges.

The significant difference of respondent's product preferences between the two countries might also impact the observed differences in effectiveness of the health nudges. Interestingly, Danish respondents choose considerably healthier products in all four experiment groups, with around half opting for the healthiest breakfast cereal choice, oats. This may be explained by oat-porridge (or grød) being a popular Danish breakfast (Denmark.dk, n.d.), while in Germany, it is not. In addition, German respondents indicated that they opted for more familiar products, which might imply that they are less likely to switch away from a familiar product, even if exposed to a health nudge (e.g. the healthier choice label in this case). Overall, the results highlight the fact that the effectiveness of nudges might not only be influenced by the consumer's cultural attitudes (e.g. German's distrust in paternalism), but also by local consumption habits of different products (e.g. Danish preference for breakfast oats).

8.3. Role of Additional Factors

Additional factors, which hold the potential to give valuable insights for effectively raising the healthiness of peoples' food choices, are examined within RQ3. In the following product involvement, food choice motivation and different demographics are discussed. Generally, more striking differences can be identified for the cereals group. As identified in H1, the prime nudge was the only intervention showing significant effects in the snacks product group. When analyzing additional factors' impact on the effectiveness of nudges for snacks, only little differences can be observed between various levels of product involvement, food choice motivation or the demographics for the three nudges. Therefore, the discussion will focus mainly on the differences observed in the cereals product group.

Product Involvement

The samples' mean product involvement score only indicates slight differences for cereals (43.30 out of 70) and snacks (42.04). Generally, people with high involvement in snacks made unhealthier choices in all four groups than those with lower involvement. For cereals, the trend is inverse: people who are more highly involved choose healthier products than those with low involvement. As shown in H3, respondents with lower involvement for cereals are effectively driven towards healthier food choices by all three nudges. In contrast, for people with higher involvement, none of the nudges show significant effects. This might be explained by people with higher involvement sticking to their favorite products, even if they are exposed to a health nudge. For snacks, the effects of nudges are similar to the ones found for H1, where only the prime nudge shows significant differences. While in the cereals product group respondents with lower involvement are more easily influenced in their decisions by the healthier choice label and product positioning, in the snacks product group, involvement does not seem to make a difference. Generally, more dominant nudges like the prime slogan might be needed to create an impact on the food choices of higher involved people.

Food Choice Motivation

The analysis of H4 shows that for snacks, there are no considerable differences between the effectiveness of nudges for people with low or high price and weight control motivation when making food choices. Only the results for the **health motive** indicate that the prime nudge is more effective for people with lower health motivation. Generally, respondents with lower health motivation opted for more unhealthy products in both product categories. For those who display low health motivation, the label nudge leads to considerably healthier cereals choices. This means that although these respondents may not look for healthy products in particular, a health label or a prime slogan might catch their attention and lead to healthier choices. People with higher health motivation at the outset already choose healthier products and their choices when being nudged do not become considerably healthier. When considering respondents' **price motivation**, the label is especially effective for high price motivation. In this case, the respondents possibly perceive the label as adding to the value of the product. Therefore, they might be more likely to choose them. Looking at respondents' **weight control motivation** when buying cereals, lower weight control makes the label nudge more effective, which is in line with the findings for the health motive. Respondents with a lower weight control motivation when making food choices take unhealthier choices than those with a high weight control motivation, except for the snacks prime treatment. For high weight control, only the position nudge leads to significant healthier cereals choices. Surprisingly, respondents with high health or weight control motivation are not

significantly influenced by the label nudge. They would be expected to pay particular attention to their nutrition and appreciate indications for healthier products. However, their food choices are already healthier overall than those of people with lower health and weight control motivation. As a consequence, they may not yield significant results.

Demographics

Within the scope of this study's third research question, the most common segmentation method of demographic consumer segments (Kotler et al., 2013) has been explored. This research revealed that certain nudges are especially effective for specific demographic segments. A higher level of education, for example, appears to be associated with a lower likelihood of obesity in developed countries (Sassi, Devaux, Church, Cecchini, & Borgonovi, 2009). This opens up the potential to segment towards individuals with lesser education when implementing nudges.

When looking at the differences between **genders**, nudges do not show any considerable effects for male respondents in either product group. Overall, males took less healthy food choices in all groups, and on average**,** took less healthy choices when exposed to the label and prime nudge in the cereals group, as well as the position nudge in the snacks product group. On the contrary, women take healthier food choices in the label and prime treatments. This can be explained by women's higher health consciousness, nutritional knowledge and their tendency to pay attention to a healthy nutrition (Frankfurter Rundschau, 2008), which could also explain the considerably larger proportion of women in this study, as the topic appears more attractive to them. This study's findings are in line with Arno and Thomas' (2016) argument that men and women respond differently to dietary interventions, thereby highlighting the importance of finding other ways to improve men's food choices.

When looking at the impact of health nudges on different **age** groups, all nudges are more effective for younger respondents from the group below 30 years. This might be explained by their potentially less pronounced shopping and nutrition habits. In general, older respondents show healthier choices across both products and all four experiment groups. Consequently, this age group may take their choices more consciously.

Regarding **education**, lower educated respondents take significantly healthier food choices in the label group compared to the control group. This is not the case for higher educated respondents. However, when respondents are less educated, the prime slogan does not yield a significant impact. In this case, people possibly do not possess enough knowledge to assess which products are healthier choices, whereas the label assumes this task. In line with this finding, lower **income** respondents show a significantly healthier food choice in the label group. This is not surprising,

since 84% of lower educated people are also in the lower income group. A critical point to be discussed in this context, is that most lower income and education respondents in this study are students and thus do not represent a cross section of the actual low income and education groups present in the whole population. This limits the generalizability of the findings. Further, some groups such as the higher income group only have a small number of respondents. As statistical power depends on the sample size, potentially no significant differences have been found in the higher income groups.

Overall, the segmentation of people along the dimensions (age, gender, education and income) creates a deeper understanding of which health nudges work most effectively for different consumer segments. Thanks to the ease of collecting customer data in the online environment, these segments could potentially be identified, thereby allowing for customized nudging techniques to be developed adapted to people's characteristics and preferences.

The Product Group

Products from both groups are regularly consumed by the majority of respondents, making them easily assessable for the context of this choice experiment. Although the product group has only been part of the additional factors considered within RQ3, the essential differences found for cereals and snacks impact the overall results of this research. Strong evidence was found for H6, since the three nudging interventions do not show the same impact for both product groups.

Interestingly, the effectiveness of the health nudges differed greatly between product groups. While all three nudging interventions were effective for cereals, in the snacks product category, only the prime slogan led to significantly healthier food choices. This could be explained by the different purposes consumers attach to the products (e.g. cereals associated with a main meal (breakfast), and snacks associated with an indulgence, an in-between meal or comfort food). People may care less about the nutritional benefits of snack products. Therefore, it is possible that consumers are less receptive to the subtler cues (positioning and label) and that it is more likely that they block out the negative nutritional attributes of unhealthier products.

Overall, the findings illustrate the importance of considering the product category as an essential factor when implementing health nudges. It is important to note, however, that the difference in effect could also have been caused by the different number of products presented to respondents in each product group (15 cereal products, 6 snacks)**.** Another reason might have been that the additional effort of scrolling down in the product selection was not necessary for snacks, since all options could be seen on one page.

8.4. The Online Setting

The present study could create new insights into the effectiveness and implementation of nudges in the online environment, which has not received much attention by researchers before. This is important because the overall online purchase intention has risen considerably over the last years and is expected to experience further growth (Morgan Stanley Research, 2016). A clear advantage of the online environment for the three nudging interventions suggested by this study are the flexibility, speed and low costs associated with implementing nudges in the online grocery setting. For instance, labels can be easily placed on the product images displayed in an online shop, which contrasts with the rather lengthy and costly process of printing labels on product packaging. Further, the online environment offers the possibility to implement a change in product positioning without much logistic effort. Additionally, filter options could be developed to ease consumers' search for healthier products. Further considering that people who shop online are frequently stressed for time (Pozzi, 2012), the label could serve as a fast decision aid by consumers.

Another interesting insight from the questionnaire is that non-directive nutritional tables are not frequently consulted by participants (see Appendix IX, d), which is in line with Benn et al., (2015), who find in the offline environment that consumers often already make their product choice after looking at the front of the package. Another reason for this might be that consumers today are often overloaded with information. As a consequence, many purchases are not preceded by information search and evaluation. Hence, information does not receive much attention by consumers (Olshavsky & Granbois, 1979). It is not clear from this study whether the lack of use of nutritional tables stems from the additional effort respondents have to make to access the nutritional table in the online shop (opening a new page, as typically the case in online shops), or from the fact that nutritional tables as non-directive labels are more difficult to understand for most consumers (van Herpen & Trijp, 2011). This leads to the assumption that nutritional tables in online shops do not cater to the majority. Other means to provide indications of the nutritional values of the products, such as labels placed directly on the products, should be found.

To sum up, health nudges in online settings hold the potential to positively influence consumers' food choices towards healthier ones. The online environment also displays a cost-efficient arena for nudging interventions and provides new possibilities, such as targeted customized nudging through data collected from the customer's account. While on the one hand, recent developments clearly point to a positive trend in online shopping, on the other hand, many consumers are still reluctant to shop online, mostly due to the difficulty in verifying the quality of products (Pozzi, 2012). Further, some consumers might perceive grocery shopping as a burden or chore and feel

time pressure, while others view it as an enjoyable activity and like to go to the shop themselves (Huang & Oppewalor, 2006). Taking this into consideration, future nudge research should be conducted in both, the online**,** as well as the offline environment, which still depicts the main channel for grocery sales.

9. Practical Implications

The present research contributes to identifying steps that can be taken by practitioners to change current food environments which do not promote healthy food choices (Wilson et al., 2016) towards more favorable ones. In the following, implications are provided for both policy makers as well as businesses.

9.1. Implications for Policy Makers

The first and most important implication from the study's results is that a "one fits all" nudging approach might be less effective than interventions targeted at specific groups. For this reason, consumers should be segmented according to nationality or even on a deeper level considering demographic factors, product involvement and food choice motivation. Although the prime slogan has shown to be the most effective method, its impact over time is unknown and needs further investigation. A healthier choice label would likely need support by a campaign to build trust among consumers. While the position nudge had the smallest effect, it should not be discarded yet, as its implementation probably does not require much effort and holds the potential for additional features, such as product filters according to healthiness, which could be further investigated. Overall, the online environment should be viewed as a field with much potential to design future-oriented health policy interventions: not only have the three nudges in this study's online shop environment shown effectiveness, but it also comes with low cost and flexibility for the implementation of health nudges. Capitalizing on this advantage, the online grocery shop environment's possibilities to collect data and optimally target nudges to consumers should be explored. Furthermore, the practical feasibility of the suggested nudges would have to be evaluated jointly with online retailers and food producers.

9.2. Implications for Businesses

The responsibility of finding solutions to fight obesity does not solely lie with policy makers. Food producers and retailers should not wait for regulations to step in, since they could contribute greatly by voluntarily implementing measures that drive consumers towards healthier choices.

Many supermarkets are already voluntarily engaging in positioning healthier products more favorably, potentially in an attempt to avoid harsher regulation (Reisch et al., 2017). Through such steps, supermarkets could raise their image among consumers. The German supermarket chain LIDL, for instance, shows commitment to the societal problem of unhealthy nutrition and cooperates with the nutritional campaign "5 a day" ("5 am Tag") (LIDL, 2016). Furthermore, loyalty card technology is already used to nudge consumers into healthier choices (Food Matters Live, 2013). Creating a choice environment, which is conductive to healthier food choices online could possibly be implemented at considerably lower costs than similar interventions in brick and mortar stores. Only small changes would be needed, such as positioning healthier products more favorably or creating a health prime message in a pop-up window. Finally, if a label such as this study's "healthier choice" label were introduced, food producers might need to consider changing the composition of their products to receive a more attractive nutritional label and thereby become more attractive for consumers (Galizzi, 2012).

10. Future Research

This exploratory study conducted under the umbrella of the Nudge-it project created insights into the effectiveness of nudges in the online environment across two countries and could serve as a basis for future, larger scale research projects. Eight potential ideas for these will be outlined in the following.

First, future studies should be conducted with a larger, representative sample to make results generalizable to other contexts. Larger-scale studies should then also contemplate excluding people who do not consume the products in an attempt to get a more realistic picture. Second, since the present study only focused on a bi-country comparison, in the future, additional countries could be investigated, potentially on the EU scale. Thereby, similarities and differences in various countries could be identified to optimally target people and introduce interventions that are effective for the majority of consumers. Third, a longitudinal design would allow for measurement of whether the nudging interventions show sustainable results over time. This would be especially relevant for the prime slogans like the one tested in this study, as it has been highly effective in this one-time measurement. However, its effects might fade if consumers are repeatedly exposed to it. Fourth, testing a combination of different nudges, as a label and a health prime, for instance, would create insights whether the combination of the nudges yields stronger effects than a single nudge. In this context, Thorndike et al. (2012), discover that the manipulation of food and beverage placement (increasing visibility and convenience) enhanced the

effectiveness of previously implemented labels. Fifth, additional demographic factors, such as ethnicity or the urban vs. rural divide, could be taken into consideration for future studies. Furthermore, relevant subgroups, such as individuals with lower education, could be part of a focused test of the effectiveness of nudges within this subgroup. Sixth, through an extension of the product choice set, a more realistic setting of an online shop could be tested: the supermarket REWE in Germany displays around 200 breakfast cereal products (REWE, 2017), for instance. Eighth, in this study, participants were only exposed to nudges in two different product groups (breakfast cereals and sweet snacks). Nevertheless, different levels of effectiveness for the same nudge in each product group have been found. Comparable choice sets of cereals and snack products from both countries have been found for this study, which endorses the use of these product groups in future studies. However, further product groups such as dairy products or salty snacks could be examined. A final consideration would be to include the price of the products to test whether interdependencies exist between the prices of the products and nudges and thereby draw conclusions from a more genuine purchase setting.

11. Limitations

While some critical points have already been discussed in chapter 5, this section broaches the issue of the research's more general shortcomings, thereby affecting the results of the study. First and foremost, time and resource constraints of the project considerably limit its generalizability, thus, due to the small convenience sample, the study's results cannot be transferred to different contexts. Second, the small sample size also limits the power of the statistical tests and a meaningful testing of statistical differences between groups. Third, the development over time is disregarded in the study, thus it displays a snapshot of participants' behavior and opinions at one point in time. A fourth consideration is the artificial setting of the study, in which respondents' choices might not reflect their choice in an actual purchase situation. This displays a general issue of choice experiments, in which consumers are usually faced with the decision *which* product to buy, whereas in reality they would often rather decide whether to buy or not (Lusk & Tonsor, 2015). Fifth, some factors could not be controlled for, including brand preferences or familiarity with specific products, prices of the products or familiarity with the store itself. These might evoke habitual behavior and could potentially change the outcome of the study. A final limitation is that only one parameter should have been changed in the choice experiment between the two choice settings (either the product category or the number of products). Thereby, a direct comparison of the effect of changes in product category or number of products would have been possible.

12. Conclusion

Already around two decades ago, Nestle and Jacobson (2000) warned about obesity by stating: "without such a national commitment and effective new approaches to making the environment more favorable to maintaining healthy weight, we doubt that the current trend [toward inactivity and obesity] can be reversed" (p.23). This study has been conducted with the overall goal to explore some of these new approaches, which aim to make the healthy choice the easy choice for consumers. In doing so, the following three RQs were examined through a carefully designed online choice experiment and questionnaire:

RQ1: Are health nudges, in particular labels, positioning and priming effective in driving Danish and German consumers' choices towards healthier food in an online grocery shop environment?

RQ2: Are there any differences in the effectiveness of these health nudges between Danish and German consumers?

RQ3: What are potential factors influencing the effectiveness of health nudges on food choices?

With regards to **RQ1**, the three nudges positively impacted the healthiness of participants' food choices, with the prime slogan showing the greatest effect, followed by the healthier choice label and the favorable positioning of healthier products. This suggests a positive influence of the three nudges on healthiness of food choice as displayed in the framework proposed in section 2.5. A differentiation should be made for the two product groups: while for breakfast cereals, all nudges significantly raise the healthiness of the respondents' choices, for snacks, only the prime nudge leads to a significant change towards healthier food choices. In examining **RQ2**, significant differences have been found in the effectiveness of nudges between German and Danish respondents, with mixed evidence for the two product categories. This implies that nudging interventions might be more effective if adapted to national culture and eating habits. The influence of nationality is thus confirmed for the study's framework. Finally, responding to **RQ3**, the product category emerges as a decisive factor for the effectiveness of nudges. Furthermore, for respondents with different levels of product involvement and food choice motivation, the effectiveness of the nudges varies. Respondents with a low motivation of weight control, for example, showed a very positive reaction to the presented label nudge. Different demographic groups also respond differently to the three nudging interventions. Yet, most of the time these differences are only present in the cereals product category. Therefore, it is suggested to examine the framework separately for each product category in the future. Although the use of behaviorally informed tools, such as nudges, has been increasing (Reisch et al., 2017), the importance to find evidence of the effectiveness of these tools should not be neglected. The results of this pilot study pave the road for more in-depth future research.

List of References

Acock, A. C. (2006). *A Gentle Introduction to Stata*. Stata Press.

Adam, A., Jensen, J. D., Sommer, I., & Hansen, G. L. (2017). Does shelf space management intervention have an effect on calorie turnover at supermarkets? *Journal of Retailing and Consumer Services*, *34*, 311–318. https://doi.org/10.1016/j.jretconser.2016.07.007

Amazon. (n.d.). Amazon Fresh. Retrieved April 13, 2017, from https://www.amazon.com/p/feature/tvannkowwtff9zo

Arno, A., & Thomas, S. (2016). The efficacy of nudge theory strategies in influencing adult dietary behaviour: a systematic review and meta-analysis. *BMC Public Health*, *16*(1), 676. https://doi.org/10.1186/s12889-016-3272-x

Aschemann-Witzel, J., Grunert, K. G., van Trijp, H., Bialkova, S., Raats, M. M., Hodgkins, C., … Koenigstorfer, J. (2013). Effects of nutrition label format and product assortment on the healthfulness of food choice. *Appetite*, *71*, 63–74. https://doi.org/10.1016/j.appet.2013.07.004

Bailey, R., & Harper, D. R. (2015). Reviewing Interventions for Healthy and Sustainable Diets, (May). Retrieved from http://www.isags-unasur.org/uploads/biblioteca/7/bb[327]ling[3]anx[1100].pdf

BBC. (2016). Food "traffic light" labelling should be mandatory, councils say. Retrieved April 10, 2017, from http://www.bbc.com/news/health-37389804

Benn, Y., Webb, T. L., Chang, B. P. I., & Reidy, J. (2015). What information do consumers consider, and how do they look for it, when shopping for groceries online? *Appetite*, *89*, 265–273. https://doi.org/10.1016/j.appet.2015.01.025

Berenson, M. L., Levine, D., & Szabat, K. A. (2015). *Basic Business Statistics*. Pearson Education Limited.

Blumberg, B. F., Cooper, D. R., & Schindler, P. S. (2014). *Business Research Methods*. London: McGraw-Hill Education.

