Public attitudes towards choice architectural nudge interventions

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Title: Public attitudes towards choice architectural nudge interventions

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The present thesis is developed as a part of the interdisciplinary Master of Science Program Integrated Food Studies (IFS) at Aalborg University in Copenhagen. The educational program embraces three research areas within food studies: Design and gastronomy, food policy and innovation and public health nutrition (IFS n.d.). Public health nutrition has been selected as the main area, and the methodological approach for the present thesis is following concepts and theories specific for this field. More specifically, the focus in the thesis is on the public attitudes towards the use of choice architectural nudge interventions to promote vegetable intake among Danish adolescents.

However, the thesis also comprises elements from the two remaining research areas within the IFS program. Food policy and innovation are represented by theories related to communication and distribution of the questionnaire as well as in the ethical discussion of the applying choice architectural nudge interventions as a political measure in health promotion. The area of design is represented in the development of nudge interventions and how choice architects can create or design such environments assisting to encourage a healthy behaviour.

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Abstract

The average European consumption of vegetables is known to be generally inadequate compared to official dietary guidelines, and especially children and adolescents do far from meet the recommendations. As the dietary habits implemented early in life tend to persist into adulthood, adolescent are an especially vulnerable group.

The use of choice architectural nudge interventions as a mean to promote healthy eating, such as increasing vegetable intake, has increasingly gained focus. Nudging as a public policy tool is highly debated at a political, academic and public level. Some argue that the tool is coercive, infantilising and containing the possibility of manipulation, since it applies knowledge of cognitive biases and works on a subconscious level targeting automatic processes. However, the evidence base is still very limited and no studies have investigated the attitude towards the use of these interventions among the population.

The present thesis investigated which factors are influencing the attitudes towards choice architectural nudge interventions aiming to increase vegetable intake among Danish teenagers in a school context. Though developing, validating and distributing a questionnaire, factors associated with attitudes were assessed through factor analysis and structural equation modeling. The theories applied in the development of the questionnaire were the Theory of Planned Behaviour and the Dual Process Theory.
The factors 'buffet habits', 'perceived intake', 'social norms' and 'responsibility' were found to have a significant association with the attitude towards choice architectural nudge interventions. However, 'self-efficacy' and 'perceived health' only had weak associations.

The respondents were found to be generally positive towards less intrusive nudges and displayed a more negative attitude towards nudges targeting their self-image. Further, the respondents considered it to be acceptable for the school to attempt to intervene with their health-related behaviour, but essentially they saw it as neither the school's obligation nor responsibility.

It is not possible to say whether attitude will lead to behaviour, but this would be interesting to investigate in a future study. Here, combining the questionnaire with actual exposure to nudges could be relevant in order to see if the results from the two methods would be associated with each other.

Keywords: Choice architectural nudge interventions, Danish teenagers, structured questionnaire, public health, attitude, vegetable intake.

Table of content

1 Introduction

The average European consumption of fruit and vegetables is considered to be generally inadequate among all age groups compared to official dietary guidelines (Ungar, Sieverding & Stadnitski 2013, Capacci et al. 2012, Pérez-Cueto et al. 2011, Tetens 2010, Elmadfa 2009, Yngve et al. 2005, Andersen, Overby & Lillegaard 2004). Especially vegetable consumption is widely insufficient, and in Denmark, where the recommended intake is 300 grams per day for the population above the age of 10, the average daily intake of vegetables is 162 grams for adults and as little as 131 grams for adolescents between 10-17 years (Pedersen et al. 2010). This leaves adolescents to be the age group with the lowest intake compared to the official dietary guidelines. In addition, the food patterns of adolescents are of great concern from a public health nutrition perspective, since food habits consolidated by mid-adolescence will tend to persist into adulthood (Lien, Lytle & Klepp 2001, Kelder et al. 1994).

Unhealthy diets are contributing to the increasing levels of lifestyle-related diseases causing immense societal challenges, and a low fruit and vegetable intake is associated with an increased risk of obesity and several lifestyle diseases i.e. certain cancers, type-2 diabetes and cardiovascular disease (Cooper et al. 2012, Jeurnink et al. 2012, Boffetta et al. 2010, He et al. 2007, Marmot et al. 2007). Hence, increasing the fruit and vegetable intake among the European population could reduce the prevalence of deaths associated with an unhealthy lifestyle. However, food related behaviours such as fruit and vegetable consumption, are complex. The barriers of increasing the consumption are numerous and involve an interaction between different factors such as acceptability, availability, intention, attitudes and beliefs as well as socio-demographic characteristics (Rasmussen et al. 2006, De Irala-Estevez et al. 2000, Neumark-Sztainer et al. 1999). It is therefor necessary to obtain a better understanding of these factors in order to overcome consumption barriers and improve the dietary habits at population level.

Health interventions across Europe have traditionally been employing information campaigns and nutrition education targeting deliberate actions and reflective thought processes as means to change behaviour among the population using behavioural theories such as the Theory of Planned Behaviour, the Health Believe Model or the Social cognition theory (Kamper-Jørgensen, Almind & 2009). These strategies aim to develop personal resources among the public, with the aim of facilitating a dietary change towards achieving a higher or lower intake of a certain food products. This approach has only to a minor extent been successful, and only at increasing the consumption of

fruit, whereas levels of vegetable intake have not been sufficiently improved (Fagt et al. 2008). Further, the interventions are more likely to affect societal groups that are already focused on sustaining a healthy lifestyle, which is leaving more vulnerable demographic and socio-economic groups behind, such as immigrants and groups with low income and with little or no education (Baadsgaard, Brønnum-Hansen 2012, Diderichsen, Andersen & Manuel 2011).

This points towards the fact that information campaigns alone cannot bring about the desired behavioural change and education in and of itself is not sufficient in altering food behaviour and, more specifically, in increasing consumption of vegetables (Marteau, Hollands & Fletcher 2012, Axelson, Federline & Brinberg 1985). Therefore, since appealing to deliberate actions has proven insufficient, it is consequently interesting to investigate the influences of less conscious factors on food behaviour.

Nudges are a subgroup of measures within the frame of Choice Architectural that live up to these premises of working to change behaviour on a sub-conscious level (see chapter 3 'Conceptual Clarification' and section 4.3.1 'Nudging'). Choice architecture is a relatively new behavioural tool that has attracted much attention among researchers and policy-makers due to promising results from experimental studies. Here it has been shown, that by applying subtle environmental alterations such as rearranging food selection, health labelling or manipulating sizes of plates and cutlery it is possible to alter an individual's food related behaviour in a predictable way while requiring minimal conscious engagement from the involved (Hollands et al. 2013). As opposed to information campaigns, choice architectural nudge interventions (CANI) and nudges target automatic processes instead of deliberate actions (Kahneman 2011). Several studies have shown that it is possible to influence eating behaviour and food choices in a positive direction (Mørk et al. 2014, Skov et al. 2012), and early results have indicated positive outcomes despite of which country of origin, cultural heritage and socio-economic status the participants of the interventions might have had. Hence, this highlights the potential of using nudging as a large-scale tool across countries and social groups (Levy et al. 2012).

The focus of the present thesis will be on teenagers and the use of CANI targeting an increased vegetable intake among this target group. The following sections will elaborate on several of the above-mentioned aspects related to this field. First, a presentation of a systematic literature search exploring the prevalence of studies investigating the effects of and attitudes towards CANI among adolescents will be presented. Secondly, the difficulties related to increasing vegetable intake among adolescents will be described. Next, the traditional methods to change behaviour will be compared

to the Dual Process Theory and the use of CANI taking environmental factors into account will be explored. Finally, the discourses within nudging will be presented.

1.1 State of the art

As part of the research for the present thesis, a systematic literature search was conducted with two main objectives. The first objective was to review the prevalence and quality of published studies regarding the effects of CANI aiming to promote the intake of vegetables among adolescents in a school context. The second objective of the search was to investigate the prevalence of studies exploring the attitude towards nudge interventions among the target group. Based on this search, a systematic literature review was conducted (see appendix 2 'Systematic Literature Review').

Overall the review found very few studies investigating the effects of CANI on vegetable intake among adolescents, and merely 12 relevant articles met the selection criteria (see appendix 2, 'Systematic Literature Review'). The studies could be divided into three categories of interventions; 1) distribution of free vegetables, 2) modifications to serving style, 3) changing the physical environment.
The results of the 12 studies were inconclusive. In general it seemed that the interventions initiating an increase in vegetable intake were the ones where the variety of vegetables was increased. The remaining included studies did not have the same consistently positive results. For instance, free distribution of vegetables did not show a significant effect on the intake levels; however, the participants gained a more positive attitude towards vegetables.

The studies included in the review were generally of weak or moderate quality. Further, it seemed that vegetables were of secondary focus in the study designs, which indicates that there is a need for additional research in this area in order to conclude, which types of CANI are more effective in improving vegetable intake, since vegetables are proving to be the most difficult food group to implement into a diet among adolescents (Morizet 2011, Sahota et al. 2001).

Regarding the prevalence of published studies investigating the attitudes towards CANI among adolescents as an outcome measure, no studies were retrieved.

In conclusion, very little research have been conducted within the target group of the present thesis regarding effects of CANI on vegetable consumption and no studies have investigated the attitude towards such interventions among adolescents. This highlights the novelty of the focus in the present thesis.

1.2 Target group

It is difficult to assess the general health status among European adolescents as the evidence base for food intake, physical activity and physical fitness are fragmented and non-comparable between countries due to incomplete or inconsistent data (Moreno et al. 2008, World Health Organization 2005). However, there is a pattern of adolescents increasingly adopting inexpedient lifestyles including poor eating habits, sedentary habits and a lack of physical activity, resulting in an increased risk of developing obesity and non-communicable diseases such as diabetes, cardiovascular diseases and certain cancers later in life (De Henauw et al. 2007, Gibney et al. 2004). This tendency also seems to apply among Danish adolescents. According to a national survey of the health status among 7th graders approximately 10 per cent is overweight and one per cent is obese. The report further shows, that as much as 30 per cent of boys and 16 per cent of girls never, rarely or once or twice a week eat fruits or vegetables (Hansson, Vinther-Larsen 2008).

As children enter the transitional phase from childhood to adolescence their eating habits are easily affected and may develop in an unhealthy direction due to increased independence from their parents, social interaction with peers and easier access to unhealthy food products (De Henauw et al. 2007, Lytle et al. 2000). There is a tendency for adolescents to move towards a more inadequate and energy dense diet with a higher content of fat and sugar, more frequent snacking habits, and a lower intake of fibres, fruits and vegetables (De Henauw et al. 2007, Lytle et al. 2000). Seeing as adolescence is such an impact sensitive period in life there is a need of better understanding the determinants of vegetable intake and how they can be influenced beyond traditional approaches at individual level. This is essential in order to improve the efficiency of public health interventions among this target group. Thus, the present thesis will concentrate on Danish teenagers between the ages of 13 to 19. This specific age group within adolescence is chosen, since the empirical data will be collected through social media, where the lower age limit is 13 years. Further, the focus will be restricted to school settings, seeing as schools provide an indispensible opportunity to influence eating habits among a large number of people at the most influential stage of their lives (Gibney et al. 2004).

1.3 A shift in behaviour change approaches

As previously mentioned, a large part of the public health campaigns aiming to improve nutritional status has been based on behavioural theories such as the *Theory of Planned Behaviour* (TPB). The theory, developed by Icek Ajzen in 1985, is based on the assumption that behaviours in general and

hence, healthy actions in particular, are a product of conscious choices and mediated by the intention to live healthy (Ajzen 1985). The theory is situated in the area of psychological research, where health behaviour is a result of cognitive processes (Kamper-Jørgensen, Almind & Bruun Jensen 2009). Other psychological models commonly used to alter dietary behaviour are the *Health Belief Model* (HBM) by Rosenstock (1988) and Bandura's (2001) *Social Cognition Theory* (SCT). According to the HBM, health behaviour is shaped on the basis of feelings and expectations connected to a potential behavioural change (Iversen et al. 2002). Two parameters are described as essential for a person to perform a health promoting behaviour. The first is a desire to avoid illness, where the individual is weighing the risk of getting a specific disease and the medical and social consequences of getting the disease. The second parameter is the individuals expectations to the outcome of the behavioural change, i.e. if it is "worth it" to change (Iversen et al. 2002). The sum of the mental weighing of the positive and negative aspects of these parameters in relation to the expected support or resistance and barriers and possibilities that the individual will meet are decisive of the behaviour to become a reality (Iversen et al. 2002).

SCT assumes that behaviour is taught through the immediate surroundings, depending on the belief that the behaviour is satisfactory and in accordance with one's goals (Kamper-Jørgensen, Almind & Bruun Jensen 2009). Additionally, a health related behaviour change requires a sense of being able to set a goal and accomplish it, also referred to as self-efficacy, which is even more important than the long term expectations of the outcome of the behavioural change (Kamper-Jørgensen, Almind & Bruun Jensen 2009).

Another example of a model commonly used by health professionals when planning a change in dietary behaviour is the *Stages of Change* model by Prochaska og DiClemente (1986), which is also commonly used in relation to theories of addiction. This model describes five stages an individual goes through when conducting a behavioural change (Mæland 1999). The first stage is pre-contemplation where the current lifestyle is not considered a threat and the individual does not feel a need to change This belief can be affected by certain conditions such as symptoms of illness within the individual, among persons in the immediate surroundings or reports of incidences in the media (Mæland 1999). This brings the individual to the second stage in the model: Contemplation. Here it is acknowledged that the current lifestyle poses a threat. The individual considers changing, but does not intent to act on it until an outer impact occurs, which brings the individual to the third phase: Determination. The individual have decided on performing the change and a plan for the execution forms. The next stage is the action phase, where the actual change happens under the control of the

individual. The last stage is the maintenance phase. This stage has two possible outcomes; 1) the individual accepts the change and it becomes incorporated as an automatic action in the everyday life of the person and 2) the individual does not accept the change, which results in a relapse to previous behavioural patterns and the individual has returned to the pre-contemplation stage (Mæland 1999).

In the past decades, health promotion has been based on these cognitive models meaning that there has been a heavy focus on applying information to increase public knowledge of healthy and nutritionally advantageous habits. Examples of this can be seen in 1) the Danish official dietary guidelines published by the Danish Veterinary and Food Administration (2013), 2) in the systematic literature review conducted in connection with the present thesis, which highlights that interventions aiming at improving dietary habits of teenagers – in terms of increasing vegetable intake – have primarily been focusing on nutrition education targeting increased knowledge (see appendix 2 'Systematic Literature Review') and 3) in The Boost Project and The Pro Children Study, which are both published studies based on psychological theories such as the TPB, and are aiming to increase fruit and vegetable intake in schools by increasing availability and incorporating it into the curriculum (Krølner et al. 2012, Te Velde et al. 2008).

Even though information is being provided to the public in many different settings and through various channels there still is – as described earlier in the introduction – a major public health challenge in Europe and in Denmark as well. One explanation could point towards the gap that exists between knowledge and behaviour. While obtaining knowledge may lead to a positive attitude, there are numerous factors that can interfere and prevent the corresponding behaviour from occurring (Armitage, Christian 2003). As an example, close to the entire Danish population claims to know or have heard about the Danish dietary guidelines recommending 300 grams of vegetable per day. However, the average consumption is as little as 162 grams for adults (Ministry of Food, Agriculture and Fishery 2011, Pedersen et al. 2010).

Behavioural scientists have emphasised the significance of automatic processes and the many subconscious food choices people make every day (Wansink, Sobal 2007). Nudging and the focus of including environmental factors in health promotion is beginning to gain ground in both Danish and European public health policy, and it can further be detected in the definition of health promotion from WHO:

"*Health promotion is the process of enabling people to increase control over, and to improve, their health. It moves beyond a focus on individual behaviour towards a wide range of social and environmental interventions*" (WHO 2014).

The Dual Process Theory (DPT) provides a theoretical background for CANI as a tool to promote health, where subconscious decisions and environmental factors are taken into account when trying to improve public health. The DPT was developed in the 1970'ies by researchers dealing with human psychology (Evans, Frankish 2009), and it explains the thought process when performing a task as divided in two systems;

"*Typically, one of the processes is characterized as fast, effortless, automatic, nonconscious, inflexible, heavily contextualized, and undemanding of working memory, and the other as slow, effortful, controlled, conscious, flexible, decontextualized, and demanding of working memory*" (Evans, Frankish 2009, p. 2).

The first system represents the automatic thought processes, such as habits and instinctive actions related to the reptile brain, and the second system embodies the more deliberate actions and thought processes based on reflections and knowledge. These two systems are often conflicting (Evans, Frankish 2009). For instance one can have a made a conscious decision about eating more vegetables, but in reality does not behave accordingly, since the automatic processes take over. This might explain why the intention to behave in a certain manner is not always directly related to actually doing so, as it is otherwise assumed in theories such as the TPB (Ajzen 1985).

The concept of the DPT and nudging as a tool based on this theory will be further elaborated in chapter 4 'Theoretical framework'.

1.4 Discourses within nudging

It is appealing for governments to employ CANI in public policy as they can enable the promotion of a desired behaviour or diminish unwanted behaviours among citizens without resorting to legislation such as national prohibitions or regulations. Further, the interventions can be initiated within a small budget, since CANI are inexpensive to apply (UK Government n.d.). Both the political administrations of President Barack Obama in the United States and the Government lead by Prime Minister David Cameron in the United Kingdom have been utilizing CANI in public policy in the recent years. In 2010 the United Kingdom established the Behavioural Insights Team, a unit working to apply behavioural insights from academic research to inform public policy and services (Gov.uk n.d.). In 2008 the

President of the United States, Barack Obama, appointed Cass Sunstein, co-author of the book 'Nudge' (Thaler, Sunstein 2008), as Administrator of the White House Office of Information and Regulatory Affairs (Sunstein 2012). Several policies applying CANI have been developed since, including the transformation of the FDA's food pyramid into a more comprehensive plate model (USDA n.d.). In 2013 the efforts of applying CANI in public policy was expanded by creating a new team equivalent to the UK Behavioural Insights Team (Fox News 2013).

In Denmark nudging is as well beginning to gain footage. The Danish Nudging network has empirically been testing interventions encouraging sustainable and healthy behaviour with initiatives such as reducing street-litter and unnecessary energy usage (The Danish Nudging Network n.d.).
In March 2014 The Danish Meal Partnership launched the project "A loving green push – nudging in the retail sector" with the intention of developing nudge initiatives to promote healthy meals and increase fruit and vegetable consumption among the population (The Danish Meal Partnership 2014), so it seems as if Danish consumers increasingly will be encountering CANI in their everyday lives if this development continues.

As a concept applied in public health policy nudging has both advocates and opponents, and in the UK and the USA it initially created a stir in the media and on blogs with headlines and comments such as 'Nudge Squad' and 'Diet Police', and some commenters compared the methods to 2nd World War propaganda (Lott 2013, Tate 2013, Lions 2012). Not only the media, bloggers and commenters have been criticising the use of nudging as a policy measure. Politicians and members of academia have likewise been sceptical and concerned about the potential implications of the systematic use of CANI in public policy.

The main concerns involve issues of intrusiveness, lack of transparency and a risk of unintended consequences as well as absence of public acceptance and the ethical considerations related to this.

Nudging is by some accused of being infantilising and assuming that citizens are unaware of what is in their best interest and that governments would be better judges of the choices people should make (Lott 2013). Especially libertarians state adverse criticism towards nudging. Even though citizens are not dispossessed of their freedom to choose and can still opt out of the nudge, it is perceived as an attempt to intervene with the personal choice, which by libertarian principles is an assault on personal freedom and thereby paternalistic and undemocratic.
Others find nudging to be coercive and containing the possibility of manipulation seeing as the interventions work best if the receiver is unaware of their influence. Critics do not see that this

'guiding' should be that much different from elimination of choices, seeing as people are unaware of the fact that they are being nudged, because the nudges cannot be too obvious if they are to be effective (Farrel, Shalizi 2011).

Another concern among opponents of nudging is that even though some interventions might be reasonable, it can easily turn into a 'slippery slope' leading to unintended consequences (Lott 2013). Dr Adam Burgess (2012), associate editor of the European Journal of Risk and Regulation, states that one of the unintended consequences could be the lack of supporting or further educating the consumer on how to make healthier choices. The consumers' knowledge of how to live healthy needs to be evolved continuously and behaviour change should not merely rely on subconscious techniques and external guidance if the effects are to be long-term.
Some commentators, who otherwise see a potential for nudging used as a tool to improve public health, are also expressing concerns related to the long-term effects. Here the opinion is that nudge interventions should not be used exclusively, since traditional approaches such as regulation and legislation still has its relevance and could even be preferable in some cases. An example could be in circumstances where the industry is reluctant to comply with the soft regulation measures, as the case has been with reducing salt in food products (Marteau et al. 2011). Here, an ecological approach would be advisable to apply, taking both individual and environmental causes of nutrition behaviour into account as well at the interaction between the two (Gibney et al. 2004, Reynolds et al. 2004). At least, CANI should be accompanied by more traditional approaches such as information campaigns and nutrition education if long-term effects are to be ensured. This is due to the fact that there is still little evidence to support that CANI can stand alone and since durability has not been properly assessed at this point (Hollands et al. 2013, Bonell et al. 2011).

Based on the critical issues pointed out by academia, politicians and media, another major concern is, that the public acceptance of these types of behavioural interventions has not been assessed to a satisfactory level at this point in time (Marteau et al. 2011). This, as well as the fact that CANI are not fully backed by substantial scientific evidence accentuates the need to investigate the ethical implications and the general level of attitude and acceptance among the public, since nudging applied in public policy seems to be a evolving into a widespread phenomenon.

1.5 The gap in evidence

The foregoing section demonstrates that the current use of CANI in public policy is highly debated. Many are critical towards relying on this method as a means to influence public behaviour and the

main concerns revolve around issues regarding uncertainty of long-term effects, the somewhat infantilising notion that others are better judges of the choices people make, and that nudging contains elements of manipulation and limits freedom of choice. Finally, it is being criticised that little evidence exists to support the current nudge policies and that it should not have been implemented before such had been generated.

Neither critics nor studies have thoroughly investigated the level of public attitude towards CANI used in health policies. The previously mentioned systematic review conducted as background for the present thesis further highlights this gap, since no studies were identified having investigated the attitudes among adolescents towards CANI. In general, very little research has been conducted on the effects of nudging and the proportion of research does not measure up to the level of interest this field has experienced (Mørk et al. 2014, Skov et al. 2012). However, a Danish survey indicates that consumers might have a positive attitude towards being nudged towards healthier choices. In the survey 70 per cent of the respondents agreed that they liked when retailers accentuated the healthy products in the stores and 57 per cent agreed that retailers should make it easier for consumers to choose healthy food products (Roland, Preisler 2011).

The public attitude towards interventions and policies is a central issue, both due to the ethical considerations related to introducing a policy, but also related to the expected effectiveness or acceptability of the interventions if consumers are not supportive of the initiatives.
Regarding the ethical issues it can be discussed to what extent the attitudes of the consumers would be important, since the interventions are being initiated by a popularly elected government that presumably has the public's best interest at heart. Further more, even though consumers might initially be against a given intervention, their attitudes might gradually change towards being more positive as evidence of the effectiveness emerges (Diepeveen et al. 2013, House of Lords, Science and Technology Select Committee 2011). It can further be discussed whether attitude towards CANI will have any say in the matter of the level of effectiveness, since nudging is functioning by utilising the automatic system and the non-conscious choices among consumers. Attitudes could be less influential in these types of interventions, unless the consumer in the given situation is aware of the fact that they are being nudged. Never the less, assessing the attitudes towards CANI is an important element in order to discuss the above mentioned issues, since nudging seems to be increasingly applied in public policy across countries. Besides, there is still no evidence whether or not attitudes play a role in the effectiveness of CANI, so the above mentioned is merely speculations.

2 Research question, delimitation and contribution

2.1 Research question

The overall research question of the present thesis is to investigate the following:

What are the factors influencing the attitude towards choice architectural nudge interventions aiming to increase vegetable intake among Danish teenagers*?*

The research question will be investigated on the basis of relevant literature and empirical data collected by the authors.

More specifically, the research question will be investigated by:

- Developing and validating a questionnaire that should be able to assess the attitudes towards choice architectural nudge interventions aiming to increase vegetable intake among teenagers
- Identifying and modelling the factors that have an influence on the attitude towards choice architectural nudge interventions using factor analysis and structural equation modeling

2.2 Delimitation

The present thesis will focus on attitudes towards CANI, and thus, behaviour will not be investigated. The interventions proposed will revolve around the intake of vegetables and will not be focusing on fruit consumption. In addition the focus will be on Danish teenagers attending school. The empirical data will be collected through a structured questionnaire, which will be analysed quantitatively, and the thesis will thus refrain from using qualitative methods.

2.3 Contribution

The thesis is composed under the pan-European EU funded Marie Curie project VeggiEAT running from 2013 to 2017 with the aim of developing an EU platform for predictive modelling of processed vegetable intake that takes into account individual characteristics (acceptability, intake level, age groups) as well as environmental cues (choice architecture and institutional settings) (VeggiEAT 2014). The work of the thesis will contribute to two out of five work packages. The development and

pilot-testing of a questionnaire assessing the attitude towards CANI will be contributing to the evidence base of work package four; 'Intervention Study', while performing the first procedures of structural equation modeling will contribute to work package five; 'Model Development'

3 Conceptual clarification

Several terminologies and concepts are being used in this thesis. Certain ones of these are relevant to clarify and explain how they are being used in order to support the readers understanding of the project.

Choice architecture: 'Choice architecture' and 'nudging' are often used interchangeably and due to the novelty of both terms neither of them have yet been properly defined (Hollands et al. 2013) causing various interpretations to exists. In this thesis choice architecture refers to the social and physical environment in which an individual makes choices and these environments can be altered with the intention to change behaviour among the population. It is an overall term for structural health promoting tools ranging from more restrictive measures, such as taxation, to the more soft non-restrictive measures applied in nudging (Skov et al. Pending). When using the term 'choice architecture' it will thus refer to the measures that alter environments with the intention to change behaviour.

Nudging: The present thesis will be applying the definition of nudging proposed by Thaler & Sunstein (2008):

> *"…any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives".*
>
> (Thaler, Sunstein 2008, p. 6)

The term 'nudging' or 'nudges' will be referring to the specific non-restrictive measures within the frame of choice architecture, such as the 10 proposed nudges presented in the quantitative questionnaire developed for the empirical data collection of the thesis (see section 5.4.1 'Design' and appendix 4 'Final Questionnaire'). Thus an individual can be 'confronted with a nudge', e.g. unknowingly be given a smaller plate in order to reduce caloric intake, or can for instance be 'nudged' towards drinking more water.

Choice architectural nudge interventions: A clear definition for health promoting choice architectural intervention utilising nudges has not been established (Hollands et al. 2013). The term 'Choice architectural nudge interventions' has been applied as a description for this concept in the present thesis. After reviewing several definitions and consulting with senior colleagues with

expertise within the field, this was considered to be the most precise term. It is therefore not a term acknowledged in current literature within the field, however, since a clear definition is not composed, choice architectural nudge interventions will be used when referring to this specific type of interventions.

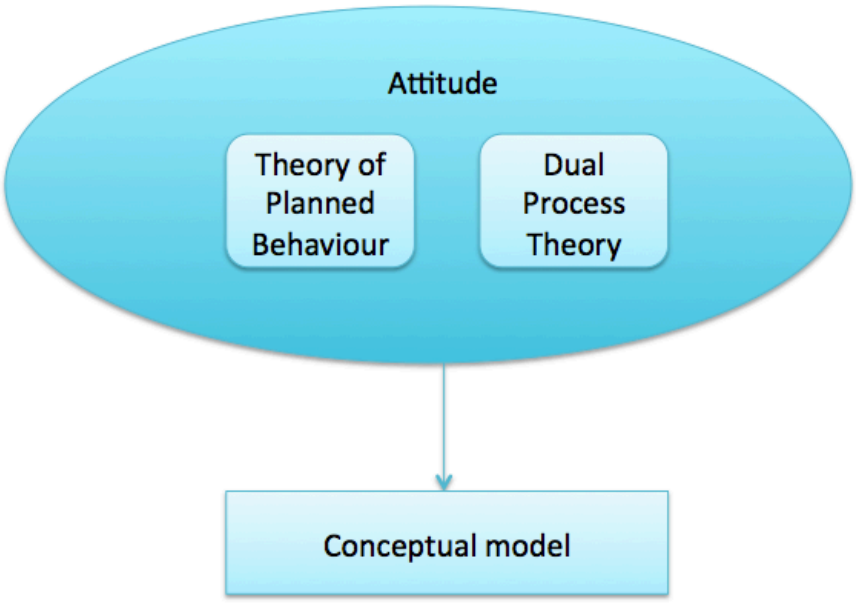
Teenager: A person between 13-19 years of age (Oxford Dictionary n.d.). The teen years is a period closely associated with adolescence, which by the World Health Organization is defined as the transitional period between childhood and adulthood from ages 10-19 characterised by a tremendous pace in physical and psychological human development (World Health Organization n.d.). The term 'teenager' will be used in relation to the chosen target group. When 'adolescence' is utilised it will be referring to the general conditions related to the development at this transitional stage in life.

4 Theoretical framework

One of the key measures in investigating the research question of the present thesis was to develop a questionnaire that integrates different factors potentially influential on the attitude towards CANI among Danish teenagers. In order to assess the respondents' attitudes it was necessary to base the choice of factors on relevant literature, since the factors influencing attitude are heterogeneous and complex. Thus, the following section presents an examination of theories relevant for the attitude-behaviour relationship. Further, it will include an identification of the factors, which are important in terms of the development of the questionnaire assessing the attitudes towards CANI as a tool to increase vegetable consumption.

The theoretical framework has been constructed as presented in figure 1, which gives an overview of the flow of this chapter. Even though the thesis limits itself from looking at behaviour, this is still crucial in the understanding and assessment of attitude, since attitude can potentially influence and, to some degree, lead to a given behaviour.

Figure 1. *Visual presentation of the structure of the theoretical framework.*



First, an examination of the concept of attitude will be presented along with a presentation of the ways in which attitudes can be measured. Attitude is the essential concept in the theoretical framework. Secondly, the TPB, the DPT and the general concepts behind nudging as a tool to alter

behaviour will be accounted for, as they are all relevant in relation to attitudes and behaviour. Thus, these sections will cover both conscious behaviour and automatic processes.
Lastly, these will all be merged into a new conceptual model, which will be utilised in the assessment of the factors associated with the attitude towards CANI among teenagers.

