A Quantitative Study to the Underlying Motives for Food Choices:

And How Do These Motives Contribute to Healthy Food Choices Among Dutch Young Adults?

"Tell me what you eat and I will tell you who you are."

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Abstract

Introduction: The aim of the present study was to explore the motivational factors underlying food choices among young adults and which factors contribute to healthy food decisions.

Method: Young adults' food choice motives and the nutritional value of their dietary intake were studied in a survey (*N* = 364). Twelve motivational factors were assessed: convenience, availability, natural content, weight benefits, sensory appeal, ecological welfare, price, familiarity, health concern, mood, subjective norm and organic concern. Also two moderation effects on food choices were examined: educational level and body mass index. The data were analyzed by use of a regression analysis (SPSS).

Results and conclusions: Results showed that young adults will make healthier food choices if they are concerned for their weight and their health. Also, organic concern will contribute to healthy food choices. On the other hand, when young adults have a high concern for familiar foods and their current emotional state (e.g. mood) when selecting foods, it will lead to unhealthy food decisions. A moderation effect was found for educational level and health concern, which indicates that young adults with high concern for health and a higher education level will make healthier food choices than those with high concern for health and a lower education level.

Implications: The factors that lead to healthy food decisions should be emphasized more towards young adults. In order to facilitate young adults in making healthy food decisions the availability of healthy foods should be ensured at places where young adults buy their food (e.g. school cafeterias, supermarkets and restaurants). The healthy foods should stand out among other products by the use of appealing food labels that provide information regarding calories, nutrition and proper portion sizes. Further research should explore whether these motivators (weight benefits, health concern and organic concern) are applicable in a broader perspective on health and well-being among young adults.

Keywords: Food Choice Motives, Dutch Young Adults, Millennials, Healthy Food Choices

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1. Introduction

In the last decades, the food environment of consumers has been changed excessively. As a consequence, the obesity rate is increasing worldwide. An analysis of McKinsey and Company (2011) showed that obesity will become, in the near future, the first cause of premature dead. As a consequence, obesity becomes the most expensive disease for the healthcare and government. A study of the World Health Organization (WHO), based on nationally available data from 2010, predicted that roughly half of the citizens in The Netherlands will become overweight in 2030. Also, young adults aged 18 to 25 years old are currently more obese and overweight than previous generations were and this trend will inevitably continue to worsen (Wang, Beydoun, Liang, Caballero, & Kumanyika, 2008).

Overweight and obesity are mostly caused by overeating and since young adults, also known as the generation Millennials, are continuously exposed to food consumption in stores, on the internet and through media, overeating becomes very tempting. Moreover, the availability of healthful foods is often limited at, for instance, colleges, cafeterias and vending machines and thus making healthful food choices is minimal encouraged. However, remarkable here is that the same generation also set in motion a movement towards healthy eating practices by demanding more healthy and fresh foods than their ancestors ever did (The NPD group, 2014). In another report, from Jeffries Alix Partners (2012), was also found that Millennials are less brand loyal and are more willing to engage in different distribution models to find specific attributes in foods such as organic, natural and specialty foods. So, young adults seem to be an interesting paradox regarding global food behaviors by means of the growing obesity rate among their generation and on the other hand their plea for more healthful and fresh foods.

A commonly used term to describe the current food environment was brought up by Brownell and Horgen (2004) and concerns the “toxic food environment”. People in Western cultures are exposed 24 hours a day by abundance of food, and due to new ways of distribution (e.g. online shopping) and food delivery services the daily physical activities are minimalized. Also, the variety of food products has taken a loop and has resulted in more processed food with an unusual high energy density. So, body weight changes as the food

and activity environment changes. As an example, laboratory animals maintaining normal weight on unlimited access to healthy food will gain vast amounts when energy-dense foods are added to the available choices (Fairburn & Brownell, 2002, p. 434). In addition, studies that analyzed obesity countries found an increase in obesity after the cultures become more modernized. So, the food environment has become obesogenic due to the increased supply of cheaper, pleasant, energy-dense foods; a faster distribution, which makes food more accessible, and due to more persuasive food marketing (Swinburn, Sacks, Hall, McPherson, Finegood, Moodie & Gortmaker, 2011). It is therefore challenging for consumers to make healthy food choices, prevent themselves from overeating and maintain an ideal (e.g. healthy) bodyweight.

Consumers make about 200 food choices every day (Voedingscentrum, 2014). These choices are based on different factors that lead additionally to healthy or unhealthy food choices. Some factors are difficult to influence because they are deeply rooted in, for instance, economic systems (e.g. price) or personal values (e.g. sensory appeal). Whereas other motivational factors are far more resilient because, for instance, the producer is able to adapt to new product norms so that it meets the consumer's demand (e.g. organic concern). However, the rapid changes in the food landscape have affected food choices and eventually human health with tremendous implications. Knowledge about the underlying motives for food selection among consumers could be used in the development of more health policies and campaigns to profile healthy eating. Therefore, it is important for health campaigns and food development to examine the sharing similar consumption patterns among young adults. Similarities that unify the group of young adults can be utilized in developing products or in more directed advertising, and thus can increase the degree of success in the market and increase the pleasantness from the consumer point of view (Pohjanheimo, Paasovaara, Luomala & Sandell, 2010).