Blumenthal-Barby, J. S., & Burroughs, H. (2012). Seeking Better Health Care Outcomes: The Ethics of Using the "nudge." *The American Journal of Bioethics*, *12*(2), 1–10. https://doi.org/10.1080/15265161.2011.634481

BMEL. (2017). EU-weit einheitliche Lebensmittel-Kennzeichnung. Retrieved April 8, 2017, from http://www.bmel.de/DE/Ernaehrung/Kennzeichnung/_Texte/DossierKennzeichnung.html?docId=431912

Breugelmans, E., & Campo, K. (2011). Effectiveness of In-Store Displays in a Virtual Store Environment. *Journal of Retailing*, *87*(1), 75–89. https://doi.org/10.1016/j.jretai.2010.09.003

Breugelmans, E., Campo, K., & Gijsbrechts, E. (2007). Shelf sequence and proximity effects on online grocery choices. *Marketing Letters*, *18*(1–2), 117–133. https://doi.org/10.1007/s11002-006-9002-x

Bryman, A., & Bell, E. (2015). *Business Research Methods* (4th ed.). Oxford University Press.

Bucher, T., Collins, C., Rollo, M. E., McCaffrey, T. A., De Vlieger, N., Van der Bend, D., … Perez-Cueto, F. J. A. (2016). Nudging consumers towards healthier choices: a systematic review of positional influences on food choice. *The British Journal of Nutrition*, *115*(12), 2252–63. https://doi.org/10.1017/S0007114516001653

Campos, S., Doxey, J., & Hammond, D. (2011). Nutrition labels on pre-packaged foods: a systematic review. *Public Health Nutrition*, *14*(8), 1496–1506. https://doi.org/10.1017/S1368980010003290

Capacci, S., Mazzocchi, M., Shankar, B., Brambila Macias, J., Verbeke, W., Pérez-Cueto, F. J., … Traill, W. B. (2012). Policies to promote healthy eating in Europe: A structured review of policies and their effectiveness. *Nutrition Reviews*, *70*(3), 188–200. https://doi.org/10.1111/j.1753-4887.2011.00442.x

Cawley, J., & Hall, M. (2010). The Medcial Care Costs of Obesity: An Instrumental Variables Approach. *National Bureau of Economic Research, Working Pa*. https://doi.org/10.3386/w16467

Cooper, R. R., & Schindler, P. S. (2008). *Business Research Methods* (10th ed.). New York: McGraw-Hill Higher Education.

Corstjens, M., & Corstjens, J. (1995). *Store wars: the battle for mindspace and shelfspace*. Chichester: Wiley.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks: SAGE Publications, Inc.

Danmarks Statistik. (2017). FERTILITETEN STEG FOR TREDJE ÅR I TRÆK. Retrieved April 20, 2017, from http://www.dst.dk/da/Statistik/nyt/NytHtml?cid=23528

De Vaus, D. (2014). *Surveys in Social Research* (6th ed.). New York: Routledge.

Degeratu, A. M., Rangaswamy, A., & Wu, J. (2000). Consumer choice behavior in online and traditional supermarkets: The effects of brand name, price, and other search attributes. *International Journal of Research in Marketing*, *17*(1), 55–78. https://doi.org/10.1016/S0167-8116(00)00005-7

Demarque, C., Charalambides, L., Hilton, D. J., & Waroquier, L. (2015). Nudging sustainable consumption:The use of descriptive norms to promote a minority behavior in a realistic online shopping environment. *Journal of Environmental Psychology*, *43*, 166–174. https://doi.org/10.1016/j.jenvp.2015.06.008

Denmark.dk. (n.d.). Food & Drink. Retrieved May 6, 2017, from http://denmark.dk/en/lifestyle/food-drink/

Devaux, M., Sassi, F., Church, J., Cecchini, M., & Borgonovi, F. (2011). Exploring the Relationship Between Education and Obesity. *OECD Journal: Economic Studies*, *2011*.

Die Zeit. (2014). Ihre nächsten zehn Jahre. Retrieved April 10, 2017, from http://www.zeit.de/zeit-wissen/2014/06/generation-zukunft-altersgruppen-unterschiede/seite-4

DIW. (2012). Medianeinkommen. Retrieved March 2, 2017, from http://www.diw.de/de/diw_01.c.413351.de/presse/diw_glossar/medianeinkommen.html

Dobbs, R., Sawers, C., Thompson, F., Manyika, J., Woetzel, J., Child, P., … Spatharou, A. (2014). Overcoming obesity : An initial economic analysis. *McKinsey Global Institute*, (November), 120.

Downs, J. S., Loewenstein, G., & Wisdom, J. (2009). Strategies for promoting healthier food choices. *American Economic Review*, *99*(2), 159–164. https://doi.org/10.1257/aer.99.2.159

Drèze, X., Hoch, S. J., & Purk, M. E. (1994). Shelf management and space elasticity. *Journal of Retailing*, *70*(4), 301–326. https://doi.org/10.1016/0022-4359(94)90002-7

European Commission. (2017). Food information to consumers - legislation. Retrieved April 8, 2017, from http://ec.europa.eu/food/safety/labelling_nutrition/labelling_legislation_en

Eurostat. (2017). Mean and median income by age and sex - EU-SILC survey. Retrieved February 23, 2017, from http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_di03&lang=en

Feilzer, M. (2009). Doing Mixed Methods Research Pragmatically: Implications for the Rediscovery of Pragmatism as a Research Paradigm. *Journal of Mixed Methods Research*, *4*(1), 6–16. https://doi.org/10.1177/1558689809349691

Field, A., & Hole, G. (2003). *How to Design and Report Experiments*. SAGE Publications.

Flick, U. (2014). *An Introduction to Qualitative Research*. Los Angeles: SAGE.

Food Matters Live. (2013). Promoting healthy choices: The role of supermarkets in improving diet and public health. Retrieved May 10, 2017, from https://www.foodmatterslive.com/news-and-comment/comment/promoting-healthy-choices-the-role-of-supermarkets-in-improving-diet-and-public-health

Frankfurter Rundschau. (2008). Frauen leben gesünder als Männer. Retrieved May 7, 2017, from http://www.fr.de/sport/ernaehrung-frauen-leben-gesuender-als-maenner-a-1158220

French, J. (2013). Social business , social behaviour and social marketing : Three cornerstones of. *Social Business*, *3*(4), 285–296. https://doi.org/10.1362/204440813X13875569153948

Galizzi, M. M. (2012). Label, nudge or tax? A review of health policies for risky behaviors. *Journal of Public Health Research*, *1*, 14–21. https://doi.org/10.4081/jsas.2013.23

Goodwin, T. (2012). Why We Should Reject "Nudge." *Politics*, *32*(2), 85–92. https://doi.org/10.1111/j.1467-9256.2012.01430.x

Grunert, K. G., & Wills, J. M. (2007). A review of European research on consumer response to nutrition information on food labels. *Journal of Public Health*, *15*(5), 385–399. https://doi.org/10.1007/s10389-007-0101-9

Hand, C., Dall'Olmo Riley, F., Harris, P., Singh, J., & Rettie, R. (2009). Online grocery shopping: the influence of situational factors. *European Journal of Marketing*, *43*(9/10), 1205–1219. https://doi.org/10.1108/03090560910976447

Hansen, P. G. (2016). What is Nudging? Retrieved April 14, 2017, from https://behavioralpolicy.org/what-is-nudging/

Hansen, P. G., & Jespersen, A. M. (2013). Nudge and the Manipulation of Choice. *European Journal of Risk Regulation*, *1*, 3–28. https://doi.org/10.2307/2489305

Hertwig, R. (2016). Damit kehrt man der Aufklärung den Rücken. *Max Planck Forschung*. Retrieved from https://bc.pressmatrix.com/de/profiles/b3b32e362f93/editions/0c0a523868a679c629d1/pages/page/4

Hofstede, G. (1991). *Cultures and Organizations: Software of the mind*. McGraw Hill Book Company Europe.

Hofstede, G. (2010). Germany. https://doi.org/10.1093/oxfordhb/9780199585762.013.0019

Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind*. New York: McGraw-Hill.

Hoyer, W. D. (1984). An Examination of Consumer Decision Making for a Common Repeat Purchase Product. *Journal of Consumer Research*, *11*(3), 822–829.

Hoyer, W. D., & MacInnis, D. J. (2010). *Consumer Behavior* (5th ed.). New York: Houghton Mifflin Company.

Huang, Y., & Oppewal, H. (2006). Why consumers hesitate to shop online. *International Journal of Retail & Distribution Management*, *34*(4/5), 334–353. https://doi.org/10.1108/09590550610660260

Huang, Y., & Oppewalor, H. (2006). Why consumers hesitate to shop online: An experimental choice analysis of grocery shopping and the role of delivery fees. *International Journal of Retail & Distribution Management*, *34*(4/5), pp.334-353. https://doi.org/10.1108/09590550610660260

Hubschmid, M. (2017). Warum Amazon Fresh bald in Deutschland starten könnte. Retrieved April 13, 2017, from http://www.tagesspiegel.de/wirtschaft/lebensmittel-lieferdienst-warum-amazon-fresh-bald-in-deutschland-starten-koennte/19537402.html

INSEE. (2016). Consumption Unit. Retrieved March 1, 2017, from https://www.insee.fr/en/metadonnees/definition/c1802

Junghans, A. F., Cheung, T. T. L., & De Ridder, D. D. . (2015). Under consumers' scrutiny - an investigation into consumers' attitudes and concerns about nudging in the realm of health behavior. *BMC Public Health*, *15*(1), 1–13. https://doi.org/10.1186/s12889-015-1691-8

Kahneman, D. (2011). *Thinking, Fast and Slow*. Farrar, Straus and Giroux.

Kotler, P., Armstrong, G., Harris, L. C., & Piercy, N. (2013). *Principles of Marketing* (6th Europe). Pearson Education Limited.

Lassen, A. D., Beck, A., Leedo, E., Andersen, E. W., Christensen, T., Mejborn, H., … Tetens, I. (2014). Effectiveness of offering healthy labelled meals in improving the nutritional quality of lunch meals eaten in a worksite canteen. *Appetite*, *75*, 128–134. https://doi.org/10.1016/j.appet.2013.12.005

Levy, D. E., Riis, J., Sonnenberg, L. M., Barraclough, S. J., & Thorndike, A. N. (2012). Food Choices of Minority and Low-Income Employees. *AMEPRE*, *43*(3), 240–248. https://doi.org/10.1016/j.amepre.2012.05.004

LIDL. (2016). Verein "5 am Tag" und Lidl setzen bewusste Ernährung auf den Stundenplan. Retrieved May 5, 2017, from http://www.presseportal.de/pm/58227/3479131

Lobstein, T., & Davies, S. (2009). Defining and labelling "healthy" and "unhealthy" food. *Public Health Nutrition*, *12*(3), 331–40. https://doi.org/10.1017/S1368980008002541

Loewenstein, G., Bryce, C., Hagmann, D., & Rajpal, S. (2015). Warning: You Are About to be Nudged. *Behavioral Science & Policy*, *1*(11), 35–42. https://doi.org/10.2139/ssrn.2417383

Lusk, J. L., & Tonsor, G. T. (2015). How Meat Demand Elasticities Vary with Price, Income, and Product Category Jayson L. Lusk and Glynn T. Tonsor * September 2, 2015 forthcoming in Applied Economic Perspectives and Policy.

Malhotra, N. K., Birks, D. F., & Wills, P. (2012). *Marketing Research: An applied Approach*. Harlow, England: Pearson.

Minkov, M., & Hofstede, G. (2012). *Cross-cultural analysis: the science and art of comparing the world's modern societies and their cultures.* Sage.

Morgan Stanley Research. (2016). Are Groceries the Next Big Driver of Global eCommerce? Retrieved April 9, 2017, from https://www.morganstanley.com/ideas/online-groceries-could-be-next-big-ecommerce-driver

Nestle, M., & Jacobson, M. F. (2000). Halting the obesity epidemic: A Public Health policy approach. *Public Health Reports*, *115*(1), 12–24. https://doi.org/10.1093/phr/115.1.12

Nielsen. (2015). The Future of Grocery. *Nielsen Global E-Commerce and The New Retail Report*, *360*(1797), 1–35. https://doi.org/10.1017/CBO9781107415324.004

Nudge-it. (2017). Project Overview. Retrieved from http://www.nudge-it.eu/project-overview.html

Pelsmacker, P. de, Geuens, M., & Bergh, J. van den. (2013). *Marketing communications: a European perspective* (5th ed.). Harlow, England: Pearson.

Pérez-Cueto, F. J. a, Aschemann-Witzel, J., Shankar, B., Brambila-Macias, J., Bech-Larsen, T., Mazzocchi, M., … Verbeke, W. (2012). Assessment of evaluations made to healthy eating policies in Europe: a review within the EATWELL Project. *Public Health Nutrition*, *15*(8), 1489–96. https://doi.org/10.1017/S1368980011003107

Peter Kölln GmbH & Co. KGaA. (n.d.). Kölln Müsli Knusper Joghurt Himbeer "30% weniger Fett." Retrieved April 13, 2017, from https://www.koelln.de/produkte/mueslis/koelln-muesli-knusper-joghurt-himbeer-30-weniger-fett/

Pozzi, A. (2012). Shopping Cost and Brand Exploration in Online Grocery. *American Economic Journal*, *4*(3), 96–120.

Rayner, M. (2007). Social marketing: How might this contribute to tackling obesity? *Obesity Reviews*, *8*(SUPPL. 1), 195–199. https://doi.org/10.1111/j.1467-789X.2007.00341.x

Rayner, M., Scarborough, P., & Stockley, L. (2004). Nutrient profiles : Options for definitions for use in relation to food promotion and children ' s diets Final report, (October), 196.

Reisch, L. A., & Sunstein, C. R. (2016). Do Europeans Like Nudges? *Judgement and Decision Making*, *11*(4), 310–325. https://doi.org/http://dx.doi.org/10.2139/ssrn.2739118

Reisch, L. A., Sunstein, C. R., & Gwozdz, W. (2017). Beyond carrots and sticks: Europeans support health nudges. *Food Policy*, *69*, 1–10. https://doi.org/http://dx.doi.org/10.1016/j.foodpol.2017.01.007

REWE. (2017). REWE Cerealien & Müsli. Retrieved May 1, 2017, from https://shop.rewe.de/productList?search=&sorting=RELEVANCE&startPage=&selectedFacets=category%3DNahrungsmittel%2FCerealien%2520%2526%2520M%25C3%25BCsli

Riebl, S. K., Estabrooks, P. A., Dunsmore, J. C., Savla, J., Frisard, M. I., Dietrich, A. M., … Davy, B. M. (2015). A systematic literature review and meta-analysis: The Theory of Planned Behavior's application to understand and predict nutrition-related behaviors in youth. *Eating Behaviors*, *18*, 160–178. https://doi.org/10.1016/j.eatbeh.2015.05.016

Rindfleisch, A., Malter, A. J., Ganesan, S., & Moorman, C. (2008). Cross-Sectional Versus Longitudinal Survey Research: Concepts, Findings, and Guidelines. *Journal of Marketing Research*, *45*(3), 261–279. https://doi.org/10.1509/jmkr.45.3.261

Sacks, G., Tikellis, K., Millar, L., & Swinburn, B. (2011). Impact of "traffic-light" nutrition information on online food purchases in Australia. *Australian and New Zealand Journal of Public Health*, *35*(2), 122–126. https://doi.org/10.1111/j.1753-6405.2011.00684.x

Sassi, F., Devaux, M., Church, J., Cecchini, M., & Borgonovi, F. (2009). Education and obesity in four OECD countries. *OECD Health Working Papers*, *46*(39). https://doi.org/10.1787/223688303816

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2015). *Research Methods for Business Students* (7th ed.). Pearson Education Limited.

Schröder, M., & Lyon, P. (2014). Embedding healthy eating: nudging or toolbox? *Nutrition & Food Science*, *43*(4), 330–338. https://doi.org/10.1108/NFS-03-2012-0028

Solomon, M., Bamossy, G., & Askegaard, S. (2001). *Konsumentenverhalten. Der europäische Markt*. Munich: Pearson Studium.

Solomon, M. R. (2009). *Marketing: Real People, Real Decisions.* Harlow, England: Pearson.

Statista. (2017). Share of internet users in selected countries in Europe in 2015. Retrieved April 18, 2017, from https://www-statista-com.esc-web.lib.cbs.dk:8443/statistics/422753/internet-reach-share-of-users-by-country-europe/

Statistisches Bundesamt. (2017). Alter der Mutter. Retrieved April 20, 2017, from https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/Bevoelkerung/Geburten/Tabellen/GeburtenMutterAlterBundeslaender.html

Steptoe, A., Pollard, T. M., & Wardle, J. (2013). Development of a Measure of the Motives Underlying the Selection of Food : the Food Choice Questionnaire Department of Psychology , St George ' s Hospital Medical School , London, 267–284.

Stevens, J. J. (1999). *Interaction Effects in ANOVA.* Retrieved from http://pages.uoregon.edu/stevensj/interaction.pdf

Sullivan, G. M., & Feinn, R. (2012). Using Effect Size—or Why the P Value Is Not Enough. *Journal of Graduate Medical Education*, *4*(3), 279–282. https://doi.org/http://doi.org/10.4300/JGME-D-12-00156.1

Sunstein, C. R. (2014). Nudging: A Very Short Guide. *Journal of Consumer Policy*, *37*(4), 583–588. https://doi.org/10.1007/s10603-014-9273-1

Sunstein, C. R. (2016). Fifty Shades of Manipulation. *Journal of Marketing Behavior*, *1*(3–4), 214–244. https://doi.org/10.1561/107.00000014

Sunstein, C. R., & Thaler, R. H. (2003). Libertarian Paternalism Is Not an Oxymoron. *The University of Chicago Law Review*, *70*(4), 1159–1202.

Syndy. (2015). *The State of Online Grocery Retail in Europe*.

Tashakkori, A., & Teddlie, C. (2010). *Sage handbook of mixed methods in social & behavioral research* (Second Edi). Los Angeles: SAGE.

Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving Decisions about Health, Wealth, and Happiness*. Yale University Press.