4.1 Attitude

Since the present thesis sets out to assess the attitude towards CANI among adolescents it is crucial to investigate the concept of attitude as well as what influences attitude and how it can be measured.
An attitude is characterised as a *"…psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor*" (Eagly, Chaiken 1993). As the definition implies attitudes can vary in either a positive or negative direction, and can differ in intensity, i.e. the strength of the feeling in question. Attitudes can be both explicit and implicit. Explicit attitudes are those that a person is consciously aware of and that clearly influence their behaviours and beliefs. Implicit attitudes are unacknowledged, but still have an effect on our beliefs and behaviours (Rydell, McConnell 2006). Attitudes are related to social norms for appropriate behaviour and self-image, and can be formed as a result of previous experience or present situation, but can also be modified based on convenience (Bowling 2009).

Attitudes have been a central area of research in social psychology and historically attitudes were thought to be a direct predictor of behaviour (Armitage, Christian 2003). However, in the 1970'ies it was determined that opinions are only marginally related to a corresponding behaviour (Wicker 1969). This ultimately lead to the development of Ajzen's Theory of Planned Behaviour (Ajzen 1985), a theory that today is assessed to be the most influential model of the relationship between attitudes and behaviour. Here it is considered that attitude is only one of several factors determining behaviour, which explains why behaviour is not always in accordance with a given attitude.

4.1.1 Measuring attitudes

The typical way of measuring attitudes is through psychometric scales, where several types of scales are available, e.g. the Semantic-differential scale, the Guttman scale or the Thurstone scale (Osgood 1957, Guttman 1944, Thurstone 1928). Most widely used is the Likert scale (Likert 1932), where respondents evaluate a series of Likert items or statements about a particular issue by expressing

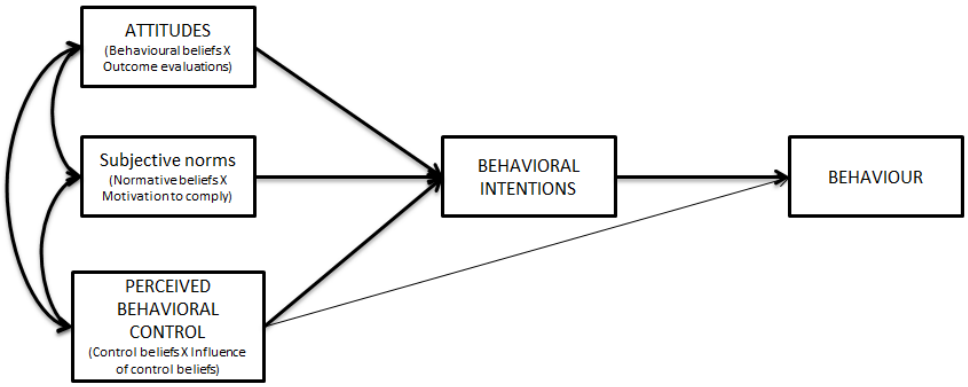
their level of agreement towards these statements based on a scale ranging from positive to negative, often with a neutral middle position.

Measuring attitudes is a highly complex matter and can be somewhat challenging for several reasons. When utilising measurement scales, such as the Likert scale or similar fixed interval scales with equal distances between them, the nuances in the responses can be difficult to interpret. Attitudes are multi-faceted, can vary in strength or can even be ambivalent depending on the situation (Bowling 2009), and since a Likert scale typically gives five to seven answer categories, only few fixed options are presented to the respondent, which might not fully describe the nuances in a person's opinion. Also, respondents might be presented with an issue to which they have not previously considered their opinion and therefore are undecided about it and are forced to state an attitude towards these questions, which might decrease the validity (Bowling 2009).

4.2 Theory of Planned Behaviour

The TPB is a theory originating in the field of psychology and is based on the assumption that healthy actions are a product of conscious choices and the intention to live healthy (Kamper-Jørgensen, Almind & Bruun Jensen 2009, Ajzen 1985). According to the theory three aspects can have an influence on the individual's intention to conduct or initiate a behavioural change: Attitude, social norms and perceived behavioural control. The first refers to a positive attitude towards, for instance, eating healthy, i.e. beliefs about the outcome of the behaviour combined with a weighing of the positive and/or negative aspects of the outcome. The second involves considerations regarding the normative expectations of others and motivation to act in accordance with these expectations, i.e. a sense of pressure from the close surroundings to live healthy. The third is a feeling of being in control of one's own life and behaviour, and thus being capable of acting in a health promoting way (Kamper-Jørgensen, Almind & Bruun Jensen 2009, Ajzen 2002). The sum of these three factors will produce either a positive or negative intention to live healthy, which can lead to a behaviour change (Ajzen 1985). The stronger the attitudes, subjective norms and perceived behavioural control, the more likely it is that a behavioural change will occur (Ajzen 2002).

Figure 2. *Ajzen's Theory of Planned Behaviour. Adapted from Francis et al.* (2004).



Intention is the key mediator in the causal chain leading to behaviour, and as seen in figure 2, attitudes play an important role in predicting a specific intention and thus ultimately in determining if a given behaviour is going to take place. Even though the TPB is widely acknowledged, there is still a gap between intention and behaviour and other factors might come into play, factors that can intervene in the link between intention and behaviour (Bowling 2009). Where the TPB primarily considers behaviour as a result of conscious decisions combined with well-meaning intentions, the following section will address this intention-behaviour gap and thus go more into depth with some of the more automatic mechanisms and their influence on behaviour.

4.3 Dual Process Theory

Behavioural economists and psychologists have sought to explain why people, despite having the knowledge and intentions for healthy behaviour, systematically have difficulties translating these good intentions into actions. They have identified that our behaviour is determined by a long list of systematic cognitive decision biases such as sticking with default settings or maintaining status-quo, loss aversion, unrealistic optimism towards one's own performance or of the risk of becoming ill etc. (Marteau, Hollands & Fletcher 2012, Kahneman 2011, Thaler, Sunstein 2008).

To explain the function of cognitive decision biases, loss aversion will be used as an example in the following. Being a term first introduced by Kahneman and Tversky (1979), loss aversion covers the assumption that *"losses and disadvantages have greater impact on preferences than gains and advantages"* (Tversky, Kahneman 1991, p. 1039). When people make deliberate choices they can either retain status quo or make an active choice that has advantages and disadvantages. Several studies show that people feel the impact of the disadvantages more deeply than the gained

advantages of an equal value (Tversky, Kahneman 1991, Kahneman, Tversky 1979). If for instance someone were to change their diet and engage in healthier eating habits, the loss of feeling the pleasure of eating unhealthy foods would be felt more strongly than the gains this new diet would have on health and absence of disease. Thus, the individual is biased towards retaining the status quo and will sustain the unhealthy behaviour.

The DPT involves these cognitive biases to explain human behaviour. DPT originates from the field of social psychology and posits a division of our way of processing information into two systems, which determine our social behaviour: the automatic system and the reflective system (Thaler, Sunstein 2008) also referred to as respectively System 1 and System 2 (Stanovich, West 2000).

The reflective system is characterised by being rational and involving conscious reasoning. Behaviour associated with this system is initiated on the basis on values, knowledge and facts related to the situation, and can therefore be affected by applying information (Strack, Deutsch 2004).

The automatic system on the other hand works faster, more unreflective and is controlled by instinct. It requires little or no thought, since decisions are based on instinct or intuition, which is why behaviour based on this system is harder to affect or change through the provision of information (Kahneman 2011). This system is where the cognitive biases are brought into play (Evans, Stanovich 2013).

Many of the choices we make every day are based on the automatic system reacting to environmental cues. According to Wansink & Sobal (2007) an individual is confronted with an average of more than 221 food-related decisions every day, but only about 15 of these decisions are made consciously. The remaining 200 decisions are made automatically.

As mentioned in section 1.3 ‘A shift in behaviour change approaches’ and 4.2 ‘Theory of Planned Behaviour’, many of the traditional methods to change diet-related behaviour are based on theories assuming that deliberate cognitive processes determine our actions related to behavioural change. But according to the DPT this is not always the case and our actions and behaviour does not always measure up to our intentions, reflect our values or serves our best interest. As Thaler and Sunstein exemplifies in Nudge (2008) the alarmingly high rates of obesity and lifestyle related deaths worldwide is a sign that many aspects and cues in our environment can influence our decisions and behaviour, both knowingly and unknowingly.

4.3.1 Nudging

The existence of the reflective and automatic system as well as the cognitive biases described above can be immensely influential on the many food choices people make every day.
Nudging is a tool derived from the DPT, and it uses the understanding of cognitive biases, automatic processes and reflective behaviour in designing interventions and new ways of how food choices are presented to the consumer in order alter their behaviour.

Nudging is, as mentioned in chapter 3 'Conceptual clarification' defined by Thaler and Sunstein as *"any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives"* (Thaler, Sunstein 2008, p. 6). Subsequently, Hausman and Welch (2010) have further expanded the definition to refrain from *"making alternatives appreciably more costly in terms of time, trouble, social sanctions, and so forth."* (Hausman, Welch 2010, p. 126)

CANI differentiates from other types of interventions by maintaining options, but still unconsciously leading people in a certain direction defined by the architects of the intervention. Thus, CANI is a relatively soft intervention where neither positive and negative incentives nor restrictions are implemented as opposed to hard regulation such as taxation or bans (Gibney et al. 2004). For these reasons nudging is defined as liberal paternalism (Sunstein, Thaler 2003). Paternalistic, because the technique is based on individuals being guided towards altering their choices and libertarian in the sense that the individual's freedom of choice is preserved due to the possibility of disregarding the nudge.

The use of nudging in changing food behaviour is a relatively new field and even though several studies have proved effective in changing behaviour, other studies are less positive or inconclusive and the need for future research has been highlighted (Mørk et al. 2014, Skov et al. 2012).

To sum up, CANI is an inexpensive tool to apply due to the fact that they are simple to implement. For this reason, such interventions are desirable to utilize compared to expensive information campaigns, which often have limited effects. Furthermore, these CANI potentially make it possible to target actions controlled by the automatic system, as described in section 4.3 'Dual Process Theory', and to reduce some of the burden from the individual to make healthier choices. All this while maintaining the freedom of choice for the individual seeing as it should still be easy to opt out of the intervention.

4.4 A conceptual model

In the foregoing sections the Theory of Planned Behaviour (TPB) and the Dual Process Theory (DPT) including nudging as a tool has been examined, and their use related to interventions aiming at changing behaviour towards healthier eating habits has been outlined. Further, the role of attitude as a predictor of behaviour has been emphasised. Where TPB focuses on the deliberate cognitive processes as the basis for conducting a behavioural change, DPT and nudging takes the automatic processes that affect peoples' behaviour into account.
In the following section, the theories will be used to create a conceptual model, which will be applied in the development of a questionnaire investigation of the factors associated with the attitudes towards CANI among teenagers.

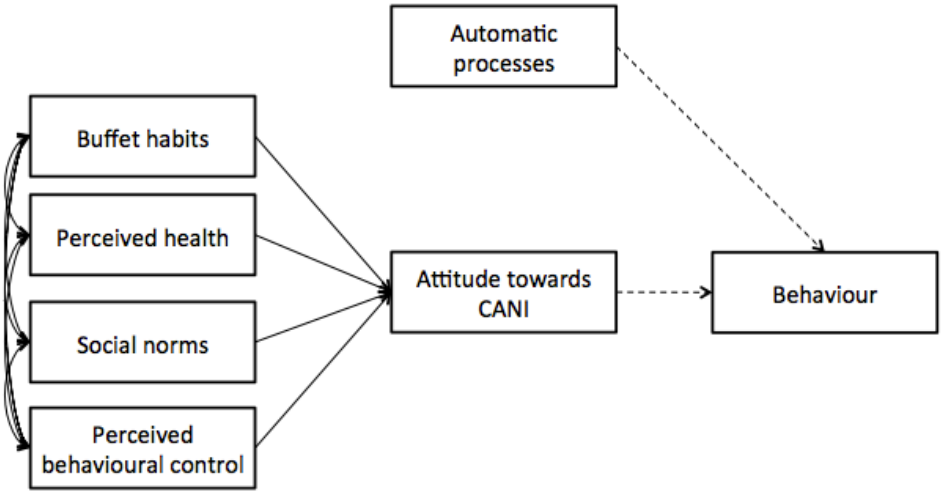
Conner and Armitage (2000, 1998) argue that the TPB is not a definitive theory of behaviour, but it is considered to be the theory that comes nearest an explanation of the determinants of behaviour. As described earlier, the TPB has a strong focus on deliberate cognitive considerations based on information and knowledge relating to three important determinants as the basis for developing a behavioural intention, which subsequently could lead to a given behaviour. However, several researchers highlight the importance of the unconsidered and automatic thought processes leading to a specific behaviour such as the DPT, Tolman's Principle of Least Effort, Hull's Law of Less Work and behaviour related to emotions such as reactions to danger (Dalgleish 2004, Hull 1943, Tolman 1933). The TPB model does to some degree incorporate automatic processes into the determinant called perceived behavioural control. Control over behaviour refers to both actual control and perceived control where the first one can explain the formation of habits. Cognitive processes related to perceived behavioural control can thereby skip intention and lead straight to behaviour (Armitage, Conner 2000). However, there are still automatic processes leading straight to a given behaviour, as the ones that the DPT describes, which are not connected to habits and these are not represented in the TPB model. These automatic processes happen independently of the judicious cognitive processes presented in the TPB model. The two processes do not depend on each other and can even overrule one another (Evans, Frankish 2009).

Even though the DPT takes both the deliberate and automatic processes into account, the theory is not as thoroughly explained and recognised as the TPB, as the DPT is not one definitive theory, but several versions of the theory exists within different scientific areas (Evans, Frankish 2009, Evans 2008). It is widely recognized through these theories that behavioural change can happen both as a product of deliberate intentions to change combined with the right circumstances as well as an

automatic process where behaviour occurs without perceiving it (Evans, Frankish 2009). The latter is used a great deal by the retail sector for instance in terms of space management, where using visibility cues can promote sales of a specific good (Yang, Chen 1999, Desmet, Renaudin 1998, Dreze, Hoch & Purk 1995).

In order to measure the attitude towards CANI neither the TPB nor the DPT can stand alone. Thus, based on the two theories a conceptual model has been created to be used in the analysis of the research question of the present thesis. The visual presentation of the model is based on the TPB, see figure 3.

Figure 3. *A conceptual model based on aspects of the Theory of Planned Behaviour and the Dual Process Theory incorporating the features of the research question. The model illustrates the factors influencing behaviour with attitude towards CANI as the mediating factor.*



As expressed in the research question, the topic of interest is attitudes towards CANI as a means to increase vegetable intake in a school context. Thus, **attitude towards CANI** is placed in the centre of the conceptual model and is considered a result of several potentially influential factors. It is not placed at the final outcome in the model, since the actual **behaviour** can be considered as the ultimate goal when the purpose of the CANI is to increase vegetable intake. However, the limitations of the research question do not allow an investigation of the association between attitude and behaviour and this relationship will not be included in the analysis.

Social norms and **perceived behavioural control** are added as factors possibly influencing the attitude towards CANI, since they are found to interact with attitude according to the TPB, as well as the fact that attitudes are related to social norms for appropriate behaviour and self-image, as mentioned in section 4.1 'Attitude'. **Perceived health** is added as one of the determinants of

attitude, since assessments of own health originally was incorporated in the aspect related to attitude presented in the TPB model (see figure 2). In order to take the DPT into account, habits are assumed to be associated with attitude in the conceptual model. Habits are stable patterns of behaviour that are executed without further reasoning (Kamper-Jørgensen, Almind & Bruun Jensen 2009). Habits require few resources to perform, but are hard to break as they would require a lot of resources and energy to change. This can be explained by Hull's Law of Less Work and Tolman's Principle of least Effort (Hull 1943, Tolman 1933). The theories argue that the resources of the individual in terms of time and energy are limited, and thus one will try to minimize the use of these resources in the daily life. This could be part the explanation to why people are overweight or have poor eating habits as they on a daily basis stand before the choice between active and sedentary lifestyle choices; stair versus escalator, detour versus shortcut, slowfood versus fastfood etc. If the choice is made unreflectively the theories propose that solution saving most time and energy will be preferred in order to economize on resources (Deckers 2001). This goes in line with the theory behind nudging, where one of the cognitive biases influencing behaviour are the status quo bias, saying that people will have a tendency to maintain their current situation due to lack of attention or the trouble it would be to change behaviour, e.g. always sit in the same seat (Thaler, Sunstein 2008). This bias is built on the same reasoning as Tolman and Hull's theories. This particular study is limited to only investigating CANI applied in a school or canteen environment and thus habits are specified to **buffet habits**.

Lastly, the model should embrace the **automatic processes** leading to a given behaviour independent of the formation of any reflective thought processes and other influences, but as with behaviour, investigating this aspect is excluded from the analysis based on the limitation.

To sum up, figure 3 presents a conceptual model illustrating the theoretical basis for the further investigation of the research question. Attitude towards CANI is the mediating factor potentially leading to behaviour, and buffet habits, perceived health, social norms and perceived behavioural control are considered to be potentially influencing the attitude towards CANI. In addition, the automatic processes have been added as a possible direct route to behaviour. In relation to the scope of the research question only the first part the model will be tested, i.e. factors potentially influencing the attitude towards CANI. Thus, neither the routes to actual behaviour nor the possible effects of the automatic processes are investigated as mentioned preciously in this section. Consequently, the routes with the dotted arrows go beyond the scope of the present study.

The conceptual model will be utilised as a vital part of the development of the quantitative structured questionnaire.

5 Methodology

In order to investigate the research question of the present thesis, different methodologies have been applied. Different kinds of data were collected in order to answer the research question. As a preliminary step, a systematic search have been conducted in relevant data bases in order to clarify the current prevalence of related scientific studies, as described in section 1.1 'State of the art'. The empirical data used in the analysis have been collected through a structured questionnaire.

The attempt to identify factors that influence attitude towards CANI among adolescents includes an empirical data collection through a structured questionnaire. As the basis for the development of the structured questionnaire, a conceptual model was developed. In this regard, the theoretical frame was based on a literature study of relevant books, official national reports and scientific articles from the online databases Aalborg University Library, Web of Knowledge and Google Scholar. In addition, the literature study was developed through meeting with supervisors.

The different methodological approaches, including the scientific foundation, applied in the thesis will be elaborated in the following sections.

5.1 Philosophy of Science

Philosophy of science relates to the foundation of scientific disciplines, how one relates to and approaches scientific knowledge and what the purpose of science is and should be (Christensen 2002). Further it concerns our understanding of reality and how validity in scientific research is achieved. These issues vary depending on which philosophical school of thought one belongs to and to some degree determines the methodological approaches when conducting research. In the following paragraph the scientific approach for the present thesis will be described.

Ontology, which is the study of being and existing, deals with how we understand the world, how reality can be explained and to what degree human beings can be placed into categories. The ontological approach for the present thesis can be described as static due to the cross-sectional approach applied in the study design, and the given factors, such as sex, age and level of education, are presumed to be unaffected by situation, setting or interpretation. The primary objective in a static ontology will be to detect patterns in behaviour and based on these observations establish general rules for specific phenomena (Vallgårda, Koch 2007).

Where ontology relates to the study of being, **epistemology** concerns the study of knowledge**,** what true knowledge is, and how and to what degree we can acquire true knowledge about the world

(Vallgårda, Koch 2007). A static ontology results in a more positivistic approach towards knowledge, with the epistemological perception that it is possible to obtain solid objective knowledge about the world (based on observations) and that it can be measured and thereby analysed and explained by rational theories.

Positivism pursues to conduct research in a clear, precise and constructive manner that should be profitable for society. Science should be *"driven by a moral and political interest to contribute to lead people and society towards a positive and beneficial development. This interest is what legitimises science"* (Langergaard, Rasmussen & Sørensen 2006).

A positivist researcher must clearly distinguish facts and feelings and thereby avoid subjective influence on the scientific findings (Vallgårda, Koch 2007). Thereby results will be objective and repeatable independent of the researcher's sex, age or political conviction. Positivists see the world as multifaceted and demand that the theories used to investigate reality are likewise complex, and for that reason phenomena cannot be investigated individually, but must be investigated in its specific context (Sørensen 2010, Langergaard, Rasmussen & Sørensen 2006).

Positivism seeks to establish general rules based on observations of the world and thus it employs induction in producing its scientific knowledge and results by using statistics to emphasise the probability of the inductively reasoned conclusions. Based on systematic observations and experiments conducted within a sample of reality it will be able to express a general statement about the explored phenomenon or about the world (Christensen 2002).

Given the character of the research question of the present thesis, which, based on a smaller sample of the population, seeks to investigate relationships between factors predicting the acceptability of choice architectural nudge interventions among adolescents, the methodological approach is **quantitative** as it puts forward a hypothesis and confronts it with reality by developing a questionnaire and categorising and quantifying the given answers and subsequently analyses the collected data using statistics (Vallgårda, Koch 2007, Aliaga, Gunderson 2005).

5.2 Systematic literature review

As a part of a preliminary background search, a systematic search resulting in a systematic review was conducted (appendix 2 'Systematic literature review'). The objective of the systematic search was to review the prevalence of studies assessing the attitude as well as the effects of CANI on promoting the intake of vegetables among adolescents in a school context.

The selection of relevant published studies for this systematic literature review included a structured search in the following three electronic databases: Web of Science, Scopus and PubMed. The databases were chosen due to sufficient coverage of the cross-disciplinary research question. The search included a predetermined search strategy developed by the authors. Both authors conducted the search during December 2013 and, to increase the reliability, both authors assessed all articles and the results were compared. In order to identify relevant studies, all titles and abstracts generated from the searches were reviewed and only rejected if it was possible to conclude that the article did not meet the inclusion criteria or if it met the exclusion criteria. The chosen studies were then divided between the authors and reviewed based on full text. The decisions on which publications to include in the review were then discussed until both authors agreed about the result. Furthermore, the reference list of each of the identified studies was searched for relevant additional publications. Also, the searches included reviews and meta-analyses as a source of information.

The search strategy was inspired by the Cochrane Handbook for Systematic Reviews of Interventions (Higgins, Green 2011). Thus, four concepts were chosen (subject, theory, setting and target group), which each consisted of several carefully chosen search terms (See table 1). Each term was identified based on current literature as well as conversations with University supervisors.

Table 1. *Search profile for systematic search in electronic databases.*

Subject		**Theory**		**Setting**		**Target group**
Vegetable Processed Cans Canned Frozen Dish Food Meal Pea Peas Carrot	**And**	Acceptability Intake Determinants of food intake Behaviour change Likeability Food selection Selection Lifestyle Food related lifestyle Attitude Behaviour Value Intervention Perception Acceptability of interventions Acceptability of policies Nudge Nudging Choice architecture Dual process theory	**And**	Laboratory setting Food lab Living lab Canteen Refectory Self service Diner Cafeteria Restaurant Buffet All you can eat School College Food outlet NOT Supermarket Home	**And**	Adolescent Youth Teen Pupil

The findings from the systematic search have been used as a knowledge base to the development of the final research question. The findings have also been incorporated throughout the thesis in relation to outlining what exists on the area.

5.3 Questionnaire

Given the nature of the research question, which seeks investigate factors influencing the attitude towards CANI promoting an increased vegetable consumption, a cross-sectional research design was chosen and a structured quantitative questionnaire was developed for testing the associations described in the proposed conceptual model illustrated in figure 3 (Gibney et al. 2004). The questionnaire was pilot tested, distributed and evaluated from March 2014 to May 2014.

5.3.1 Design

The questionnaire was developed to contain questions in the categories of 1) basic characteristics (i.e. standard anthropometric and socio-demographic features), 2) questions regarding factors potentially having an effect on CANI and lastly 3) questions regarding attitude towards specific nudge interventions.

The chosen hypothesised factors were based on the variables in the conceptual model presented in figure 3. The factors are social norms, buffet habits, self-efficacy, attitude towards CANI and automatic processes. Questions regarding the attitude towards CANI were centred on each of the nine cues affecting behaviour, as presented in the MINDSPACE framework by Dolan et al. (2012). The MINDSPACE cues are developed by the Behavioural Insights Team of the UK Government as a checklist of influences on behaviour for usage in present and future policymaking. Due to the fact that the area of CANI is very novel and underexplored, the MINDSPACE report represents the closest we get to a set of psychological nudge-based influences into behaviour. Thus, these cues were used to develop specific scenarios of CANI, in which the respondents would be able to identify themselves in order to assess their attitude towards each scenario. Table 2 presents an overview of the original nine MINDSPACE cues.

Table 2. *MINDSPACE framework for behaviour change (Dolan et al. 2012).*

MINDSPACE cue	**Behaviour**
Messenger	We are heavily influenced by who communicates information
Incentives	Our responses to incentives are shaped by predictable mental shortcuts such as strongly avoiding losses
Norms	We are strongly influenced by what others do
Defaults	We „go with the flow" of pre-set options
Salience	Our attention is drawn to what is novel and seems relevant to us
Priming	Our acts are often influenced by sub-conscious cues
Affect	Our emotional associations can powerfully shape our actions
Commitments	We seek to be consistent with our public promises, and reciprocate acts
Ego	We act in ways that make us feel better about ourselves

The remainder of the questions were formulated based on existing research within the area. Previously validated questions from The EatWell Project, The Pro Children Study and the General Self-Efficacy Scale were used directly or modified to fit the target group (De Bourdeaudhuij et al. 2005, Schwarzer, Jerusalem 1995, Mazzocchi et al. n.d). Questions from the EatWell study were translated from English to Danish and the Pro Children questionnaire and the General Self-efficacy scale was available in Danish and needed no translation. Also, the wording of the questions from the EatWell and Pro children study were changed to fit the objectives of this study. This fact questions whether the original validation still applies. Further, if a question had not previously been developed, new ones were formulated taking into consideration the age of the respondents regarding use of language and concepts. To deal with these issues a validation of the questionnaire has been conducted based on a pilot test.

The sequence of the questions in the developed questionnaire was considered carefully as this can influence the willingness to answer as well as the validity seeing as the understanding of a given question can be affected by the previous questions (Vallgårda, Koch 2007). Simple and easy questions were placed in the beginning of the questionnaire and advanced from there. Anthropometrical as well as more personal socio-economic questions were placed at the end, seeing

as the respondents could feel intimidated if these were presented in the beginning. The questionnaire was divided into themes covering the chosen factors developed through the theoretical framework as presented in the conceptual model (see appendix 4.3 'Dimensions in the questionnaire'.)

For the majority of the response options a fixed choice response format was applied, but few open-ended answer options were inserted, when answers were assumed to have a high degree of diversity or to possibly fall out of category. For questions of attitudinal character, such as attitudes towards CANI, a 5-point Likert scale was chosen (Likert 1932) including a neutral middle position in order to avoid forcing respondents to express an opinion (Bowling 2009, Rattray, Jones 2007). Only in questions relating to self-efficacy the 4-point Likert scale was applied, as this had previously been validated in the General Self-efficacy Scale, see appendix 4 'Final questionnaire'.
The response option "I don't know" was included in the validation process as an attempt to detect questions that might be unintelligible to the respondents. This category was removed in the final version of the questionnaire, as the neutral middle position of the 5-point Likert scale was considered sufficient.

5.3.2 Validation of questionnaire

In the process of validating the questionnaire the methods used included content validity, face validity and reliability tests in the form of internal consistency reliability (Cronbach's alpha) and a test-retest, which all will be described in the following.

5.3.2.1 Validity

Validity in research is the process of assessing whether an instrument is capable of measuring what is actually intended and corresponds accurately to reality, as well as to what extent the results can be generalised to the wider population (Bowling 2009).
To ensure that the items of the questionnaire were sufficient to answer the objective of the study, the questionnaire was coded into the hypothesised factors, (see appendix 4.3 'Dimensions in the questionnaire') to make sure that all vital concepts in the research question was covered in the questionnaire. Subsequently the questionnaire was revised by senior colleagues, due to their experience in development of questionnaires, and in implementing online research questionnaires in the fields of nutrition and consumer behaviour. On the basis of their comments the questionnaire was amended.

To ensure that the questionnaire would be appropriate to the target group of the study a pre-test was carried out with two adolescents; a 12 year-old boy and a 17 year-old girl, in order to ensure clarity of wording, consistency in layout and style and appropriate level of difficulty. The two pre-test respondents answered the questionnaire and gave written and oral feedback. Smaller adjustments were made subsequent to the pre-test.

5.3.2.2 Reliability

The questionnaire was pilot tested during March 2014 using a test-retest approach to assess reliability in terms of internal consistency and stability over time. The survey was administered electronically through SurveyXact to a convenience sample of 26 pupils (16 females) in a 6th grade class of a public school in Copenhagen, Denmark. The respondents were asked to answer the questionnaire twice with an interval of two weeks apart. The respondents were added as profiles in SurveyXact and the link to the survey was sent individually to their school e-mail, which made it possible to compare the test-retest answers on respondent level.

Test 1 had a response rate of 35% (*n*=9; 8 females) and for Test 2 the response rate was 96% (*n*=25; 16 females). Consequently the stability over time was calculated based on the two test-retest responses from nine respondents, while Cronbach's alpha could be calculated for 25 individuals.

Test-retest reliability

To estimate reproducibility, i.e. stability over time, mean differences between answers from Test 1 and Test 2 were analysed using SPSS (Version 20.0 IBM SPSS® Statistics). For normal data, mean differences were assessed with the paired-sample t-test. For non-normal data mean differences were assessed with the Wilcoxon signed-rank test. A *p*-value above 0.05 would indicate that there was no difference between the means, which indicates stability over time. A lack of difference between the means is preferable in this case since it indicates that the reproducibility criteria are ensured.

Internal consistency

Based on answers from the 25 respondents in Test 2, Cronbach's alpha values were computed on items within each factor to investigate the level of inter-item correlations, i.e. to what degree different test items that probed the same construct would produce similar results. Alpha values $\geq$ 0.7 were considered satisfactory (DeVon et al. 2007).

5.4 Results and discussion of pilot test

As mentioned, the final questionnaire was amended on the basis of results from a pilot test of the first version of the questionnaire conducted during March 2014. Two data sets were achieved from the pilot test; 1) a test-retest with data from nine respondents and 2) a single response test with data from 25 respondents, including the nine respondents who completed the test-retest.

The results from the reproducibility test showed that for the majority of the questions the null hypothesis saying, that the pairs of data from the test-retest are the same, cannot be rejected, and thus the responses from the test and the retest is not significantly different from each other (p-value > 0.05). The results are presented in appendix 3, table 3.1 and 3.2, stating mean differences, standard deviations, t and p-values for normal data, and Z and p-values for non-normal data (Field, Hole 2003). Only one question showed a significant difference between the two means (p = 0.046). The question stated: *"To what extent do you agree or disagree with the following statement: There are usually vegetables available at home that I like".* On the background of the test result the question was deleted.

In order to test the internal consistency of the constructs, Cronbach's Alpha was calculated. For this study a value above 0.7 was considered sufficient. Since the sample size of the pilot test was too small to perform factor analysis, the questions were divided into pre-determined factors, for which the Alpha values were calculated. On the basis of the results from this test, nine questions were deleted. The Alpha values for the remaining groups of questions are illustrated beneath in table 3. The table show that all Alpha values, except one, were $\geq$ 0.7, which indicated high inter-item correlations within each factor and thereby considered reliable. The category "Social norms", which scored 0.544, was kept in the final questionnaire, since the test-retest showed no significant differences between means and because the factor was considered essential in determining the attitude towards CANI.

Table 3. *Cronbach's Alpha values for factors after sorting the categories on the basis of the internal consistency analysis.*

Factor	**Cronbach's alpha**
Attitude towards CA	0.783
Self-efficacy	0.777
Social norms	0.544
Perceived health	0.723
Responsibility	0.705
Buffet habits	0.806

Finally, all the questions were critically examined with the results from the pilot test as well as the research question in mind. A total of 14 questions were removed leaving 63 questions in the final version of the questionnaire. The questions that were deleted on the basis of the research questions were addressing social norms in the home environment, since this aspect went beyond the scope of the project.

There are a few biases connected to the test sample. The respondents consist of 12 to 13 year-olds attending the same school class. The fact that they are from the same area of Denmark should not have a significant effect on the results since it is the reliability that is tested, and no conclusions are drawn on the content of the questions. Also, the mean age of the respondents was 12.8 years, and the questionnaire addressed 13 to 19 year old adolescents. Again, since it is the pilot test, it is assumed, that if a younger person can understand the questions, the target group will understand them as well and thus it is assumed that comprehension will improve with increased age. Next, the sample size in the test-retest was relatively small and therefore it was not possible to perform factor analysis to confirm relevant factors, thus these were determined based on applicable theories within the field. However, for the purpose of testing the reproducibility, it is argued that the sample size is acceptable.

Seemingly, this is the first study seeking to investigate the determinants of attitudes towards CANI among teenagers and the validation process indicates that the final questionnaire can be used as an accurate measure for this purpose within the target group in Denmark.

5.5 Distribution of the final questionnaire

The questionnaire was developed as an electronic questionnaire, which made it possible to distribute it online. The distribution process was inspired by Malcolm Gladwell's theory on how "*ideas and products and messages and behaviors spread just like viruses do*" (Gladwell 2000, p. 7), described in the book *The Tipping Point*. According to Gladwell, ideas or products become a sudden massive trend, or 'epidemic ' as he refers to it, because the 'right' people change behaviour, which causes more and more people to follow suit, and not because of commercial efforts (Gladwell 2000). This method is also seen within the area of strategic communication. For instance, Katz and Lazarsfeld developed the Two-Step Flow of Information Model in 1955, where communicational efforts are spread through two steps (Windahl, Signitzer & Olson 2009). The first step is to contact opinion leaders, who in the second step spread the message to their followers, who then pass the message

on, and so on. However, there are a couple of critical points when using this method. One is that only the original sender of the message can control the first step in the model. Another is the importance of identifying the right opinion leaders to pass on the message most effectively (Windahl, Signitzer & Olson 2009). The characteristics of a good opinion leader to cause a 'social epidemic' are a person who is sociable and influential among their peers (Gladwell 2000).

The just mentioned methods were adapted in a small scale to the distribution of the questionnaire. This was done in order to get the questionnaire distributed to as many in the target group as possible within the allocated time frame, and thus increase the sample size. Both people within the target group as well as people in contact with the target group were involved in the distribution process, thus making use of the snowballing effect. This included reaching out to adolescents, school principals, schoolteachers, student teachers, scout leaders, sport coaches etc. in the authors' personal network and the networks network. These actors then distributed the questionnaire on relevant sites via Facebook and/or school intranet. In addition, a large number of gymnasiums and other schools were contacted via Facebook with the aim of having them share the questionnaire on their Facebook site. All those responding to the questionnaire were further encouraged to share the questionnaire on their Facebook wall. In order to overcome the critical point of not being able to control more than the first part of the distribution process, a standard text presenting the Integrated Food Studies master program, the purpose of the thesis and the focus of the questionnaire was send to potential opinion leaders with the link to the questionnaire. They were then encouraged to add the pre-written text when they distributed it. Also, an introductory text was added on the first page of the questionnaire. In terms of contacting the right opinion leaders, this was more difficult since we did not have enough knowledge on who are the most socially influential persons in relation to the target group. Rather, people and sites with an influence of a more authoritarian nature were primarily selected.

As the questionnaire was rather long (response time approximately eight minutes) a competition for two cinema tickets was added to potentially increase the completion rate. The competition was mentioned on page one of the questionnaire and on the last page a link was leading to the competition in another site. To qualify for the competition the respondents had to answer the questionnaire and write their e-mail on the external link. The competition was placed at a different site for ethical reasons, since the respondents were promised anonymity. By using a link to a different site where they could sign up for the competition made it impossible to link their identity to their response.

5.6 Ethical considerations

In the process of collecting the empirical data some ethical considerations have been made. In relation to the pilot study, a sample of under aged children (average age 12.8) from a selected school class was used. Before collecting the data, a written consent was obtained from the class' main teacher. Also, the participants gave their consent to be part of the study and were free to leave at any point. They could not be promised complete anonymity since their identity had to be connected to their responses in order to compare the data from the test-retest on respondent level. However, they were ensured that the data would only be seen by the authors and that their identity would not be revealed at any point.

Some ethical considerations were also made in relation to the final data collection. In order to make the sender and the purpose of the study transparent, a letter of introduction, which supported that informed consent was implied, was added to the first page of the questionnaire. In the letter the respondents were informed about the identity of the sender, the purpose of the survey as well as ensuring the respondents complete anonymity. As mentioned in the previous section, a competition was added in the end of the questionnaire, where the respondents had to write their e-mail addresses to participate. To ensure complete anonymity, the competition was created as an individual survey – also via SurveyXact – and the respondents could gain access by tapping the link in the end of the survey.

5.7 Data management and statistical analysis

The final questionnaire was open for answers from the 31st of March till the 22nd of April 2014 and a total of 449 complete answers were obtained. Prior to the analysis, the data was cleaned for incomplete responses and responses that did not live up to the inclusion criteria's about age (must be between 13 to 19) and school enrolment (must be enrolled in a school). This resulted in 33 responses removed due to age and three since they were not attending school. Additionally, five responses were removed since only some answers were provided. Responses with only a few missing answers was included, and the blanks were replaced with a mean. As a result of the sorting of the data a total of 41 responses was removed, leaving 408 approved responses for the analysis.

Data from the final questionnaire were analysed using SPSS (Version 20.0 IBM SPSS® Statistics) and Amos (Version 22.0.0 IBM® SPSS®). Three types of analyses were applied: 1) descriptive analysis, 2) exploratory and confirmatory factor analysis and 3) structural equation modelling. The statistics from the different analyses are presented in chapter 6 'Results'.

6 Results

6.1 Respondent profile

The following section will present the results from the descriptive analysis with the purpose of describing the profile of the participants by displaying their anthropometric and socio-demographic features. Also, the descriptive analysis entails an overview of the responses in relation to the respondents' attitude towards different nudges and their opinions of where whether the responsibility to promote a healthy diets and increase vegetable intake lies with their school or canteens, implying that this is not the individual's responsibility.

6.1.1 Anthropometrics

Table 4 presents the profile of the respondents regarding gender, age, nutritional status (body-mass-index) and level of physical activity. The majority of the respondents were female (78.4%) with a mean age of 17.9 years (±SD 1.27). For males the mean age was 17.6 (±SD 1.44). Body Mass Index (BMI) was calculated based on self-reported values of height (m) and weight (kg) by dividing weight by the square of the height (World Health Organization 2000). Since body mass index changes extensively throughout childhood and adolescence, the adult cut off points for overweight and obesity cannot be applied in this population. For the calculated BMI values to be meaningful in the sample it must be compared to a reference standard where age and sex are adjusted for, and consequently Coles (2000) cut off points were used to assess whether the respondents were overweight, obese or neither, since levels for underweight is not accounted for in these cut off points. For respondents above the age of 18 the adult cut off points were used, where a BMI of 25 indicates overweight and 30 indicates obesity (World Health Organization 2000). For these to be comparable to the cut off points for adolescence, cases where respondents were above the age of 18 and categorised as underweight were not reported.

Table 4. *Anthropometric features and level of physical health*

Variable	Number of respondents	% of *n*
Valid responses (*n*)	408	100
Gender:		
Male:	88	21.6
Female:	320	78.4
Age*:		
< 13.999	5	1.2
14-14.999	8	2.0
15-15.999	17	4.2
16-16.999	59	14.5
17-17.999	116	28.4
18-18.999	116	28.4
>19	87	21.3
BMI:**		
Overweight	48	11.8
Obese	13	3.2
Neither overweight nor obese	347	85.0

*Mean (±SD) of age: Male = 17.64 (±1.44); Female = 17.93 (±1.27); Total = 17.87 (±1.31)

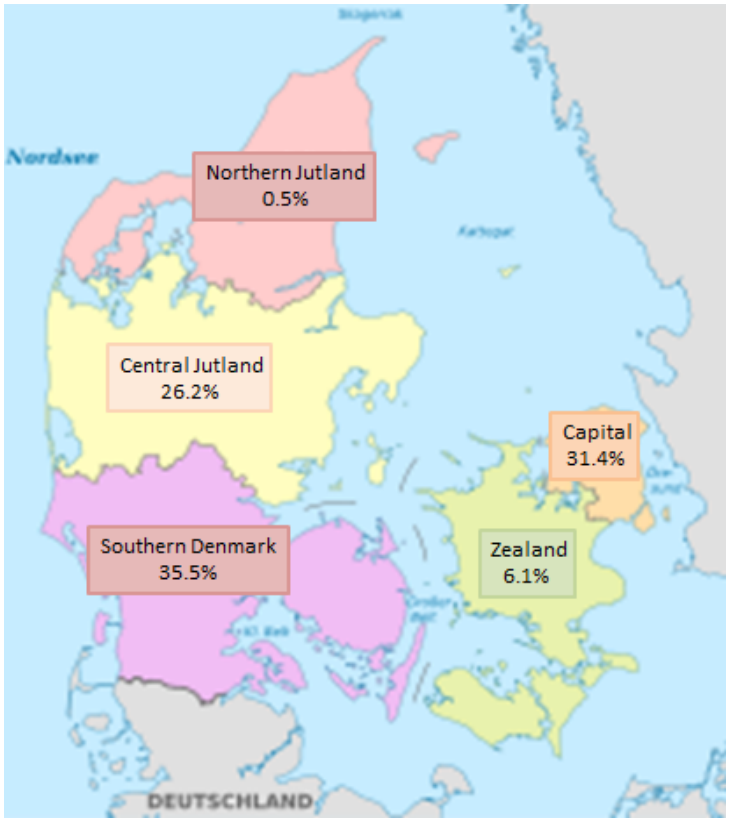
**BMI for ages ≤ 18 based on Cole et al. (2000) and according to WHO (2000) for ages > 18 years

6.1.2 Socio-demographic characteristics

Questions relating to the socio-demographic characteristics of the respondents are presented in appendix 5, table 5.1, which displays whether the respondents and their parents are born in Denmark, who they live with and number of siblings. The descriptive analysis showed that the majority of the respondents were born in Denmark (96%) and had parents who were born in Denmark (84%). Further, 61% of the respondents lived full time with both their parents and only 6% lived away from their parents, either because they have moved into their own apartment or are staying at a boarding school. About three fourths of the respondents have one or two siblings and 19% have three or four siblings. Furthermore, the majority of the respondents attended school at gymnasium level (90%).

Figure 4 illustrates the distribution of the place of residence of the respondents distributed on the five regions of Denmark. It shows that the majority of the data is collected from respondents in Southern Denmark, Central Jutland and the capital, equivalent of 93.1% collectively.

Figure 4. *Regional distribution of responses.*



6.1.3 Consumption patterns and knowledge of recommended vegetable intake

According to table 5.2 in appendix 5, 28% of the respondents were aware of the official dietary recommendations advising 300 grams of vegetables per day. Further, 51% of the answers assessed a healthy intake to be below the recommendations and 21% assessed the recommended intake to be more than what is the case.

Regarding lunch habits (see figure 5.1 in appendix 5) the respondents were asked to assess how many times a week they 1) ate packed lunch, 2) ate from the canteen or from a school food scheme, 3) bought from outside the school or 4) did not eat lunch. A total of 73% of respondents ate a packed lunch three to five times a week. Further, 67% answered that it never happened that they did not eat lunch, where as little as 6% did not eat lunch three to five days a week. 22% never ate at the canteen, while 33% ate at the canteen one or two times a week. Of all the respondents, 90% had access to a canteen at their school and as little as 3% neither had a canteen or a school food scheme. A bit more than half the respondents (54%) never bought lunch from outside the school.

6.1.4 Attitude towards CANI

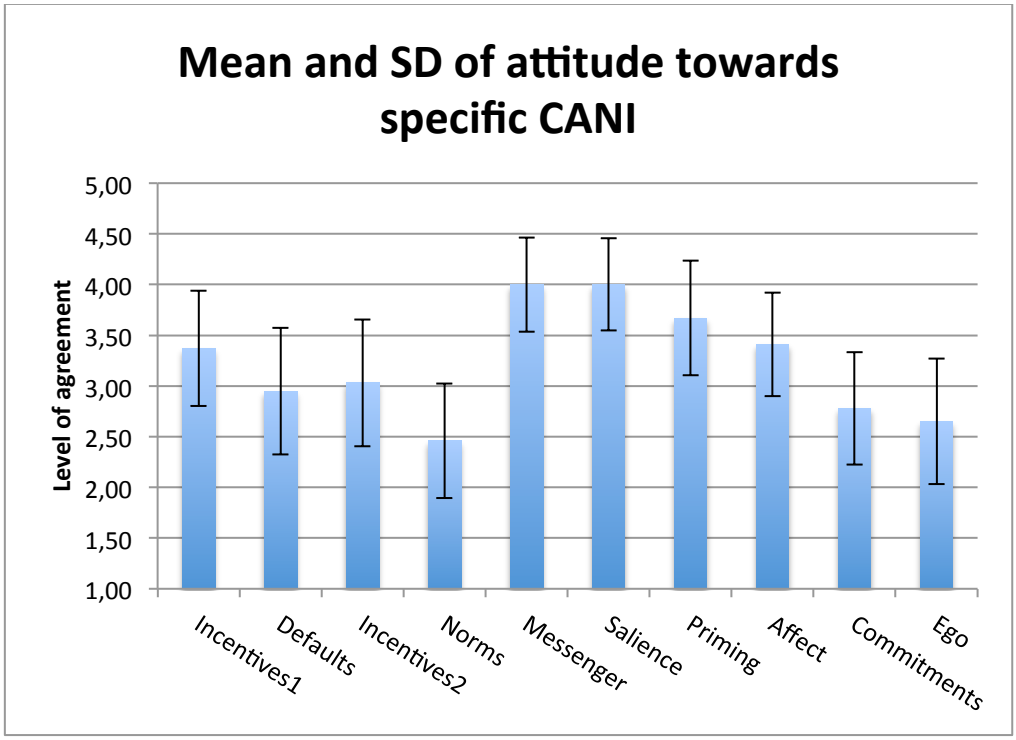
As previously mentioned the respondents' attitude towards applying CANI to improve vegetable consumption in a school context was assessed by level of attitude towards 10 proposed examples of nudges in each category of the nine MINDSPACE cues (Dolan et al. 2012) measured on a 5-point Likert scale.

The level of acceptability among each nudge put forward in the survey varied depending on the type of intervention as well as the approach and the level of interference in the respondents' lives, see figure 5 and appendix 5, table 5.3.
They were generally more positive towards nudges such as the use of competitions (Incentives1), the use of posters with simple and easy advise on how to increase vegetable consumption (Salience), the use of celebrities in the promotion of vegetables (Messenger), changing the names of the dishes (Affect) and canteen staff asking them if they wanted more vegetables (Priming). The questions proposed in the questionnaire, assessing attitude towards CANI, is presented in appendix 1.1 'Description of variables and factors'.

On the other hand they were more negatively minded towards being encouraged to participate in a club related to vegetables (Commitments), being presented with posters portraying sad young people eating unhealthy food (Ego) or being informed about their vegetable intake compared with their class mates' (Norms), see figure 5 and appendix 5, table 5.3.

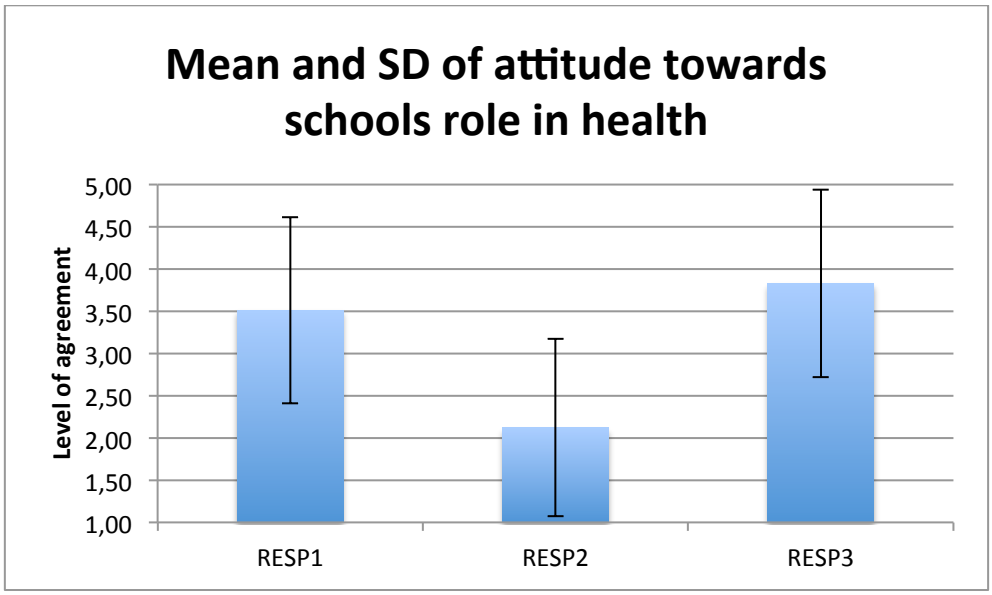
On average, the respondents had a neutral attitude towards automatically being given a salad when ordering food (Defaults) or nudges applying scare campaigns showing the consequences of a low vegetable intake (Incentives2).

Figure 5. *Mean and standard deviation (±SD) of questions assessing attitudes towards CANI measured on a 5-point Likert scale ranging from 1=Strongly disagree to 5=strongly agree*



Regarding the questions assessing the respondents' attitude towards the responsibility of the school or canteen to increase the vegetable intake among adolescents, a bit over half of the respondents (57%) agreed or strongly agreed that it was acceptable if the school or a canteen tried to influence their vegetable consumption by making it easier to choose vegetables instead of more unhealthy foods 25% were neutral towards this and 17% found disagreed or strongly disagreed in this statement. When asking whether it is the schools obligation rather than merely acceptable for them to intervene, as little as 11% agreed or strongly agreed in this, while a considerable majority (68%) disagreed or strongly disagreed. See figure 6 and appendix 5, table 5.4. To sum up, this points towards an agreement that it is acceptable for the school to attempt to intervene, but essentially it is not seen as their obligation or responsibility to improve vegetable intake among the respondents.

Figure 6. *Mean and standard deviation (±SD) measured on a 5-point Likert scale ranging from 1=Strongly disagree to 5=strongly agree. RESP1 refers to whether it is acceptable that a school or a canteen interferes, RESP2 refers to whether it is their obligation and RESP3 is a reversed phrased question stating it is not their responsibility.*



6.2 Factor analysis and structural equation modelling

The following section will present the outcomes from the exploratory factor analysis conducted using SPSS followed by the results from the confirmatory factor analysis and the structural equation modelling executed in SPSS Amos. First, latent factors are identified based on the variables form the questionnaire in an exploratory factor analysis. Secondly, the identified factors are confirmed in a confirmatory factor analysis and lastly a structural equation model is estimating the relationship between the latent factors and the attitude towards nudge interventions.

6.2.1 Exploratory factor analysis

The exploratory factor analysis (EFA) was applied in order to identify how the observed variables from the data set were correlated in order to reduce these variables by grouping them into clusters of unobserved latent variables or factors, which can otherwise be difficult to measure (Field 2013). Correlations are measured by factor loadings (Field 2013). The variables with high correlation are thereby assumed to measure different aspects of a common underlying factor. Factor loadings above 0.4 were considered sufficient in the EFA (Stevens 2009).

A Varimax Rotation was applied in order to acquire a better view of the loadings and thus make it

easier to interpret the results (Field 2013). The EFA showed that the variables with a sufficient factor loading could be divided into seven factors. After visual inspection, one of the factors was divided into two with two variables in each, since the authors assessed that the four variables were not appropriate to group together as one factor.

Cronbach's Alpha values were computed for each of the eight factors in order to analyse the internal consistency of the groups of variables. Since a Cronbach's Alpha above 0.7 proves sufficient reliability in terms of what the factors are supposed to measure (Field 2013), the analysis showed that all the selected factors had acceptable alpha values and were therefor appropriate for further analysis. Factor number eight had a value of 0.547, which is below 0.7, but it is still high, and thus is kept for the next step in the analysis. Thus, the EFA identified eight factors (latent variables), which could further be computed in Amos for the confirmatory analysis (see table 5).

Table 5. *Results from the rotated factor matrix from the EFA displaying factor loadings for each variable. Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization. For all groups of variables the Cronbach's Alpha is added. See appendix1 and 1.1 for list of abbreviations.*

Variable	**Factor**							
	1	2	3	4	5	6	7	8
Cronbach's alpha	0.848	0.855	0.717	0.85	0.659	0.794	0.725	0.548
PH1			.790					
PH2			.720					
INT1								
SEa		.564						
SEb		.524						
SEc		.466						
SEd		.647						
SEe		.680						
SEf		.623						
SEg		.687						
SEh		.617						
SEi		.656						
SEj		.587						
PH3			.570					
PI1				.667				
PI2				.555				
INT2								
SN1								
SN2					.518			
SN3					.659			

BH1					
BH2					
BH3					
BH4					.535
BH5					
BH6					
BH7					
BH8					.474
BH9			.748		
BH10			.702		
Incentives1	.562				
Default	.613				
Incentives2	.589				
Norms					
Messenger	.481				
Salience	.648				
Priming	.681				
Affect	.688				
Commitment	.550				
Ego	.427				
RESP1	.670				
RESP2				.594	
RESP3*				.533	

*Since this is a reversed asked question, the answers have been reversed for the analysis.

6.2.2 Confirmatory factor analysis

The confirmatory factor analysis (CFA) was computed in Amos on the basis of the results of the identified factors from the EFA. The purpose of the CFA was to confirm the assumed factors extracted from the EFA in a CFA model. The Robust Maximum Likelihood was used as the estimation method.

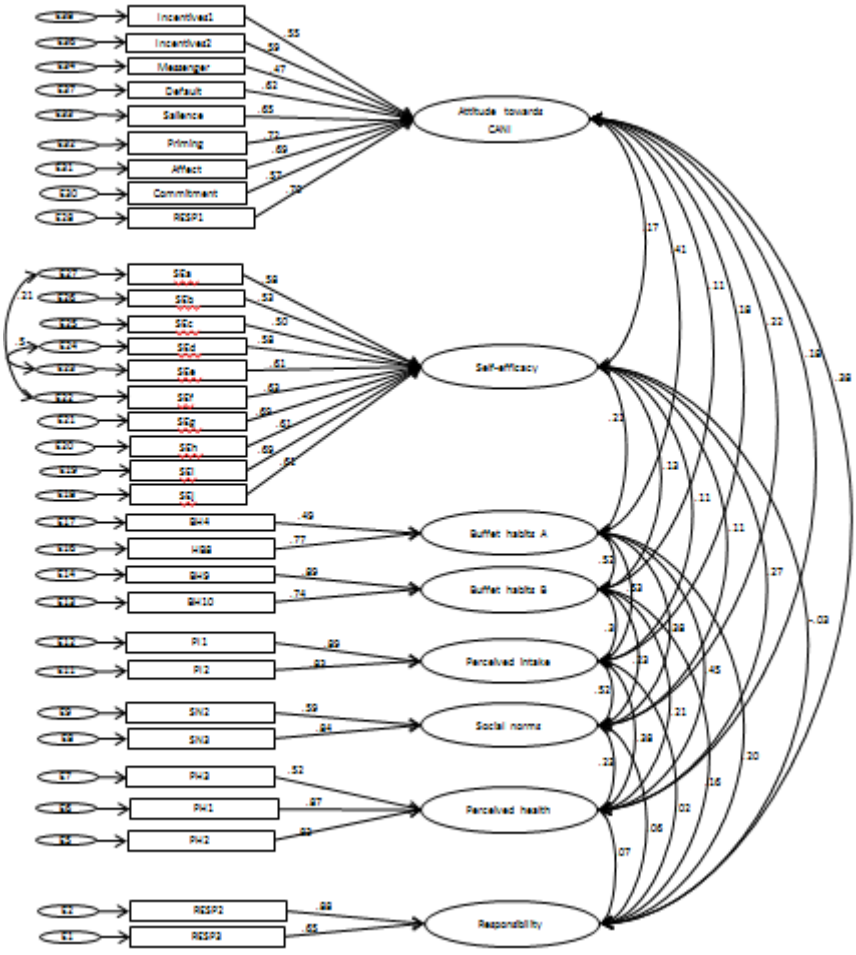
To assess model fit, i.e. how well the CFA model fitted the data set, different fit indices were applied. Chi-square (X^2) can be used for this purpose, where a non-significant result (≤ 0.05) would indicate a good fit, but for large sample sizes this is difficult to achieve and the Chi-square is therefore, in this case, not a reliable identifier of good fit (Bentler, Bonett 1980). Thus, other fit indices have been developed to assess model fit. In the present study the root mean square of approximation (RMSEA), Normed Fit Index (NFI), Goodness of Fit (GFI), Comparative Fit Index (CFI), Incremental Fit Index (IFI) and *p*-value for test of close fit (PCLOSE) was used. For GFI, CFI, NFI and IFI values >0.90 is considered to be a good fit and for RMSEA, which looks at the average size of residuals, a value <0.05 is a good

fit (Bentler, Bonett 1980). The values from the model fit are presented in table 6 and the fitted model is illustrated in figure 7. The model generally performed well and indicates that there is a good fit in the final model and that it is appropriate to move on to structural equation modelling.

Table 6. *Values and criteria for good model fit.*

Fit index	Obtained result	Categorized as good fit
RMSEA	0.039	<0.05
GFI	0.902	>0.90
PCLOSE	1.000	Close to 1
NFI	0. 852	>0.90
CFI	0. 937	>0.90
IFI	0. 938	>0.90

Figure 7. *Confirmatory factor analysis of final path diagram computed in Amos. The figure illustrates which variables (i.e. questions) that load on each factor as well as standardized estimates of the path coefficients.*

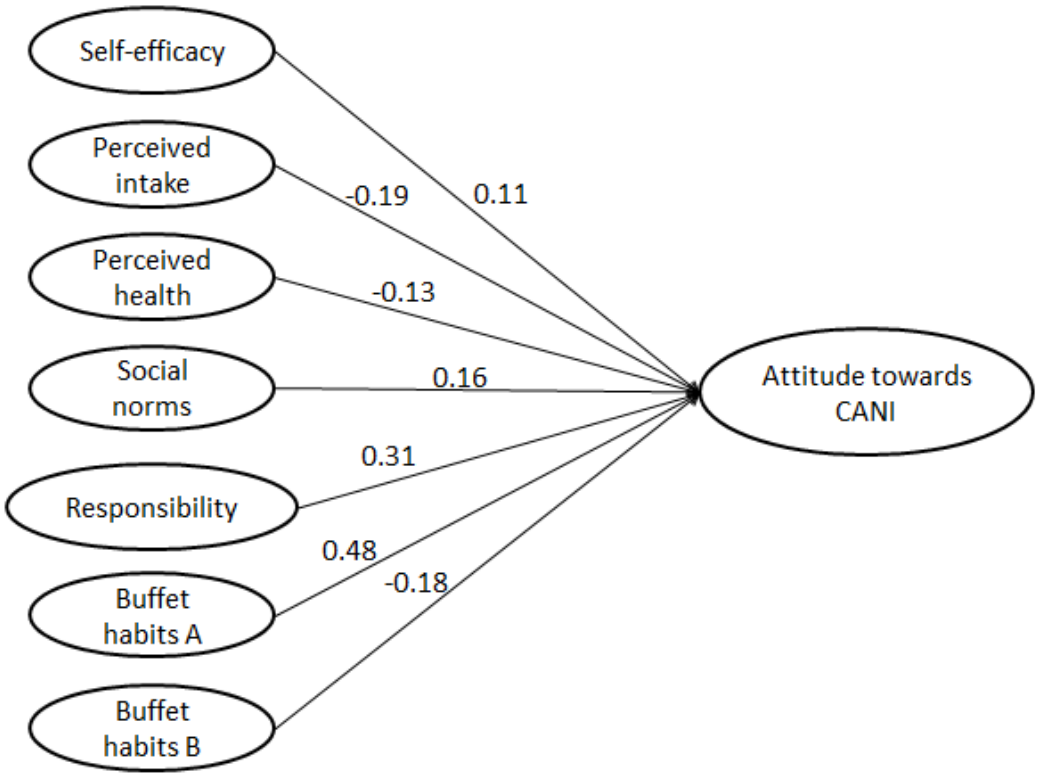


6.2.3 Structural equation modeling

As a last step of the analysis, a structural equation model (SEM) was constructed based on the confirmed factors from the CFA. The purpose of the SEM was to estimate the strengths of the relations and the direction of association between the latent factors and the chosen outcome factor; attitude towards CANI.

Again, the Robust Maximum Likelihood was used as the estimation method. Attitude towards CANI was placed as the outcome factor and the rest were the latent factors of which the strength and direction of association to the outcome was explored.