Thorndike, A. N., Sonnenberg, L., Riis, J., Barraclough, S., & Levy, D. E. (2012). A 2-phase labeling and choice architecture intervention to improve healthy food and beverage choices. *American Journal of Public Health*, *102*(3), 527–533. https://doi.org/10.2105/AJPH.2011.300391

Traylor, M. B., & Joseph, W. B. (1984). Measuring consumer involvement in products: Developing a general scale. *Psychology and Marketing*, *1*(2), 65–77. https://doi.org/10.1002/mar.4220010207

UNESCO. (2013). *The International Standard Classification of Education 2011*. *Comparative Social Research*. https://doi.org/10.1108/S0195-6310(2013)0000030017

Usunier, J.-C. (1998). *International and Cross-Cultural Management Research*. Sage Publications Ltd.

van Herpen, E., & Trijp, H. C. M. van. (2011). Front-of-pack nutrition labels. Their effect on attention and choices when consumers have varying goals and time constraints. *Appetite*, *57*(1), 148–160. https://doi.org/10.1016/j.appet.2011.04.011

van Trijp, H., Brug, J., & Maas, van der R. (2005). *Consumer determinants and intervention strategies for obesity prevention*. *Food, Diet and Obesity*. Woodhead Publishing Limited. https://doi.org/10.1533/9781845690540.3.331

Visschers, V. H. M., Hess, R., & Siegrist, M. (2010). Health motivation and product design determine consumers' visual attention to nutrition information on food products. *Public Health Nutr*, *13*(7), 1099–1106. https://doi.org/10.1017/s1368980009993235

Vyth, E. L., Steenhuis, I. H. M., Vlot, J. a, Wulp, A., Hogenes, M. G., Looije, D. H., … Seidell, J. C. (2010). Actual use of a front-of-pack nutrition logo in the supermarket: consumers' motives in food choice. *Public Health Nutrition*, *13*(11), 1882–1889. https://doi.org/10.1017/S1368980010000637

VZBV. (2016). EU-Lebensmittel-Informationsverordnung: wichtige Änderungen im Überblick. Retrieved April 8, 2017, from http://www.lebensmittelklarheit.de/informationen/die-neue-lebensmittelinformationsverordnung

Walsh, D. (2014). Can priming a healthy eating goal cause depleted consumers to prefer healthier snacks ? *Journal of Consumer Marketing*, *3*, 1–24. https://doi.org/10.1108/JCM-09-2013-0697

Wansink, B. (2004). Environmental Factors That Increase the Food Intake and Consumption Volume of Unknowing Consumers *. *Annu. Rev. Nutr*, *24*(217), 455–79. https://doi.org/10.1146/annurev.nutr.24.012003.132140

Wansink, B., & Hanks, A. S. (2013). Slim by Design: Serving Healthy Foods First in Buffet Lines Improves Overall Meal Selection. *PLoS ONE*, *8*(10), 1–5. https://doi.org/10.1371/journal.pone.0077055

Wansink, B., Painter, J. E., & Lee, Y.-K. (2006). The office candy dish: proximity's influence on estimated and actual consumption. *International Journal of Obesity*, *30*(5), 871–875. https://doi.org/10.1038/sj.ijo.0803217

WHO. (1986). The Ottawa Charter for Health Promotion. Retrieved March 29, 2017, from http://www.who.int/healthpromotion/conferences/previous/ottawa/en/index1.html

WHO. (2014). Global Health Observatory (GHO) data. Retrieved March 18, 2017, from http://www.who.int/gho/ncd/risk_factors/overweight/en/

WHO. (2016). Obesity and overweight. Retrieved March 15, 2017, from http://www.who.int/mediacentre/factsheets/fs311/en/

Wilson, A. L., Buckley, E., Buckley, J. D., & Bogomolova, S. (2016). Nudging healthier food and beverage choices through salience and priming. Evidence from a systematic review. *Food Quality and Preference*, *51*, 47–64. https://doi.org/10.1016/j.foodqual.2016.02.009

Zaichkowsky, J. L. (1985). Measuring the Involvement Construct. *Journal of Consumer Re*, *12*(3), 341–352.

Zaichkowsky, J. L. (1986). Conceptualizing Involvement. *Journal of Advertising*, *15*(2), 4–34. https://doi.org/10.1080/00913367.1986.10672999

Zaichkowsky, J. L. (1994). The Personal Involvement Inventory: Reduction, Revision, and Application to Advertising. *Journal of Advertising*, *23*(4), 59–70. https://doi.org/10.1080/00913367.1943.10673459

Appendix

Appendix I: List of Abbreviations

The following abbreviations are used throughout the study to reduce complexity in the flow of the text for the reader.

BMI	body-mass-index
CBS	Copenhagen Business School
CU	consumption unit
DIW	Deutsches Institut für Wirtschaftsforschung e.V.
DK	Denmark
EU	European Union
FCQ	food choice questionnaire
FOP	front-of-package
g	grams
GDA	Guideline Daily Amount
GER	Germany
H	hypothesis
INSEE	Institut National de la Statistique et des Etudes Economiques
ISCED	International Standard Classification of Education
MTL	multiple-traffic-light
mg	milligrams
NMES	non-milk extrinsic sugars
PI	product involvement
PII	Personal Involvement Inventory
Q	question
RQ	research question
UK	United Kingdom
US	United States
VZBV	Bundesverband der Verbraucherzentralen und Verbraucherverbände - Verbraucherzentrale Bundesverband e.V.
WHO	World Health Organization

Appendix II: Questionnaire

Please note the following:

The questionnaire for this study was designed for the online tool Qualtrics. Therefore, the subsequent version does not reflect the actual online design of the questionnaire which was presented to participants. In Q2 and Q3 respondents were randomly assigned to one of four treatment arms (*a - control, b - label, c - position, d – prime*). The English questionnaire shows examples of both, German and Danish product pictures to illustrate the choice experiment for the two countries. In the following, product images are only displayed for the label and position treatment. For the control and prime treatment, these images were shown in randomized order.

a English Questionnaire

Q1 Dear participant, welcome to this survey. In order to provide you with a country-specific version of the questionnaire, please answer the following question: Where are you from?

- ❍ Germany
- ❍ Denmark
- ❍ Other countries

In case "other countries" is selected:

Thank you for your participation. Unfortunately, this survey is only relevant to Danes and Germans, so you cannot continue at this point. Have a nice day.

Best regards, Elena

Dear participant,

Welcome and thank you in advance for taking part in this study. I am conducting this survey as part of my Master thesis at Copenhagen Business School. Please make sure to read all questions carefully and to answer as precisely and honestly as possible. The estimated time to complete this survey is less than 10 minutes. Once you have successfully reached the end of the questionnaire, you have the opportunity to win a (GER) 25€ voucher for MyMuesli / (DK) surprise superfoods package by Taste Nature worth 180dkk.

All data collected will be kept confidential and will only serve research purposes. Your responses will be anonymized and analyzed according to the legal requirements of data protection.

Please click the ">>" Button at the end of the questionnaire, to ensure your answers are saved.

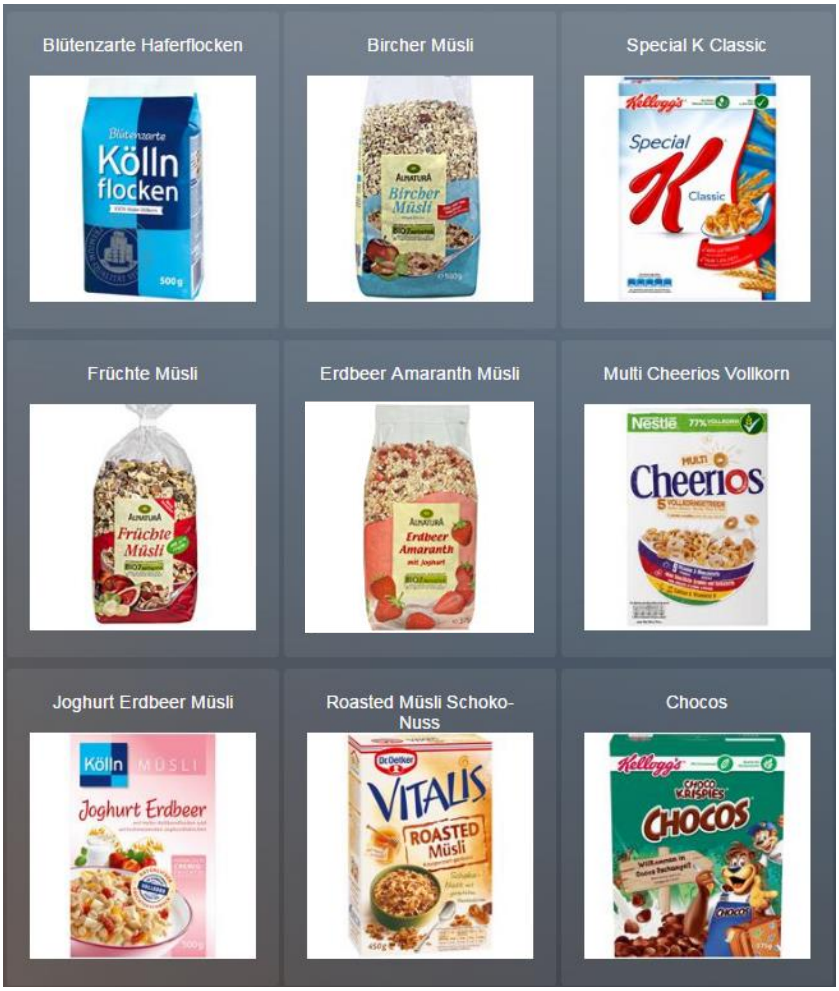
Best regards,

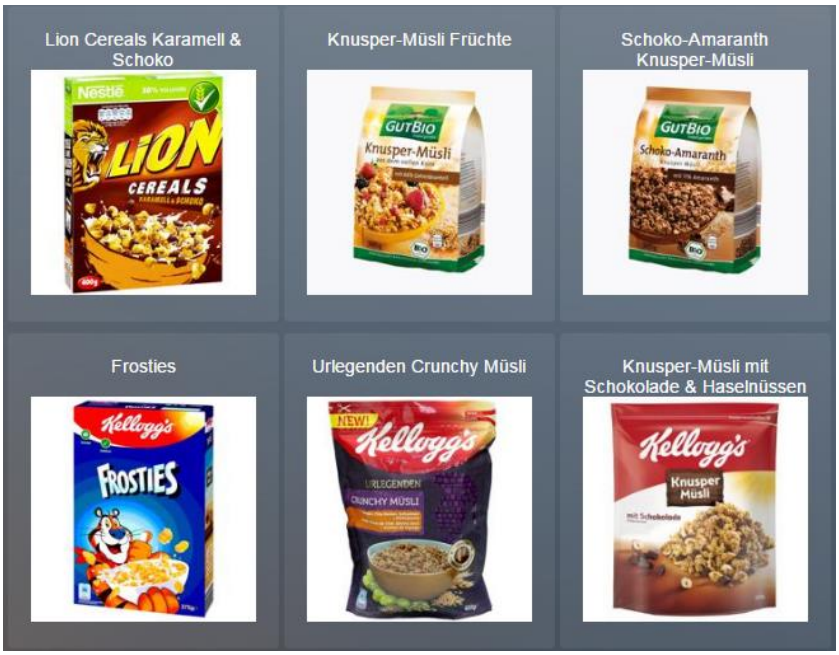
Elena Fahrländer (e-mail: elfa15ad@student.cbs.dk)

Q2a Please imagine the following situation. You are doing grocery shopping online and would like to buy your preferred breakfast cereals. Below you see different breakfast cereals in the online shop. Please make your choice of one product as you would do in this situation.

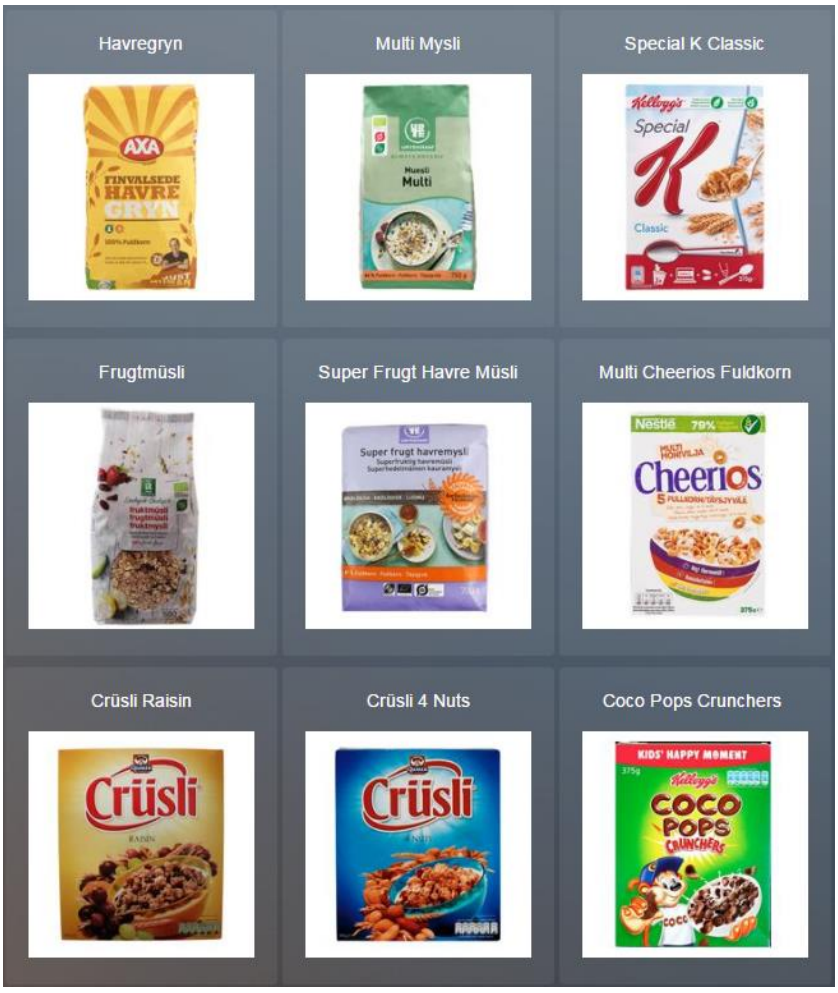
Please note:
1) You can choose the product by clicking on the product name.
2) Nutritional values of the products appear when clicking on the product image.

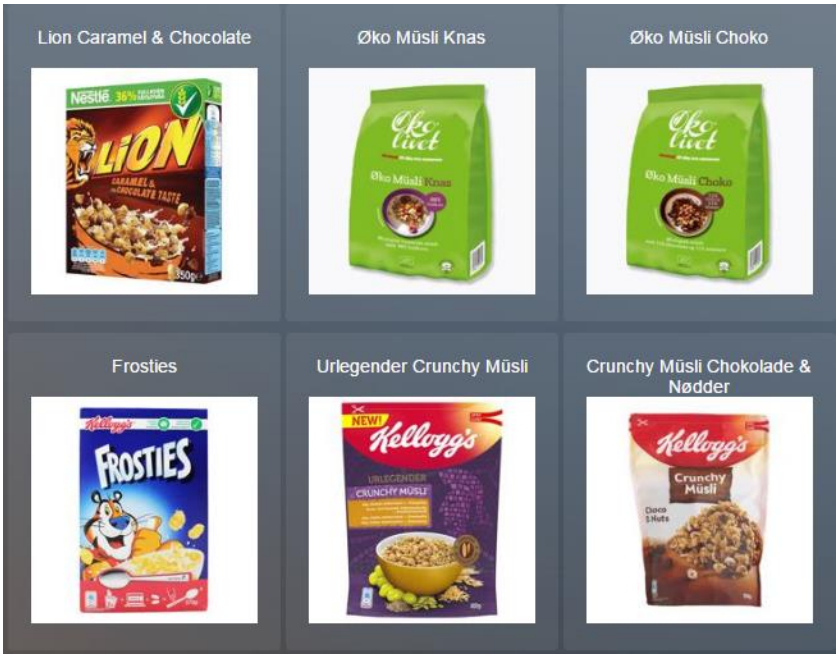
GERMAN products: exemplary product overview as in position treatment (ranked according to healthiness score)





DANISH products: exemplary product overview as in position treatment

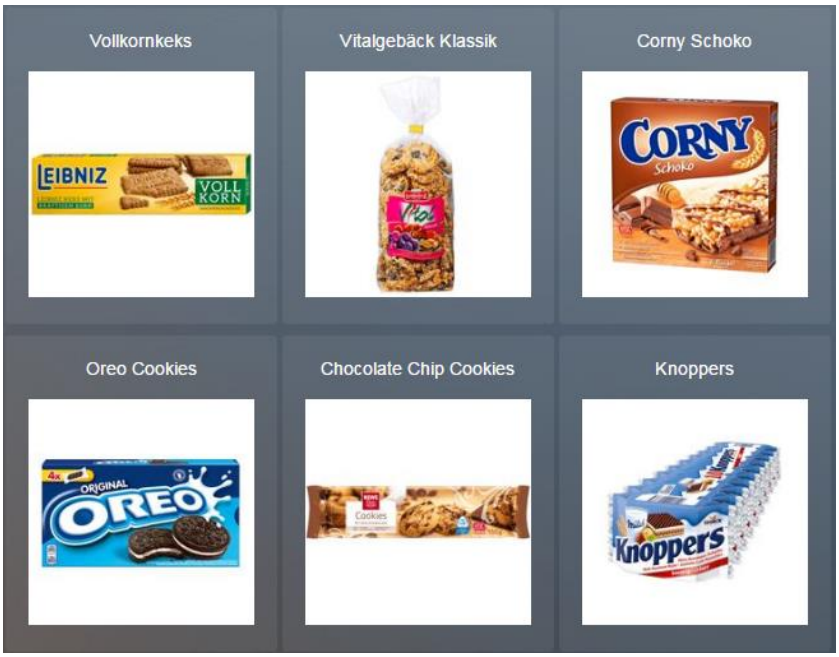




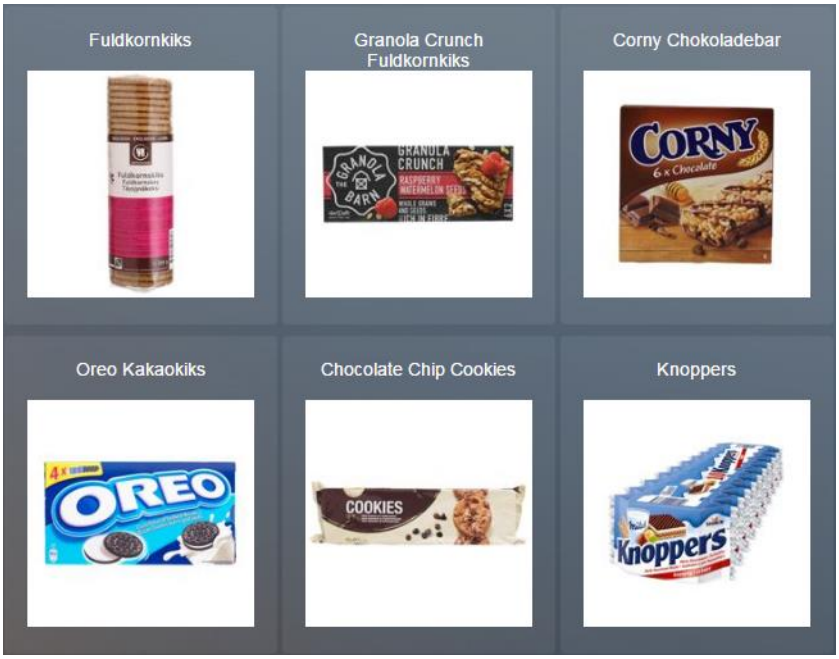
Q3a Now, you would like to buy a snack. Below you see different snacks in the online shop. Please make your choice of one product as you would do in this situation.

Please note:
1) You can choose the product by clicking on the product name.
2) Nutritional values of the products appear when clicking on the product image.

GERMAN products: exemplary product overview as in position treatment



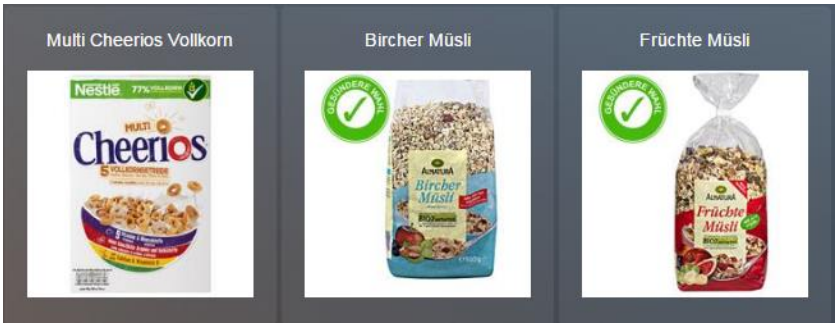
DANISH products: exemplary product overview as in position treatment



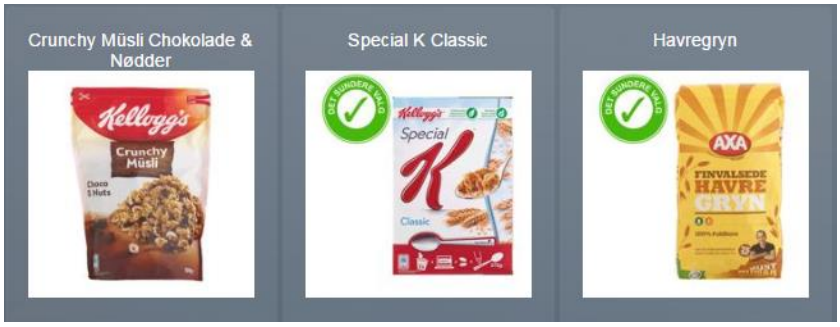
Q2b Please imagine the following situation. You are doing grocery shopping online and would like to buy your preferred breakfast cereals. Below you see different breakfast cereals in the online shop. Please make your choice of one product as you would do in this situation.