Figure 8. *Final structural equation model of correlates of attitude towards CANI showing standardized regression weights.*



The final SEM is presented above in figure 8. The path coefficients represent the regression weights, and the values indicates the strength of the association where 'responsibility' and 'buffet habits A' have the strongest associations, and thus explains the most of the variation in the outcome factor. Conversely, 'self-efficacy' and 'perceived health' is positively, but relatively weak associated with the attitude towards CANI, meaning, that people who perceive themselves to be more self-efficient have a more positive attitudes towards CANI, which also goes for people perceiving themselves as healthy. The values also indicate the direction of the association where 'perceived intake' and 'perceived health' as well as 'buffet habits B' have a reverse effect on the outcome factor, and the rest have a

positive effect. The regression weights, also known as regression coefficients (table 7), support this conclusion. According to the *p*-values, 'responsibility' (p>0.001) and 'buffet habits A' (p=0.001) have the smallest value which indicates that they have a significant effect on 'attitude towards CANI' together with 'buffet habits B' (p=0.025), 'perceived intake' (p=0.041) and 'social norms' (p=0.037). On the other hand, 'self-efficacy', which had a *p*-value slightly above 0.05 (p=0.073) and 'perceived health' (p=0.847) did not have a significant effect on the outcome factor.

Table 7. *Regression weights (factor loadings) including standard error (S.E.), critical ratio (C.R.) and level of significance.*

			Estimate	**S.E.**	**C.R.**	***P***
Attitude towards CANI	←	Self-efficacy	0.182	0.102	1.792	0.073
Attitude towards CANI	←	Buffet habits A	0.473	0.148	3.204	0.001
Attitude towards CANI	←	Buffet habits B	-0.162	0.072	-2.248	0.025
Attitude towards CANI	←	Perceived intake	-0.171	0.084	-2.041	0.041
Attitude towards CANI	←	Social norms	0.142	0.068	2.085	0.037
Attitude towards CANI	←	Perceived health	-0.014	0.075	-0.193	0.847
Attitude towards CANI	←	Responsibility	0.330	0.070	4.717	***

7 Discussion

The present thesis has investigated the factors associated with the attitude towards CANI among teenagers and was limited to interventions focusing on increasing vegetable intake in a school context. As part of the preliminary research, a systematic literature review was conducted, which revealed that no previous study in any country had sought to assess the attitude towards CANI among the selected target group (appendix 2). Thus, to our knowledge, this is the first study assessing the level of attitude towards CANI among the selected target group, even though the field is highly debated. In general, very little research about the effects of nudging has been conducted among adolescents and the ones found were generally of week or moderate quality. So based on the level of debate and interest in nudging used as a tool in health promotion, further research is highly demanded.

Based on the TPB and the DPT, a conceptual model was developed capturing both reflective and automatic processes. From this model a quantitative structured questionnaire was developed, validated and distributed among teenagers in Denmark. Based on the retrieved data from the questionnaire, an exploratory factor analysis was performed in SPSS resulting in eight latent factors; 'Self-efficacy', 'perceived intake', 'perceived health', 'social norms', 'responsibility', 'attitude towards CANI', 'buffet habits A' and 'buffet habits B'. Subsequently these assumed latent factors were established in a confirmatory factor analysis and ultimately a structural equation model was built in Amos analysing the strengths of associations between the confirmed factors with the final outcome; Attitude towards CANI. The results of the analysis showed that 'responsibility' and 'buffet habits A' had the strongest association towards the outcome factor, while 'self-efficacy' and 'perceived health' proved no significant association to the outcome factor.

In the following section the findings from the data collection and subsequent analysis, the choice of theoretical framework, the chosen methodology and the impact of the delimitation will be discussed.

7.1 Discussion of results

There are a few potential biases connected to the empirical data, especially regarding the sample, which consisted of a relatively homogenous group regarding age, gender, degree of education and nationality (see tables 4 and appendix 5, table 5.1). Also, most respondents had a good perceived health status based on the questions regarding perceived health, perceived level of physical activity

as well as leisure time activity (see appendix 5, table 5.2). Due to the high level of homogeneity within the sample, it is not possible to generalise the results of the analysis to the entire target population, but rather to state that the results are valid for this particular socio-demographic group. Their profile is described in chapter 6, section 6.1.1 and 6.1.2.
The sample size is rather large (*n* = 408) and the responses are spread throughout the majority of Denmark (the Capital, Central Jutland and Southern Denmark), including both larger cities and less populated areas. This implies that it is acceptable to generalize the results to a national level for this group. In order to be able to generalise the results to the entire population, additional studies should be carried out because of the homogeneity of the sample.

In terms of the socio-economic profile of the respondents, this is difficult to measure in a sample of teenagers, since they, on the one hand, seldom have an income of their own and, on the other hand, rarely have knowledge of neither income levels and household budgets for the family nor educational level of their parents (Currie et al. 1997). Socio-economic status is interesting, since there seems to be an inequality in health, which is connected to a larger risk of health issues among groups of lower socio-economic status, and this would have been interesting to control for (Baadsgaard, Brønnum-Hansen 2012, Diderichsen, Andersen & Manuel 2011). Instead the questionnaire included questions regarding socio-demographic aspects including the respondents' living situations etc. It is difficult to transfer the socio-demographic status of the respondents to the socio-economic status of their families. However, there is a tendency of characterising children growing up in families, where the biological parents do not live together, as more vulnerable (Olsen, Larsen & Lange 2005). Almost two thirds of the respondents stated that they lived with both their parents leaving approximately one third living with only one of their biological parents, and this roughly matches the national average, where three quarters of children are living with both parents (Petersen, Nielsen 2008). Also, the number of siblings and whether the respondent and/or their parents were originally from the country of residence can be predictors of socio-economic status. Here, some studies have shown an association between increased number of siblings and an increased likelihood of belonging to more vulnerable groups. Further, originating from a different country can be associated with and increased vulnerability (Egelund, Nielsen & Rangvid 2011, Ermisch, Francesconi 2001). However, it is important to note that these observations are suggestive, and that there are a number of other factors that play a role in determining the socio-economic status. In relation to the present study, the majority of the respondents and their parents were born in Denmark and approximately three quarters had one or two siblings. The remaining quarter had

three or more siblings. This could indicate that the majority of the respondents belong in a higher socio-economic group, but this is not confirmed.

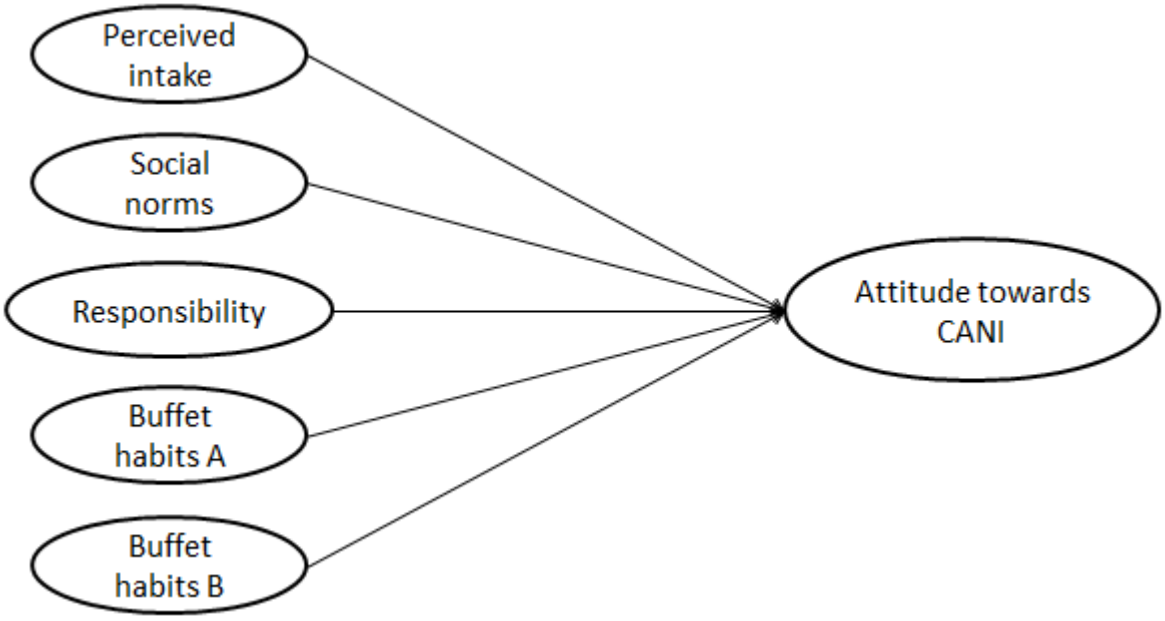
In terms of confounding factors that might have an effect on the results, there is a limiting factor connected to the study design as well and the content specific aspects of the questionnaire. There is a possibility that the relationships found in the analysis is due to conditions that is not accounted for in the questionnaire and study design. Possible confounding factors could be linked to the homogeneous features of the sample, i.e. that there are undetected conditions regarding the sample that could cause the findings in the results of this thesis. Maybe the group that completed this rather long questionnaire is of a certain character, which makes them more prone to be positive towards CANI. Some of the most common confounders, such as age and gender, could be controlled for in an extension of the statistical analysis (Gibney et al. 2004). In order to further adjust for confounding, using a randomised sample or applying a randomized controlled trial as the study design could be the solution. However, this was not possible within the scope and timeframe of this study and thus, a cross-sectional study was appropriate. Still, it is important to have the limitations of the study in mind when making conclusions.

The results from the factor analysis were evaluated in light of the theoretical frame as well as the developed conceptual model, which included the theories previously discussed in chapter 4 'Theoretical framework' (see figure 3 in the section 'A conceptual model'). Through visual inspection of the variables that were grouped together into latent factors extracted from the EFA it seemed as if the groups were overall consistent with the factors proposed in the conceptual model. The proposed factors were then labelled according to the names of the factors in figure 3. Some variables ultimately did not load sufficiently on any factor. These were related to the factor 'buffet habits'. The ones that did not load were supposed to represent automatic processes, such as always evaluating the entire selection at a buffet before starting to serve oneself. As a consequence of not having a sufficient factor loading, these were excluded from the further analysis. However, this does not necessarily imply that habits or automatic processes are not having an effect regarding the attitude towards CANI. It could be an expression of the fact that it is difficult to measure automatic processes and their effect on a given phenomenon in a questionnaire, as they are often performed on a subconscious level without being aware of it. It could thus be assumed that attitudes towards CANI are unaffected by automatic processes, but will have an effect on behaviour as it has also been hypothesised in the conceptual model, where automatic processes are an expression of an automatic accept expressed by an immediate change in behaviour without reflecting on the acceptability

beforehand (see figure 3 in the section 'A conceptual model'). This effect has been shown in previous studies (Wansink, Painter & North 2005, Wansink 2004), where people's behaviour has been altered without them realising it. As previously stated, testing this attitude-behaviour relationship is beyond the scope of the present study. However, it would be interesting to investigate this aspect in future studies, where the questionnaire could be supplemented with actual exposure to CANI.

The results from the SEM revealed that two of the proposed factors did not explain a significant amount of the variability in the outcome factor, namely 'self-efficacy' and 'perceived health'. Figure 9 gives a visual illustration of the SEM, where only the factors that actually had an effect are portrayed.

Figure 9. *Visual illustration of the factors that had a significant effect on the outcome. The illustration does not include the path coefficient and is merely included as an overview.*



The following variables seemed to have the largest association to the attitude towards CANI; 1) 'Responsibility', i.e. whether responsibility of healthy eating lies with the school or a canteen and 2) 'buffet habits A', i.e. whether the respondents think it is important that a buffet is healthy and whether they usually choose vegetables first when taking food from a buffet. The strong associations of these two factors to the outcome factor, 'attitude towards CANI', correlate with previous findings of the thesis.

As seen in section 1.4 'Discourses within nudging', the ethical considerations related to CANI has been widely debated, since CANI as a public health promoting tool is somewhat controversial, since it works by making people change behaviour more or less unknowingly. Thus, the discussion about where the responsibility for health should be placed would be reasonable to associate to attitudes

towards CANI.

Regarding healthy buffet habits, the association between concerns about healthy eating at a buffet and attitude towards interventions aiming at promoting healthy behaviour seems logical. This is in line with previous studies showing, that those engaged in an unwanted behaviour are less prone to be supportive of interventions aiming to prevent or reduce this particular behaviour (Diepeveen et al. 2013). Thus, people already prioritising vegetables when choosing food at a buffet will be more supportive of an intervention aiming to increase vegetable intake. In addition, this could further be tied to the Principle of Least Effort and Law of Less Work, as presented in section 4.4 'Conceptual Model'.

As previously mentioned, 408 people answered the questionnaire sufficiently to be included in the analysis and the power was calculated to 0.99 based on the questions related to attitude towards CANI. Thus, the results of the analysis are likely to be accurate, i.e. there was an absence of type I and II errors, and it emphasizes the assumption that the observed associations did not occur by chance and ultimately the associations were true (Gibney et al. 2004).

In terms of the attitude towards CANI, the descriptive analysis revealed that the respondents generally had a higher level of agreement with the use of competitions (Incentives1), posters with simple advise (Salience), using celebrities (Messenger), canteen staff asking if they want more vegetables (Priming) and changing the names of the dishes (Affect). These were all relatively non-intrusive interventions that one could easily ignore or choose not to participate in, and that would not intervene extensively in their lives. As previously shown in relation to the discourses within nudging (section 1.4), especially the issue of intrusiveness has been accentuated as a major concern among nudge critics and could thereby be considered as predominant reasons for possessing a critical attitude towards CANI. This tendency has also been shown in previous studies, where public attitude towards government behaviour change interventions are greater for the least intrusive interventions (Diepeveen et al. 2013). Further, it can be hypothesised that, at least for using celebrity ambassadors, posters with easy tips and competitions, the target group is somewhat used to being confronted with these types of measures as they are already widespread tools, which are frequently being utilised both in public health campaigns, but also through private marketing initiatives in commercials and on social media (Arla 2014, The Whole Grain Partnership n.d.). Moreover, research shows that public attitudes change over time and that they may become more favourable towards and intervention after its application (Diepeveen et al. 2013).

The respondents seemed to agree less with the use of nudges using posters portraying sad, lonely

teenagers eating unhealthy foods (Ego), encouraging them to join a "vegetable club" (Commitment) and informing them about their vegetable intake compared with their class mates (Norms). These three CANI could be categorised as more intrusive than the ones towards which the respondents had a higher level of agreement. Having their food intake compared with their friends' could potentially display a lack of will power or portrait the respondents in an undesirable way if they themselves did not eat vegetables frequently or if they ate unhealthy foods. These nudges are in nature no more restrictive of choice than the ones the respondents agreed with, but they relate to the self-image of the respondents. Adolescence is by social psychologists characterised as a period of lower self-esteem, a heightened self-consciousness and greater instability of self-image (Simmons, Rosenberg & Rosenberg 1973), and these conditions could be causing the more negative attitudes.

Neutral attitudes were expressed towards automatically being given a salad (Default) as well as the use of scare campaigns (Incentives2), which is somewhat unexpected since both could be regarded as relatively intervening approaches in targeting increased vegetable intake. In the case of using scare campaigns, the target group might have gotten accustomed to such measures, as they – as it was the case with the use of celebrities and competitions - are widely utilised in present health campaigns (Danish Health and Medicines Authority n.d.). Another possible explanation could be that the respondents do not possess strong opinions towards these types of nudges because they are undecided or have never considered such issues beforehand. As previously mentioned in section 4.1 'Attitude', this can sometimes be the issue in questionnaires of attitudinal character (Bowling 2009). If this is the case it contradicts some of the critique regarding intrusiveness put forward by academia and politicians (see section 1.4 'Discourses in nudging').
The findings of the descriptive analysis of the proposed CANI might indicate which types of interventions to concentrate on if a school or a canteen were to implement a CANI.

The respondents were generally found to be positive towards a school or a canteen attempting to change the food related behaviour of their users. However, it was also concluded that the respondents did generally see it as neither the school's obligation nor responsibility to improve their vegetable intake. In the common approach to health policy, individuals are for the most part being held ethically responsible for own health and food choices (Resnik 2007). Health promotion and interventions have until recently primarily been targeting individual factors (Peersman, Harden & Oliver 1998), but on a market where the food industry has a major influence on food intake, and where 75% of the food available is processed, which is being heavily marketed by large budgets (Moodie et al. 2013), there is a need to also consider the environmental factors and thus creating

environments supportive of improving dietary behaviour and food choices (World Health Organization 1986). People cannot always be held responsible for their food behaviour due to social, cultural or mental circumstances (Wikler 2002). The importance of the surrounding environment is becoming more and more recognised to be immensely influential on food behaviour, and a development towards placing more significance on both the social and physical environments has been seen in recent years. Ecological approaches have been emerging, where both individual and environmental factors as well as the interaction between the two are taken into consideration (Gibney et al. 2004, Reynolds et al. 2004). As it has been pointed out in section 1.4 'Discourses within nudging', CANI cannot stand alone, and they must be accompanied by more traditional information campaigns if long-term effects are to be ensured (Bonell et al. 2011). Acknowledging the significance of environmental factors has proven to be advantageous for CANI, which can be seen in the interest towards the field, both among researchers and on the political arena. This interest, as well as the current use of nudging in public policy worldwide, could pave the way for a generally positive attitude towards CANI among the general public, academia and policy-makers, as the acceptability has previously been shown to rise after the introduction of a policy (Diepeveen et al. 2013, House of Lords, Science and Technology Select Committee 2011). However, there is still a large gap between the level of interest and the evidence base for CANI, which emphasizes the need for further research, both regarding level of attitude, but also concerning the effectiveness of nudge interventions in general.

On the basis of the results it is interesting to reflect upon whether attitudes actually matter if the interventions are working by means of automatic processes, i.e. without the participants even noticing it. Would a potentially positive or negative attitude make such CANI more or less effective? Several scenarios could be imagined. As stated in section 1.4 'Discourses within nudging', the use of CANI in health promotion is highly debated and is by some considered to be infantilising and intrusive. The interventions work best if the actual nudges are not obvious to the public eye, but a counter action could be expected if users of the canteen, who were reluctant towards the use of CANI, were to realise that they were being nudged. In protest, they might stop buying their meals in the canteen or be extra aware of what they were choosing, and could even be choosing more unhealthy products as a statement of aversion. On the other hand, the opposite scenario could be anticipated among people approving of CANI, and possibly the interventions would be welcomed as a way of lifting the burden of eating healthy – and thereby maybe even be more effective among this group. This could, as previously stated, be due to the fact that people are more positive towards interventions targeting a behaviour that they themselves do not engage in (Diepeveen et al. 2013). A

final reflection could be that, despite of a hypothetically negative attitude, the nudges would still be effective, since CANI as mentioned target the automatic processes, which could be a direct influence of behaviour as presented in figure 3 in section 4.4. These reflections could be interesting to investigate in future studies.

7.2 Choice of theoretical frame

The structured questionnaire was developed on the basis of selected theories, i.e. the TPB and the DPT, each with their strengths and weaknesses. They both look at how behaviour can be influenced. Where the focus in TPB is on reflective cognitive processes within the individual, DPT also takes the automatic processes leading to a specific behaviour into account. A theory or a model is a tool to describe a relatively complex interaction between different factors. Often the reality is simplified through theoretical models, which means that different nuances or interactions between different elements could be overlooked. Thus it is important to use such models with caution and be aware of this level of uncertainty when a conclusion is derived using a model. In relation to attitudes towards CANI, other factors might be influential, for instance environmental, socio-demographic or socio-economic characteristics such as availability, food security, economic aspects etc. This has to some extend been taken into account by including elements from both the TPB and the DPT, see chapter 4.

The chosen theories have been selected on the basis of their level of scientific recognition as well as their relevance for explaining factors influencing behaviour.

7.3 Choice of methodology

In the present thesis, empirical data from a structured questionnaire have been analysed. Because of the quantitative nature of the data, a statistical analysis has been applied. Whether quantitative or qualitative methods should be used depends on the purpose (Andersen 2008). Since the purpose of the present thesis is to model the factors influencing the attitude towards CANI, it is of interest to quantify the data. For this reason, the data were collected through an online questionnaire with mostly closed-ended questions. The advantages of using this data collection method is that it is cheap, quick, easy to administer, it has the potential to reach many people quickly and it is easy to process the data afterwards (Andersen 2008). On the other hand, there are also some limitations to the use of this method. Due to the fact that the answers in the questionnaire are fixed, nuances in the answers might get lost. Also, a lot of questionnaires circulate online, which emphasize the

importance of considering the distribution process beforehand to ensure a high sample size (Andersen 2008), see section 5.5 'Distribution of the questionnaire'. Lastly, the data collection occurred at a single point in time and thus provides a snapshot of the current situation.

The questionnaire was conducted in Danish, which means that it was limited to Danish speaking respondents. This does not have an effect on the outcome, since the research question was limited to Danish teenagers.

Prior to the construction of the questionnaire, important factors to be included in the questionnaire were developed on the basis of the theoretical framework and relevant literature. The possibly influential factors were; Perceived health, buffet habits, social norms, self-efficacy and attitude towards CANI. Also, standard background measures were included such as anthropometrics and socio-demographic characteristics, level of physical activity, lunch behaviour and knowledge of recommended vegetable intake (see appendix 4.3 'Dimensions in the questionnaire'). After developing the questionnaire, a thorough validation was conducted prior to the primary data collection. It is accounted for in section 5.4 'Results and discussion of pilot test'.

There are a few potential biases connected to the study design and method. The potential biases connected to the study design are related to confounding and causality. Since the study is categorised as a cross-sectional study it provides a snapshot of reality at a specific point in time, and thus the survey design does not allow inferring causality, but only provides suggestive tendencies. This means that the results regarding the strength of the associations are suggestive, since cause and effect cannot be inferred by a cross-sectional study.

A potential bias connected to the method could be associated with the recruitment of respondents, the so-called selection bias (Gibney et al. 2004). The sample used in this study is a convenience sample, which means that the respondents were not selected trough randomization, which is the strongest sampling method. The convenience sampling was chosen since it is easier and quicker to conduct, and due to time limits it was not possible to plan and execute a random sampling. To minimize the bias, as many people in the target group as possible were contacted through online platforms, and a large sample was obtained (see section 5.5 'Distribution of the final questionnaire').

Other potential biases to take into account are measurement biases (Gibney et al. 2004). These could be associated with 1) the choice of factors to be included in the questionnaire, 2) the questions chosen to examine the factors and 3) the formulation of these questions.
As a means to minimize the first potential bias, i.e. the choice of factors, a wide range of literature

and questionnaires measuring some of the same factors has been examined.
In relation to the second potential bias, it is important to note that since the respondent had to voluntarily respond to the questionnaire it had to have a limited amount of questions. If the questionnaire was too long, it would be difficult to obtain a large sample. The fact the amount of questions had to be limited could represent a limitation to the study.
In terms of the third potential bias connected to the formulation of the actual questions, the language and understanding have been validated in a pre-test where two respondents provided written or oral feedback on the language, understanding and layout of the questionnaire. This contributed to limiting the existence of this bias. Also, senior colleagues with experience with the target group, nudging and questionnaire development in general, provided feedback on the formulation of the questions.

7.4 Impact of delimitation

In the present thesis, attitudes towards CANI are limited to a school context. This could mean that the results would be different in another context, for instance if investigated in a home environment or in a supermarket context. Further, the fact that the thesis has been limited to Danish teenagers between the ages of 13 to 19 means that the results cannot directly be transferred to other demographic groups or to the Danish population in general, but is only valid for this particular societal group. Also, the focus is on attitude towards CANI aiming at increasing vegetable intake, which means that the results of the thesis do not apply for CANI in general.

8 Conclusion

The aim of the present thesis was to investigate, which factors that influence the attitudes towards choice architectural nudge interventions aiming to increase vegetable intake among Danish teenagers. This was addressed by developing a questionnaire based on the theories chosen for the theoretical frame; the Theory of Planned Behaviour and The Dual Process Theory. A validation of the questionnaire through a pilot test was performed prior to the primary data collection.

By analysing the empirical data from the questionnaire using factor analysis and structural equation modelling it was found that the factors 'buffet habits', 'perceived intake', 'social norms' and 'responsibility' was found to have a significant association on the attitude towards choice architectural nudge interventions. On the other hand, 'self-efficacy' and 'perceived health' did not have strong associations. However, it is important to keep in mind that due to the cross-sectional study design, the results are suggestive since cause and effect cannot be inferred.

A descriptive analysis revealed that the respondents were generally positive towards the following proposed CANI; the use of competitions (Incentives1), posters with simple advise (Salience), using celebrities (Messenger), canteen staff asking if they want more vegetables (Priming) and changing the names of the dishes (Affect). These represent relatively non-intrusive examples of CANI.
On the contrary, the respondents expressed more negative attitudes towards CANI, which could potentially display a lack of will power or portrait the respondents in an undesirable way. These included using posters portraying sad, lonely teenagers eating unhealthy foods (Ego), encouraging the respondents to join a "vegetable club" (Commitment) and informing them about their vegetable intake compared with their classmates (Norms).
Neutral attitudes were expressed towards automatically being given a salad (Default) as well as the use of scare campaigns (Incentives2). These two proposed CANI could be regarded as relatively intervening approaches to target an increased vegetable intake.
Further, it was concluded that the respondents found it acceptable for the school to attempt to intervene with their health-related behaviour, but essentially it was seen as neither their obligation nor responsibility.

It is not possible to say whether attitude will lead to accept or behaviour, but it will be interesting to investigate in a future study. Here the combining of the questionnaire with actual exposure could be relevant to see if the results from the two methods are consistent with each other.

9 Future perspectives

The focus of the present thesis has been on investigating the attitudes towards CANI and the factors possibly associated with these attitudes among Danish teenagers. Prior to the analysis, a conceptual model has been developed, placing attitudes as the mediating factor between the hypothesised factors, possibly associated with attitude, and behaviour. Also, the potential influence of automatic processes on behaviour was added to the model, but since the scope of the study was limited to investigating the first part of the conceptual model, i.e. the factors influencing attitude, the next logical step would be to test the model as a whole. By combining the questionnaire with exposing the respondents to CANI it would be possible to measure how strong the association was between the attitude towards the intervention and the actual behaviour. More specifically, this could be tested by experimenting with the ten proposed nudges based on the MINDSPACE cues, and see if the results of attitudinal character would be associated with the level of effectiveness of the interventions. Since CANI attempts to nudge people towards a certain behaviour, often without them knowing it, relevant questions could be: Is attitude associated with behaviour when it comes to nudging? Do people even realize they are being exposed to nudging? Could a potential positive or negative attitude show a significant effect on behaviour? These questions would be interesting to investigate in the light of the previous discussion of whether attitudes would play a role in changing behaviour, or if it exclusively would be the nudge that induces the change without being influenced by the attitude. This hypothesis could refer to the automatic processes added in the conceptual model as a direct route to behaviour.

Further, it could be interesting to distinguish between the types of nudges presented in the MINDSPACE cues. This could be done by testing the association between the hypothesised factors and the attitude towards each nudge proposed in the questionnaire. In the descriptive analysis it was found, that some nudges were more acceptable than others, which makes it relevant to investigate if the factors influencing attitude are dependent of the specific type of nudge. This could especially be interesting for policy-makers, as it could give an idea as to which nudges would create the least resistance and which associated factors to be aware of prior and during an implementation.

As highlighted in the present thesis, the evidence base for CANI, both regarding public attitudes and effectiveness is very limited, and this is problematic, since CANI is gaining ground in public policies in several countries, so as it is now policy informs science, not the other way around. As reflected on in this chapter, the findings from the present study creates a foundation for further studies

investigating public attitudes as well as the association between the attitudes and actual behaviour. This research is needed before further implementing CANI in public policy as a tool to change health related behaviour.

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Appendix

Appendix 1: List of abbreviations

ANT	Anthropometrics
AVA	Availability
BH	Buffet habits
CANI	Choice Architectural Nudge Interventions
CFA	Confirmatory Factor Analysis
DPT	Dual Process Theory
EFA	Exploratory Factor Analysis
HBM	Health Believe Model
IFS	Integrated Food Studies
INT	Intention
KNOW	Knowledge
LH	Lunch Habits
NUD	Nudging
PH	Perceived Health
PI	Perceived Intake
RESP	Responsibility
SCT	Social Cognition Theory
SD	Socio-demography
SE	Self-efficacy
SEM	Structural Equation Modelling
SN	Social Norms
TPB	Theory of Planned Behaviour

Appendix 1.1: Description of variables and factors

Variable	Question in questionnaire
PH1	I am healthier compared to others my age.
PH2	I eat healthier compared to others my age.
INT1	I would like to lose weight.
SEa	I can always manage to solve difficult problems if I try hard enough.
SEb	If someone opposes me, I can find the means and ways to get what I want.
SEc	It is easy for me to stick to my aims and accomplish my goals.
SEd	I am confident that I could deal efficiently with unexpected events.
SEe	Thanks to my resourcefulness, I know how to handle unforeseen situations.
SEf	I can solve most problems if I invest the necessary effort.
SEg	I can remain calm when facing difficulties because I can rely on my coping abilities.
SEh	When I am confronted with a problem, I can usually find several solutions.
SEi	If I am in trouble, I can usually think of a solution.
SEj	I can usually handle whatever comes my way.
PH3	How physically active are you compared to others your age?
PI1	In a normal week I eat a lot of vegetables.
PI2	I eat more vegetables than most people at my age.
INT2	I plan to begin to eat more vegetables.
SN1	My friends eat vegetables every day.
SN2	My parents encourage me to eat vegetables every day.
SN3	My parents eat vegetables every day.
BH1	At a buffet I view the entire offer before I decide what I want to take on my plate.
BH2	At a buffet I first take the meat and then the other dishes.
BH3	At a buffet I first take the pasta, rice or potatoes and then the other dishes.

BH4	At a buffet I first take the vegetables or salad and then the other dishes.
BH5	In general, how important, if at all, are each of the following to your choice of food at a buffet?: The appearance of the food.
BH6	In general, how important, if at all, are each of the following to your choice of food at a buffet?: How good I think the food tastes.
BH7	In general, how important, if at all, are each of the following to your choice of food at a buffet?: The name of the dishes.
BH8	In general, how important, if at all, are each of the following to your choice of food at a buffet?: How healthy the food is.
BH9	In general, how important, if at all, are each of the following to your choice of food at a buffet?: Organically produced.
BH10	In general, how important, if at all, are each of the following to your choice of food at a buffet?: Animal welfare.
Incentives1	I think it would be acceptable if the school or a canteen held a competition where the winner would be the one with the largest vegetable intake in one week.
Default	I think it would be acceptable if the canteen automatically gave me a green salad with my lunch in order to get me to eat more vegetables if I easily could choose not to take it.
Incentives2	I think it would be acceptable if the school or a canteen made scare campaigns to get me to eat more vegetables, e.g. by showing examples of diseases caused by low vegetable intake.
Norms	I think it would be acceptable if the canteen informed me about how many vegetables I eat compared to my friends and class mates.
Messenger	I think it would be acceptable if the school or a canteen used celebrities to inform me about health related to eating vegetables.
Salience	I think it would be acceptable if the school or a canteen had posters with simple and easy tips on how I could eat more vegetables to get me to eat healthier.
Priming	I think it would be acceptable if the staff in the canteen asked me if I wanted more vegetables when buying my lunch.
Affect	I think it would be acceptable to change the names of the dishes in the canteen so the dishes containing many vegetables would sound more appealing and make me want to choose them.
Commitment	I think it is acceptable if the school encouraged me to sign up for a “6 a day” or “I love vegetables” club to make me feel obligated to eat more vegetables.

Ego	I think it would be acceptable the canteen had posters showing happy and popular teenagers eating vegetables and a lonely and sad teenager eating unhealthy food in order to make me feel like eating more vegetables.
RESP1	I think it is acceptable that the school or a canteen tries to influence my food choices so that it is easier for me to choose vegetables instead of more unhealthy foods.
RESP2	I think it is the school's or a canteen's obligation to try and improve me vegetable intake.
RESP3	I do not think it is the school's or a canteen's responsibility to try to get me to eat healthier.

Factors:	**Includes the following variables:**
Attitude towards CANI	Insentives1 Defaults Incentives2 Messenger Salience Priming Affect Commitment RESP1
Self-efficacy	SEa-j
Buffet habits A	BH4 BH8
Buffet habits B	BH9 BH10
Perceived intake	PI1 PI2
Perceived health	PH1 PH2 PH3
Social norms	SN2 SN3
Responsibility	RESP2 RESP3

Appendix 2: Systematic literature review

Choice architectural nudge interventions for increased vegetable intake in a school setting – A systematic review of attitudes and effectiveness

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Summary

The primary objective of this review was to investigate the prevalence and quality of published studies regarding the effects of choice architectural nudge interventions aiming to promote the intake of vegetables among adolescents in a school context and to investigate the prevalence of studies exploring the attitude towards choice architectural nudge interventions among the target group. Three databases were searched systematically for experimental studies with a predefined search strategy in the period November 2013 – December 2013. The search showed that only very few studies investigate the effects and none had attitude as an outcome measure. Following, twelve studies met the inclusion criteria. These studies were grouped according to type of interventions and underwent a narrative synthesis. The results of the 12 studies were inconclusive and the majority of studies were of weak or moderate quality. This indicates that there is a need for further studies on the effect of and attitude towards choice architectural nudge interventions aiming to promote the intake of vegetables among adolescents in a school context.

Key Words: Choice Architecture, nudging, attitude, adolescence, school setting, vegetables, obesity.

Background and objective

The average European consumption of fruit and vegetables is considered to be generally inadequate among all age groups compared to official dietary guidelines (Ungar, Sieverding & Stadnitski 2013, Capacci et al. 2012, Pérez-Cueto et al. 2011, EFSA Panel on Dietetic Products, Nutrition, and Allergies 2010, Elmadfa 2009, Yngve et al. 2005, Andersen, Overby & Lillegaard 2004) . Especially the vegetable consumption is widely insufficient, and in Denmark, where the recommended consumption is 300 grams per day for the population above the age of 10 years, the average daily intake of vegetables is 162 grams for adults and as little as 131 grams among adolescents between 10-17 years (Pedersen et al. 2010). This leaves adolescents to be the age group with the lowest intake in Denmark compared to the official guidelines. In addition, the food patterns of adolescents are of great concern from a public health nutrition perspective, since food habits consolidated by mid-adolescence will tend to persist into adulthood (Lien, Lytle & Klepp 2001, Kelder et al. 1994) .

A low intake of vegetables is associated with enlarged risk of obesity and several lifestyle diseases i.e. several types of cancers as well as cardiovascular disease (Cooper et al. 2012, Jeurnink et al. 2012, Boffetta et al. 2010, He et al. 2007), which are all some of the main causes of death in developed countries. Increasing vegetable intake among the European population could reduce the prevalence of mortality associated with an unhealthy lifestyle, but food related behaviours are complex. The barriers of increasing the consumption are numerous and involve an interaction between different factors such as acceptability, availability, intention, attitudes and beliefs as well as socio-demographic characteristics (Rasmussen et al. 2006, De Irala-Estevez et al. 2000, Neumark-Sztainer et al. 1999).

If healthy dietary habits are implemented early in life they tend to persist into adulthood (Lien, Lytle & Klepp 2001, Kelder et al. 1994) , but as children enter the transitional phase from childhood to adolescence their eating habits are easily affected and may develop in an unhealthy direction towards a more inadequate and energy dense diet with a higher content of fat and sugar, more frequent snacking habits, and a lower intake of fibres, fruits and vegetables (De Henauw et al. 2007, Lytle et al. 2000).

Adolescents spend a considerable part of their day in school where they often consume one or several of their meals, for which reason this arena is ideal for executing health promotion and

improving eating habits (Sharma 2006, World Health Organization 1986). Numerous interventions focusing on nutrition education have been implemented in schools worldwide, but many studies have been unable to show significant associations with improved dietary habits (Axelson, Federline & Brinberg 1985) and studies point towards expanding the focus to include environmental influences instead of solely aiming to influence individual factors (Wansink 2010, Kubik et al. 2003).

The relatively new field of choice architectural nudge interventions has experienced an increasing interest among researchers in the political environment, and studies targeting adults have shown that subtle environmental alterations such as health labelling or manipulating sizes of plates and cutlery can modify eating behaviour and food choices in a positive direction (Mørk et al. 2014, Skov et al. 2012).

The objectives of the present literature review was to assess the prevalence and quality of existing studies investigating the attitude towards choice architectural nudge interventions as well as the effects of such interventions on promoting the intake of vegetables among adolescents in a school context.

Theoretical framework

This study investigates the effects of nudge interventions among adolescents. Nudging is defined as *"ways of influencing choice without limiting the choice set or making alternatives appreciably more costly in terms of time, trouble, social sanctions, and so forth."* (Hausman, Welch 2010) Nudging is based on the Dual Process Theory originating from the field of psychology, which involves a division of the human cognition into two systems: the reflective system and the automatic system. The reflective system is rational and involves conscious reasoning, whereas the automatic system is more unreflective and controlled by instinct (Kahneman 2011). These two systems account for a number of cognitive biases, which explains why people, despite awareness of the consequences, systematically have difficulties translating good intentions into actions. Nudging uses the understanding of these biases in designing interventions and new ways of how food choices are presented to the consumers in order for them to change behaviour, e.g. towards unconsciously making healthier food choices.

Methodology

Search strategy

The selection of relevant published studies for this systematic literature review included a structured search in the following three electronic databases: Web of Science, Scopus and PubMed. The databases were chosen due to sufficient coverage of the cross-disciplinary research objectives. The search included a predetermined search strategy developed by LH and TRN. Both LH and TRN conducted the search during December of 2013, and to increase the reliability both authors have assessed all articles and the results have been compared. In order to identify relevant studies, all titles and abstracts generated from the searches were reviewed and only rejected if it was possible to conclude that the article did not meet inclusion criteria or if it met the exclusion criteria. The chosen studies were then divided between the two reviewers, LH and TRN, and reviewed based on full text. The evaluations were then discussed until both reviewers agreed about the result.

Furthermore, the reference list of each of the identified studies was searched for relevant additional publications. Also, the searches were utilising reviews and meta-analyses as a source of information.

The search strategy was inspired by the Cochrane Handbook for Systematic Reviews of Interventions (Higgins, Green 2011). Thus, four concepts were chosen (subject, theory, setting and target group), which each consisted of several carefully chosen search terms (table 1). Each term was identified based on current literature as well as from conversation with senior colleagues with experience within the fields of nutrition and consumer behaviour.

Table 1. *Search profile for systematic search in the electronic databases; Web of Science, Scopus and PubMed.*

Subject		Theory		Setting		Target group
Vegetable	**And**	Acceptability	**And**	Laboratory setting	**And**	Adolescent
Processed		Intake		Food lab		Youth
Cans		Determinants of food intake		Living lab		Teen
Canned		Behaviour change		Canteen		Pupil
Frozen		Likeability		Refector		
Dish		Food selection		Self service		
Food		Selection		Diner		
Meal		Lifestyle		Cafeteria		
Pea		Food related lifestyle		Restaurant		
Peas		Attitude		Buffet		
Carrot		Behaviour		All you can eat		
		Value		School		
		Intervention		College		
		Perception		Food outlet		
		Acceptability of interventions		NOT		
		Acceptability of policies		Supermarket		
		Nudge		Home		
		Nudging				
		Choice architecture				
		Dual process theory				

Language and date restrictions

Limits regarding year of publication was not applied. The term 'Nudging' had not been defined before 2008 (Thaler, Sunstein 2008). However, studies prior to this could contain elements that could be interpreted as nudging. Languages were limited to: English, Danish, Swedish and Norwegian.

Selection criteria

The following inclusion criteria were applied: 1) Studies had to apply choice architectural nudging in the study design; 2) the study design had to be an intervention or an experimental study; 3) participants had to be in good health, i.e. not studies designed for treatment of chronic diseases, eating or malnourished children and adolescents; 4) study sample had to include adolescents (aged 11-19); 5) the setting for the intervention had to be a school environment (elementary school, primary school, high school, college or university) and; 6) the study had to have attitude

towards nudge interventions OR food consumption as an outcome measure and 7) the outcome measure had to include vegetable intake. The exclusion criteria were: 1) studies where the output data of vegetables could not be extracted from the results, e.g. in studies looking at fruits and vegetables collectively and 2) studies that used nutrition education as a mean to change behaviour.

Data extraction and data synthesis

In order to review the characteristics of the included studies, information on the country of origin, study design, type of intervention, setting, sample size and outcome measures was summarised (see table 2.1.1 in appendix 2.1).

Due to high heterogeneity in type of intervention and selected outcome measures a meta-analysis was not applied for the analysis of the included studies. Rather, a narrative synthesis was conducted. The studies were grouped according to the type of intervention and a narrative synthesis was performed on each group.

The studies differed in the following areas: Type of intervention, outcome measures and types of vegetables. The studies were similar in the following areas: Intervention site (school setting) and participants (healthy adolescents).

Study quality assessment

To assess the quality of the chosen studies, a tool for quantitative studies developed by the Effective Public Health Practice Project was applied (EPHPP 2010). By using this method, the quality of the studies are assessed according to eight quality assessment criteria related to; 1) selection bias, 2) study design, 3) confounders, 4) blinding, 5) data collection methods, 6) withdrawals and drop-outs, 7) intervention integrity and 8) analyses. Each of the criteria can be rated as either weak, moderate or strong. Finally the scores are summarised and the studies receive one of the following overall rankings; weak (if two or more weak ratings), moderate (if one weak rating) or strong (if no weak ratings), see table 2.1.2 in appendix 2.1.

The reviewers (LH+TRN) performed the quality assessments of first two articles collectively in order to make sure that there was an agreement of the ratings in the different steps of the tool in order to increase the validity of the quality ratings. The remainder of the articles were divided between the authors for review.

Results

Literature search and general characteristics of the study

The objective of the present literature review was to assess the prevalence and quality of existing studies investigating the attitude towards choice architectural nudge interventions as well as the effects of such interventions on promoting the intake of vegetables among adolescents in a school context.

A systematic search on interventions and experimental studies investigating the attitude as well as the effects of choice architectural nudge interventions on vegetable intake among adolescents in a school context was conducted. The initial search revealed 2158 publications whereof 1214 was excluded based on the title and 864 were excluded after reviewing the abstract. Reviewing reference lists and related articles included two articles. This left a total of 82 publications to be retrieved for full text review.

The majority of studies targeting eating behaviour or/and food selection among children did not include subjects between the ages of 11-19. When searching for studies focusing on the health behaviour of adolescents, the emphasis is primarily on smoking, drinking and physical activity, and secondly on whole grain, fruit and vegetable intake. This meant that only a limited number of studies were found relevant for this review, since they did not investigate vegetable intake. However, since most interventions targeting fruit and vegetable intake also include other factors, these studies have been included in the review, but only if diverging from the exclusion criteria saying that data related to fruit and vegetables had to be able to be extracted from the results. In terms of increasing vegetable intake among the target group, nutrition education and health communication to improve self-efficacy, the impact of parents and the home environment, and obesity have been the dominant types of interventions. However, this review focuses on studies focusing on environmental changes.

Ultimately, based on the inclusion and exclusion criteria, a total of 12 studies were included in the final review.

The included studies examined changes in intake levels and in attitudes towards vegetables. The chosen studies used the following types of interventions to influence adolescent's vegetable intake; 1) distribution of free vegetables, 2) modifications to serving style and 3) changing the physical environment.
No studies were found to measure the attitudes towards choice architectural nudge interventions.

Study quality assessment

The methodological quality of the identified studies was evaluated on the basis of the Effective Public Health Practice Project (EPHPP) quality assessment tool for quantitative studies (EPHPP 2010). Of the 12 studies included in the present review six were classified as weak (Hanks, Just & Wansink 2013, Olsen et al. 2012, Sharp, Sobal 2012, Davis et al. 2009, Cullen et al. 2007, Buscher, Martin & Crocker 2001) , five as moderate (Di Noia, Contento 2010, Coyle et al. 2009, He et al. 2009, Jamelske et al. 2008, Adams et al. 2005) and one as strong (Slusser et al. 2007). The general shortages in the studies, which resulted in a low quality rating consisted of too small sample sizes and/or short intervention periods as well as the lack of information regarding the methodology in general, such as evidence of control of confounders and degrees of blinding (see table 2.1.2 in appendix 2.1).

Effect of intervention

As mentioned in section 3.4, 'Data extraction and data synthesis', there was a lack of an overall homogeneity among the included studies. Thus, a narrative approach was applied, and the studies were synthesised in groups according to type of intervention (table 2.1.1 in appendix 2.1).

Overall, the results related to changes in the relationship between adolescents and vegetable intake was inconclusive. Similar for all the studies was that none of them had attitude towards of the intervention itself as an outcome measure. For further details on the results, see table 2.1.3 in appendix 2.1.

Free provisioning

All four studies distributing free vegetables (Coyle et al. 2009, Davis et al. 2009, He et al. 2009, Jamelske et al. 2008) showed to have an effect on the attitudes towards vegetables and the willingness to try a new vegetable. On the other hand, none of the studies showed a significant increase in vegetable consumption.

Serving style

Six studies investigated the effects of modifications to the way the vegetables were presented to the adolescents (Hanks, Just & Wansink 2013, Olsen et al. 2012, Di Noia, Contento 2010, Cullen et al. 2007, Slusser et al. 2007, Adams et al. 2005) . In one of them (Hanks, Just & Wansink 2013) , small changes to the lunchroom are made in order to make vegetables more convenient and attractive. This resulted in an increase of vegetable consumption of 25% (p<0.001). Olsen et al. (2012) examined the influence of the size and shape of snack vegetables. Generally, the participants preferred cut vegetables, and in most cases size did not matter. In the study by Di Noia & Contento (2010) the greater variety was expressed in the form of increasing the number of servings presented during the day. Here, an increase was found in consumption from an average of 3.6 to 5.41 servings (p<0.01). Cullen et al. (2007) found a positive association between an increased variety of types of vegetables and vegetable intake. However, the article lacks to inform whether the results are statistically significant, and the quality of the study was assessed as weak in general. The publication by Slusser et al. (2007) studied the effects of the introduction of a salad bar in terms of how frequent vegetables were consumed during a day. The study showed a statistically significant increase in frequency of 1.12 times per day (p<0.001). Adams et al. (2005) investigated the relationship between pre-packed salads and self-service salad bars in relation to consumption levels and found no difference. However, as shown in the two previously mentioned studies (Cullen et al. 2007, Slusser et al. 2007) a positive association between increased variety of vegetables and intake was found.

Changes to the physical environment

Two of the included studies investigated the effects of changing the physical environment (Sharp, Sobal 2012, Buscher, Martin & Crocker 2001) . Sharp & Sobal (2012) studied the effects of different plate sizes, while Buscher, Martin & Crocker (2001) studied the influence of point-of-purchase messages. The study investigating influence of plate-size found that bigger plates resulted in bigger vegetable servings (p<0.001), with a 52% larger vegetable increase among

women compared to men (p<0.01). The use of point-of-purchase messages did not show an increase in vegetable sales.

Discussion

As previously mentioned, a low vegetable intake is associated with an increased risk of obesity and various lifestyle diseases (Cooper et al. 2012, Jeurnink et al. 2012, Boffetta et al. 2010, He et al. 2007). Dealing with this issue at an early stage in life is preferable, since studies show that food habits established in childhood and adolescence tend to continue into adulthood (Lien, Lytle & Klepp 2001, Kelder et al. 1994) .

When national interventions have targeted fruit and vegetable consumption, there has been a tendency for fruit intake to be somewhat increased, whereas vegetable intake has been left almost unaffected (Fagt et al. 2008) . In Denmark, a national survey of the dietary habits among the population was conducted between 2003 to 2008, showing that adolescents on average eat 274 grams of fruit per day and 131 grams of vegetables per day (Pedersen et al. 2010). While the level of fruit intake has increased over the past years, intake levels for vegetables seem to have stagnated (Fagt et al. 2008). This highlights the need for an isolated focus on vegetables in health promotion strategies towards adolescents.

The systematic search for relevant publications for this review revealed that there is a limited number of studies investigating the effects of choice architectural nudge interventions aiming to increase vegetable consumption among adolescents. Thus, only 12 publications met the inclusion criteria.

In general, it seemed that the interventions initiating an increase in intake levels were those where the variety of vegetables was increased (Di Noia, Contento 2010, Cullen et al. 2007). Free distribution of vegetables did not show a significant effect on the intake levels; however, the participants gained a more positive attitude towards vegetables (Coyle et al. 2009, Davis et al. 2009, He et al. 2009, Jamelske et al. 2008). Greater convenience also seemed to have an effect on intake levels (Hanks, Just & Wansink 2013, Olsen et al. 2012) , while it was questionable if salad bars made a significant difference (Slusser et al. 2007, Adams et al. 2005). In relation to altering the physical environment, point-of-purchase information did not show any effects on intake (Buscher, Martin & Crocker 2001) . Increasing the plate size seemed to have a positive effect, but

the study by Sharp and Sobal (2012) was a fictive scenario, where the participants were asked to draw the food on plates instead of using real food items. Previous studies dealing with the influence of plate size have focused on whether smaller plates would make people consume fewer calories, whereas bigger plates show an increase in calories consumed (Wansink 2004, Wansink, Painter & North 2005) .

Overall, the results from the 12 included studies were inconclusive in relation to the effects of the nudge interventions on adolescents' vegetable consumption. A reason could be that vegetables generally seemed to be of secondary focus in the study designs. Also, the included studies were mostly of weak or moderate quality with several potential biases present. This indicates a need for further research in this area before it is possible to conclude if nudge interventions have an effect vegetable intake among adolescents.

Nine of the 12 included studies were conducted in the United States, two in Canada and only one in Europe (Denmark), and therefore the results are foremost applicable to an American context, and cannot be directly transferred to European adolescents. This further supports the statement that more studies should be carried out to see if the same results would apply in a European context.

Furthermore, the present study aimed to review the evidence of the attitude towards choice architectural nudge interventions among the target group, but no studies were found to include this aspect as an outcome measure. It would be interesting to investigate this in order to examine the influence of the participants' attitude towards choice architectural nudge interventions on the level of success of such interventions. This indicates that there is a gap within the area of nudging that needs to be further examined.

Conclusion

This review found that studies investigating the relationship between adolescents and vegetable intake using choice architectural nudge interventions are very limited, and their results are inconclusive. In general, it seemed that the interventions initiating an increase in vegetable intake are those where the variety of vegetables are increased. The other included studies did not have the same consistently positive results. For instance, free distribution of vegetables did not significantly show an effect on the intake levels; however, the participants gained a more positive attitude towards vegetables.

None of the studies had attitude towards the intervention itself as an outcome measure, which would be interesting to investigate in order to examine the participants' attitude towards this type of intervention and its possible effect on the success of the study.

Studies included in this review were generally of weak or moderate quality and vegetables generally seemed to be of secondary focus in the study designs, which indicates that there is a need for further research in this area in order to conclude which types of interventions are effective among adolescents.

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Appendix 2.1: Tables from systematic literature search

Table 2.1.1. *Characteristics of the included studies.*

Reference	Country	Design	Intervention	Setting	Subjects	Size	Outcome measure
			DISTRIBUTION OF FREE VEGETABLES				
Coyle *et al*. (2009)	USA	Pre/post-test experiment	Free (fruits and) vegetables	School	Kindergarten-12th grade from 5 schools	Questionnaire: 660; 24 h dietary recall: 191	Food consumption and attitudes towards vegetables
Davis *et al*. (2009)	USA	Quasi-experimental study	Provision of a daily free basket of fruit and vegetable in the classrooms	School classroom	High school, 1 school	Intervention group: 2080, control group: 1610	Food consumption
He *et al.* (2009)	Canada	Cluster-randomised controlled trial	Free (fruit and) vegetable snacks	Schools	Students in elementary school, 5th-8th grade	1277	Food consumption and differences in cognitive factors
Jamelske *et al*. (2008)	USA	Evaluation using post-test survey	Provision of free (fruit and) vegetables	School	4th, 7th and 9th graders, 20 schools	1127	Attitudinal and behavioural program effects
			SERVING STYLE				
Adams *et al.* (2005)	USA	Pre/post-test experiment	Pre-portioned vs. self-service of (fruit and) vegetables	School canteen	Students in elementary school, 4 schools	288	Food consumption and food waste
Cullen *et al*. (2007)	USA	Pre/post-test experiment	Increased vegetable variety	School canteen	Students in middle school, 6 schools		Food availability and consumption
Di Noia & Contento (2010)	USA	Intervention (cohort)	Increase in number of (fruit, juice) and vegetable servings a day	Summer camp	African American adolescents aged 10-14	156	Food consumption
Hanks, Just & Wansink (2013)	USA	Pre/post test experiment	Making (fruits and) vegetables more convenient, attractive and normative	School cafeterias	High school students, 7th-12th grade		Food consumption

Olsen, Ritz, Kramer & Møller (2012)	Denmark	Experimental intervention	Visual exposure and tasting	School classroom	Students from 9-12 years	138	Preference of serving style, liking of vegetables and willingness to participate in fruit and vegetable subscription
Slusser *et al.* (2007)	USA	Pre/post test experiment	Introduction of a salad bar as a lunch meal option	School canteen	Students aged 7-11, 2nd-5th grade	337	Frequency of fruit and vegetable consumption
CHANGES IN THE PHYSICAL ENVIROMENT							
Buscher, Martin & Crocker (2001)	Canada	Experimental intervention	Point-of-purchase (POP) information	School canteen	Undergraduates	2280	Change in daily food sales
Sharp & Sobal (2012)	USA	Quasi experimental design	Effects of plate size on meals by drawing the wanted dinner on a 9" or 11" paper plate	University classroom	University students: 9" = mean age 21 ± 2; 11" = mean age 19.5 ± 2	270	Size of drawn meal size and composition

Table 2.1.2. *Quality assessment scheme.*

Reference	**Sampling**	**Duration (ex. baseline)**	**Control group (yes/no)**	**Random allocation (Yes/no)**	**Setting (N*/NN**)**	**Missing information**	**Quality rating**
DISTRIBUTION OF FREE VEGETABLES							
Coyle *et al*. (2009)	Convenience	1 year	No	Yes, but only for dietary recall	N	-	Moderate
Davis *et al*. (2009)	-	1 year	Yes	-	N	Missing information on how the participating schools were selected.	Weak
He *et al.* (2009)	Cluster	21 weeks	Yes	Yes	N	-	Moderate
Jamelske *et al*. (2008)	Convenience	3 month	Yes	No	N	-	Moderate

SERVING STYLE

Adams *et al.* (2005)	Convenience -(Random within the sample)	1 day	No	No	N	Missing information on how the participating schools were selected.	Moderate
Cullen *et al*. (2007)	-	6 weeks	-	-	N	Information on how the analysis took place and if the observed effects are statistically significant. Missing information on the participants and how they were chosen.	Weak
Di Noia & Contento (2010)	Convenience	3 days	No	No	N	No control group or baseline observations. Missing information on how the sample was chosen.	Moderate
Hanks, Just & Wansink (2013)	Convenience	2 months	No	-	N	Missing information on how the participating schools were selected.	Weak
Olsen, Ritz, Kramer & Møller (2012)	Convenience	-	No	No	N	Duration. Sampling procedure is unclear	Weak
Slusser *et al.* (2007)	Systematic stratified sampling	One week x 2 (Part of a larger study)	No	Yes	N	Information of recruitment and sampling is described in Slusser et at. (2004) *Overweight in urban, low-income, African American and Hispanic children attending Los Angeles elementary schools: research stimulating action*	Strong

CHANGES IN THE PHYSICAL ENVIROMENT

Buscher, Martin & Crocker (2001)	Convenience	28 days and 13 days follow up	No	-	N	The age of the participants	Weak
Sharp & Sobal (2012)	Convenience	2 days	No	No	N	Statistical methods	Weak

*Natural environment; **Not natural environment

Table 2.1.3. *Results from included reviews.*

Reference	Results
	DISTRIBUTION OF FREE VEGETABLES
Coyle *et al*. (2009)	Free provisioning is associated with increased familiarity with vegetables (p<0.05). One grade (8th) had a more positive attitude towards vegetables (p<0.01). Free distribution was not associated with a higher consumption of vegetables.
Davis *et al*. (2009)	Students from the intervention school reported consuming total fruit, juice, and vegetables (22% vs. 18.4%; P 0.05) five or more times per day in the preceding 7 days. There were no group differences in vegetable intake.
He *et al.* (2009)	Distribution of free vegetables is associated with increased consumption (up by 0.42 servings, p>0.05 - not significant). Combining free vegetables with nutrition education is associated with increased consumption (up by 0.24 servings, p<0.05).
Jamelske *et al*. (2008)	Free provisioning is associated with increased willingness to try new vegetables (p=0.01)
	SERVING STYLE
Adams *et al.* (2005)	The difference between average served portion size and consumption using a salad bar vs. pre-portioned vegetables is not statistically significant. Greater variety was related to a higher consumption (F=2.83, P≤.05).
Cullen *et al*. (2007)	Vegetable servings increased from 0.65 to 0.79
Di Noia & Contento (2010)	A high availability is associated with a high consumption (on average 5.41 servings compared to general mean of 3.6 servings, p<0.01)
Hanks, Just & Wansink (2013)	After the makeover student were 23% more likely to take a vegetable (p<0.001). The vegetable consumption increased by 25% (p<0.001).
Olsen, Ritz, Kramer & Møller (2012)	Size of vegetables did not matter (P = 0.95), except for vegetables served whole or as chunks. The small-sized whole vegetables were liked less than the ordinary-sized chunks (P < 0.0001). Slices and sticks were equally liked (P = 0.16) and they were liked more than ordinary- sized vegetables served whole or as chunks (P < 0.0001). Children preferred figures to slices and sticks (P < 0.0001). The included vegetables were all liked during taste evaluations: carrot (81 ± 2 mm), cucumber (78 ± 2 mm), and red pepper (70 ± 3 mm) (mean ± SEM). Generally, children express high willingness to participate in fruit and vegetable subscription services during school.
Slusser *et al.* (2007)	Significant increase in frequency (2.97 to 4.09, P=0.001) of F&V consumed among the children studied. The increase in frequency of F&V consumed was almost all due to an increase during lunch (84%).

CHANGES IN THE PHYSICAL ENVIROMENT	
Buscher, Martin & Crocker (2001)	POP-messages had no effect on vegetable basket sales (p>0.5)
Sharp & Sobal (2012)	Vegetable portions were 62% bigger on 11'' plates (p < .001). The main gender moderation effect was that females drew their vegetable portion 79% bigger on 11" plates than on 9" plates (p < .01) and while there was no significant difference in vegetable portion size between men and women on 9" plates, women drew 52% bigger vegetable dishes than men on 11" plates (p < .01).