Please note:
1) You can choose the product by clicking on the product name.
2) Nutritional values of the products appear when clicking on the product image.
3) The "Healthier Choice" Label is awarded to products that display a healthier choice within a product category.

GERMAN products: exemplary products with the healthier choice label (in original, all 15 products are displayed)



DANISH products: exemplary products with the healthier choice label (in original, all 15 products are displayed)

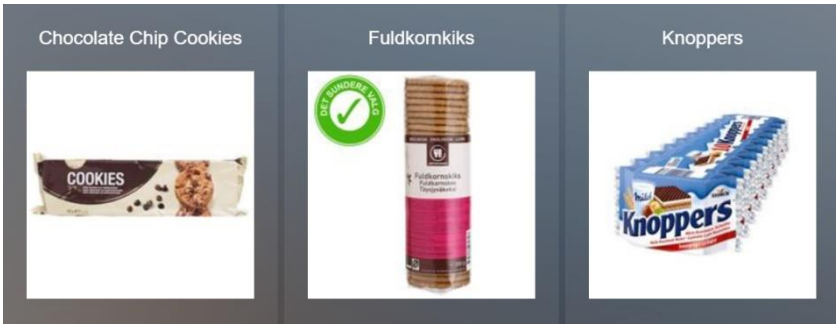


Q3b Now, you would like to buy a snack. Below you see different snacks in the online shop. Please make your choice of one product as you would do in this situation.

Please note:
1) You can choose the product by clicking on the product name.
2) Nutritional values of the products appear when clicking on the product image.
3) The "Healthier Choice" Label is awarded to products that display a healthier choice within a product category.

GERMAN products: exemplary products with the healthier choice label (in original, all 15 products are displayed)

DANISH products: exemplary products with the healthier choice label (in original, all 15 products are displayed)



Q2c Please imagine the following situation. You are doing grocery shopping online and would like to buy your preferred breakfast cereals. Below you see different breakfast cereals in the online shop. Please make your choice of one product as you would do in this situation.

Please note:
1) You can choose the product by clicking on the product name.
2) Nutritional values of the products appear when clicking on the product image.

(ranked products are displayed here)

Q3c Now, you would like to buy a snack. Below you see different snacks in the online shop. Please make your choice of one product as you would do in this situation.

Please note:
1) You can choose the product by clicking on the product name.
2) Nutritional values of the products appear when clicking on the product image.

(ranked products are displayed here)

Q2d Please imagine the following situation. You are doing grocery shopping online and would like to buy a breakfast cereal that will give you a healthy start in the day. Below you see different breakfast cereals in the online shop. Please make your choice of one product as you would do in this situation.

Please note:
1) You can choose the product by clicking on the product name.
2) Nutritional values of the products appear when clicking on the product image.

(randomized products are displayed here)

Q3d Now, you would like to buy a snack for a healthy diet. Below you see different snacks in the online shop. Please make your choice of one product as you would do in this situation.

Please note:
1) You can choose the product by clicking on the product name.
2) Nutritional values of the products appear when clicking on the product image.

(randomized products are displayed here)

Q4 Were you familiar with the cereals and snack products you chose in the previous two questions?

- ❍ Yes, with both products.
- ❍ Only with the cereal product.
- ❍ Only with the snack product.
- ❍ No, both were new products for me.

Q5 Have you used the nutritional tables to make your decision?

- ❍ Yes, for both products.
- ❍ Only for the cereal product.
- ❍ Only for the snack product.
- ❍ No, for neither of the products.

Q6 On average, how often do you eat breakfast cereals?

- ❍ daily
- ❍ 3-4 times per week
- ❍ At least once per week
- ❍ At least once every two weeks
- ❍ At least once per month
- ❍ Less than once per month or never

Q7 On average, how often do you eat snacks?

- ❍ daily
- ❍ 3-4 times per week
- ❍ At least once per week
- ❍ At least once every two weeks
- ❍ At least once per month
- ❍ Less than once per month or never

Q8 Please make a choice on the scale for the following 10 points.

For me, breakfast cereals are…

8.1 Important	❍	❍	❍	❍	❍	❍	❍	Unimportant
8.2 Boring	❍	❍	❍	❍	❍	❍	❍	interesting
8.3 Relevant	❍	❍	❍	❍	❍	❍	❍	irrelevant
8.4 Exciting	❍	❍	❍	❍	❍	❍	❍	unexciting
8.5 Mean nothing	❍	❍	❍	❍	❍	❍	❍	mean a lot to me
8.6 appealing	❍	❍	❍	❍	❍	❍	❍	unappealing

8.7 fascinating	□	□	□	□	□	□	□	mundane
8.8 worthless	□	□	□	□	□	□	□	valuable
8.9 involving	□	□	□	□	□	□	□	uninvolving
8.10 not needed	□	□	□	□	□	□	□	needed

Q9 Please make a choice on the scale for the following 10 points.

For me, snacks are…

9.1 Important	□	□	□	□	□	□	□	Unimportant
9.2 Boring	□	□	□	□	□	□	□	interesting
9.3 Relevant	□	□	□	□	□	□	□	irrelevant
9.4 Exciting	□	□	□	□	□	□	□	unexciting
9.5 Mean nothing	□	□	□	□	□	□	□	mean a lot to me
9.6 appealing	□	□	□	□	□	□	□	unappealing
9.7 fascinating	□	□	□	□	□	□	□	mundane
9.8 worthless	□	□	□	□	□	□	□	valuable
9.9 involving	□	□	□	□	□	□	□	uninvolving
9.10 not needed	□	□	□	□	□	□	□	needed

Q10 It is important to me that the food I eat on a typical day:

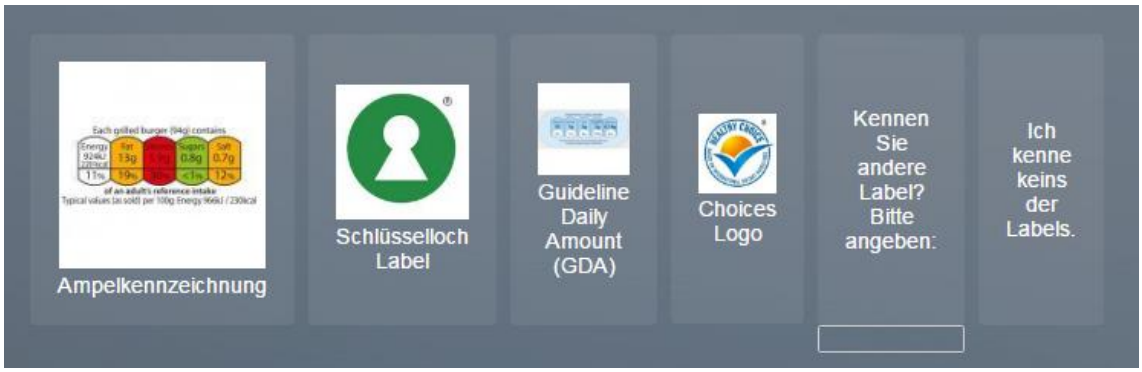
Rated on the following scale:
Strongly disagree - Somewhat disagree - Neither agree nor disagree - Strongly agree - Somewhat agree

10.1 Contains a lot of vitamins and minerals
10.2 Keeps me healthy
10.3 Is nutritious
10.4 Is high in protein
10.5 Is good for my skin/teeth/hair/nails, etc.
10.6 Is high in fiber and roughage
10.7 Is not expensive
10.8 Is cheap
10.9 Is good value for money
10.10 Is low in calories
10.11 Helps me control my weight
10.12 Is low in fat

Q11 Which of the following food labels are you familiar with (multiple choices possible)?

- ❍ Traffic Light Label
- ❍ Choices Logo
- ❍ Guideline Daily Amount
- ❍ Keyhole Label
- ❍ Do you know of any others? Please specify: _____

original question layout:



You have almost reached the end of the survey. In this last section, there are some demographic questions about yourself.

Q12 What is your gender?

- ❍ male
- ❍ female
- ❍ I prefer not to answer this question.

Q13 How old are you? _____

Q14 What is your highest completed education level?

German version

- ❍ Haupt- oder Realschulabschluss (mittlere Reife)
- ❍ Abitur oder Fachabitur
- ❍ Berufs- oder Fachoberschulabschulabschluss, Berufsakademie, Meisterprüfung
- ❍ Bachelor, Diplom (FH) oder vergleichbarer Abschluss
- ❍ Master, Diplom (Universität) oder vergleichbarer Abschluss
- ❍ Promotion oder vergleichbarer Abschluss
- ❍ Anderer Abschluss, nämlich: _____

Danish version

- Folkeskolens afgangsprøve
- Studentereksamen (STX), Højere Forberedelseseksamen (HF), Højere Handelseksamen (HHX), Handels Grundeksamen (HG), Højere Teknisk Eksamen (HTX), el.lign.
- Korte videregaende uddannelse: Erhvervsakademigrad (AK), Ingeniøruddannelsen, Svendeprøver (Erhvervsuddannelser), el.lign
- Mellemlange videregående uddannelser: Bachelor- og diplomuddannelser, el.lign.
- Lange videregående uddannelser: Master- og kandidatuddannelser, el.lign.
- Ph.D / Forskeruddannelse el.lign.
- Anden uddanelse, angiv: _____

International version

- ISCED level 2 – Lower secondary education
- ISCED level 3 – Upper secondary education
- ISCED levels 4&5 – Post-secondary non-tertiary education & Short-cycle tertiary education
- ISCED level 6 – Bachelor's or equivalent level
- ISCED level 7 – Master's or equivalent level
- ISCED level 8 – Doctoral or equivalent level
- Other, please specify: _____

Q15 What is your average monthly net income? This includes all revenues (salary, pension, child allowance, scholarships, etc.).

German version

- <1.100€
- 1.101€-1.400€
- 1.401€-1.900€
- 1.901€-2.200€
- 2.201€-3.400€
- 3.401€-4.600€
- >4.600€
- I prefer not to answer this question.

Danish version

- <11.000dkk
- 11.001dkk-15.000dkk
- 15.001dkk-19.000dkk
- 19.001dkk-23.000dkk
- 23.000dkk-35.000dkk
- 35.001dkk-47.000dkk
- >47.000dkk
- I prefer not to answer this question.

Q16 How many people (excluding yourself) are depending on this income?

- ❍ Number of other persons aged 14 years or older _____
- ❍ Number of children under the age of 14 _____
- ❍ only me

Thank you for your time and effort invested in this survey!

Please remember to click the ">>" button below to ensure your answers are saved.

As a small appreciation for your support, you now have the chance to win a (GER) 25€ MyMuesli voucher / (DK) Taste Nature surprise superfoods package worth 190dkk by entering your email-address below.
Please note that some of the information presented in this questionnaire is fictitious. This means that the products you have seen and the corresponding labels or nutritional values might not be accurate. If you have any questions or remarks about this survey, do not hesitate to contact me via e-mail: elfa15ad@student.cbs.dk

Thank you very much!
Elena

I would like to participate in the (GER) voucher / (DK) surprise package lottery.
My e-mail address is: _____

b German Questionnaire

Liebe/r Teilnehmer/in,
Willkommen und vielen Dank im Voraus, dass Sie an meiner Studie teilnehmen. Ich führe diese Umfrage als Teil meiner Masterarbeit an der Copenhagen Business School durch. Bitte lesen Sie alle Fragen sorgfältig und beantworten Sie sie so genau und ehrlich wie möglich. Das Ausfüllen der Umfrage wird weniger als 10 Minuten dauern. Sobald Sie das Ende des Fragebogens erfolgreich erreicht haben, haben Sie die Möglichkeit, einen 25€ Gutschein für MyMuesli zu gewinnen.
Alle gesammelten Daten werden vertraulich behandelt und dienen nur Forschungszwecken. Ihre Antworten werden nach den gesetzlichen Bestimmungen des Datenschutzes anonymisiert und analysiert. Bitte klicken Sie auf die Schaltfläche ">>" am Ende des Fragebogens, um sicherzustellen, dass Ihre Antworten gespeichert werden.

Vielen Dank!
Elena Fahrländer (e-mail: elfa15ad@student.cbs.dk)

Q2aGER Stellen Sie sich bitte die folgende Situation vor. Sie kaufen gerade im Online-Supermarkt ein und würden gerne Ihre bevorzugten Frühstückscerealien kaufen. Unten sehen Sie verschiedene Cerealien im Online Shop. Bitte wählen Sie ein Produkt, für das Sie sich in dieser Situation entscheiden würden.

Hinweise:
1) Sie können das Produkt auswählen, indem Sie auf den Produktnamen klicken.
2) Die Nährwerte des Produkts erscheinen, wenn Sie auf das Produktbild klicken.

(randomized products are displayed here)

Q3aGER Nun würden Sie gerne einen Snack kaufen. Unten finden Sie verschiedene Snacks im Online Shop. Bitte wählen Sie ein Produkt, für das Sie sich in dieser Situation entscheiden würden.

Hinweise:
1) Sie können das Produkt auswählen, indem Sie auf den Produktnamen klicken.
2) Die Nährwerte des Produkts erscheinen, wenn Sie auf das Produktbild klicken.

(randomized products are displayed here)

Q2bGER Stellen Sie sich bitte die folgende Situation vor. Sie kaufen gerade im Online-Supermarkt ein und würden gerne Ihre bevorzugten Frühstückscerealien kaufen. Unten sehen Sie verschiedene Cerealien im Online Shop. Bitte wählen Sie ein Produkt, für das Sie sich in dieser Situation entscheiden würden.

Hinweise:
1) Sie können das Produkt auswählen, indem Sie auf den Produktnamen klicken.
2) Die Nährwerte des Produkts erscheinen, wenn Sie auf das Produktbild klicken.
3) Das "Gesündere Wahl" Label wird an Produkte vergeben, die eine gesündere Wahl innerhalb einer Produktkategorie darstellen.

(labeled randomized products are displayed here)

Q3bGER Nun würden Sie gerne einen Snack kaufen. Unten finden Sie verschiedene Snacks im Online Shop. Bitte wählen Sie ein Produkt, für das Sie sich in dieser Situation entscheiden würden.

Hinweise:
1) Sie können das Produkt auswählen, indem Sie auf den Produktnamen klicken.
2) Die Nährwerte des Produkts erscheinen, wenn Sie auf das Produktbild klicken.
3) Das "Gesündere Wahl" Label wird an Produkte vergeben, die eine gesündere Wahl innerhalb einer Produktkategorie darstellen.

(labeled randomized products are displayed here)

Q2cGER Stellen Sie sich bitte die folgende Situation vor. Sie kaufen gerade im Online-Supermarkt ein und würden gerne Ihre bevorzugten Frühstückscerealien kaufen. Unten sehen Sie verschiedene Cerealien im Online Shop. Bitte wählen Sie ein Produkt, für das Sie sich in dieser Situation entscheiden würden.

Hinweise:
1) Sie können das Produkt auswählen, indem Sie auf den Produktnamen klicken.
2) Die Nährwerte des Produkts erscheinen, wenn Sie auf das Produktbild klicken.

(ranked products are displayed here)

Q3cGER Nun würden Sie gerne einen Snack kaufen. Unten finden Sie verschiedene Snacks im Online Shop. Bitte wählen Sie ein Produkt, für das Sie sich in dieser Situation entscheiden würden.

Hinweise:
1) Sie können das Produkt auswählen, indem Sie auf den Produktnamen klicken.
2) Die Nährwerte des Produkts erscheinen, wenn Sie auf das Produktbild klicken.

(ranked products are displayed here)

Q2dGER Stellen Sie sich bitte die folgende Situation vor. Sie kaufen gerade im Online-Supermarkt ein und würden gerne Frühstückscerealien kaufen, die Ihnen einen gesunden Start in den Tag ermöglichen. Unten sehen Sie verschiedene Cerealien im Online Shop. Bitte wählen Sie ein Produkt, für das Sie sich in dieser Situation entscheiden würden.

Hinweis:
1) Sie können das Produkt auswählen, indem Sie auf den Produktnamen klicken.
2) Die Nährwerte des Produkts erscheinen, wenn Sie auf das Produktbild klicken.

(randomized products are displayed here)

Q3dGER Nun würden Sie gerne einen Snack für eine gesunde Ernährung kaufen. Unten finden Sie verschiedene Snacks im Online Shop. Bitte wählen Sie ein Produkt, für das Sie sich in dieser Situation entscheiden würden.

Hinweise:
1) Sie können das Produkt auswählen, indem Sie auf den Produktnamen klicken.
2) Die Nährwerte des Produkts erscheinen, wenn Sie auf das Produktbild klicken.

(randomized products are displayed here)

Q4GER Waren Ihnen die Frühstückscerealien und Snack Produkte bekannt, die Sie in den vorigen zwei Fragen ausgewählt haben?

- ❍ Ja, ich kannte beide Produkte.
- ❍ Ich kannte nur die gewählten Frühstückscerealien.
- ❍ Ich kannte nur den gewählten Snack.
- ❍ Nein, beide Produkte waren neu für mich.

Q5GER Haben Sie die Nährwerttabellen benutzt, um Ihre Entscheidung zu treffen?

- ❍ Ja, für beide Produkte.
- ❍ Nur für die Frühstückscerealien.
- ❍ Nur für die Snacks.
- ❍ Nein, für keins der Produkte.

Q6GER Wie oft konsumieren Sie durchschnittlich Frühstückscerealien?

- ❍ täglich
- ❍ 3-4 mal pro Woche
- ❍ mindestens einmal pro Woche
- ❍ mindestens einmal alle zwei Wochen

- ❍ mindestens einmal pro Monat
- ❍ weniger als einmal pro Monat oder nie

Q7GER Wie oft konsumieren Sie durchschnittlich Snack Produkte (z.B. Kekse)?

- ❍ täglich
- ❍ 3-4 mal pro Woche
- ❍ mindestens einmal pro Woche
- ❍ mindestens einmal alle zwei Wochen
- ❍ mindestens einmal pro Monat
- ❍ weniger als einmal pro Monat oder nie

Q8GER Bitte machen Sie eine Auswahl auf der Skala für die folgenden 10 Punkte.

Für mich sind Frühstückscerealien ...

8.1 wichtig	☐	☐	☐	☐	☐	☐	☐	unwichtig
8.2 langweilig	☐	☐	☐	☐	☐	☐	☐	interessant
8.3 relevant	☐	☐	☐	☐	☐	☐	☐	irrelevant
8.4 aufregend	☐	☐	☐	☐	☐	☐	☐	unaufregend
8.5 bedeuten mir nichts	☐	☐	☐	☐	☐	☐	☐	bedeuten mir viel
8.6 attraktiv	☐	☐	☐	☐	☐	☐	☐	unattraktiv
8.7 faszinierend	☐	☐	☐	☐	☐	☐	☐	banal
8.8 wertlos	☐	☐	☐	☐	☐	☐	☐	wertvoll
8.9 involvierend	☐	☐	☐	☐	☐	☐	☐	nicht involvierend
8.10 nutzlos	☐	☐	☐	☐	☐	☐	☐	nützlich

Q9GER Bitte machen Sie eine Auswahl auf der Skala für die folgenden 10 Punkte.

Für mich sind Snack Produkte (z.B. Kekse) ...

9.1 wichtig	☐	☐	☐	☐	☐	☐	☐	unwichtig
9.2 langweilig	☐	☐	☐	☐	☐	☐	☐	interessant
9.3 relevant	☐	☐	☐	☐	☐	☐	☐	irrelevant
9.4 aufregend	☐	☐	☐	☐	☐	☐	☐	unaufregend
9.5 bedeuten mir nichts	☐	☐	☐	☐	☐	☐	☐	bedeuten mir viel
9.6 attraktiv	☐	☐	☐	☐	☐	☐	☐	unattraktiv
9.7 faszinierend	☐	☐	☐	☐	☐	☐	☐	banal
9.8 wertlos	☐	☐	☐	☐	☐	☐	☐	wertvoll
9.9 involvierend	☐	☐	☐	☐	☐	☐	☐	nicht involvierend
9.10 nutzlos	☐	☐	☐	☐	☐	☐	☐	nützlich

Q10GER Es ist mir wichtig, dass die Nahrung, die ich an einem gewöhnlichen Tag esse:

Rated on the following scale:
Lehne vollständig ab – lehne eher ab - unentschieden – stimme eher zu – stimme vollständig zu

10.1 Viele Vitamine und Mineralstoffe enthält
10.2 Mich gesund hält
10.3 Nahrhaft ist
10.4 Reich an Eiweiß ist
10.5 Gut für meine Haut / Zähne / Haare / Nägel, etc. ist
10.6 Reich an Ballaststoffen ist
10.7 Nicht teuer ist
10.8 Günstig ist
10.9 Ein gutes Preis-Leistungs-Verhältnis hat
10.10 Kalorienarm ist
10.11 Mir hilft, mein Gewicht zu kontrollieren
10.12 Fettarm ist

Q11GER Welche(s) der folgenden Nahrungsmittel-Labels kennen Sie? Mehrfachauswahl möglich.

- ❍ Ampelkennzeichnung
- ❍ Choices Logo
- ❍ Guideline Daily Amount (GDA)
- ❍ Schlüsselloch Label
- ❍ Kennen Sie andere Label? Bitte angeben: _____
- ❍ Ich kenne keins der Labels.

Sie haben fast das Ende der Umfrage erreicht. In diesem letzten Abschnitt werden Ihnen nur noch einige demographische Fragen gestellt.

Q12GER Was ist Ihr Geschlecht?

- ❍ männlich
- ❍ weiblich
- ❍ Ich ziehe es vor, diese Frage nicht zu beantworten.

Q13GER Wie alt sind Sie? _____

Q14GER Was ist Ihre höchste abgeschlossene Ausbildung?

- ❍ Haupt- oder Realschulabschluss (mittlere Reife)
- ❍ Abitur oder Fachabitur
- ❍ Berufs- oder Fachoberschulabschulabschluss, Berufsakademie, Meisterprüfung
- ❍ Bachelor, Diplom (FH) oder vergleichbarer Abschluss
- ❍ Master, Diplom (Universität) oder vergleichbarer Abschluss
- ❍ Promotion oder vergleichbarer Abschluss
- ❍ Anderer Abschluss, nämlich: _____

Q15GER Was ist Ihr durchschnittliches monatliches Nettoeinkommen? Dazu gehören alle Einnahmen (Gehalt, Rente, Kindergeld, Stipendien, Bafög, etc.).

- ❍ < 1.100€
- ❍ 1.101€-1.400€
- ❍ 1.401€-1.800€
- ❍ 1.801€-2.200€
- ❍ 2.201€-3.400€
- ❍ 3.401€-4.600€
- ❍ >4.600€
- ❍ Ich ziehe es vor, diese Frage nicht zu beantworten.

Q16GER Wie viele Personen (außer Sie selbst) sind von diesem Einkommen abhängig?

- ❍ Anzahl der anderen Personen ab 14 Jahren _____
- ❍ Anzahl der Kinder unter 14 Jahren _____
- ❍ nur ich

Vielen Dank für die Zeit und Mühe, die Sie in diese Umfrage investiert haben! Bitte denken Sie daran, auf die ">>" Schaltfläche zu klicken, um sicherzustellen, dass Ihre Antworten gespeichert werden. Als eine kleine Wertschätzung für Ihre Unterstützung haben Sie jetzt die Chance, einen 25€ MyMuesli Gutschein zu gewinnen, indem Sie Ihre E-Mail-Adresse in das Feld unten eingeben.

Bitte beachten Sie, dass einige Informationen in diesem Fragebogen fiktiv sind. Das bedeutet, dass Produkte, Labels oder Nährwerte nicht real sind. Bei Fragen oder Anmerkungen zu dieser Umfrage können Sie mich gerne per E-Mail kontaktieren: elfa15ad@student.cbs.dk

Vielen herzlichen Dank!
Elena

Ich möchte an der Verlosung des 25€ MyMuesli Gutscheins teilnehmen. Meine E-Mail-Adresse ist: _____

c Danish Questionnaire

Kære deltager,

Velkommen og tak for din deltagelse i denne undersøgelse.
Denne spørgeskemaundersøgelse er en del af mit speciale ved Copenhagen Business School. Studer venligst spørgsmålene grundigt før du besvarer dem og prøv at besvare spørgsmålene så præcist og ærligt som muligt. Det tager ca. 10 minutter at udfylde spørgeskemaet.
Ved at besvare spørgeskemaet, er du automatisk med i konkurrencen om at vinde en overraskelsespakke (værdi a 180dkk) med superfood produkter fra Taste Nature.
Alt indsamlet data er fortroligt og vil kun blive brugt til forskning. Dine svar er anonyme og vil kun blive brugt i henhold til databeskyttelsesloven.
Vær venlig at trykke på ">>" symbolet i bunden af siden, efter afsluttet besvarelse, for at sikre at dine svar bliver gemt.

Med venlig hilsen

Elena Fahrländer
e-mail: elfa15ad@student.cbs.dk

Q2aDK Forestil dig følgende situation. Du er i gang med at handle dagligvarer på nettet og du vil gerne købe dine fortrukne morgenmadsprodukter. Nedenfor kan du se en liste over de forskellige morgenmadsprodukter som netbutikken sælger. Foretag venligst dit valg (vælg en), som du ville i denne situation.

Bemærk venligst:
1) Du kan vælge produktet ved at klikke på produktnavnet.
2) Næringsindholdet vises ved at klikke på produktbilledet.

(randomized products are displayed here)

Q3aDK Nu vil du gerne købe en snack. Nedenfor kan du se en liste over de snacks som netbutikken sælger. Foretag venligst dit valg (vælg en), som du ville i denne situation.
Bemærk venligst:
1) Du kan vælge produktet ved at klikke på produktnavnet.
2) Næringsindholdet vises ved at klikke på produktbilledet.

(randomized products are displayed here)

Q2bDK Forestil dig følgende situation. Du er i gang med at handle dagligvarer på nettet og du vil gerne købe dine fortrukne morgenmadsprodukter. Nedenfor kan du se en liste over de forskellige morgenmadsprodukter som netbutikken sælger. Foretag venligst dit valg (vælg en), som du ville i denne situation.

Bemærk venligst:
1) Du kan vælge produktet ved at klikke på produktnavnet.
2) Næringsindholdet vises ved at klikke på produktbilledet.
3) Mærket "Det Sundere Valg" bliver tildelt produkter i denne produktkategori som er et sundere valg.

(labeled randomized products are displayed here)

Q3bDK Nu vil du gerne købe en snack. Nedenfor kan du se en liste over de snacks som netbutikken sælger. Foretag venligst dit valg (vælg en), som du ville i denne situation.

Bemærk venligst:
1) Du kan vælge produktet ved at klikke på produktnavnet.
2) Næringsindholdet vises ved at klikke på produktbilledet.
3) Mærket "Det Sundere Valg" bliver tildelt produkter i denne produktkategori som er et sundere valg.

(labeled randomized products are displayed here)

Q2cDK Forestil dig følgende situation. Du er i gang med at handle dagligvarer på nettet og du vil gerne købe dine fortrukne morgenmadsprodukter. Nedenfor kan du se en liste over de forskellige morgenmadsprodukter som netbutikken sælger. Foretag venligst dit valg (vælg en), som du ville i denne situation.

Bemærk venligst:
1) Du kan vælge produktet ved at klikke på produktnavnet.
2) Næringsindholdet vises ved at klikke på produktbilledet.

(ranked products are displayed here)

Q3cDK Nu vil du gerne købe en snack. Nedenfor kan du se en liste over de snacks som netbutikken sælger. Foretag venligst dit valg (vælg en), som du ville i denne situation.
Bemærk venligst:
1) Du kan vælge produktet ved at klikke på produktnavnet.
2) Næringsindholdet vises ved at klikke på produktbilledet.

(ranked products are displayed here)

Q2dDK Forestil dig følgende situation. Du er i gang med at handle dagligvarer på nettet og du vil gerne købe et morgenmadsprodukt som giver dig en sundere start på dagen. Nedenfor kan du se en liste over de forskellige morgenmadsprodukter som netbutikken sælger. Foretag venligst dit valg (vælg en), som du ville i denne situation.

Bemærk venligst:
1) Du kan vælge produktet ved at klikke på produktnavnet.
2) Næringsindholdet vises ved at klikke på produktbilledet.

(randomized products are displayed here)

Q3dDK Nu vil du gerne købe en snack til en sund kost. Nedenfor kan du se liste over de snacks som netbutikken sælger. Foretag venligst dit valg (vælg en), som du ville i denne situation.

Bemærk venligst:
1) Du kan vælge produktet ved at klikke på produktnavnet.
2) Næringsindholdet vises ved at klikke på produktbilledet.

(randomized products are displayed here)

Q4DK Kendte du på forhånd de morgenmadsprodukter og snacks, som du valgte i de foregående to spørgsmål?

- ❍ Ja, begge produkter.
- ❍ Kun morgenmadsproduktet.
- ❍ Kun snacken.
- ❍ Nej, begge var for mig nye produkter.

Q5DK Brugte du næringsværditabellerne til at foretage dine produktvalg?

- ❍ Ja, jeg brugte dem til begge produkter.
- ❍ Ja, til morgenmadsprodukterne.
- ❍ Ja til snacks.
- ❍ Nej, jeg brugte dem ikke.

Q6DK Hvor ofte spiser du i gennemsnit morgenmadsprodukter?

- ❍ Dagligt
- ❍ 3-4 gange om ugen
- ❍ Mindst engang om ugen
- ❍ Mindst engang hver anden uge
- ❍ Mindst engang om måneden
- ❍ Mindre end engang om måneden eller aldrig

Q7DK Hvor ofte spiser du i gennemsnit snack produkter (f.eks. småkager)?

- ❍ Dagligt
- ❍ 3-4 gange om ugen
- ❍ Mindst engang om ugen
- ❍ Mindst engang hver anden uge
- ❍ Mindst engang om måneden
- ❍ Mindre end engang om måneden eller aldrig

Q8DK Foretag et valg for de følgende 10 punkter.

For mig er morgenmadsprodukter ...

8.1 væsentligt	□	□	□	□	□	□	□	uvæsentligt
8.2 kedeligt	□	□	□	□	□	□	□	interessant
8.3 relevant	□	□	□	□	□	□	□	irrelevant
8.4 spændende	□	□	□	□	□	□	□	ikke spændende
8.5 betyder ingenting for mig	□	□	□	□	□	□	□	betyder meget for mig
8.6 tiltalende	□	□	□	□	□	□	□	utiltalende
8.7 fascinerende	□	□	□	□	□	□	□	dagligdags
8.8 værdiløst	□	□	□	□	□	□	□	værdifuldt
8.9 engagerende	□	□	□	□	□	□	□	uengagerede
8.10 unødvendigt	□	□	□	□	□	□	□	nødvendigt

Q9DK Foretag et valg for de følgende 10 punkter.

For mig er snacks ...

9.1 væsentligt	□	□	□	□	□	□	□	uvæsentligt
9.2 kedeligt	□	□	□	□	□	□	□	interessant
9.3 relevant	□	□	□	□	□	□	□	irrelevant
9.4 spændende	□	□	□	□	□	□	□	ikke spændende
9.5 betyder ingenting for mig	□	□	□	□	□	□	□	betyder meget for mig
9.6 tiltalende	□	□	□	□	□	□	□	utiltalende
9.7 fascinerende	□	□	□	□	□	□	□	dagligdags
9.8 værdiløst	□	□	□	□	□	□	□	værdifuldt
9.9 engagerende	□	□	□	□	□	□	□	uengagerede
9.10 unødvendigt	□	□	□	□	□	□	□	nødvendigt

Q10DK Det er vigtigt for mig, at den mad jeg spiser på en typisk dag:

Rated on the following scale:
Helt uenig - Nogenlunde uenig - Hverken enig eller uenig - Nogenlunde enig - Helt enig

10.1 Indeholder mange vitaminer og mineraler
10.2 Holder mig sund
10.3 Er næringsrigt
10.4 Har et højt proteinindhold
10.5 Er godt for min hud/mine tænder/mit hår/mine negle osv.
10.6 Har et højt indhold af kostfibre
10.7 Ikke er dyrt
10.8 Er billigt
10.9 Er god værdi for pengene
10.10 Har et lavt kalorieindhold
10.11 Hjælper mig med at kontrollere min vægt
10.12 Har et lavt fedtindhold

Q11DK Hvilken af følgende fødevarer mærker kender du? Det er muligt at vælge flere.

- ❍ Traffiklys mærket
- ❍ Choices Logo
- ❍ Anbefalet dagligt indtag
- ❍ Nøglehulsmærket
- ❍ Kender du andre? Hvilke: _____
- ❍ Jeg kender ikke nogen af mærker.

Du er nu næsten færdig med spørgeskemaet. Den sidste sektion indeholder nogle simple demografiske spørgsmål om dig selv.

Q12DK Hvad er dit køn?

- ❍ Mand
- ❍ Kvinde
- ❍ Jeg ønsker ikke at besvare dette spørgsmål.

Q13DK Hvor gammel er du? _____

Q14DK Hvad er din højst opnåede uddannelse?

- ❍ Folkeskolens afgangsprøve
- ❍ Studentereksamen (STX), Højere Forberedelseseksamen (HF), Højere Handelseksamen (HHX), Handels Grundeksamen (HG), Højere Teknisk Eksamen (HTX), el.lign.
- ❍ Korte videregaende uddannelse: Erhvervsakademigrad (AK), Ingeniøruddannelsen, Svendeprøver (Erhvervsuddannelser), el.lign
- ❍ Mellemlange videregående uddannelser: Bachelor- og diplomuddannelser, el.lign.
- ❍ Lange videregående uddannelser: Master- og kandidatuddannelser, el.lign.
- ❍ Ph.D / Forskeruddannelse el.lign.
- ❍ Anden uddanelse, angiv: _____

Q15DK Hvad er din gennemsnitlige månedlige nettoindkomst? Inklusiv alle indtægtskilder (løn, pension, børnepenge, legater, SU osv.)

- ❍ <11.000dkk
- ❍ 11.001dkk-15.000dkk
- ❍ 15.001dkk-19.000dkk
- ❍ 19.001dkk-23.000dkk
- ❍ 23.000dkk-35.000dkk
- ❍ 35.001dkk-47.000dkk
- ❍ >47.000dkk
- ❍ Jeg ønsker ikke at besvare dette spørgsmål.

Q16DK Hvormange (udover dig selv) er afhængige af din indkomst?

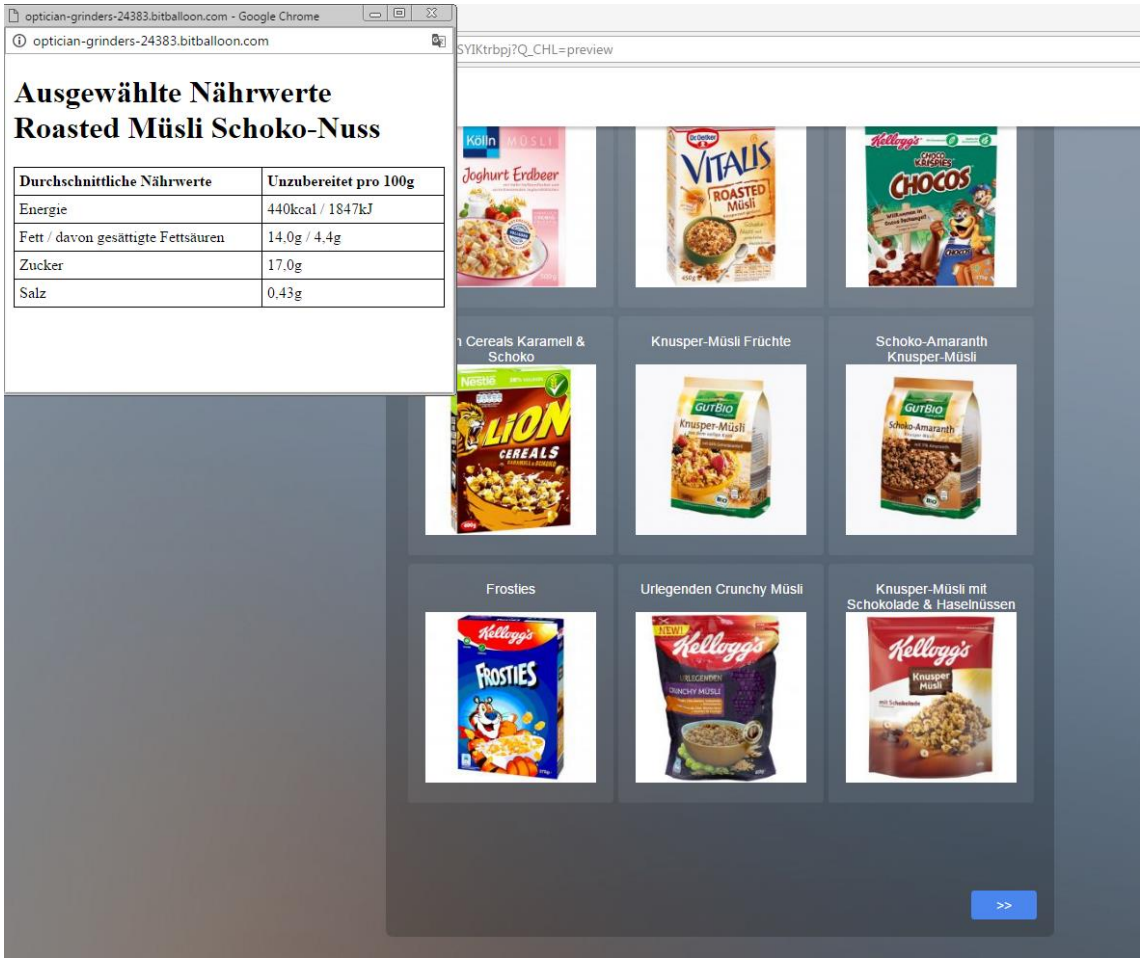
- ❍ Antal personer over 14 år _____
- ❍ Antal børn under 14 år _____
- ❍ Kun mig

Tak for din tid og deltagelse i denne undersøgelse!
Husk venligst at klikke på ">>" symbolet for at gemme dine svar.
Som en lille anerkendelse for din støtte, har du nu mulighed for at deltage i konkurrencen om at vinde en overraskelsespakke fra Taste Nature ved at indtaste din e-mail nedenfor.
Bemærk, at nogle af informationerne i spørgeskemaet er opdigtede. Det betyder at nogle af de produkter og deres tilhørende produktmærkater og næringsværdier, som du har set muligvis ikke er korrekte. Hvis du har nogen spørgsmål eller kommentarer til denne undersøgelse, er du meget velkommen til at henvende dig til mig via min e-mail: elfa15ad@student.cbs.dk
Hav en god dag og tak igen!
Elena