Appendix 3: Output from pilot test

Table 3.1. *Paired sample t-test applied on the test-retest responses. Results are presented as means, standard deviations and t and p values.*

Pairs	**Mean (±SD)**	***t* value**	***p* value**
I would like to eat healthier.	-.556 (±1.236)	-1.348	.214
I would like to lose weight.	-.889 (±1.616)	-1.650	.137
How many times a week do you buy lunch from the school canteen/EAT.	-.111 (±.333)	-1.000	.347
Self-efficacy. e: Thanks to my resourcefulness. I know how to handle unforeseen situations.	.333 (±.707)	1.414	.195
How many vegetables do you think you should eat in order to eat healthy?	-.111 (±.928)	-.359	.729
On a regular week I eat a lot of vegetables.	0.000 (±.500)	0.000	1.000
My friends eat vegetables every day.	-.333 (±.707)	-1.414	.195
In general it is important to me what my friends think I should do.	-.333 (±.500)	-2.000	.081
My parents buy me the vegetables I want.	.111 (±.928)	.359	.729
In general it is important to me what my parents think I should do.	-.333 (±.500)	-2.000	.081
My parents eat vegetables every day.	-.222 (±.667)	-1.000	.347
At a buffet I view the entire offer before I decide what I want to take on my plate.	0.000 (±1.500)	0.000	1.000
At a buffet I follow the line and decide what I want or don't want as the dishes are presented to me.	-.111 (±.928)	-.359	.729
At a buffet I first take the pasta. rice or potatoes and then the other dishes.	.333 (±.707)	1.414	.195
The appearance of the food important when choosing food at a buffet.	-.111 (±.601)	-.555	.594
Healthiness important when choosing food at a buffet.	-.556 (±1.014)	-1.644	.139
Animal welfare important when choosing food at a buffet.	-.778 (±1.394)	-1.673	.133
Messenger: I think it would be acceptable if the school or a canteen used celebrities to inform me about health related to eating vegetables.	.556 (±1.014)	1.644	.139

Incentives1: I think it would be acceptable if the school or a canteen held a competition where the winner would be the one with the largest vegetable intake in one week.	.222 (±1.093)	.610	.559
Incentives2: I think it would be acceptable if the school or a canteen made scare campaigns to get me to eat more vegetables.	.333 (±.707)	1.414	.195
Salience: I think it would be acceptable if the school or a canteen had posters with simple and easy tips on how I could eat more vegetables to get me to eat healthier.	.111 (±.782)	.426	.681
Ego: I think it would be acceptable the canteen had posters showing happy and popular teenagers eating vegetables and a lonely and sad teenager eating unhealthy food in order to make me feel like eating more vegetables.	.222 (±.833)	.800	.447
I think it is acceptable that the school or a canteen tries to influence my food choices so that it is easier for me to choose vegetables instead of more unhealthy foods.	-.667 (±1.414)	-1.414	.195
I think it is the school's or a canteen's obligation to try and improve me vegetable intake.	-.222 (±2.167)	-.308	.766
Height.	-.444 (±.726)	-1.835	.104
Weight.	.6111 (±1.833)	1.000	.347

Table 3.2. *Wicoxons signed-rank test applied on the test-retest responses. Results are presented as means. standard deviations and t and p values.*

Pairs	**Z value**	***p* value***
I am healthier compared to others my age.	-1.604[b]	.109
I eat healthier compared to others my age.	-1.633[c]	.102
I care about eating healthy.	.000[d]	1.000
I would like to gain weight.	-.816[c]	.414
How many times a week do you eat lunchbox brought from home.	.000[d]	1.000
How many times a week do you buy lunch outside the school?	-1.000[c]	.317
How many times a week do you skip lunch?	.000[d]	1.000
Self-efficacy a: I can always manage to solve difficult problems if I try hard enough.	.000[d]	1.000

Self-efficacy b: If someone opposes me, I can find the means and ways to get what I want.	.000[b]	1.000
Self-efficacy c: It is easy for me to stick to my aims and accomplish my goals.	-1.134[b]	.257
Self-efficacy d: I am confident that I could deal efficiently with unexpected events.	-.447[b]	.655
Self-efficacy f: I can solve most problems if I invest the necessary effort.	-.378[b]	.705
Self-efficacy g: I can remain calm when facing difficulties because I can rely on my coping abilities.	-.816[b]	.414
Self-efficacy h: When I am confronted with a problem, I can usually find several solutions.	-.447[c]	.655
Self-efficacy i: If I am in trouble, I can usually think of a solution.	.000[d]	1.000
Self-efficacy j: I can usually handle whatever comes my way.	-.378[b]	.705
How physically active are you compared to others your age?	-.577[b]	.564
I like to eat vegetables every day.	-1.000[b]	.317
I think it is healthy for me to eat vegetables every day.	-1.000[c]	.317
I eat more vegetables than most people at my age.	.000[d]	1.000
It would be easy for me to eat three or more portions of vegetables every day.	.000[d]	1.000
I plan to begin to eat more vegetables.	-1.342[b]	.180
There are usually several kinds of vegetables available at home.	-1.000[c]	.317
There are usually vegetables available at home that I like.	-2.000[b]	.046
My parents encourage me to eat vegetables every day.	.000[d]	1.000
At a buffet I first take the meat and then the other dishes.	-1.134[c]	.257
At a buffet I first take the vegetables or salad and then the other dishes.	-.552[b]	.581
Liking of the food important when choosing food at a buffet.	-.632[b]	.527
The name of the dishes important when choosing food at a buffet.	-.707[c]	.480
Calorie content important when choosing food at a buffet.	-.816[c]	.414
Organic important when choosing food at a buffet.	-.447[b]	.655
Norms: I think it would be acceptable if the canteen informed me about how many vegetables I eat compared to my friends and class mates.	-1.342[c]	.180

Defaults: I think it would be acceptable if the canteen automatically gave me a green salad with my lunch in order to get me to eat more vegetables if I easily could choose not to take it.	.000[d]	1.000
Commitments: I think it is acceptable if the school encouraged me to sign up for a "6 a day" or "I love vegetables" club to make me feel obligated to eat more vegetables.	-.378[c]	.705
Priming: I think it would be acceptable if the staff in the canteen asked me if I wanted more vegetables when buying my lunch.	-1.732[c]	.083
Affect: I think it would be acceptable to change the names of the dishes in the canteen so the dishes containing many vegetables would sound more appealing and make me want to choose them.	-1.406[d]	.160
I do not think it is the school's or a canteen's responsibility to try to get me to eat healthier.	-.577[b]	.564

*p-values are two-tailed. a. Wilcoxon Signed Ranks Test. b. Based on positive ranks. c. Based on negative ranks. d. The sum of negative ranks equals the sum of positive ranks.

Table 3.3: *Cronbach's Alpha values for factors.*

Factor	**Cronbach's alpha**	**Cronbach's alpha if item is deleted**
Attitude towards CANI	0.783	
Self-efficacy	0.683	0.777
Social desirability/norms	-0.467	
Social norms	0. 243	0.544
Perceived health	0.723	
Buffet habits/choice	0.653	0.705
Buffet habits	0.77	0.806
Social norms in home environment	0.766	
Perceived intake	0.397	

Table 3.4. *Questions from the questionnaire used in the pilot test that was removed in the final version of the questionnaire on the basis of results from the test-retest, Cronbach's Alpha and the research question respectively.*

Deleted on the basis of Cronbach's Alpha and the research question:	**Deleted on the basis of Cronbach's Alpha:**
To what extent do you agree or disagree with the following statement: I would like to eat more healthy To what extent do you agree or disagree with the following statement: I am interested in healthy eating To what extent do you agree or disagree with the following statement: I would like to gain weight	To what extent do you agree or disagree with the following statement: In general I care about what my best friends think To what extent do you agree or disagree with the following statement: There is usually different kinds of vegetables available in my home To what extent do you agree or disagree with the following statement: If I tell at home what vegetables I would like to have it will be bought To what extent do you agree or disagree with the following statement: In general I care about what my parents think I should do In general, how important, if at all, are each of the following to your choice of food at a buffet?: Calorie content
Deleted on the basis of the research question:	**Deleted on the basis of the test-retest:**
To what extent do you agree or disagree with the following statement: I like to eat vegetables every day To what extent do you agree or disagree with the following statement: I think it is healthy for me to eat vegetables every day To what extent do you agree or disagree with the following statement: It would be easy for me to eat three portions of vegetables every day Do you consider yourself to be a vegetarian?	To what extent do you agree or disagree with the following statement: There are usually vegetables available at home that I like

Appendix 4: Final questionnaire

Appendix 4.1: In Danish (original)

Indledende spørgsmål:

Er du mellem 13-19 år (begge år inklusiv)?

□ Ja
□ Nej

Først nogle spørgsmål om dig:

1. **Hvornår er du født?**

   Dag _____ Måned _____ År _____

(Boolsen 2004)

2. **Går du i skole?**

□ Ja
□ Nej
Hvis nej → hopper videre til slutningen af spørgeskemaet.

3. **Hvilken slags skole går du i?**

□ Folkeskole
□ Gymnasium
□ Handelsskole
□ Teknisk skole
□ Erhvervsskole
□ Professionshøjskole
□ Universitet
□ Andet _____

Nu kommer der nogle spørgsmål om dig og sundhed:

4. **Hvor enig eller uenig er du med følgende udsagn: (sæt ét kryds per udsagn)**

	Udsagn	**Meget uenig**	**Uenig**	**Hverken enig eller uenig**	**Enig**	**Meget enig**	**Ved ikke**
4.a	Jeg er sundere end andre på min alder						
4.b	Jeg spiser sundere end andre på min alder						
4.c	Jeg vil gerne tabe mig						

5. Er der følgende på din skole: (Sæt evt. flere krydser)

En kantine □

Skolemad/EAT eller mad som er bestilt eller betalt i forvejen (af mine forældre) □

Begge dele □ Ingen af delene □

6. På en normal uge, hvor mange gang om ugen gør du følgende i skolen?: (sæt ét kryds per spørgsmål)

		Aldrig	**Mindre end en gang om ugen**	**1-2 gange om ugen**	**3-5 gange om ugen**
6.a	Spiser madpakke				
6.b	Spiser mad fra skolens kantine eller skolemad/EAT				
6.c	Køber frokost uden for skolen				
6.d	Spiser ingen frokost				

7. I hvor høj grad passer følgende udsagn på dig? (sæt ét kryds ud for hvert udsagn)

		Passer slet ikke	**Passer en smule**	**Passer nogenlunde**	**Passer præcist**
7.a	Jeg kan altid løse vanskelige problemer, hvis jeg prøver ihærdigt nok				
7.b	Hvis nogen modarbejder mig, finder jeg en måde til at opnå det, jeg vil				
7.c	Det er let for mig at holde fast ved mine planer og realisere mine mål				
7.d	Jeg er sikker på, at jeg kan håndtere uventede hændelser				
7.e	Takket være mine personlige ressourcer, ved jeg, hvordan jeg skal klare uforudsete situationer				
7.f	Jeg kan løse de fleste problemer, hvis jeg yder den nødvendige indsats				
7.g	Jeg bevarer roen, når der er problemer, da jeg stoler på mine evner til at løse dem				
7.h	Når jeg støder på et problem, kan jeg som regel finde flere løsninger				
7.i	Hvis jeg er i vanskeligheder, kan jeg som regel finde en udvej				
7.j	Lige meget hvad der sker, kan jeg som regel klare det				

8. **Hvor fysisk aktiv synes du at du er sammenlignet med andre på din alder? (sæt ét kryds)**

Meget mere □ Mere □ Samme □ Mindre □ Meget mindre □

9. **Hvad har du af fritidsbeskæftigelser?: (sæt evt. flere krydser)**

□ Sport (f.eks. fodbold, fitness, ridning osv.)
□ Stillesiddende hobbyer (f.eks. computerspil, syning, musik osv.)
□ Har ingen fritidsbeskæftigelser
□ Andet _____

Nu nogle spørgsmål om grøntsager:

De næste spørgsmål handler om grøntsager. Du skal kun krydse én boks af ved hvert spørgsmål.
Her ser du tre eksempler på én portion grøntsager, hvor en portion svarer til 100 gram



10. **Hvor mange portioner grøntsager tror du, at du skal spise for at have sunde spisevaner? Her tænker vi ikke på frugt, men kun på grøntsager:**

□ Ingen grøntsager
□ 1-3 portioner om *ugen*
□ 4-6 portioner om *ugen*
□ 1 portion hver dag
□ 2 portioner hver dag
□ 3 portioner hver dag
□ 4 portioner hver dag
□ 5 eller flere portioner hver dag

11. **I hvor høj grad er du enig eller uenig I følgende udsagn: (sæt ét kryds per spørgsmål)**

	Udsagn	**Meget uenig**	**Uenig**	**Hverken enig eller uenig**	**Enig**	**Meget enig**	**Ved ikke**
11.a	På en normal uge spiser jeg mange grøntsager						
11.b	Jeg spiser flere grøntsager end de fleste andre på min alder						
11.c	Jeg har planer om at begynde at spise flere grøntsager						

11.d	Mine venner spiser grøntsager hver dag						
11.e	Mine forældre siger, at jeg skal spise grøntsager hver dag						
11.f	Mine forældre spiser grøntsager hver dag						

Nu nogle spørgsmål om, hvordan du vælger mad i en kantine eller ved en buffet:

12. Forestil dig, at du skal spise mad fra en buffet eller en kantine med flere forskellige retter. Hvor enig eller uenig er du med følgende udsagn om, hvordan du vælger din mad? (sæt ét kryds per spørgsmål)

	Udsagn	**Meget uenig**	**Uenig**	**Hverken enig eller uenig**	**Enig**	**Meget enig**	**Ved ikke**
12.a	Når jeg tager mad fra en buffet tjekker jeg først hvad der er på buffeten før jeg beslutter mig for, hvad jeg vil tage op på min tallerken						
12.b	Når jeg tager mad fra en buffet starter jeg altid fra begyndelsen og vælger eller fravælger retterne efterhånden som jeg kommer til dem						
12.c	Når jeg tager mad fra en buffet starter jeg med at tage kød og tager derefter de andre retter						
12.d	Når jeg tager mad fra en buffet starter jeg med at tage pasta, ris eller kartofler og tager derefter de andre retter						
12.e	Når jeg tager mad fra en buffet starter jeg altid med at tage grøntsager og salat og tager derefter de andre retter						

13. Hvor vigtige – hvis de overhovedet er vigtige – er hver af de følgende ting når du vælger mad fra en buffet?:

		Slet ikke vigtigt	**Ikke vigtigt**	**Hverken eller**	**Vigtigt**	**Meget vigtigt**	**Ved ikke**
13.a	Madens udseende						
13.b	Hvor godt jeg tror jeg kan lide maden						
13.c	Navnet på retterne						
13.d	Hvor sund maden er						
13.e	Økologi						
13.f	Dyrevelfærd						

Nogle spørgsmål om måder at få dig til at spise flere grøntsager:

14. De næste spørgsmål handler om, hvad man kan gøre for at få folk til spise flere grøntsager. Du skal forestille dig, at de næste eksempler i spørgeskemaet er noget din skole eller en kantine gør for at få dig og de andre til at spise flere grøntsager.
I hvor høj grad er du enig eller uenig i at det er i orden at gøre følgende: (sæt ét kryds for hvert udsagn)

	Udsagn	**Meget uenig**	**Uenig**	**Hverken enig eller uenig**	**Enig**	**Meget enig**	**Ved ikke**
14.a	Jeg synes det ville være i orden, hvis kantinen fortalte, hvor mange grøntsager jeg spiste i forhold til mine venner og klassekammerater.						
14.b	Jeg synes det ville være i orden, hvis kantinen automatisk gav mig en grøn salat sammen med min frokost for at få mig til at spise flere grøntsager, hvis jeg uden problemer kunne vælge salaten fra.						
14.c	Jeg synes det ville være i orden, hvis skolen eller en kantine lavede skræmmekampagner for at få mig til at spise flere						

	grøntsager, fx ved at vise mig eksempler på sygdomme man kan få, hvis man ikke lever sundt.						
14.d	Jeg synes det ville være i orden, hvis skolen eller en kantine brugte en kendt person til at give mig information om sundhed og grøntsager.						
14.e	Jeg synes det ville være i orden, hvis skolen eller en kantine havde en konkurrence hvor vinderen ville være den der havde spist flest grøntsager på en uge.						
14.f	Jeg synes det ville være i orden, hvis skolen eller en kantine hang skilte op med simple og let forståelige råd til, hvordan jeg kunne spise flere grøntsager for derved at få mig til at spise sundere.						
14.g	Jeg synes det ville være i orden, hvis kantinepersonalet spurgte om ikke jeg ville have flere grøntsager når jeg købte mad der.						
14.h	Jeg synes det ville være i orden, at ændre navnet på retterne i kantinen så mad med mange grøntsager i fik et navn, der gav mig en positiv følelse, så jeg får mere lyst til at vælge retten med mange grøntsager.						
14.i	Jeg synes det ville være i orden, hvis skolen opfordrede mig til at melde mig ind i en ”seks om dagen” eller ”Jeg <3 grøntsager” klub for at få mig til at føle mig forpligtet til at spise flere grøntsager						
14.j	Jeg synes det ville være i orden, hvis der hang plakater, der viser glade og populære teenagere, der spiser						

	grøntsager og andre plakater med en ensomt og trist teenager, der spiser usund mad, for derved at give mig lyst til at spise flere grøntsager.						

Nogle spørgsmål om andres indflydelse på dine spisevaner:

15. De næste spørgsmål handler om dit syn på hvem der er ansvarlig for, at der spises sund mad i en kantine, f.eks. på en skole. I hvor høj grad er du enig eller uenig i de følgende udsagn? (Sæt ét kruds for hvert udsagn)

	Udsagn	**Meget uenig**	**Uenig**	**Hverken enig eller uenig**	**Enig**	**Meget enig**	**Ved ikke**
15.a	Jeg synes det er i orden at skolen eller en kantine prøver at påvirke mit valg af mad, så det bliver lettere for mig at vælge grøntsagerne frem for mere usunde madvarer						
15.b	Jeg synes det er skolens eller en kantines pligt at forsøge at få mig til at spise flere grøntsager						
15.c	Jeg synes ikke det er skolens eller en kantines ansvar at forsøge at få mig til at spise sundere						

Nu nogle afsluttende spørgsmål om dig:

16. Er du dreng eller pige?

□ Dreng
□ Pige

17. Hvilken by bor du i? Hvis du bor flere steder, så skriv den by du bor mest i.

_____ by

18. Hvem bor du sammen med? (Hvis du bor to steder kan du sætte kryds to steder)

□ Sammen med begge mine forældre
□ Sammen med min mor, som bor uden partner
□ Sammen med min far, som bor uden partner
□ Sammen med min mor og hendes nye kæreste/ægtefælle
□ Sammen med min far og hans nye kæreste/ægtefælle
□ Jeg er flyttet hjemmefra
□ Sammen med andre voksne – hvis ja, skriv hvem _____

19. Hvor mange brødre har du? (Hvis du ikke har nogen skriver du 0)

____bror/brødre

20. Hvor mange søstre har du? (Hvis du ikke har nogen skriver du 0)

____søster/søstre

21. Hvor høj er du cirka?

_____ cm □ Ved ikke

22. Hvor meget vejer du cirka?

_____Kg □ Ved ikke

23. Er du født i Danmark?

□ Ja
□ Nej

24. I hvilket land er din mor født?

_____

25. I hvilket land er din far født?

_____

26. Har du nogen alvorlige sygdomme?

□ Nej
□ Ja, skriv evt. hvad: _____

Appendix 4.2: Final questionnaire translated into English

Initial question:

Are you between 13-19 years old? (Including both years)

□ Yes
□ No
If no → go to the end of the questionnaire

First some information about you:

1. **When are you born?**

   Day____ Month_____ Year_____

2. **Do you attend school?**

□ Yes
□ No
If no → go to the end of the questionnaire

3. **Which kind of school do you attend?**

□ Folkeskole
□ Gymnasium
□ Handelsskole
□ Teknisk skole
□ Erhvervsskole
□ Folkeskole
□ Professionshøjskole
□ Universitet
□ Other_____

Now some questions about you, your general health and physical activity:

4. **To what extend do you either agree or disagree with each of the following statements:**

	Statement	**Strongly disagree**	**Disagree**	**Neither**	**Agree**	**Strongly agree**
4.a	I am healthier compared to others my age					
4.b	I eat healthier compared to others my age					
4.c	I would like to lose weight					

5. **At your school do you have the following: (tick one or more boxes)**

A canteen □ A lunch scheme/EAT/Food that has been ordered in advance □
Both □ Neither □

6. How many days do you do the following in a regular week: (tick one box per question)

		Never	**Less than once a week**	**1-2 times a week**	**3-5 times a week**
6.a	Eat lunchbox brought from home				
6.b	Eat from the school canteen/EAT				
6.c	Buy lunch from outside school				
6.d	Don't eat lunch				

7. To what degree are the following statements true about you? (Tick one box per statement)

		Not at all true	**Hardly true**	**Moderately true**	**Exactly true**
7.a	I can always manage to solve difficult problems if I try hard enough.				
7.b	If someone opposes me, I can find the means and ways to get what I want.				
7.c	It is easy for me to stick to my aims and accomplish my goals.				
7.d	I am confident that I could deal efficiently with unexpected events.				
7.e	Thanks to my resourcefulness, I know how to handle unforeseen situations.				
7.f	I can solve most problems if I invest the necessary effort.				
7.g	I can remain calm when facing difficulties because I can rely on my coping abilities.				
7.h	When I am confronted with a problem, I can usually find several solutions.				
7.i	If I am in trouble, I can usually think of a solution.				
7.j	I can usually handle whatever comes my way.				

8. How physically active are you compared to others your age? (tick one box)
Much more □ More □ Equally □ Less □ Much less □

9. What do you do in your spare time? (tick one or more boxes)

□ Sports (e.g. football, fitness, riding etc.)
□ Sedentary hobbies (e.g. computer games, sewing, playing music etc.)
□ I have no hobbies
□ Other _____

Now some questions about vegetables

The next questions are about vegetables. You should only tick off one box for each question.
Here are three examples of a standard portion of vegetables, where one portion corresponds to 100 grams:



10. How many vegetables do you think you should eat in order to eat healthy? You only have to consider vegetable intake and not fruit intake

□ No vegetables
□ 1-3 portions every week
□ 4-6 portions every week
□ 1 portion every day
□ 2 portions every day
□ 3 portions every day
□ 4 portions every day
□ 5 or more portions every day

11. To what extent do you agree or disagree with the following statements: (tick of one box per statement)

		Strongly dis-agree	Dis-agree	Neither	Agree	Strongly agree
11.a	In a normal week I eat a lot of vegetables					
11.b	I eat more vegetables than most people at my age					
11.c	I plan to begin to eat more vegetables					
11.d	My friends eat vegetables every day					
11.e	My parents encourage me to eat vegetables every day					
11.f	My parents eat vegetables every day					

Now some questions about how you choose your foods at buffets or in a canteen:

12. Imagine that you are going to eat at a buffet or in a canteen with several different dishes. To what extend do you agree or disagree with the following statements about how you choose your food? (Tick of one box per statement)

		Strongly disagree	Disagree	Neither	Agree	Strongly agree
12.a	At a buffet I view the entire offer before I decide what I want to take on my plate					
12.b	At a buffet I follow the line and decide what I want or don't want as the dishes are presented to me					
12.c	At a buffet I first take the meat and then the other dishes					
12.d	At a buffet I first take the pasta, rice or potatoes and then the other dishes					
12.e	At a buffet I first take the vegetables or salad and then the other dishes					

13. In general, how important, if at all, are each of the following to your choice of food at a buffet?: (tick of one box per question)

		Not at all important	Not important	Neither	Important	Very important
13.a	The appearance of the food					
13.b	How good I think the food tastes					
13.c	The name of the dishes					
13.d	How healthy the food is					
13.e	Organically produced					
13.f	Animal welfare					

Some questions about ways to get you to eat more vegetables:

14. **The next questions are about ways to get you to eat more vegetables- Imagine that the next examples are things your school or a canteen does to get you to eat more vegetables. To what extend do you either agree or disagree with each of the following statements: (tick of one box per question)**

	Statement	**Strongly disagree**	**Disagree**	**Neither**	**Agree**	**Strongly agree**
14.a	I think it would be acceptable if the school or a canteen held a competition where the winner would be the one with the largest vegetable intake in one week					
14.b	I think it would be acceptable if the canteen automatically gave me a green salad with my lunch in order to get me to eat more vegetables if I easily could choose not to take it					
14.c	I think it would be acceptable if the school or a canteen made scare campaigns to get me to eat more vegetables, e.g. by showing examples of diseases caused by low vegetable intake					
14.d	I think it would be acceptable if the canteen informed me about how many vegetables I eat compared to my friends and class mates					
14.e	I think it would be acceptable if the school or a canteen used celebrities to inform me about health related to eating vegetables					
14.f	I think it would be acceptable if the school or a canteen had posters with simple and easy tips on how I could eat more vegetables to get me to eat healthier					
14.g	I think it would be acceptable if the staff in the canteen asked me if I wanted more vegetables when buying my lunch					
14.h	I think it would be acceptable to change the names of the dishes in the canteen so the dishes containing					

	many vegetables would sound more appealing and make me want to choose them					
14.i	I think it is acceptable if the school encouraged me to sign up for a "6 a day" or "I love vegetables" club to make me feel obligated to eat more vegetables					
14.j	I think it would be acceptable the canteen had posters showing happy and popular teenagers eating vegetables and a lonely and sad teenager eating unhealthy food in order to make me feel like eating more vegetables					

Some questions about who should influence your eating habits:

15. **The next questions regard your view on who is responsible for people eating healthy in a canteen, e.g. at your school. To what extend do you either agree or disagree with each of the following statements: (Tick of one box per question)**

	Statement	**Strongly disagree**	**Disagree**	**Neither**	**Agree**	**Strongly agree**
15.a	I think it is acceptable that the school or a canteen tries to influence my food choices so that it is easier for me to choose vegetables instead of more unhealthy foods					
15.b	I think it is the school's or a canteen's obligation to try and improve me vegetable intake					
15.c	I do not think it is the school's or a canteen's responsibility to try to get me to eat healthier					

Some final questions about you:

16. **Are you a boy or a girl?**

□ Boy
□ Girl

17. **In which city do you live? (If you live several places state the city you live in most frequently)**

_____ City

18. Do you live together with your parents? (If you live two places you can check two boxes)

□ Together with both my parents
□ Together with my mom who lives without a partner
□ Together with my dad who lives without a partner
□ Together with my mom who lives with her new partner/husband
□ Together with my dad who lives with his new partner/wife
□ I have left home
□ Together with other adults (state who) _____

19. How many brothers do you have? (If non, write 0)

____brother(s)

20. How many sisters to you have (If non, write 0)

____sister(s)

21. How tall are you (approximately)?

_____cm □ Don't know

22. How much do you weigh (approximately)?

_____Kg □ Don't know

23. Are you born in Denmark?

□ Yes
□ No

24. In which country is your mother born?

_____

25. In which country is your father born?

_____

26. Do you have any serious diseases?

□ No
□ Yes, if you want to, write which here:_____

Appendix 4.3: Dimensions in the questionnaire

Question number	Dimension	Items	Measurement scale	Origin	Coding	How the question will be used in the analysis
1	Anthropometric features	Age	Continuous	Pro Children	ANT	Profile of the respondents. Control for differences between genders.
2+3	Background info on occupation – type of school	Occupation	2: Binary 3: Nominal	TRN+LH	SD	Profile of the respondents. Socio-demographic status
4.a,b,c	Perceived health and intention towards losing weight		Continuous	TRN+LH	PH: a,b INT: c	Identify intention and own perceived health
5	Food facilities and availability at school		Continuous	TRN+LH	AVA	Identify food facilities at school
6.a-d	Lunch habits at school		Ordinal	EatWell inspired	PB	Food habits
7.a-j	Self-efficacy		Continuous, 4-point likert	GSE	SE	Estimate level of self-efficacy from General self-efficacy scale
8	Level of physical activity		Continuous, 5-point Likert	TRN+LH	PH	Identify level of physical activity
9	Leisure-time occupation / physical activity		Nominal	TRN+LH		Estimate level of physical activity on the basis of leisure-time activity
10	Knowledge of recommended vegetable intake		Ordinal	Pro Children	KNOW	Knowledge of recommended vegetable intake
11.a-f	Perceived health, intention to eat vegetables, (past behavior), social norms		Continuous, 5-point likert scale	Pro Children: a,c,d,g,h,i, j,l,m TRN+LH b,e,f,k,n	PH: a,b, c SN: d,e,f	Measure attitude towards vegetable intake, self-efficacy, intention to eat vegetables, past behavior, availability of vegetable in home and social influence on

						vegetable intake
12.a-e	Buffet habits		Continuous, 5-point Likert scale	TRN+LH	BH	Measuring automatic /reflective behavior when visiting a buffet
13.a-f	Buffet habits		Continuous, 5-point likert scale	EatWell modified	BH	Measure the level of importance of different properties of dishes at a buffet which could influence food choices
14.a-j	Acceptability of specific nudging interventions		Continuous, 5-point likert scale	TRN+LH (Mindspace cues)	NUD	Measuring acceptability of/attitude towards different categories of nudging interventions
15.a-c	General attitude towards others influence on own health)		Continuous, 5-point Likert scale		NUD	(Measuring attitude towards others influence on own health)
16	Anthropometric features	Gender	Binary	Pro Children	ANT	Anthropometric features
17	Home town	City	Nominal	TRN+LH	SD	Socio-demographic status
18	Living arrangements		Nominal	Pro Children	SD	Socio-demographic status
19+20	Family - Number of brothers and sisters		Continuous	Pro Children	SD	
21+22	Anthropometric features	Height and weight	Continuous	TRN+LH	ANT	To calculate BMI
23	Place of birth		Binary	Pro Children	SD	Socio-demographic status
24+25	Parents country of birth	Country	Nominal	Pro Children	SD	
26	Occurrence of non-communicable diseases	Non-communicable diseases	Binary	TRN+LH	SD	Correct for occurrence of diseases and their influence on food habits

Appendix 5: Output from empirical data collection

Table 5.1. *Socio-demographic profile of the respondents including country of birth, current living situation, number of siblings and at which level of education they currently are enrolled in.*

Variable	Number of respondents (n)	% of n
Born in Denmark	392	96.1
Both parents born in Denmark	341	83.6
One parent born abroad	37	9.1
Both parents born abroad	30	7.4
Live with both parents	249	61
Live with one parent	97	23.8
Live with both parents separately	37	9.1
Do not live with the parents	25	6.1
Number of siblings*:		
0	19	4.7
1-2	298	73
3-4	77	18.8
5<	14	3.4
Current educational enrolment		
Secondary school	32	7.8
Technical collage	1	0.2
High school	370	90.7
University collage	1	0.2
University	3	0.7

*Mean (±SD) number of siblings = 1.86 (±1.2).

Table 5.2. *The respondents' knowledge of recommended vegetable intake, which types of lunch options they have, perceived health status and level of physical activity and leisure time activity.*

Question	Number of respondents (*n*)	% of *n*
Knowledge of recommended vegetable intake		
No vegetables	1	0.2
1-3 portions a week	4	1.0
4-6 portions a week	37	9.1
1 portion a day	73	17.9
2 portions a day	92	22.5
3 portions a day	114	27.9
4 portions a day	52	12.7
5 or more portions a day	35	8.6
Lunch options		
Canteen	369	90.4
School meal scheme/pre-ordered	5	1.2
Both	23	5.6
None	11	2.7
Perceived health status*		
Strongly disagree	11	2.7
Disagree	66	16.2
Neither	219	53.7
Agree	89	21.8
Strongly agree	23	5.6
Perceived level of physical activity**		
Much less		
Less	18	4.4
The same	79	19.4
More	153	37.5
Much more	116	28.4
	42	10.3
Leisure time activity		
Sports	286	70.1
Sedentary	194	47.5
No leisure time activity	24	5.9
Both	109	26.7

*Based on the question: “I am healthier than others my age”. **Based on the question: “How physically active are you compared to others your age?”