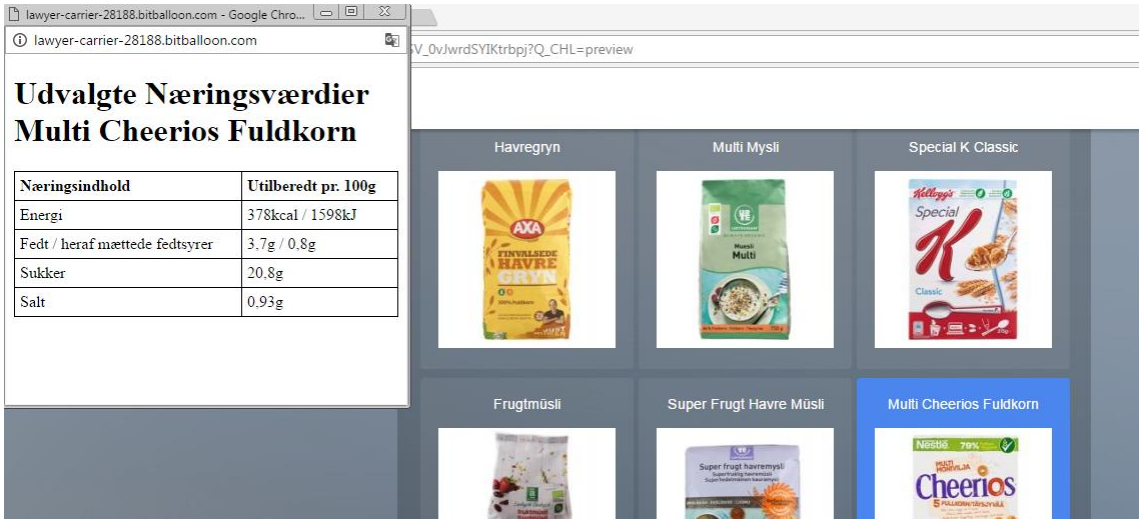
Jeg vil gerne deltage i superfoods pakkelotteriet. Min e-mail er: _____

d Additional Screenshots

Screenshot 1: Pop-up Window Nutritional Table GER



Screenshot 2: Pop-up Window Nutritional Table DK



Appendix III: Questionnaire Structure

Focus	Content	Rating Scale	Measurement Scale	Q #
Elimination Question	Country of origin	Multiple choice– single answer	nominal	1
Choice Experiment	Cereals choice (15 products)	Multiple choice – single answer	ordinal	2
	Snack choice (6 products)	Multiple choice – single answer	ordinal	3
Consumer Behavior	Familiarity with products	Multiple choice, single answer	nominal	4
	Use of nutritional tables	Multiple choice, single answer	nominal	5
	Consumption frequency cereals	Multiple choice, single answer	ordinal	6
	Consumption frequency snacks	Multiple choice, single answer	ordinal	7
	Product involvement cereals	7-point Semantic differential rating scale (10 items)	interval	8
	Product involvement snacks	7-point Semantic differential rating scale (10 items)	interval	9
	Food choice motivation	5-point Likert-scale (12 items)	interval	10
	Familiarity with food labels	Multiple choice, multiple answer possible, text fill in	nominal	11
Demographic Questions	Gender	Multiple choice, single answer	nominal	12
	Age	Number fill in	ratio	13
	Education	Multiple choice, single answer, text fill in	nominal	14
	Income	Multiple choice, single answer	ordinal	15
	# of people depending on income	Multiple choice, multiple answers possible, number fill in	nominal / ratio	16

Appendix IV: Operationalization of Hypotheses

RQ	Hypothesis	Dependent variable	Independent variable	Relevant questions
RQ1	H1	Product choice score (gr.1: control)	Product choice scores (gr.2-4: all treatment groups)	Q2&3 (product choice)
RQ2	H2	Product choice scores (gr.1-4)	Country	Q1 (country), Q2&3 (product choice)
RQ3	H3	Product choice scores (gr.1-4)	Product involvement (high/low)	Q2&3 (product choice), Q8&9 (product involvement)
	H4	Product choice scores (gr.1-4)	Food choice motivation (high/low) on health, price, weight control	Q2&3 (product choice), Q10 (food choice motivation)
	H5	Product choice scores (gr.1-4)	Demographics (gender, age, education, income)	Q2&3 (product choice), Q12 (gender), Q13 (age), Q14 (education), Q15 (income)
	H6	Product choice scores (gr.1-4)	Product group (cereals/snacks)	Q2&3 (product choice)

Appendix V: Background Questionnaire

Please note: CAT refers to the questionnaire category (answer possibilities for questionnaire respondents)

a Breakfast Cereals GER

No.	Product name	Brand	kJ/100g	*score*	Saturates /100g	*score*	Sugar /100g	*score*	Sodium /100g in mg	*score*	SSAg/1 score
1	Haferflocken	Kölln	1520	*1*	1.3	*0*	1.2	*0*	2	*0*	**1**
2	Bircher Müsli	Alnatura	1490	*1*	0.9	*0*	14.0	*2*	16	*0*	**3**
3	Special K Classic	Kellogg	1578	*1*	0.3	*0*	11.9	*1*	400	*1*	**3**
4	Früchte Müsli	Alnatura	1352	*1*	0.6	*0*	25.0	*3*	16	*0*	**4**
5	Erdbeer Amaranth Müsli	Alnatura	1557	*1*	2.0	*0*	21.0	*3*	20	*0*	**4**
6	Multi Cheerios Vollkorn	Nestlé	1598	*1*	0.8	*0*	20.8	*3*	372	*1*	**5**
7	Joghurt Erdbeer Müsli	Koelln	1699	*1*	7.3	*2*	14.7	*2*	100	*0*	**5**
8	Roasted Müsli Schoko-Nuss	Dr. Oetker	1847	*2*	4.4	*1*	17.0	*2*	172	*0*	**5**
9	Chocos	Kellogg	1612	*1*	1.0	*0*	29.0	*4*	312	*1*	**6**
10	Lion Cereals Karamell & Schoko	Nestlé	1729	*1*	3.1	*1*	28.7	*4*	200	*0*	**6**
11	Knusper-Müsli Früchte	Aldi Süd	1832	*2*	7.0	*2*	17.0	*2*	132	*0*	**6**
12	Schoko-Amaranth Knusper-Müsli	Aldi Süd	1858	*2*	6.3	*2*	17.0	*2*	132	*0*	**6**
13	Frosties	Kellogg	1594	*1*	0.1	*0*	37.0	*5*	332	*1*	**7**
14	Urlegenden Crunchy Müsli	Kellogg	1788	*1*	5.4	*2*	20.0	*3*	252	*1*	**7**
15	Knusper-Müsli mit Schokolade & Haselnüssen	Kellogg	2076	*2*	12.0	*4*	21.0	*3*	252	*1*	**10**

b Breakfast Cereals DK

No.	Product name	Brand	kJ/100g	*score*	Saturates /100g	*score*	Sugar /100g	*score*	Sodium /100g in mg	*score*	SSAg/1 score
1	Havregryn	AXA	1550	*1*	1.1	*0*	1.1	*0*	2	*0*	**1**
2	Multi Mysli	Urtekram	1550	*1*	1.3	*0*	15.0	*2*	4	*0*	**3**
3	Special K Classic	Kellogg	1578	*1*	0.3	*0*	11.9	*1*	400	*1*	**3**
4	Frugtmüsli	Änglamark	1513	*1*	2.8	*1*	18.0	*2*	44	*0*	**4**
5	Super Frugt Havre Müsli	Urtekram	1510	*1*	2.5	*0*	25.0	*3*	8	*0*	**4**
6	Multi Cheerios Fuldkorn	Nestlé	1598	*1*	0.8	*0*	20.8	*3*	372	*1*	**5**
7	Crüsli Raisin	Crüsli	1860	*2*	1.5	*0*	25.0	*3*	20	*0*	**5**
8	Crüsli 4 Nuts	Crüsli	2000	*2*	2.4	*0*	21.0	*3*	20	*0*	**5**
9	Coco Pops Crunchers	Kellogg	1612	*1*	1.0	*0*	29.0	*4*	312	*1*	**6**
10	Lion Caramel & Chocolate	Nestlé	1729	*1*	3.1	*1*	28.7	*4*	200	*0*	**6**
11	Øko Müsli Knas	Aldi DK	1832	*2*	7.0	*2*	17.0	*2*	132	*0*	**6**
12	Øko Müsli Choko	Aldi DK	1858	*2*	6.3	*2*	17.0	*2*	132	*0*	**6**
13	Frosties	Kellogg	1594	*1*	0.1	*0*	37.0	*5*	332	*1*	**7**
14	Urlegender Crunchy Müsli	Kellogg	1788	*1*	5.4	*2*	20.0	*3*	252	*1*	**7**
15	Crunchy Müsli Chokolade & Nødder	Kellogg	2076	*2*	12.0	*4*	21.0	*3*	252	*1*	**10**

c Snacks GER

No.	Product name	Brand	kJ/100g	*score*	Saturates /100g	*score*	Sugar /100g	*score*	Sodium /100g in mg	*score*	SSAg/1 score
1	Leibniz Vollkornkeks	Leibniz	1841	*2*	3.4	*1*	22.0	*3*	404	*1*	**7**
2	Vitalgebäck Klassik	Lambertz	2146	*2*	4.9	*1*	31.2	*4*	12	*0*	**7**
3	Corny Schoko	Corny	1910	*2*	10.5	*4*	34.0	*5*	200	*0*	**11**
4	Oreo Cookies	Oreo	2010	*2*	9.8	*3*	38.0	*6*	360	*1*	**12**
5	Chocolate Chip Cookies	REWE	2102	*2*	14.0	*5*	40.0	*5*	260	*1*	**13**
6	Knoppers	Storck	2283	*2*	18.5	*7*	34.8	*5*	148	*0*	**14**

d Snacks DK

No.	Product name	Brand	kJ/100g	*score*	Saturates /100g	*score*	Sugar /100g	*score*	Sodium /100g in mg	*score*	SSAg/1 score
1	Fuldkornkiks	Urtekram	1770	*1*	7.0	*2*	19.0	*3*	400	*1*	**7**
2	Granola Crunch Fuldkornkiks	Van Delft	1797	*2*	2.4	*0*	27.0	*4*	432	*1*	**7**
3	Corny Chokoladebar	Corny	1910	*2*	10.5	*4*	34.0	*5*	200	*0*	**11**
4	Oreo Kakaokiks	Oreo	2010	*2*	9.8	*3*	38.0	*6*	360	*1*	**12**
5	Chocolate Chip Cookies	Coop	2079	*2*	14.0	*5*	38.0	*5*	312	*1*	**13**
6	Knoppers	Storck	2283	*2*	18.5	*7*	34.8	*5*	148	*0*	**14**

e SSAg/1 Score

SSAg/1 Score = energy (kJ) score + saturates (fat) score + sugar (NMES) score + sodium score

	Energy in kJ		**Saturates in g**		**Sugar in g**		**Sodium in mg**	
score	*lower*	*upper*	*lower*	*upper*	*lower*	*upper*	*lower*	*upper*
0	0	895	0	2.6	0.0	6.3	0	235
1	895	1790	2.6	5.2	6.3	12.6	235	470
2	1790	2685	5.2	7.8	12.6	18.9	470	705
3	2685	3580	7.8	10.4	18.9	25.2	705	940
4	3580	4475	10.4	13.0	25.2	31.5	940	1175
5	4475	5370	13.0	15.6	31.5	37.8	1175	1410
6	5370	6265	15.6	18.2	37.8	44.1	1410	1645
7	6265	7160	18.2	20.8	44.1	50.4	1645	1880
8	7160	8055	20.8	23.4	50.4	56.7	1880	2115
9	8055	8950	23.4	26.0	56.7	63.0	2115	2350
10	8950	9845	26.0	28.6	63.0	69.3	2350	2585

f Classification of Education across Countries

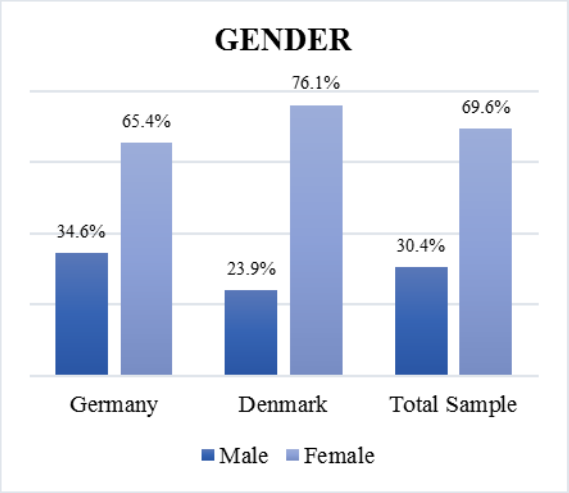
CAT	International Level (ISCED, 2011)	Germany	Denmark	Categories for analysis
1	**ISCED level 2** Lower secondary education	Haupt- oder Realschulabschluss (mittlere Reife)	Folkeskolens afgangsprøver	*Lower education*
2	**ISCED level 3** Upper secondary education	Abitur oder Fachabitur	Studentereksamen (STX), Højere Forberedelseseksamen (HF), Højere Handelseksamen (HHX), Handels Grundeksamen (HG), Højere Teknisk Eksamen (HTX), el.lign.	
3	**ISCED levels 4 & 5** Post-secondary non-tertiary education & Short-cycle tertiary education	Berufs- oder Fachoberschulabschulabschluss, Berufsakademie Meisterprüfung	Korte videregaende uddannelse: Erhvervsakademigrad (AK), Ingeniøruddannelsen, Svendeprøver (Erhvervsuddannelser), el.lign	*Higher education*
4	**ISCED level 6** Bachelor's or equivalent level	Bachelor, Diplom (FH) oder vergleichbarer Abschluss	Mellemlange videregående uddannelser: Bachelor- og diplomuddannelser, Diplomuddannelser, el.lign.	
5	**ISCED level 7** Master's or equivalent level	Master, Diplom (Universität) oder vergleichbarer Abschluss	Lange videregående uddannelser: Master- og kandidat-uddannelser, el.lign.	
6	**ISCED level 8** Doctoral or equivalent level	Promotion oder vergleichbarer Abschluss	Ph.D / Forskeruddannelse el.lign.	
7	Other	Andere, nämlich….	Other, namely….	*Exclude*

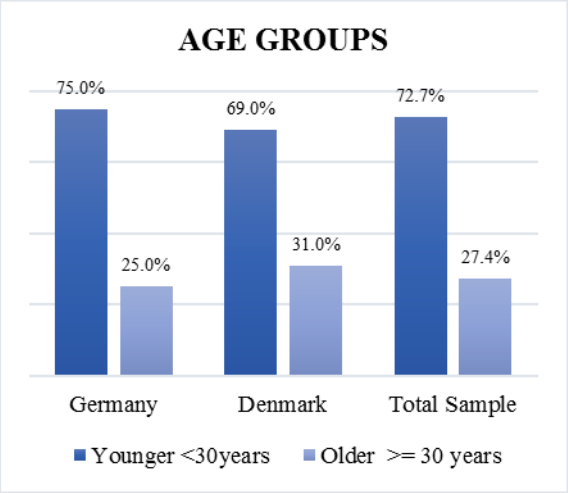
g Classification of Income Groups across Countries

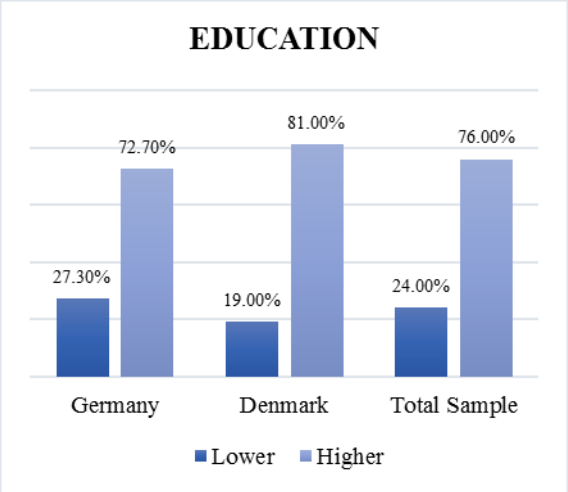
CAT	Categories across countries	DK lower	DK upper	GER lower	GER upper	New categories for analysis
1	very low income	<11.000	-	<1.000	-	*Lower income*
2	low income	11.001	15.000	1.001	1.400	
3	lower med	15.001	19.000	1.401	1.800	*Medium income*
4	med income	19.001	23.000	1.801	2.200	
5	higher med	23.001	35.000	2.201	3.400	
6	high income	35.001	47.000	3.401	4.600	*Higher income*
7	very high income	>47.000	-	>4.600	-	
8	No answer	-	-	-	-	*No answer*

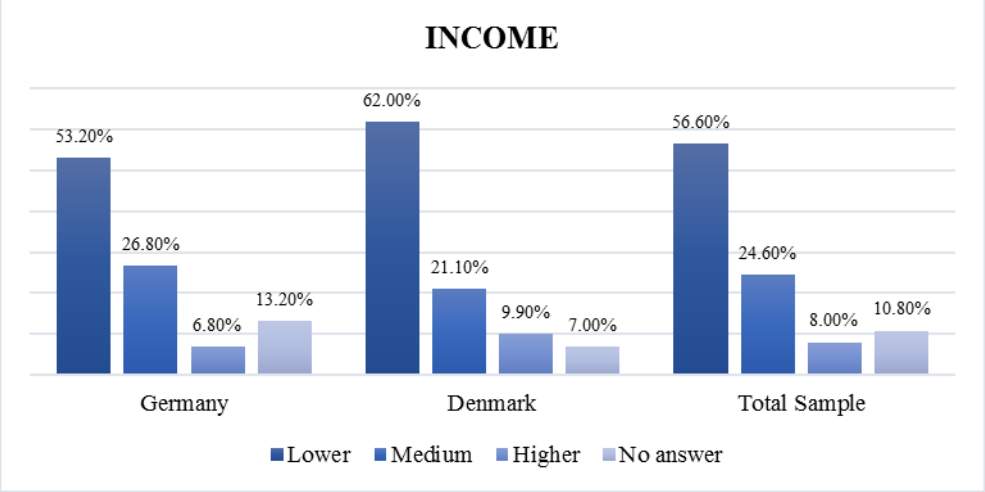
Appendix VI: Presentation of the Sample

Distribution of Demographics by Country









Appendix VII: Presentation of Experiment Groups

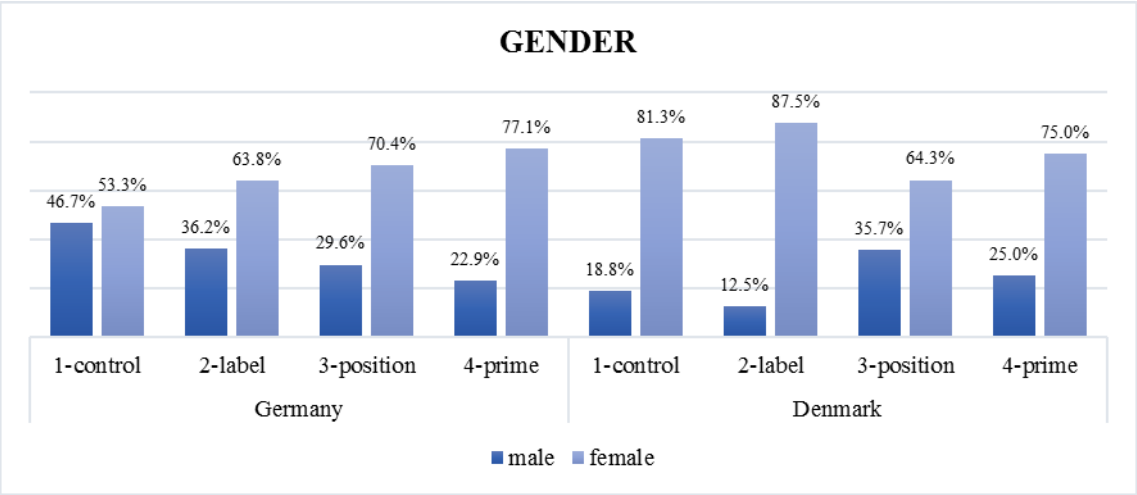
a Distribution of Respondents to Experiment Groups

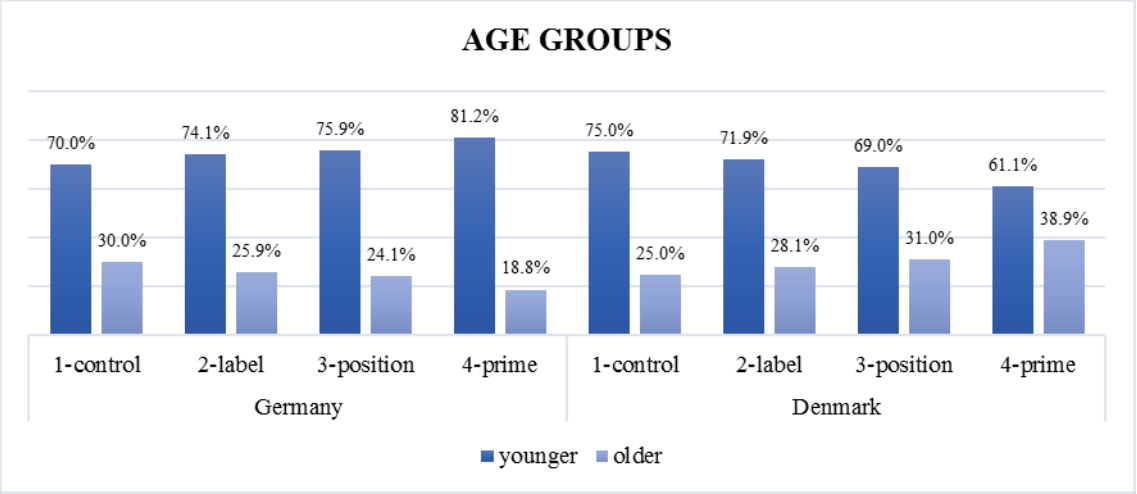
Count and percentage

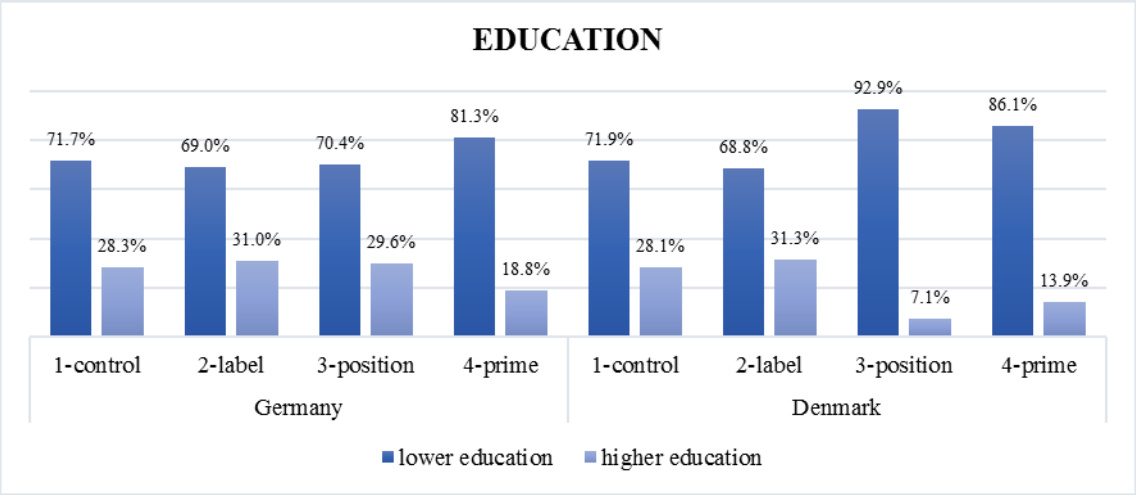
	1-control	2-label	3-position	4-prime	Total
Germany	60	58	54	48	220
	27.3%	*26.4%*	*24.5%*	*21.8%*	*100.0%*
Denmark	32	32	42	36	142
	22.5%	*22.5%*	*29.6%*	*25.4%*	*100.0%*
Total	92	90	96	84	362
	25.4%	*24.9%*	*26.5%*	*23.2%*	*100.0%*

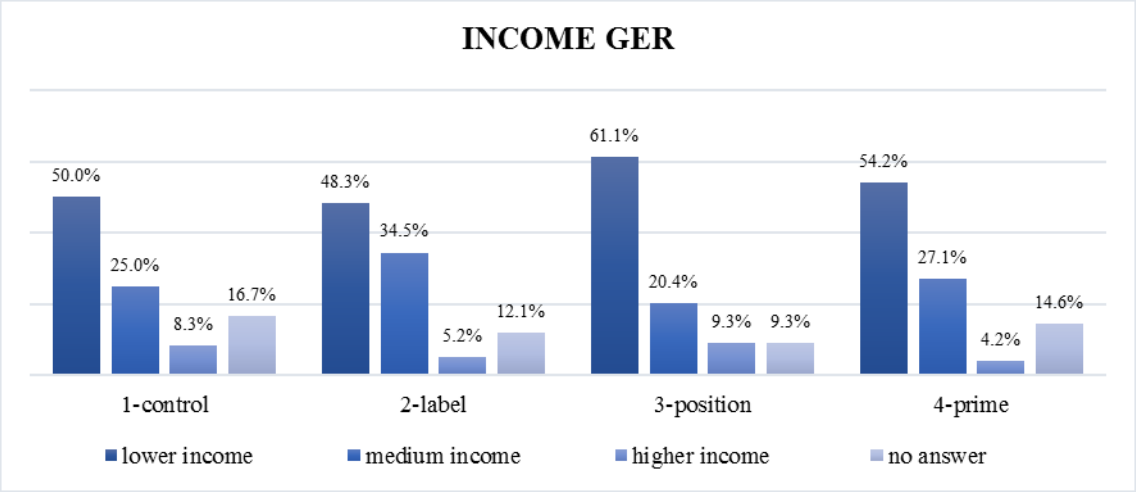
b Demographics

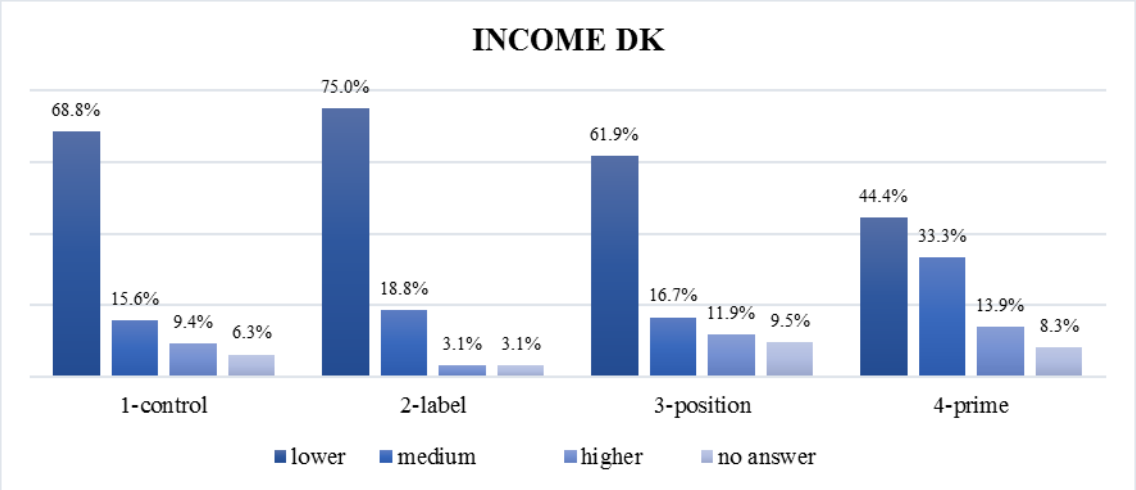
Distribution of Demographics by Experiment Group






EDUCATION
71.7%
28.3%
69.0%
31.0%
70.4%
29.6%
81.3%
18.8%
71.9%
28.1%
68.8%
31.3%
92.9%
7.1%
86.1%
13.9%
1-control
2-label
3-position
4-prime
1-control
2-label
3-position
4-prime
Germany
Denmark
lower education
higher education


INCOME GER
50.0%
25.0%
8.3%
16.7%
48.3%
34.5%
5.2%
12.1%
61.1%
20.4%
9.3%
9.3%
54.2%
27.1%
4.2%
14.6%
1-control
2-label
3-position
4-prime
lower income
medium income
higher income
no answer

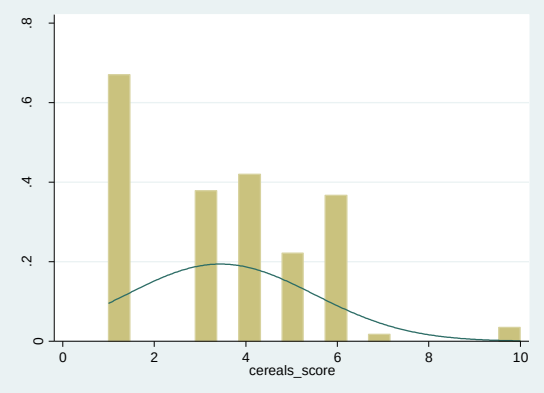

INCOME DK
68.8%
15.6%
9.4%
6.3%
75.0%
18.8%
3.1%
3.1%
61.9%
16.7%
11.9%
9.5%
44.4%
33.3%
13.9%
8.3%
1-control
2-label
3-position
4-prime
lower
medium
higher
no answer

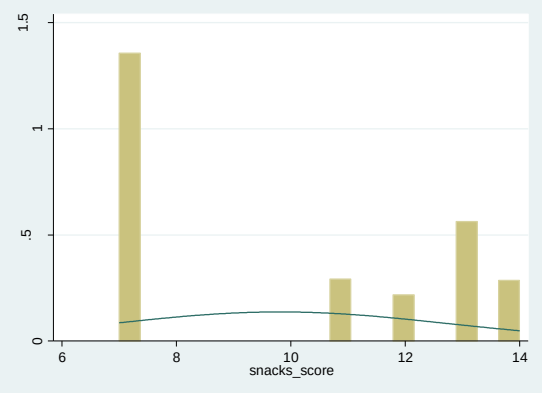
Appendix VIII: Hypotheses Testing

a Output Shapiro-Wilk Test for Outcome Measures

```
. swilk cereals_score

                    Shapiro-Wilk W test for normal data

    Variable |      Obs        W           V          z       Prob>z
-------------+--------------------------------------------------------
cereals_sc~e |      362    0.97566       6.128      4.294      0.00001

. swilk snacks_score

                    Shapiro-Wilk W test for normal data

    Variable |      Obs        W           V          z       Prob>z
-------------+--------------------------------------------------------
snacks_score |      362    0.93943      15.252      6.453      0.00000
```

b Histograms: Distribution of Healthiness Scores





c Output Levene's Test for Outcome Measures across Treatment Groups

```
. robvar cereals_score, by(group)

      group |        Summary of cereals_score
            |        Mean   Std. Dev.       Freq.
------------+------------------------------------
          1 |    3.923913   2.0925493          92
          2 |   3.3444444   2.0176809          90
          3 |   3.3958333   2.1150049          96
          4 |   3.0833333   1.9088149          84
------------+------------------------------------
      Total |   3.4447514   2.0528981         362

W0   =  0.20680593   df(3, 358)      Pr > F = 0.89166719

W50  =  0.11474407   df(3, 358)      Pr > F = 0.95144379

W10  =  0.26771471   df(3, 358)      Pr > F = 0.84866236
```

```
. robvar snacks_score, by(group)

      group |        Summary of snacks_score
            |        Mean   Std. Dev.       Freq.
------------+------------------------------------
          1 |        10.5   2.8535692          92
          2 |  10.177778   2.9777368          90
          3 |  10.552083   2.9267183          96
          4 |   7.8095238   1.7866721          84
------------+------------------------------------
      Total |  9.8093923    2.908507         362

W0   =  41.824209   df(3, 358)      Pr > F = 0.00000000

W50  =  20.970026   df(3, 358)      Pr > F = 0.00000000

W10  =  47.039822   df(3, 358)      Pr > F = 0.00000000
```

d Shapiro-Wilk Test for Log-transformed Scores

```
                    Shapiro-Wilk W test for normal data

    Variable |     Obs        W           V          z       Prob>z
-------------+--------------------------------------------------------
 log_cereals |     362    0.89481      26.487      7.760     0.00000

. swilk log_snacks

                    Shapiro-Wilk W test for normal data

    Variable |     Obs        W           V          z       Prob>z
-------------+--------------------------------------------------------
  log_snacks |     362    0.91434      21.570      7.274     0.00000
```

e Box Plots: Distribution of Healthiness Scores

f Table H1 & H6

Results for Mann Whitney U Test: Experiment Groups and Product Category

BOTH COUNTRIES		**1_control**	**2_label**	**3_position**	**4_prime**
	sample (n)	*92*	*90*	*96*	*84*
cereals	**mean (μ)**	3.92	3.34	3.40	3.08
	median (M)	4	4	3	3
	p-value		0,03**	0,06*	0,01**
snacks	**mean (μ)**	10.50	10.18	10.55	7.81
	median (M)	11	12	12	7
	p-value		0.61	0.72	0,00**

g Table H2

Results Mann-Whitney U Test: Germany and Denmark

CEREALS		**1_control**	**2_label**	**3_position**	**4_prime**
GER	***n***	*60*	*58*	*54*	*48*
	μ	4.45	4.03	3.89	3.42
	M	5	4	4	3
	p		0.11	0,09*	0,01**
DK	***n***	*32*	*32*	*42*	*36*
	μ	2.94	2.09	2.76	2.64
	M	1	1	2	3
	p		0.20	0.85	0.82
SNACKS		**1_control**	**2_label**	**3_position**	**4_prime**
GER	***n***	*60*	*58*	*54*	*48*
	μ	10.73	10.19	10.52	7.83
	M	12	11	13	7
	p		0.35	0.91	0,00**
DK	***n***	*32*	*32*	*42*	*36*
	μ	10.06	10.16	10.60	7.78
	M	11	11	11	7
	p		0.71	0.46	0,00**

h Table H3

Results Mann-Whitney U Test: High & Low Product Involvement by Experiment Groups

BOTH COUNTRIES	***Sample (n)***	**1_control** *92*	**2_label** *90*	**3_position** *96*	**4_prime** *84*
cereals & low involvement	***n***	38	39	42	35
	µ	4.45	3.59	3.55	3.14
	M	5	4	4	3
	p		0,05*	0,05*	0,00**
cereals & high involvement	***n***	54	51	54	49
	µ	3.56	3.16	3.28	3.04
	M	4	4	3	3
	p		0.26	0.38	0.26
snacks & low involvement	***n***	40	47	47	46
	µ	9.88	9.23	10.30	7.52
	M	9	7	11	7
	p		0.31	0.74	0,00**
snacks & high involvement	***n***	52	43	49	38
	µ	10.98	11.19	10.80	8.16
	M	12	13	12	7
	p		0.45	0.99	0,00**

i Table H4

Results Mann-Whitney U Test: High & Low Food Choice Motivation by Experiment Groups

CEREALS		**1_control**	**2_label**	**3_position**	**4_prime**
SNACKS		**1_control**	**2_label**	**3_position**	**4_prime**
low health motivation	***n***	43	38	39	36
	µ	11.35	11.18	11.33	7.95
	M	12	13	13	7
	p		**0.79**	**0.51**	**0,00****
high health motivation	***n***	49	52	57	48
	µ	9.76	9.44	10.02	7.71
	M	7	7	11	7
	p		**0.59**	**0.65**	**0,00****
low price motivation	***n***	54	52	48	49
	µ	10.41	9.98	9.85	7.73
	M	12	11	9	7
	p		**0.49**	**0.46**	**0,00****
high price motivation	***n***	38	38	48	35
	µ	10.63	10.45	11.25	7.90
	M	12	11.5	13	7
	p		**0.94**	**0.32**	**0,00****
low weight control motivation	***n***	48	42	46	35
	µ	10.60	10.64	11.07	7.80
	M	12	12	13	7
	p		**0.66**	**0.18**	**0,00****
high weight control motivation	***n***	44	48	50	49
	µ	10.39	9.77	10.08	7.82
	M	11.5	9	11	7
	p		**0.38**	**0.54**	**0,00****

j Tables H5

Results Mann-Whitney U Test: Demographic Factors (gender, age, education, income)

		CEREALS				*SNACKS*			
GENDER		**1_control**	**2_label**	**3_position**	**4_prime**	**1_control**	**2_label**	**3_position**	**4_prime**
male	***n***	34	25	31	20	34	25	31	20
	µ	4.12	4.36	3.52	3.40	10.68	10.52	11.00	8.30
	M	4	4	3	3	12	11	12	7
	p		**0.82**	**0.26**	**0.35**		**0.91**	**0.36**	**0,00****
female	***n***	58	65	65	64	58	65	65	64
	µ	3.81	2.95	3.34	2.98	10.40	10.05	10.34	7.66
	M	4	3	3	3	12	11	11	7
	p		**0,01****	**0.13**	**0,01****		**0.65**	**0.87**	**0,00****

		CEREALS				*SNACKS*			
AGE		**1_control**	**2_label**	**3_position**	**4_prime**	**1_control**	**2_label**	**3_position**	**4_prime**
younger than 30	***n***	66	66	70	61	66	66	70	61
	µ	4.29	3.41	3.56	3.25	10.86	10.41	11.07	7.72
	M	5	4	3	3	12	11	12.5	7
	p		**0,00****	**0,03****	**0,00****		**0.53**	**0.50**	**0,00****
older than 30	***n***	26	24	26	23	26	24	26	23
	µ	3.00	3.17	2.96	2.65	9.58	9.54	9.15	8.04
	M	3	3	3	1	7	7	7	7
	p		**0.80**	**0.84**	**0.58**		**0.97**	**0.61**	**0,04****

		CEREALS				*SNACKS*			
EDUCATION		**1_control**	**2_label**	**3_position**	**4_prime**	**1_control**	**2_label**	**3_position**	**4_prime**
lower	***n***	26	28	19	14	26	28	19	14
	µ	4.42	2.75	3.90	3.71	10.92	10.39	11.05	7.86
	M	4.5	3	3	3.5	13	11	13	7
	p		**0,00****	**0.41**	**0.33**		**0.64**	**0.87**	**0,00****
higher	***n***	66	62	77	70	66	62	77	70
	µ	3.72	3.61	3.27	2.96	10.33	10.08	10.43	7.80
	M	4	4	3	3	11.5	11	12	7
	p		**0.48**	**0.12**	**0,02****		**0.72**	**0.63**	**0,00****

		CEREALS				*SNACKS*			
INCOME		**1_control**	**2_label**	**3_position**	**4_prime**	**1_control**	**2_label**	**3_position**	**4_prime**
lower	***n***	52	52	59	42	52	52	59	42
	µ	4.13	3.08	3.64	3.31	10.69	10.12	10.64	7.38
	M	5	3	3	3	12	11	12	7
	p		**0,00****	**0.18**	**0,05***		**0.52**	**0.87**	**0,00****
medium	***n***	20	26	18	25	20	26	18	7
	µ	3.95	3.85	2.67	2.52	11.00	10.42	10.17	8.04
	M	4	4	3	1	12	11.5	10	7
	p		**0.55**	**0,02****	**0,02****		**0.62**	**0.85**	**0,00****
higher	***n***	8	4	10	7	8	4	10	7
	µ	2.63	3.00	3.40	3.43	9.50	9.75	10.40	9.57
	M	2	3.5	3	4	9	12.5	11.5	11
	p		**0.65**	**0.43**	**0.40**		**0.93**	**0.40**	**0.90**

Appendix IX: Additional Insights

In the following, additional insights gained form the questionnaire are outlined. These include the respondents' product choice, their familiarity with the products they chose, consumption frequency of the products, their use of nutritional tables to make their choice and familiarity with food labels.

a Product Choice (Q2&3)

As exhibited in the tables below, there are considerable differences between the product choices of participants from the different experiment groups. The most striking ones will be summarized in this section.