Figure 5.1: *Lunch habits in percentages to the following question: How many days do you do the following in a regular week? Eat lunchbox brought from home, eat from the school canteen/EAT, buy lunch from outside school and/or don't eat lunch.*

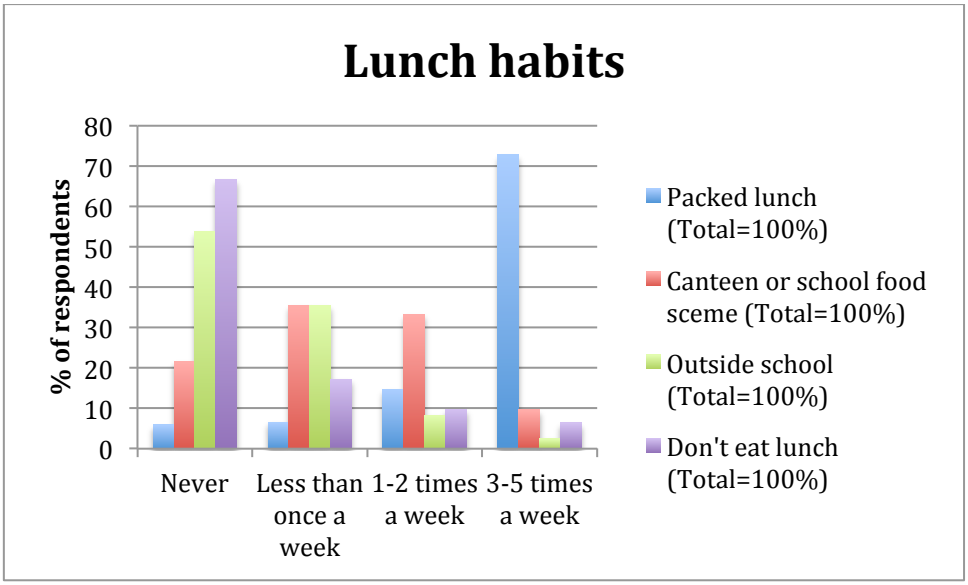

Table 5.3. *Frequencies, percentages, mean and standard deviation (SD) of level of acceptability towards nudge interventions.*

Statement	Strongly disagree	Disagree	Neither	Agree	Strongly agree	Mean* (±SD)	N**
Incentives1	35 8.6%	48 11.8%	122 29.9%	137 33.6%	66 16.2%	3.37 (±1.14)	408
Default	64 15.7%	84 20.6%	121 29.7%	88 21.6%	51 12.5%	2.95 (±1.25)	408
Incentives2	63 15.4%	68 16.7%	127 31.1%	95 23.3%	55 13.5%	3.03 (±1.25)	408
Norms	101 24.8%	110 27%	125 30.6%	54 13.2%	18 4.4%	2.46 (±1.13)	408
Messenger	9 2.2%	12 2.9%	61 15%	152 37.3%	174 42.6%	4.15 (±0.93)	408
Salience	10 2.5%	9 2.2%	78 19.1%	181 44.4%	128 31.4%	4.00 (±0.91)	406
Priming	28 6.9%	30 7.4%	91 22.3%	158 38.7%	100 24.5%	3.67 (±1.13)	407
Affect	21 5.1%	33 8.1%	175 42.9%	111 27.2%	64 15.7%	3.41 (±1.02)	404
Commitment	61 15%	92 22.5%	160 39.2%	63 15.4%	30 7.4%	2.78 (±1.11)	406
Ego	93 22.8%	89 21.8%	128 31.4%	58 14.2%	38 9.3%	2.65 (±1.24)	406

*Mean values of the 5-point Likert Scale ranging from strongly agree to strongly disagree.
**N = number of responses.

Table 5.4. *Frequencies, percentages, means and standard deviation (SD) of level of attitude towards the schools or a canteens responsibility regarding health promotion/healthy behaviour/healthy eating habits.*

Statement	**Strongly disagree**	**Disagree**	**Neither**	**Agree**	**Strongly agree**	**Mean* (±SD)**
15.a: Acceptable with school interference	28 6.9%	41 10%	104 25.5%	164 40.2%	71 17.4%	3.51 (±1.10)
15.b: Schools/a canteens obligation to encourage healthy eating	136 33.3%	143 35%	85 20.8%	32 7.8%	12 2.9%	2.12 (±1.05)
15.c: Not the schools/a canteens responsibility to encourage healthy eating	10 2.5%	49 12%	83 20.3%	123 30.1%	143 35%	3.83 (±1.11)

*Mean values of the 5-point Likert Scale ranging from strongly agree to strongly disagree.

Appendix 6: Raw output from Amos

Appendix 6 displays Amos output from the CFA and SEM analyses. The outputs are directly imported and represent the raw unhandled data. This means that variable and factor labels have not been altered to fit the abbreviations in appendix 1 and 1.1.

Appendix 6.1: Confirmatory factor analysis output

Analysis Summary

Date and Time

Date: 5. maj 2014
Time: 12:45:58

Title

Path gaskin 030514: 5. maj 2014 12:45

Notes for Group (Group number 1)

The model is recursive.
Sample size = 408

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments:	528
Number of distinct parameters to be estimated:	95
Degrees of freedom (528 - 95):	433

Result (Default model)

Minimum was achieved
Chi-square = 699,619
Degrees of freedom = 433
Probability level = ,000

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	95	699,619	433	,000	1,616
Saturated model	528	,000	0		
Independence model	32	4736,640	496	,000	9,550

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	,044	,902	,880	,740
Saturated model	,000	1,000		
Independence model	,192	,435	,398	,409

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	,852	,831	,938	,928	,937
Saturated model	1,000		1,000		1,000
Independence model	,000	,000	,000	,000	,000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	,873	,744	,818
Saturated model	,000	,000	,000
Independence model	1,000	,000	,000

NCP

Model	NCP	LO 90	HI 90
Default model	266,619	198,236	342,913
Saturated model	,000	,000	,000
Independence model	4240,640	4023,802	4464,780

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	1,719	,655	,487	,843
Saturated model	,000	,000	,000	,000
Independence model	11,638	10,419	9,886	10,970

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	,039	,034	,044	1,000
Independence model	,145	,141	,149	,000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	889,619	906,384	1270,689	1365,689
Saturated model	1056,000	1149,176	3173,949	3701,949
Independence model	4800,640	4806,287	4929,001	4961,001

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	2,186	2,018	2,373	2,227
Saturated model	2,595	2,595	2,595	2,824
Independence model	11,795	11,262	12,346	11,809

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	281	294
Independence model	48	50

Estimates (Group number 1 – Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P
q15cREVERSEDIkkeskolensansvar	<---	Responsibility	1,000			
q15bNudgeansvarSkolenspligt	<---	Responsibility	1,277	,214	5,975	***
q4bEniguenigJegspisersundere	<---	Perceived_health	1,000			
q4aEniguenigJegersundere	<---	Perceived_health	1,021	,071	14,385	***
q8Hvorfysiskaktiverdu	<---	Perceived_health	,731	,073	10,064	***
q11fForaeldrespiser	<---	socialnorms	1,000			
q11eForaeldreopfordrer	<---	socialnorms	,788	,115	6,877	***
q11bSpiserflereGendandre	<---	veggieating	1,000			
q11SpisermangeG	<---	veggieating	1,072	,073	14,613	***
q13fBuffetvalgDyrevelfaerd	<---	Buffetchoiceb	1,000			
q13eBuffetvalgOekologi	<---	Buffetchoiceb	1,245	,141	8,812	***
q13dBuffetvalgSundhed	<---	Buffetchoicea	1,000			
q12eBuffetvanerGrontsagerforst	<---	Buffetchoic	,702	,093	7,565	***

			Estimate	S.E.	C.R.	P
		ea				
q7jSelfefficacyLigemegethvadderskerkanjegsomregelk	<---	Selfefficacy	1,000			
q7iSelfefficacyHvisjegerivanskelighederkanjegsomreg	<---	Selfefficacy	,973	,096	10,169	***
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	Selfefficacy	1,006	,104	9,720	***
q7gSelfefficacyJegbevarerroennaardererproblemerda	<---	Selfefficacy	1,194	,112	10,641	***
q7fSelfefficacyJegkanlosedeflesteproblemerhvisjegyd	<---	Selfefficacy	,921	,093	9,891	***
q7eSelfefficacyTakketværeminepersonligeressourcer	<---	Selfefficacy	1,035	,106	9,783	***
q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	<---	Selfefficacy	,992	,107	9,294	***
q7cSelfefficacyDeterletformigatholdefastvedminepla	<---	Selfefficacy	,796	,096	8,331	***
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<---	Selfefficacy	,834	,095	8,813	***
q7aSelfefficacyJegkanaltidlosevanskeligeproblemer	<---	Selfefficacy	,901	,097	9,305	***
q15aNudgeansvarOkskoleindflydelse	<---	Attnudge	1,000			
q14iNudgeattitudeTilmeldeklub	<---	Attnudge	,815	,078	10,392	***
q14hNudgeattitudeAendrenavn	<---	Attnudge	,906	,073	12,434	***
q14gNudgeattitudeTilbudtmeregront	<---	Attnudge	1,050	,081	12,903	***
q14fNudgeattitudePosterraad	<---	Attnudge	,761	,065	11,781	***
q14eNudgeattitudeKendisser	<---	Attnudge	,568	,066	8,651	***
q14cNudgeattitudeSkraemmekampagne	<---	Attnudge	,948	,089	10,692	***
q14bNudgeattitudeGroensalat	<---	Attnudge	1,005	,089	11,331	***
q14aNudgeattitudeKonkurrence	<---	Attnudge	,809	,081	9,996	***

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
q15cREVERSEDIkkeskolensansvar	<---	Responsibility	,651
q15bNudgeansvarSkolenspligt	<---	Responsibility	,876
q4bEnigueniqJegspisersundere	<---	Perceived_health	,828
q4aEnigueniqJegersundere	<---	Perceived_health	,873
q8Hvorfysiskaktiverdu	<---	Perceived_health	,517
q11fForaeldrespiser	<---	socialnorms	,845
q11eForaeldreopfordrer	<---	socialnorms	,587
q11bSpiserflereGendandre	<---	veggieating	,826

			Estimate
q11SpisermangeG	<---	veggieating	,895
q13fBuffetvalgDyrevelfaerd	<---	Buffetchoiceb	,738
q13eBuffetvalgOekologi	<---	Buffetchoiceb	,892
q13dBuffetvalgSundhed	<---	Buffetchoicea	,773
q12eBuffetvanerGrontsagerforst	<---	Buffetchoicea	,491
q7jSelfefficacyLigemegethvadderskerkanjegsomregelk	<---	Selfefficacy	,605
q7iSelfefficacyHvisjegerivanskelighederkanjegsomreg	<---	Selfefficacy	,652
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	Selfefficacy	,614
q7gSelfefficacyJegbevarerroennaardererproblemerda	<---	Selfefficacy	,691
q7fSelfefficacyJegkanlosedeflesteproblemerhvisjegyd	<---	Selfefficacy	,626
q7eSelfefficacyTakketværeminepersonligeressourcer	<---	Selfefficacy	,614
q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	<---	Selfefficacy	,575
q7cSelfefficacyDeterletformigatholdefastvedminepla	<---	Selfefficacy	,499
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<---	Selfefficacy	,535
q7aSelfefficacyJegkanaltidlosevanskeligeproblemer	<---	Selfefficacy	,579
q15aNudgeansvarOkskoleindflydelse	<---	Attnudge	,700
q14iNudgeattitudeTilmeldeklub	<---	Attnudge	,568
q14hNudgeattitudeAendrenavn	<---	Attnudge	,689
q14gNudgeattitudeTilbudtmeregront	<---	Attnudge	,718
q14fNudgeattitudePosterraad	<---	Attnudge	,649
q14eNudgeattitudeKendisser	<---	Attnudge	,469
q14cNudgeattitudeSkraemmekampagne	<---	Attnudge	,585
q14bNudgeattitudeGroensalat	<---	Attnudge	,623
q14aNudgeattitudeKonkurrence	<---	Attnudge	,545

Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P
Responsibility	<-->	Perceived_health	,034	,031	1,079	,280
Responsibility	<-->	socialnorms	,036	,041	,877	,381
Responsibility	<-->	veggieating	,016	,037	,417	,677
Responsibility	<-->	Buffetchoiceb	,096	,040	2,374	,018
Responsibility	<-->	Buffetchoicea	,113	,042	2,678	,007
Responsibility	<-->	Selfefficacy	-,011	,020	-,561	,575
Responsibility	<-->	Attnudge	,209	,046	4,513	***
Perceived_health	<-->	socialnorms	,155	,040	3,868	***
Perceived_health	<-->	veggieating	,238	,041	5,872	***
Perceived_health	<-->	Buffetchoiceb	,127	,038	3,333	***
Perceived_health	<-->	Buffetchoicea	,248	,041	6,062	***
Perceived_health	<-->	Selfefficacy	,086	,021	4,153	***
Perceived_health	<-->	Attnudge	,097	,033	2,956	,003
socialnorms	<-->	veggieating	,397	,055	7,265	***
socialnorms	<-->	Buffetchoiceb	,173	,050	3,488	***
socialnorms	<-->	Buffetchoicea	,243	,051	4,821	***

			Estimate	S.E.	C.R.	P
socialnorms	<-->	Selfefficacy	,043	,025	1,718	,086
socialnorms	<-->	Attnudge	,145	,043	3,369	***
veggieating	<-->	Buffetchoiceb	,226	,050	4,558	***
veggieating	<-->	Buffetchoicea	,389	,053	7,382	***
veggieating	<-->	Selfefficacy	,044	,023	1,868	,062
veggieating	<-->	Attnudge	,084	,039	2,141	,032
Buffetchoiceb	<-->	Buffetchoicea	,345	,057	6,066	***
Buffetchoiceb	<-->	Selfefficacy	,049	,024	2,063	,039
Buffetchoiceb	<-->	Attnudge	,071	,039	1,826	,068
Buffetchoicea	<-->	Selfefficacy	,075	,025	3,027	,002
Buffetchoicea	<-->	Attnudge	,245	,044	5,561	***
Selfefficacy	<-->	Attnudge	,059	,021	2,758	,006
e24	<-->	e23	,196	,025	7,912	***
e20	<-->	e19	,062	,018	3,406	***
e27	<-->	e22	,062	,018	3,523	***

Correlations: (Group number 1 - Default model)

			Estimate
Responsibility	<-->	Perceived_health	,066
Responsibility	<-->	socialnorms	,057
Responsibility	<-->	veggieating	,025
Responsibility	<-->	Buffetchoiceb	,157
Responsibility	<-->	Buffetchoicea	,201
Responsibility	<-->	Selfefficacy	-,034
Responsibility	<-->	Attnudge	,376
Perceived_health	<-->	socialnorms	,249
Perceived_health	<-->	veggieating	,383
Perceived_health	<-->	Buffetchoiceb	,210
Perceived_health	<-->	Buffetchoicea	,446
Perceived_health	<-->	Selfefficacy	,265
Perceived_health	<-->	Attnudge	,177
socialnorms	<-->	veggieating	,524
socialnorms	<-->	Buffetchoiceb	,234
socialnorms	<-->	Buffetchoicea	,360
socialnorms	<-->	Selfefficacy	,109
socialnorms	<-->	Attnudge	,215
veggieating	<-->	Buffetchoiceb	,307
veggieating	<-->	Buffetchoicea	,577
veggieating	<-->	Selfefficacy	,111
veggieating	<-->	Attnudge	,126
Buffetchoiceb	<-->	Buffetchoicea	,524
Buffetchoiceb	<-->	Selfefficacy	,127
Buffetchoiceb	<-->	Attnudge	,109

			Estimate
Buffetchoicea	<-->	Selfefficacy	,213
Buffetchoicea	<-->	Attnudge	,409
Selfefficacy	<-->	Attnudge	,168
e24	<-->	e23	,507
e20	<-->	e19	,208
e27	<-->	e22	,208

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P
Responsibility	,520	,108	4,809	***
Perceived_health	,512	,058	8,870	***
socialnorms	,760	,123	6,175	***
veggieating	,756	,085	8,870	***
Buffetchoiceb	,717	,111	6,477	***
Buffetchoicea	,603	,095	6,343	***
Selfefficacy	,206	,033	6,208	***
Attnudge	,593	,078	7,613	***
e1	,707	,096	7,378	***
e5	,234	,034	6,948	***
e6	,166	,033	5,094	***
e7	,749	,056	13,365	***
e8	,306	,102	2,984	,003
e11	,353	,049	7,136	***
e13	,599	,085	7,018	***
e14	,286	,117	2,451	,014
e16	,407	,075	5,414	***
e17	,935	,074	12,636	***
e24	,410	,032	12,805	***
e23	,363	,029	12,511	***
e20	,344	,028	12,365	***
e19	,263	,022	12,007	***
e27	,332	,026	12,711	***
e22	,271	,022	12,327	***
e28	,617	,051	12,061	***
e32	,616	,052	11,826	***
e33	,471	,037	12,596	***
e36	1,022	,078	13,075	***
e21	,322	,028	11,683	***
e12	,216	,051	4,206	***
e2	,258	,135	1,907	,056
e9	,898	,089	10,146	***
e18	,356	,028	12,636	***
e25	,394	,030	13,338	***

	Estimate	S.E.	C.R.	P
e26	,357	,027	13,141	***
e38	,918	,069	13,300	***
e37	,946	,074	12,817	***
e34	,678	,050	13,623	***
e31	,540	,044	12,196	***
e30	,828	,063	13,178	***

Modification Indices (Group number 1 - Default model)

Covariances: (Group number 1 - Default model)

			M.I.	Par Change
e37	<-->	Responsibility	6,254	,095
e37	<-->	e38	6,925	,131
e36	<-->	e37	12,441	,186
e34	<-->	Responsibility	10,709	-,103
e34	<-->	e37	7,955	-,119
e33	<-->	e38	4,224	,073
e33	<-->	e36	7,884	-,105
e32	<-->	e38	4,680	-,089
e32	<-->	e37	4,453	-,090
e32	<-->	e33	8,822	,090
e31	<-->	veggieating	6,006	-,074
e31	<-->	Responsibility	7,750	-,082
e30	<-->	e33	11,988	-,116
e30	<-->	e31	7,267	,098
e28	<-->	Responsibility	4,042	,064
e26	<-->	socialnorms	8,870	-,082
e26	<-->	e27	10,343	,057
e25	<-->	Buffetchoicea	16,178	,101
e25	<-->	Buffetchoiceb	16,431	-,109
e25	<-->	Perceived_health	4,889	,050
e25	<-->	e36	7,140	-,090
e25	<-->	e31	6,396	-,063
e24	<-->	Buffetchoicea	4,945	-,048
e24	<-->	veggieating	5,121	,048
e24	<-->	e37	9,039	,085
e24	<-->	e26	4,940	-,038
e21	<-->	e24	5,497	,040
e20	<-->	Buffetchoicea	4,452	-,049
e20	<-->	Buffetchoiceb	4,322	,051
e20	<-->	Responsibility	10,233	,071
e18	<-->	e38	4,410	,064

			M.I.	Par Change
e18	<-->	e19	5,973	,040
e17	<-->	Buffetchoiceb	5,099	-,095
e17	<-->	e25	4,081	,065
e16	<-->	e25	9,020	,078
e16	<-->	e24	5,178	-,051
e14	<-->	e25	8,009	-,078
e14	<-->	e17	4,701	-,093
e12	<-->	Perceived_health	4,271	-,048
e11	<-->	Perceived_health	5,369	,056
e11	<-->	e16	4,635	-,060
e9	<-->	Attnudge	13,176	,136
e9	<-->	e38	13,795	,184
e9	<-->	e36	4,875	,116
e9	<-->	e23	4,181	-,054
e9	<-->	e22	5,242	-,061
e8	<-->	Attnudge	5,632	-,074
e8	<-->	e26	4,954	-,057
e8	<-->	e23	4,424	,046
e8	<-->	e17	4,381	,088
e7	<-->	Buffetchoicea	4,778	,076
e7	<-->	Buffetchoiceb	4,386	-,078
e7	<-->	e36	4,050	-,093
e7	<-->	e25	8,349	,082
e6	<-->	veggieating	10,431	-,068
e6	<-->	e37	4,894	,062
e6	<-->	e34	4,574	-,049
e5	<-->	Selfefficacy	8,710	-,041
e5	<-->	Buffetchoiceb	4,195	,050
e5	<-->	veggieating	12,754	,079
e5	<-->	e34	4,219	,050
e5	<-->	e26	5,062	-,040
e5	<-->	e11	13,526	,074
e5	<-->	e7	8,042	-,072
e2	<-->	e34	4,980	-,078
e2	<-->	e31	6,353	-,082
e2	<-->	e28	4,126	,071
e2	<-->	e25	5,077	,060
e2	<-->	e24	5,992	-,057
e2	<-->	e20	6,984	,065
e1	<-->	Buffetchoicea	7,639	-,098
e1	<-->	e26	4,545	-,059
e1	<-->	e24	8,512	,073
e1	<-->	e23	4,444	-,050

			M.I.	Par Change
e1	<-->	e16	10,822	-,119
e1	<-->	e11	5,145	,071

Variances: (Group number 1 - Default model)

	M.I.	Par Change

Regression Weights: (Group number 1 - Default model)

			M.I.	Par Change
q14aNudgeattitudeKonkurrence	<---	q11eForaeldreopfordrer	9,445	,128
q14bNudgeattitudeGroensalat	<---	Responsibility	4,367	,163
q14bNudgeattitudeGroensalat	<---	q14aNudgeattitudeKonkurrence	4,609	,095
q14bNudgeattitudeGroensalat	<---	q14cNudgeattitudeSkraemmekampagne	7,647	,112
q14bNudgeattitudeGroensalat	<---	q14eNudgeattitudeKendisser	5,986	-,132
q14bNudgeattitudeGroensalat	<---	q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	5,112	,146
q14bNudgeattitudeGroensalat	<---	q15bNudgeansvarSkolenspligt	4,862	,106
q14cNudgeattitudeSkraemmekampagne	<---	veggieating	4,233	-,132
q14cNudgeattitudeSkraemmekampagne	<---	q14bNudgeattitudeGroensalat	7,003	,111
q14cNudgeattitudeSkraemmekampagne	<---	q14fNudgeattitudePosterraad	4,137	-,117
q14cNudgeattitudeSkraemmekampagne	<---	q7cSelfefficacyDeterletformigatholdefastvedminepla	6,661	-,185
q14cNudgeattitudeSkraemmekampagne	<---	q8Hvorfysiskaktiverdu	5,672	-,122
q14eNudgeattitudeKendisser	<---	Responsibility	7,437	-,175
q14eNudgeattitudeKendisser	<---	q14bNudgeattitudeGroensalat	4,462	-,071
q14eNudgeattitudeKendisser	<---	q15bNudgeansvarSkolenspligt	7,833	-,111

			M.I.	Par Change
q14eNudgeattitudeKendisser	<--	q15cREVERSEDIkkeskolensansvar	4,774	-,082
q14fNudgeattitudePosterraad	<--	q14cNudgeattitudeSkraemmekampagne	4,851	-,063
q14fNudgeattitudePosterraad	<--	q14iNudgeattitudeTilmeldeklub	7,647	-,090
q14gNudgeattitudeTilbudtmeregront	<--	q14fNudgeattitudePosterraad	4,677	,101
q14hNudgeattitudeAendrenavn	<--	Responsibility	5,132	-,136
q14hNudgeattitudeAendrenavn	<--	q14iNudgeattitudeTilmeldeklub	4,645	,076
q14hNudgeattitudeAendrenavn	<--	q7cSelfefficacyDeterletformigatholdefastvedminepla	4,792	-,118
q14hNudgeattitudeAendrenavn	<--	q15bNudgeansvarSkolenspligt	6,353	-,093
q14iNudgeattitudeTilmeldeklub	<--	q14fNudgeattitudePosterraad	6,286	-,130
q15aNudgeansvarOkskoleindflydelse	<--	Buffetchoicea	5,482	,146
q15aNudgeansvarOkskoleindflydelse	<--	q13dBuffetvalgSundhed	5,452	,097
q15aNudgeansvarOkskoleindflydelse	<--	q15bNudgeansvarSkolenspligt	4,339	,083
q7aSelfefficacyJegkanaltidlosevanskeligeproblemer	<--	q7bSelfefficacyHvisnogenmodarbejdermigfinder	6,928	,107
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<--	veggieating	7,056	-,100
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<--	socialnorms	14,134	-,150
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<--	q7aSelfefficacyJegkanaltidlosevanskeligeproblemer	7,201	,116
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<--	q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	5,508	-,092
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<--	q11SpisermangeG	7,305	-,080
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<--	q11eForaeldreopfordrer	6,688	-,068
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<--	q11fForaeldrespiser	12,761	-,106
q7cSelfefficacyDeterletformigatholdefastvedminepla	<--	Buffetchoicea	9,004	,143
q7cSelfefficacyDeterletformigatholdefastvedminepla	<--	veggieating	6,551	,101

			M.I.	Par Change
q7cSelfefficacyDeterletformigatholdefastvedminepla	<--	Perceived_health	10,835	,159
q7cSelfefficacyDeterletformigatholdefastvedminepla	<--	q14cNudgeattitudeSkraemmekampagne	4,173	-,052
q7cSelfefficacyDeterletformigatholdefastvedminepla	<--	q12eBuffetvanerGrontsagerforst	8,773	,085
q7cSelfefficacyDeterletformigatholdefastvedminepla	<--	q13dBuffetvalgSundhed	12,337	,112
q7cSelfefficacyDeterletformigatholdefastvedminepla	<--	q13eBuffetvalgOekologi	4,085	-,055
q7cSelfefficacyDeterletformigatholdefastvedminepla	<--	q11SpisermangeG	6,056	,076
q7cSelfefficacyDeterletformigatholdefastvedminepla	<--	q8Hvorfysiskaktiverdu	15,876	,126
q7cSelfefficacyDeterletformigatholdefastvedminepla	<--	q4aEniguenigJegersundere	11,261	,128
q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	<--	q14bNudgeattitudeGroensalat	5,352	,051
q7fSelfefficacyJegkanlosedeflesteproblemerhvisjegyd	<--	q11eForaeldreopfordrer	6,579	-,057
q7gSelfefficacyJegbevarerroennaardererproblemerda	<--	q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	6,115	,096
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<--	Attnudge	4,447	,086
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<--	Buffetchoiceb	6,721	,098
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<--	veggieating	4,697	,078
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<--	socialnorms	5,152	,087
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<--	Responsibility	14,806	,174
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<--	q14hNudgeattitudeAendrenavn	4,690	,063
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<--	q13eBuffetvalgOekologi	6,898	,065
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<--	q11SpisermangeG	4,085	,057
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<--	q11bSpiserflereGendandre	4,097	,056
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<--	q15bNudgeansvarSkolenspligt	14,446	,106
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<--	q15cREVERSEDIkkeskolensansvar	5,652	,063

			M.I.	Par Change
q7iSelfefficacyHvisjegerivanskelighederkanjegsomreg	<---	Perceived_health	4,294	-,081
q7jSelfefficacyLigemegethvadderskerkanjegsomregelk	<---	q14aNudgeattitudeKonkurrence	4,300	,056
q12eBuffetvanerGrontsagerforst	<---	veggieating	4,068	,124
q12eBuffetvanerGrontsagerforst	<---	socialnorms	5,064	,147
q12eBuffetvanerGrontsagerforst	<---	q11bSpiserflereGendandre	4,236	,098
q12eBuffetvanerGrontsagerforst	<---	q11fForaeldrespiser	5,789	,117
q13dBuffetvalgSundhed	<---	q7cSelfefficacyDeterletformigatholdefastvedminepla	6,254	,138
q13dBuffetvalgSundhed	<---	q15cREVERSEDIkkeskolensansvar	6,064	-,089
q13eBuffetvalgOekologi	<---	q7cSelfefficacyDeterletformigatholdefastvedminepla	6,432	-,149
q11SpisermangeG	<---	Perceived_health	4,425	-,105
q11SpisermangeG	<---	q7bSelfefficacyHvisnogenmodarbejdermigfinder	4,455	-,099
q11SpisermangeG	<---	q4aEniguenigJegersundere	5,569	-,094
q11bSpiserflereGendandre	<---	Perceived_health	5,528	,123
q11bSpiserflereGendandre	<---	q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	6,172	,110
q11bSpiserflereGendandre	<---	q4bEniguenigJegspisersundere	12,349	,141
q11bSpiserflereGendandre	<---	q15cREVERSEDIkkeskolensansvar	4,703	,068
q11eForaeldreopfordrer	<---	Attnudge	7,339	,190
q11eForaeldreopfordrer	<---	q14aNudgeattitudeKonkurrence	19,305	,193
q11eForaeldreopfordrer	<---	q14bNudgeattitudeGroensalat	6,596	,103
q11eForaeldreopfordrer	<---	q14cNudgeattitudeSkraemmekampagne	10,227	,128
q11eForaeldreopfordrer	<---	q14fNudgeattitudePosterraad	5,076	,125
q11eForaeldreopfordrer	<---	q14hNudgeattitudeAendrenavn	4,038	,099

			M.I.	Par Change
q11eForaeldreopfordrer	<--	q7fSelfefficacyJegkanlosedeflestepr oblemerhvisjegyd	4,336	-,156
q11fForaeldrespiser	<--	q14aNudgeattitudeKonkurrence	5,422	-,085
q8Hvorfysiskaktiverdu	<--	q7bSelfefficacyHvisnogenmodarbejd ermigfinder	6,066	,153
q8Hvorfysiskaktiverdu	<--	q7cSelfefficacyDeterletformigathold efastvedminepla	10,580	,198
q8Hvorfysiskaktiverdu	<--	q7gSelfefficacyJegbevarerroennaard ererproblemerda	5,066	,127
q4aEniguenigJegersundere	<--	Buffetchoicea	9,895	-,128
q4aEniguenigJegersundere	<--	Buffetchoiceb	4,451	-,074
q4aEniguenigJegersundere	<--	veggieating	13,252	-,123
q4aEniguenigJegersundere	<--	q14eNudgeattitudeKendisser	5,757	-,071
q4aEniguenigJegersundere	<--	q7cSelfefficacyDeterletformigathold efastvedminepla	5,117	,086
q4aEniguenigJegersundere	<--	q13dBuffetvalgSundhed	7,736	-,076
q4aEniguenigJegersundere	<--	q11SpisermangeG	13,020	-,095
q4aEniguenigJegersundere	<--	q11bSpiserflereGendandre	10,443	-,084
q4bEniguenigJegspisersundere	<--	Selfefficacy	5,553	-,164
q4bEniguenigJegspisersundere	<--	Buffetchoicea	8,387	,124
q4bEniguenigJegspisersundere	<--	Buffetchoiceb	7,437	,101
q4bEniguenigJegspisersundere	<--	veggieating	15,019	,138
q4bEniguenigJegspisersundere	<--	q14eNudgeattitudeKendisser	4,973	,069
q4bEniguenigJegspisersundere	<--	q7bSelfefficacyHvisnogenmodarbejd ermigfinder	8,945	-,122
q4bEniguenigJegspisersundere	<--	q7cSelfefficacyDeterletformigathold efastvedminepla	5,956	-,097
q4bEniguenigJegspisersundere	<--	q7dSelfefficacyJegersikkerpaaatjegk anhaandtereuven	6,908	-,097
q4bEniguenigJegspisersundere	<--	q7eSelfefficacyTakketværeminepers onligeressourcer	5,078	-,085