For the **German** cereals selection, oats (product 1: Haferflocken) were only chosen by 10.0% of respondents in the control condition but more than three times as much in the prime treatment group (31.3%), in which respondents considered it as the healthy start into the day. Some of the products were overall not popular, with choice scores of less than 5% in all of the groups (products 3, 9, 10, 13, 14). Product 11 (Knusper Müsli Früchte, engl.: crunchy fruits muesli) has constantly higher choice rates in the nudge groups compared to the control group, although being a rather unhealthy choice. In the German snacks selection, both healthier choices (product 1: Leibniz Vollkornkeks and product 2: Vitalgebäck Klassik) were considerably more popular in the prime condition (chosen by 43.8% and 37.5%, respectively), compared to the control condition (20.0% and 15.0%, respectively).

Being the first choice for around half of the **Danish** respondents in each of the four conditions, oats (product 1: Havregryn) display a clear preference. One of the healthier products, Frugtmüsli (product 4) was not selected in the control scenario but showed clearly higher values in the nudge scenarios (label: 9.4%, position: 4.7% and prime: 16.7%). Two products (product 10: Lion Caramel & Chocolate and product 13: Frosties) were never chosen. Similar to the observation for German snacks, a steep increase in popularity could be detected for one of the Danish healthier snack choices (Fuldkornkiks), with 28.1% in the control condition to 66.7% in the prime treatment.

Tables: Respondents' Product Choice

Please note: values in %, relatively healthier products (which received the Healthier Choice Label) are marked in light grey

BREAKFAST CEREALS GER		1_control	2_label	3_position	4_prime
1	Haferflocken	10.0	17.2	18.5	31.3
2	Bircher Müsli	15.0	15.5	25.9	22.9
3	Special K Classic	1.7	0.0	3.7	0.0
4	Früchte Müsli	11.7	22.4	13.0	12.5
5	Erdbeer Amaranth Müsli	5.0	8.6	3.7	4.2
6	Multi Cheerios Vollkorn	1.7	5.2	0.0	0.0
7	Joghurt Erdbeer Müsli	6.7	5.2	3.7	0.0
8	Roasted Müsli Schoko-Nuss	20.0	5.2	1.9	2.1
9	Chocos	1.7	1.7	1.9	0.0
10	Lion Cereals Karamell & Schoko	5.0	3.5	1.9	0.0
11	Knusper-Müsli Früchte	5.0	5.2	7.4	16.7
12	Schoko-Amaranth Knusper-Müsli	15.0	6.9	14.8	8.3
13	Frosties	0.0	0.0	0.0	2.1
14	Urlegenden Crunchy Müsli	0.0	0.0	1.9	0.0
15	Knusper-Müsli mit Schokolade & Haselnüssen	1.7	3.5	1.9	0.0

SNACKS GER		1_control	2_label	3_position	4_prime
1	Leibniz Vollkornkeks	20.0	20.7	16.7	43.8
2	Vitalgebäck Klassik	15.0	22.4	25.9	37.5
3	Corny Schoko	6.7	15.5	0.0	14.6
4	Oreo Cookies	15.0	6.9	7.4	0.0
5	Chocolate Chip Cookies	31.7	19.0	35.2	4.2
6	Knoppers	11.7	15.5	14.8	0.0

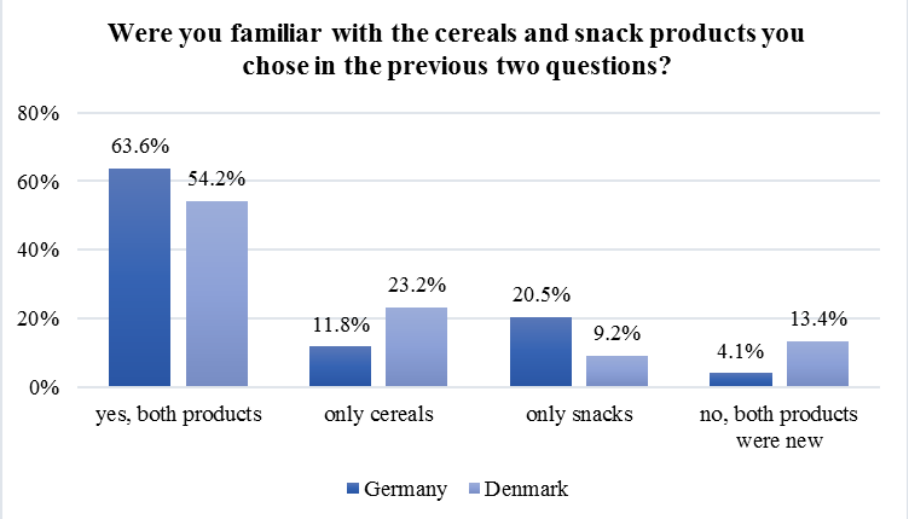
BREAKFAST CEREALS DK		1_control	2_label	3_position	4_prime
1	Havregryn	53.1	59.4	50.0	47.2
2	Multi Mysli	6.3	12.5	9.5	13.9
3	Special K Classic	15.6	6.3	4.7	0.0
4	Frugtmüsli	0.0	9.4	4.7	16.7
5	Super Frugt Havre Müsli	0.0	9.4	11.9	8.3
6	Multi Cheerios Fuldkorn	0.0	0.0	2.4	2.8
7	Crüsli Raisin	0.0	0.0	2.4	2.8

8	**Crüsli 4 Nuts**	**6.3**	**0.0**	**2.4**	**2.8**
9	**Coco Pops Crunchers**	**3.1**	**3.1**	**0.0**	**0.0**
10	**Lion Caramel & Chocolate**	**0.0**	**0.0**	**0.0**	**0.0**
11	**Øko Müsli Knas**	**3.1**	**0.0**	**4.7**	**5.6**
12	**Øko Müsli Choko**	**6.3**	**0.0**	**4.7**	**0.0**
13	**Frosties**	**0.0**	**0.0**	**0.0**	**0.0**
14	**Urlegender Crunchy Müsli**	**3.1**	**0.0**	**0.0**	**0.0**
15	**Crunchy Müsli Chokolade & Nødder**	**3.1**	**0.0**	**2.4**	**0.0**

SNACKS DK		**1_control**	**2_label**	**3_position**	**4_prime**
1	**Fuldkornkiks**	**28.1**	**31.3**	**9.5**	**66.7**
2	**Granola Crunch Fuldkornkiks**	**15.6**	**15.6**	**23.8**	**16.7**
3	**Corny Chokoladebar**	**12.5**	**6.3**	**21.4**	**11.1**
4	**Oreo Kakaokiks**	**15.6**	**9.4**	**9.5**	**0.0**
5	**Chocolate Chip Cookies**	**18.8**	**18.8**	**23.8**	**5.6**
6	**Knoppers**	**9.4**	**18.8**	**11.9**	**0.0**

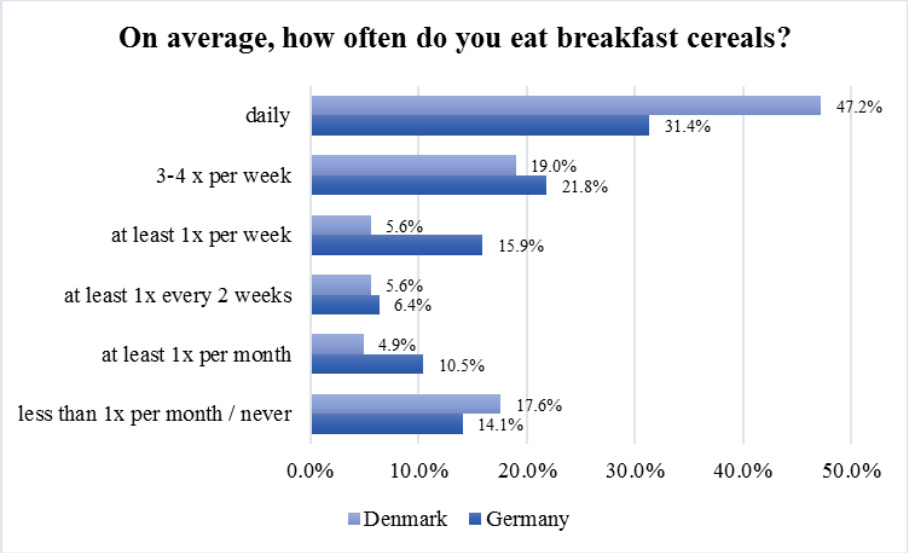
b Familiarity with the Products (Q4)

The data from Q4 reveals that most people have chosen products that were familiar to them (63.6% of Germans and 54.2% of Danes, see graph below). Only a very small share of German respondents (4.1%) indicated they opted for new products from both product groups, whereas 13.4% of Danish respondents have chosen two new products. Nearly a quarter (23.2%) of Danish respondents was only familiar with the cereal product they chose, as compared to 11.8% of Germans. In contrast, more German respondents (20.5%) selected a familiar snack and a new cereal product and only 9.2% of Danes chose this combination.

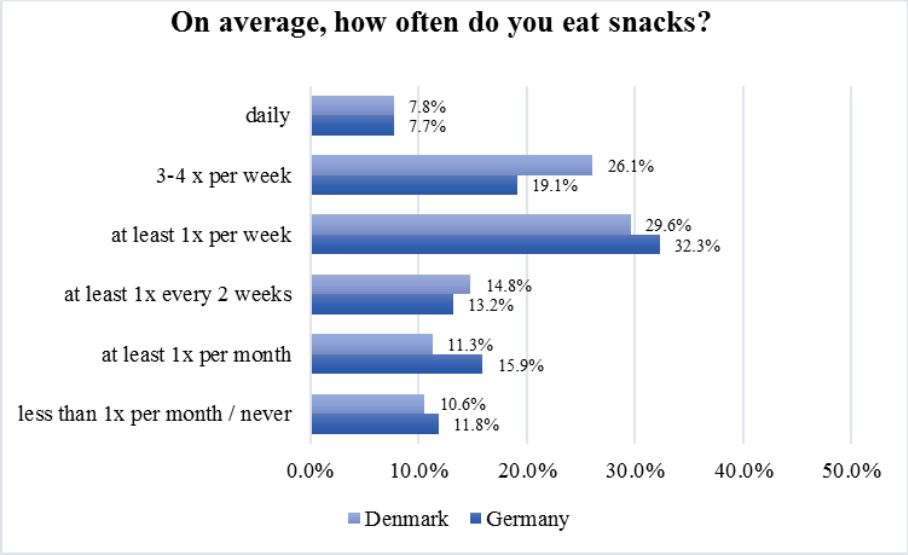


c Consumption frequency (Q6&7)

Insights into the German and Danish respondents' consumption habits of breakfast cereals and snacks are gained from Q6 and Q7 (see graph below). Overall, 69.1% of German and 71.8% of Danish respondents can be classified as more frequent cereals consumers (daily, 3-4x per week, at least 1x per week) and 30.9% of Germans and 28.2% of Danes as more seldom cereals consumers (less than 1x per month or never, at least 1x per month, at least 1x every 2 weeks). Nearly half of the Danish respondents and one third of Germans consume cereals daily. On the other end of the scale, 17.6% of Danes and 14.1% of Germans never or very rarely eat breakfast cereals. Besides the fact that a bigger share of Danish respondents are daily cereal consumers, no additional considerable differences between the two country samples in their consumption habits of cereals are found.

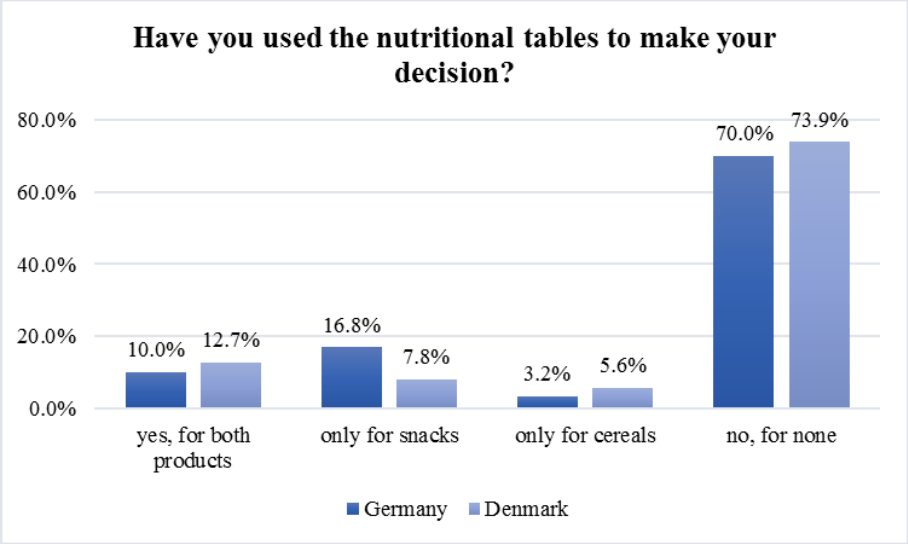


For snacks, there are slightly different consumption patterns with less than 10% of respondents from each country sample stating that they eat snacks daily (7.8% of Danes and 7.7% of Germans). Most of the respondents consume snacks 3-4 times per week (26.1% of Danes and 19.1% of Germans) or at least once per week (29.6% of Danes and 32.3% of Germans). Similar to the cereals category, no considerable difference between the samples can be observed, except for the tendency of Danish respondents to consume snacks more frequently, with 63.4% (daily, 3-4x per week, at least 1x per week), compared to 59.1% of Germans. On the other end, 36.6% of Danes and 40.9% Germans can be classified as seldom snacks consumers (less than 1x per month or never, at least 1x per month, at least 1x every 2 weeks).



d Use of Nutritional Tables (Q5)

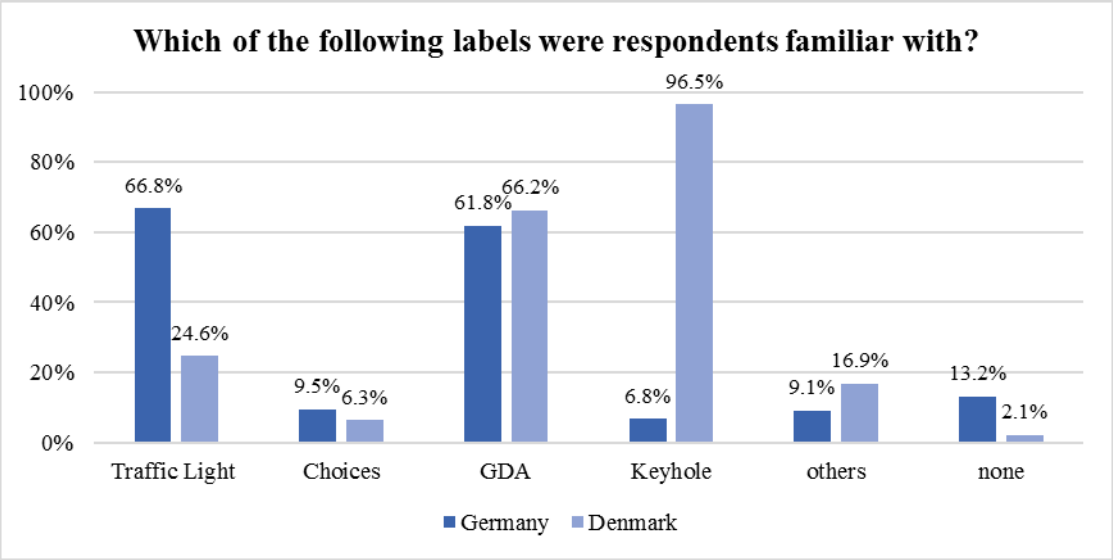
When asking respondents whether they had used the nutritional tables to make their decision for a product, a clear majority of both samples indicated they had not made use of them at all (70.0% of Germans and 73.9% of Danes, see graph below). Only 10.0% of German and 12.7% of Danish respondents used the nutritional tables for both products. 16.8% of Germans and 7.8% of Danes considered the nutritional table exclusively for cereals, and 3.2% of Germans and 5.6% of Danes for snacks only. Overall, the Danish respondents made slightly less use of the nutritional tables.



e Familiarity with Labels (Q11)

As can be seen in in the graph below, the majority of German respondents was familiar with the Traffic Light Label (66.8%), which is present on some German products and only 24.6% of Danish respondents know the label. As expected, the Choices logo, which is primarily found in the Netherlands, was not familiar to more than 9.5% of German and 6.3% of Danish respondents. A high proportion of Germans and Danes stated to know the GDA logo (61.8% and 66.2%, respectively), which is present on many products in both countries. Not surprisingly, 96.5% of Danes indicated they know the Nordic Keyhole Label, compared to 6.8% of Germans. A higher percentage of Germans (13.2%) versus Danes (2.1%) stated that they do not know any labels.

Besides the suggested labels, respondents were asked to fill in other labels they know. The text responses by 21 German and 24 Danish participants have been analyzed and grouped into six categories: health-related food labels, organic labels, fair trade labels, sustainability-related food labels, vegan labels and others (see table below). Overall, Danish respondents indicated more health-related labels, such as different "fuldkorn" (whole-wheat) labels and in turn, German respondents seem to be more aware of fair trade labels. This might imply that Danish consumers are already more sensitized to whole-wheat and fiber in their nutrition, while Germans are more attentive towards fair trade quality of the products they buy.



f Label Text Responses (Q11)

Q11: Do you know other labels, if yes, which ones – multiple answers possible)

Please note: "Total" refers to the number of times this label type has been named by respondents

Label Group	Respondents' answers GER (21 respondents)	Total	Respondents' answers DK (24 respondents)	Total
Health-related food labels	1x Nahrungspyramide 1x einfacheres Ampelkennzeichen	2	1x Vælg fuldkorn først 7x Fuldkornsmærket 1x Den gule fiber mand 1x kostfiber logoet	10
Organic labels	14x Bio Label 4x Demeter 1x Bioland 1x NaturLand	20	17x Øko mærket	17
Fair trade – labels	13x Fairtrade 1x fair gehandelt (GEPA) 1x dwp	15	2x Fairtrade	2
Sustainability-related food labels	2x MSC (certified sustainable seafood) 2x Rainforest alliance	3	1x UTZ	1
Vegan labels	4x Vegan label	4	2x vegansk	2
Others	1x DLG (quality of food) 2x Gentechnikfrei-Label	3	1x Svanemærket 1x ingen parabener 1x FSC	3
	Total answers GER	**48**	**Total answers DK**	**35**