			M.I.	Par Change
q4bEniguenigJegspisersundere	<---	q7gSelfefficacyJegbevarerroennaarderproblemerda	4,386	-,077
q4bEniguenigJegspisersundere	<---	q13dBuffetvalgSundhed	6,626	,074
q4bEniguenigJegspisersundere	<---	q13eBuffetvalgOekologi	6,720	,063
q4bEniguenigJegspisersundere	<---	q13fBuffetvalgDyrevelfaerd	4,625	,054
q4bEniguenigJegspisersundere	<---	q11SpisermangeG	9,699	,086
q4bEniguenigJegspisersundere	<---	q11bSpiserflereGendandre	22,583	,130
q4bEniguenigJegspisersundere	<---	q8Hvorfysiskaktiverdu	5,724	-,068
q15bNudgeansvarSkolenspligt	<---	q7cSelfefficacyDeterletformigatholdefastvedminepla	4,644	,124
q15bNudgeansvarSkolenspligt	<---	q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	4,901	,124
q15cREVERSEDIkkeskolensansvar	<---	q7bSelfefficacyHvisnogenmodarbejdermigfinder	4,497	-,135
q15cREVERSEDIkkeskolensansvar	<---	q13dBuffetvalgSundhed	6,368	-,113

Appendix 6.2: Structural equation model output

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments: 528

Number of distinct parameters to be estimated: 95

Degrees of freedom (528 - 95): 433

Result (Default model)

Minimum was achieved

Chi-square = 699,619

Degrees of freedom = 433

Probability level = ,000

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	95	699,619	433	,000	1,616

Model	NPAR	CMIN	DF	P	CMIN/DF
Saturated model	528	,000	0		
Independence model	32	4736,640	496	,000	9,550

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	,044	,902	,880	,740
Saturated model	,000	1,000		
Independence model	,192	,435	,398	,409

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	,852	,831	,938	,928	,937
Saturated model	1,000		1,000		1,000
Independence model	,000	,000	,000	,000	,000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	,873	,744	,818
Saturated model	,000	,000	,000
Independence model	1,000	,000	,000

NCP

Model	NCP	LO 90	HI 90
Default model	266,619	198,236	342,913
Saturated model	,000	,000	,000
Independence model	4240,640	4023,802	4464,780

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	1,719	,655	,487	,843
Saturated model	,000	,000	,000	,000
Independence model	11,638	10,419	9,886	10,970

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	,039	,034	,044	1,000
Independence model	,145	,141	,149	,000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	889,619	906,384	1270,689	1365,689
Saturated model	1056,000	1149,176	3173,949	3701,949
Independence model	4800,640	4806,287	4929,001	4961,001

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	2,186	2,018	2,373	2,227
Saturated model	2,595	2,595	2,595	2,824
Independence model	11,795	11,262	12,346	11,809

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	281	294
Independence model	48	50

Estimates (Group one – Default model)

Scalar Estimates (Group one - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group one - Default model)

			Estimate	S.E.	C.R.	P
Attnudge	<---	Selfefficacy	,182	,102	1,792	,073
Attnudge	<---	Buffetchoicea	,473	,148	3,204	,001
Attnudge	<---	Buffetchoiceb	-,162	,072	-2,248	,025
Attnudge	<---	veggieating	-,171	,084	-2,041	,041
Attnudge	<---	socialnorms	,142	,068	2,085	,037
Attnudge	<---	Perceived_health	-,014	,075	-,193	,847
Attnudge	<---	Responsibility	,330	,070	4,717	***
q15cREVERSEDIkkeskolensansvar	<---	Responsibility	1,000			
q15bNudgeansvarSkolenspligt	<---	Responsibility	1,277	,214	5,975	***
q4bEniguenigJegspisersundere	<---	Perceived_health	1,000			
q4aEniguenigJegersundere	<---	Perceived_health	1,021	,071	14,385	***
q8Hvorfysiskaktiverdu	<---	Perceived_health	,731	,073	10,064	***
q11fForaeldrespiser	<---	socialnorms	1,000			
q11eForaeldreopfordrer	<---	socialnorms	,788	,115	6,877	***
q11bSpiserflereGendandre	<---	veggieating	1,000			
q11SpisermangeG	<---	veggieating	1,072	,073	14,613	***
q13fBuffetvalgDyrevelfaerd	<---	Buffetchoiceb	1,000			
q13eBuffetvalgOekologi	<---	Buffetchoiceb	1,245	,141	8,812	***
q13dBuffetvalgSundhed	<---	Buffetchoicea	1,000			

			Estimate	S.E.	C.R.	P
q12eBuffetvanerGrontsagerforst	<---	Buffetchoicea	,702	,093	7,565	***
q7jSelfefficacyLigemegethvadderskerkanjegsomregelk	<---	Selfefficacy	1,000			
q7iSelfefficacyHvisjegerivanskelighederkanjegsomreg	<---	Selfefficacy	,973	,096	10,169	***
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	Selfefficacy	1,006	,104	9,720	***
q7gSelfefficacyJegbevarerroennaardererproblemerda	<---	Selfefficacy	1,194	,112	10,641	***
q7fSelfefficacyJegkanlosedeflesteproblemerhvisjegyd	<---	Selfefficacy	,921	,093	9,891	***
q7eSelfefficacyTakketværeminepersonligeressourcer	<---	Selfefficacy	1,035	,106	9,783	***
q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	<---	Selfefficacy	,992	,107	9,294	***
q7cSelfefficacyDeterletformigatholdefastvedminepla	<---	Selfefficacy	,796	,096	8,331	***
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<---	Selfefficacy	,834	,095	8,813	***
q7aSelfefficacyJegkanaltidlosevanskeligeproblemer	<---	Selfefficacy	,901	,097	9,305	***
q15aNudgeansvarOkskoleindflydelse	<---	Attnudge	1,000			
q14iNudgeattitudeTilmeldeklub	<---	Attnudge	,815	,078	10,392	***
q14hNudgeattitudeAendrenavn	<---	Attnudge	,906	,073	12,434	***
q14gNudgeattitudeTilbudtmeregront	<---	Attnudge	1,050	,081	12,903	***
q14fNudgeattitudePosterraad	<---	Attnudge	,761	,065	11,781	***
q14eNudgeattitudeKendisser	<---	Attnudge	,568	,066	8,651	***
q14cNudgeattitudeSkraemmekampagne	<---	Attnudge	,948	,089	10,692	***
q14bNudgeattitudeGroensalat	<---	Attnudge	1,005	,089	11,331	***
q14aNudgeattitudeKonkurrence	<---	Attnudge	,809	,081	9,996	***

Standardized Regression Weights: (Group one - Default model)

			Estimate
Attnudge	<---	Selfefficacy	,107
Attnudge	<---	Buffetchoicea	,477
Attnudge	<---	Buffetchoiceb	-,178
Attnudge	<---	veggieating	-,193
Attnudge	<---	socialnorms	,161
Attnudge	<---	Perceived_health	-,013
Attnudge	<---	Responsibility	,308

			Estimate
q15cREVERSEDIkkeskolensansvar	<---	Responsibility	,651
q15bNudgeansvarSkolenspligt	<---	Responsibility	,876
q4bEnigueniqJegspisersundere	<---	Perceived_health	,828
q4aEnigueniqJegersundere	<---	Perceived_health	,873
q8Hvorfysiskaktiverdu	<---	Perceived_health	,517
q11fForaeldrespiser	<---	socialnorms	,845
q11eForaeldreopfordrer	<---	socialnorms	,587
q11bSpiserflereGendandre	<---	veggieating	,826
q11SpisermangeG	<---	veggieating	,895
q13fBuffetvalgDyrevelfaerd	<---	Buffetchoiceb	,738
q13eBuffetvalgOekologi	<---	Buffetchoiceb	,892
q13dBuffetvalgSundhed	<---	Buffetchoicea	,773
q12eBuffetvanerGrontsagerforst	<---	Buffetchoicea	,491
q7jSelfefficacyLigemegethvadderskerkanjegsomregelk	<---	Selfefficacy	,605
q7iSelfefficacyHvisjegerivanskelighederkanjegsomreg	<---	Selfefficacy	,652
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	Selfefficacy	,614
q7gSelfefficacyJegbevarerroennaardererproblemerda	<---	Selfefficacy	,691
q7fSelfefficacyJegkanlosedeflesteproblemerhvisjegyd	<---	Selfefficacy	,626
q7eSelfefficacyTakketværeminepersonligeressourcer	<---	Selfefficacy	,614
q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	<---	Selfefficacy	,575
q7cSelfefficacyDeterletformigatholdefastvedminepla	<---	Selfefficacy	,499
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<---	Selfefficacy	,535
q7aSelfefficacyJegkanaltidlosevanskeligeproblemer	<---	Selfefficacy	,579
q15aNudgeansvarOkskoleindflydelse	<---	Attnudge	,700
q14iNudgeattitudeTilmeldeklub	<---	Attnudge	,568
q14hNudgeattitudeAendrenavn	<---	Attnudge	,689
q14gNudgeattitudeTilbudtmeregront	<---	Attnudge	,718
q14fNudgeattitudePosterraad	<---	Attnudge	,649
q14eNudgeattitudeKendisser	<---	Attnudge	,469
q14cNudgeattitudeSkraemmekampagne	<---	Attnudge	,585
q14bNudgeattitudeGroensalat	<---	Attnudge	,623
q14aNudgeattitudeKonkurrence	<---	Attnudge	,545

Covariances: (Group one - Default model)

			Estimate	S.E.	C.R.	P	Label
Responsibility	<-->	Perceived_health	,034	,031	1,079	,280	par_25
Responsibility	<-->	socialnorms	,036	,041	,877	,381	par_26
Responsibility	<-->	veggieating	,016	,037	,417	,677	par_27
Responsibility	<-->	Buffetchoiceb	,096	,040	2,374	,018	par_28
Responsibility	<-->	Buffetchoicea	,113	,042	2,678	,007	par_29
Responsibility	<-->	Selfefficacy	-,011	,020	-,561	,575	par_30
Perceived_health	<-->	socialnorms	,155	,040	3,868	***	par_31
Perceived_health	<-->	veggieating	,238	,041	5,872	***	par_32

			Estimate	S.E.	C.R.	P	Label
Perceived_health	<-->	Buffetchoiceb	,127	,038	3,333	***	par_33
Perceived_health	<-->	Buffetchoicea	,248	,041	6,062	***	par_34
Perceived_health	<-->	Selfefficacy	,086	,021	4,153	***	par_35
socialnorms	<-->	veggieating	,397	,055	7,265	***	par_36
socialnorms	<-->	Buffetchoiceb	,173	,050	3,488	***	par_37
socialnorms	<-->	Buffetchoicea	,243	,051	4,821	***	par_38
socialnorms	<-->	Selfefficacy	,043	,025	1,718	,086	par_39
veggieating	<-->	Buffetchoiceb	,226	,050	4,558	***	par_40
veggieating	<-->	Buffetchoicea	,389	,053	7,382	***	par_41
veggieating	<-->	Selfefficacy	,044	,023	1,868	,062	par_42
Buffetchoiceb	<-->	Buffetchoicea	,345	,057	6,066	***	par_43
Buffetchoiceb	<-->	Selfefficacy	,049	,024	2,063	,039	par_44
Buffetchoicea	<-->	Selfefficacy	,075	,025	3,027	,002	par_45
e23	<-->	e24	,196	,025	7,912	***	par_46
e19	<-->	e20	,062	,018	3,406	***	par_47
e22	<-->	e27	,062	,018	3,523	***	par_48

Correlations: (Group one - Default model)

			Estimate
Responsibility	<-->	Perceived_health	,066
Responsibility	<-->	socialnorms	,057
Responsibility	<-->	veggieating	,025
Responsibility	<-->	Buffetchoiceb	,157
Responsibility	<-->	Buffetchoicea	,201
Responsibility	<-->	Selfefficacy	-,034
Perceived_health	<-->	socialnorms	,249
Perceived_health	<-->	veggieating	,383
Perceived_health	<-->	Buffetchoiceb	,210
Perceived_health	<-->	Buffetchoicea	,446
Perceived_health	<-->	Selfefficacy	,265
socialnorms	<-->	veggieating	,524
socialnorms	<-->	Buffetchoiceb	,234
socialnorms	<-->	Buffetchoicea	,360
socialnorms	<-->	Selfefficacy	,109
veggieating	<-->	Buffetchoiceb	,307
veggieating	<-->	Buffetchoicea	,577
veggieating	<-->	Selfefficacy	,111
Buffetchoiceb	<-->	Buffetchoicea	,524
Buffetchoiceb	<-->	Selfefficacy	,127
Buffetchoicea	<-->	Selfefficacy	,213
e23	<-->	e24	,507
e19	<-->	e20	,208
e22	<-->	e27	,208

Variances: (Group one - Default model)

	Estimate	S.E.	C.R.	P	Label
Responsibility	,520	,108	4,809	***	par_56
Perceived_health	,512	,058	8,870	***	par_57
socialnorms	,760	,123	6,175	***	par_58
veggieating	,756	,085	8,870	***	par_59
Buffetchoiceb	,717	,111	6,477	***	par_60
Buffetchoicea	,603	,095	6,343	***	par_61
Selfefficacy	,206	,033	6,208	***	par_62
e39	,405	,061	6,647	***	par_63
e1	,707	,096	7,378	***	par_64
e2	,258	,135	1,907	,056	par_65
e5	,234	,034	6,948	***	par_66
e6	,166	,033	5,094	***	par_67
e7	,749	,056	13,365	***	par_68
e8	,306	,102	2,984	,003	par_69
e9	,898	,089	10,146	***	par_70
e11	,353	,049	7,136	***	par_71
e12	,216	,051	4,206	***	par_72
e13	,599	,085	7,018	***	par_73
e14	,286	,117	2,451	,014	par_74
e16	,407	,075	5,414	***	par_75
e17	,935	,074	12,636	***	par_76
e18	,356	,028	12,636	***	par_77
e19	,263	,022	12,007	***	par_78
e20	,344	,028	12,365	***	par_79
e21	,322	,028	11,683	***	par_80
e22	,271	,022	12,327	***	par_81
e23	,363	,029	12,511	***	par_82
e24	,410	,032	12,805	***	par_83
e25	,394	,030	13,338	***	par_84
e26	,357	,027	13,141	***	par_85
e27	,332	,026	12,711	***	par_86
e28	,617	,051	12,061	***	par_87
e30	,828	,063	13,178	***	par_88
e31	,540	,044	12,196	***	par_89
e32	,616	,052	11,826	***	par_90
e33	,471	,037	12,596	***	par_91
e34	,678	,050	13,623	***	par_92
e36	1,022	,078	13,075	***	par_93
e37	,946	,074	12,817	***	par_94
e38	,918	,069	13,300	***	par_95

Modification Indices (Group one - Default model)

Covariances: (Group one - Default model)

			M.I.	Par Change
e37	<-->	Responsibility	5,526	,094
e37	<-->	e38	6,925	,131
e36	<-->	e37	12,441	,186
e34	<-->	Responsibility	8,947	-,098
e34	<-->	e37	7,955	-,119
e33	<-->	e38	4,224	,073
e33	<-->	e36	7,884	-,105
e32	<-->	e38	4,680	-,089
e32	<-->	e37	4,453	-,090
e32	<-->	e33	8,822	,090
e31	<-->	veggieating	6,644	-,077
e31	<-->	Responsibility	6,939	-,081
e30	<-->	e33	11,988	-,116
e30	<-->	e31	7,267	,098
e27	<-->	Responsibility	4,307	-,047
e26	<-->	socialnorms	9,028	-,083
e26	<-->	e27	10,343	,057
e25	<-->	Buffetchoicea	9,319	,076
e25	<-->	Buffetchoiceb	13,611	-,099
e25	<-->	Perceived_health	4,998	,050
e25	<-->	e36	7,140	-,090
e25	<-->	e31	6,396	-,063
e24	<-->	veggieating	4,293	,044
e24	<-->	e37	9,039	,085
e24	<-->	e26	4,940	-,038
e21	<-->	e24	5,497	,040
e20	<-->	Responsibility	13,597	,086
e18	<-->	e38	4,410	,064
e18	<-->	e19	5,973	,040
e17	<-->	Buffetchoiceb	4,270	-,086
e17	<-->	veggieating	4,671	,083
e17	<-->	e25	4,081	,065
e16	<-->	e25	9,020	,078
e16	<-->	e24	5,178	-,051
e14	<-->	e25	8,009	-,078
e14	<-->	e17	4,701	-,093
e12	<-->	Perceived_health	4,233	-,048
e11	<-->	Perceived_health	5,320	,056
e11	<-->	e16	4,635	-,060
e9	<-->	e39	13,176	,136
e9	<-->	e38	13,795	,184

			M.I.	Par Change
e9	<-->	e36	4,875	,116
e9	<-->	e23	4,181	-,054
e9	<-->	e22	5,242	-,061
e8	<-->	e39	5,632	-,074
e8	<-->	e26	4,954	-,057
e8	<-->	e23	4,424	,046
e8	<-->	e17	4,381	,088
e7	<-->	e36	4,050	-,093
e7	<-->	e25	8,349	,082
e6	<-->	veggieating	9,016	-,063
e6	<-->	e37	4,894	,062
e6	<-->	e34	4,574	-,049
e5	<-->	Selfefficacy	7,731	-,039
e5	<-->	veggieating	10,685	,072
e5	<-->	e34	4,219	,050
e5	<-->	e26	5,062	-,040
e5	<-->	e11	13,526	,074
e5	<-->	e7	8,042	-,072
e2	<-->	e34	4,980	-,078
e2	<-->	e31	6,353	-,082
e2	<-->	e28	4,126	,071
e2	<-->	e25	5,077	,060
e2	<-->	e24	5,992	-,057
e2	<-->	e20	6,984	,065
e1	<-->	Buffetchoicea	5,433	-,082
e1	<-->	e26	4,545	-,059
e1	<-->	e24	8,512	,073
e1	<-->	e23	4,444	-,050
e1	<-->	e16	10,822	-,119
e1	<-->	e11	5,145	,071

Variances: (Group one - Default model)

	M.I.	Par Change

Regression Weights: (Group one - Default model)

			M.I.	Par Change
q14aNudgeattitudeKonkurrence	<---	q11eForaeldreopfordrer	9,445	,128
q14bNudgeattitudeGroensalat	<---	Responsibility	4,367	,163

			M.I.	Par Change
q14bNudgeattitudeGroensalat	<--	q14aNudgeattitudeKonkurrence	4,609	,095
q14bNudgeattitudeGroensalat	<--	q14cNudgeattitudeSkraemmekampagne	7,647	,112
q14bNudgeattitudeGroensalat	<--	q14eNudgeattitudeKendisser	5,986	-,132
q14bNudgeattitudeGroensalat	<--	q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	5,112	,146
q14bNudgeattitudeGroensalat	<--	q15bNudgeansvarSkolenspligt	4,862	,106
q14cNudgeattitudeSkraemmekampagne	<--	veggieating	4,233	-,132
q14cNudgeattitudeSkraemmekampagne	<--	q14bNudgeattitudeGroensalat	7,003	,111
q14cNudgeattitudeSkraemmekampagne	<--	q14fNudgeattitudePosterraad	4,137	-,117
q14cNudgeattitudeSkraemmekampagne	<--	q7cSelfefficacyDeterletformigatholdefastvedminepla	6,661	-,185
q14cNudgeattitudeSkraemmekampagne	<--	q8Hvorfysiskaktiverdu	5,672	-,122
q14eNudgeattitudeKendisser	<--	Responsibility	7,437	-,175
q14eNudgeattitudeKendisser	<--	q14bNudgeattitudeGroensalat	4,462	-,071
q14eNudgeattitudeKendisser	<--	q15bNudgeansvarSkolenspligt	7,833	-,111
q14eNudgeattitudeKendisser	<--	q15cREVERSEDIkkeskolensansvar	4,774	-,082
q14fNudgeattitudePosterraad	<--	q14cNudgeattitudeSkraemmekampagne	4,851	-,063
q14fNudgeattitudePosterraad	<--	q14iNudgeattitudeTilmeldeklub	7,647	-,090
q14gNudgeattitudeTilbudtmeregront	<--	q14fNudgeattitudePosterraad	4,677	,101
q14hNudgeattitudeAendrenavn	<--	Responsibility	5,132	-,136
q14hNudgeattitudeAendrenavn	<--	q14iNudgeattitudeTilmeldeklub	4,645	,076
q14hNudgeattitudeAendrenavn	<--	q7cSelfefficacyDeterletformigatholdefastvedminepla	4,792	-,118
q14hNudgeattitudeAendrenavn	<--	q15bNudgeansvarSkolenspligt	6,353	-,093
q14iNudgeattitudeTilmeldeklub	<--	q14fNudgeattitudePosterraad	6,286	-,130

			M.I.	Par Change
q15aNudgeansvarOkskoleindflydelse	<---	Buffetchoicea	5,482	,146
q15aNudgeansvarOkskoleindflydelse	<---	q13dBuffetvalgSundhed	5,452	,097
q15aNudgeansvarOkskoleindflydelse	<---	q15bNudgeansvarSkolenspligt	4,339	,083
q7aSelfefficacyJegkanaltidlosevanskeligeproblemer	<---	q7bSelfefficacyHvisnogenmodarbejdermigfinder	6,928	,107
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<---	veggieating	7,056	-,100
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<---	socialnorms	14,134	-,150
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<---	q7aSelfefficacyJegkanaltidlosevanskeligeproblemer	7,201	,116
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<---	q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	5,508	-,092
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<---	q11SpisermangeG	7,305	-,080
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<---	q11eForaeldreopfordrer	6,688	-,068
q7bSelfefficacyHvisnogenmodarbejdermigfinder	<---	q11fForaeldrespiser	12,761	-,106
q7cSelfefficacyDeterletformigatholdefastvedminepla	<---	Buffetchoicea	9,004	,143
q7cSelfefficacyDeterletformigatholdefastvedminepla	<---	veggieating	6,551	,101
q7cSelfefficacyDeterletformigatholdefastvedminepla	<---	Perceived_health	10,835	,159
q7cSelfefficacyDeterletformigatholdefastvedminepla	<---	q14cNudgeattitudeSkraemmekampagne	4,173	-,052
q7cSelfefficacyDeterletformigatholdefastvedminepla	<---	q12eBuffetvanerGrontsagerforst	8,773	,085
q7cSelfefficacyDeterletformigatholdefastvedminepla	<---	q13dBuffetvalgSundhed	12,337	,112
q7cSelfefficacyDeterletformigatholdefastvedminepla	<---	q13eBuffetvalgOekologi	4,085	-,055
q7cSelfefficacyDeterletformigatholdefastvedminepla	<---	q11SpisermangeG	6,056	,076
q7cSelfefficacyDeterletformigatholdefastvedminepla	<---	q8Hvorfysiskaktiverdu	15,876	,126
q7cSelfefficacyDeterletformigatholdefastvedminepla	<---	q4aEnigUenigJegersundere	11,261	,128
q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	<---	q14bNudgeattitudeGroensalat	5,352	,051

			M.I.	Par Change
q7fSelfefficacyJegkanlosedeflesteproblemerhvisjegyd	<---	q11eForaeldreopfordrer	6,579	-,057
q7gSelfefficacyJegbevarerroennaardererproblemerda	<---	q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	6,115	,096
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	Buffetchoiceb	6,721	,098
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	veggieating	4,697	,078
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	socialnorms	5,152	,087
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	Responsibility	14,806	,174
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	Attnudge	4,447	,086
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	q14hNudgeattitudeAendrenavn	4,690	,063
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	q13eBuffetvalgOekologi	6,898	,065
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	q11SpisermangeG	4,085	,057
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	q11bSpiserflereGendandre	4,097	,056
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	q15bNudgeansvarSkolenspligt	14,446	,106
q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	<---	q15cREVERSEDIkkeskolensansvar	5,652	,063
q7iSelfefficacyHvisjegerivanskelighederkanjegsomreg	<---	Perceived_health	4,294	-,081
q7jSelfefficacyLigemegethvadderskerkanjegsomregelk	<---	q14aNudgeattitudeKonkurrence	4,300	,056
q12eBuffetvanerGrontsagerforst	<---	veggieating	4,068	,124
q12eBuffetvanerGrontsagerforst	<---	socialnorms	5,064	,147
q12eBuffetvanerGrontsagerforst	<---	q11bSpiserflereGendandre	4,236	,098
q12eBuffetvanerGrontsagerforst	<---	q11fForaeldrespiser	5,789	,117
q13dBuffetvalgSundhed	<---	q7cSelfefficacyDeterletformigatholdefastvedminepla	6,254	,138
q13dBuffetvalgSundhed	<---	q15cREVERSEDIkkeskolensansvar	6,064	-,089
q13eBuffetvalgOekologi	<---	q7cSelfefficacyDeterletformigatholdefastvedminepla	6,432	-,149

			M.I.	Par Change
q11SpisermangeG	<--	Perceived_health	4,425	-,105
q11SpisermangeG	<--	q7bSelfefficacyHvisnogenmodarbejdermigfinder	4,455	-,099
q11SpisermangeG	<--	q4aEniguenigJegersundere	5,569	-,094
q11bSpiserflereGendandre	<--	Perceived_health	5,528	,123
q11bSpiserflereGendandre	<--	q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	6,172	,110
q11bSpiserflereGendandre	<--	q4bEniguenigJegspisersundere	12,349	,141
q11bSpiserflereGendandre	<--	q15cREVERSEDIkkeskolensansvar	4,703	,068
q11eForaeldreopfordrer	<--	Attnudge	7,339	,190
q11eForaeldreopfordrer	<--	q14aNudgeattitudeKonkurrence	19,305	,193
q11eForaeldreopfordrer	<--	q14bNudgeattitudeGroensalat	6,596	,103
q11eForaeldreopfordrer	<--	q14cNudgeattitudeSkraemmekampagne	10,227	,128
q11eForaeldreopfordrer	<--	q14fNudgeattitudePosterraad	5,076	,125
q11eForaeldreopfordrer	<--	q14hNudgeattitudeAendrenavn	4,038	,099
q11eForaeldreopfordrer	<--	q7fSelfefficacyJegkanlosedeflesteproblemerhvisjegyd	4,336	-,156
q11fForaeldrespiser	<--	q14aNudgeattitudeKonkurrence	5,422	-,085
q8Hvorfysiskaktiverdu	<--	q7bSelfefficacyHvisnogenmodarbejdermigfinder	6,066	,153
q8Hvorfysiskaktiverdu	<--	q7cSelfefficacyDeterletformigatholdefastvedminepla	10,580	,198
q8Hvorfysiskaktiverdu	<--	q7gSelfefficacyJegbevarerroennaarderererproblemerda	5,066	,127
q4aEniguenigJegersundere	<--	Buffetchoicea	9,895	-,128
q4aEniguenigJegersundere	<--	Buffetchoiceb	4,451	-,074
q4aEniguenigJegersundere	<--	veggieating	13,252	-,123
q4aEniguenigJegersundere	<--	q14eNudgeattitudeKendisser	5,757	-,071

			M.I.	Par Change
q4aEniguenigJegersundere	<---	q7cSelfefficacyDeterletformigatholdefastvedminepla	5,117	,086
q4aEniguenigJegersundere	<---	q13dBuffetvalgSundhed	7,736	-,076
q4aEniguenigJegersundere	<---	q11SpisermangeG	13,020	-,095
q4aEniguenigJegersundere	<---	q11bSpiserflereGendandre	10,443	-,084
q4bEniguenigJegspisersundere	<---	Selfefficacy	5,553	-,164
q4bEniguenigJegspisersundere	<---	Buffetchoicea	8,387	,124
q4bEniguenigJegspisersundere	<---	Buffetchoiceb	7,437	,101
q4bEniguenigJegspisersundere	<---	veggieating	15,019	,138
q4bEniguenigJegspisersundere	<---	q14eNudgeattitudeKendisser	4,973	,069
q4bEniguenigJegspisersundere	<---	q7bSelfefficacyHvisnogenmodarbejdermigfinder	8,945	-,122
q4bEniguenigJegspisersundere	<---	q7cSelfefficacyDeterletformigatholdefastvedminepla	5,956	-,097
q4bEniguenigJegspisersundere	<---	q7dSelfefficacyJegersikkerpaaatjegkanhaandtereuven	6,908	-,097
q4bEniguenigJegspisersundere	<---	q7eSelfefficacyTakketværeminepersonligeressourcer	5,078	-,085
q4bEniguenigJegspisersundere	<---	q7gSelfefficacyJegbevarerroennaardererproblemerda	4,386	-,077
q4bEniguenigJegspisersundere	<---	q13dBuffetvalgSundhed	6,626	,074
q4bEniguenigJegspisersundere	<---	q13eBuffetvalgOekologi	6,720	,063
q4bEniguenigJegspisersundere	<---	q13fBuffetvalgDyrevelfaerd	4,625	,054
q4bEniguenigJegspisersundere	<---	q11SpisermangeG	9,699	,086
q4bEniguenigJegspisersundere	<---	q11bSpiserflereGendandre	22,583	,130
q4bEniguenigJegspisersundere	<---	q8Hvorfysiskaktiverdu	5,724	-,068
q15bNudgeansvarSkolenspligt	<---	q7cSelfefficacyDeterletformigatholdefastvedminepla	4,644	,124
q15bNudgeansvarSkolenspligt	<---	q7hSelfefficacyNaarjegstoderpaaetproblemkanjegso	4,901	,124

			M.I.	Par Change
q15cREVERSEDIkkeskolensansvar	<---	q7bSelfefficacyHvisnogenmodarbejdermigfinder	4,497	-,135
q15cREVERSEDIkkeskolensansvar	<---	q13dBuffetvalgSundhed	6,368	-,113