This research examines twelve motivational factors underlying food choices among Dutch young adults and explores how these factors contribute to healthy food choices measured by a healthy food intake index that was adjusted to the Dutch guidelines for a healthy diet. As far as known, literature does not cover any data related to the twelve predictors for food choice motives and their contribution to healthy eating practices, in a Dutch context.

This study is a first step towards more healthy eating practices among Dutch young adults. Therefore, this study addresses the following research question:

RQ: What are the underlying food choice motives among young Dutch adults and how do these motives contribute to healthy food choices?

2. Theoretical framework

In this theoretical framework the relevant topics regarding this study will be discussed. First, the importance of healthy eating habits, according to young adults (e.g. Millennials) in The Netherlands, is elaborated. Second, the measurement that has been used in order to examine the healthfulness of a consumer's diet is discussed. Third, twelve predictors for food choices are further explained and also the expected moderating effects of education level and body mass index on food choices will be stressed out. The theoretical framework ends with the author's conceptual framework for the hypotheses.

2.1 Healthy eating habits among young adults

Millennials have much higher rates of obesity and less overall fitness than previous generations at the same age (Wang, Beydoun, Liang, Caballero, & Kumanyika, 2008). Also, Millennials (born between 1981 and 2000) are less likely now to identify themselves as overweight which results in less social pressure to expend effort to maintain an ideal body weight (Deal, Altman, & Rogelberg 2010). According to Millennials, one of the multiple factors underlying the obese epidemic is unhealthy behavior such as poor eating habits. Contradictory to this development is that research found that Millennials want more healthy and fresh ingredients than the older portion of the population ever did which signals a global trend towards healthy eating that will have major impacts on future eating behaviors (The NPD Group, 2014). These findings indicate that consumers are in the middle of a movement where disturbing statistics may have set in motion a global movement towards healthy eating. Contributive, Millennials acknowledge the importance of healthy eating practices, but also admit that they do not always eat as healthful as they would like (Greenblum, 2014). As far as known, only few qualitative studies have examined determinants of eating behavior among young adults. Results reported that lack of discipline and time, self-control, social support, product prices and limited budgets, and the availability of and access to (healthy) food options were important influencers of young adults eating habits (Greaney, Less, White, Dayton, Riebe, Blissmer, Shoff, Walsh, and Greene, 2009).

Young adults suggested that unhealthful foods served at college cafeterias contributed to overeating and made it challenging to eat healthy. Young adults also acknowledged that their study and work obligations made it difficult to exercise on a regular basis because of a lack of time but that exercising on a regular basis would benefit them in times of overindulgence (Greaney *et al.,* 2009). So, Millennials argue that it is very important to know what to eat and what not eat, and that they are willing to engage in a health-conscious lifestyle but they are not always models of good health (Heneghan, 2016).

2.2 What is a healthful diet and how is it measured in research?

Literature is kind of diffused when it comes to the constitution of a healthy diet. Some argue that the concept of nutrition is the focus for health-related behavior (Bisogni, Connors, Devine & Sobal, 2002), whereas others see it as maintaining a diet where only foods that contain no additives are consumed (Halkier, 2001; Harrison & Jackson, 2009). But, healthy eating habits have also brought in relation to the social context where an individual is together with its family consuming a home cooked meal (Neumark-Sztainer, Story, Ackard, Moe, & Perry, 2000). In the Dutch context the constitution of a healthy diet is provided by 'Het Voedingscentrum', a Dutch institution for nutrition. This organization, fully subsidized by the Dutch government, launches every year new and improved guidelines for a healthy diet. Het Voedingscentrum (2016) claims that the guidelines are scientifically proven and will help consumers choosing an optimal combination of products that provide health benefits, enough energy and all necessary nutrients. According to Het Voedingscentrum (2016) the following recommendations outline a healthful diet for a young adult (female):

- Fruit and vegetables; two portions of each per day.
- Whole-wheat products such as whole wheat bread and pasta or brown rice; 4 or 5 slices of bread per day and 4-5 servings of pasta or brown rice.
- Eat less meat and more plant-based products such as nuts, legume, fish and eggs (1 portion per day).
- Eat 2-3 portions of dairy products such as yoghurt, milk and <40 grams of cheese.
- Eat a handful of unsalted nuts every day (<25 grams).
- Only use soft and fluid greases such as oils (<40 grams a day).

- For good hydration (1,5l – 2l a day) drink water, tea and coffee.

Furthermore, Het Voedingscentrum (2016) recommends consumers to limit the amount of processed foods, sauces, sweets, cakes, snacks and juices to a maximum of 15 per cent of the total dietary intake because these products are not beneficial for a consumer's health.

The nutritional value of a consumer's dietary intake can be measured by a questionnaire that gathers information about the daily or weekly intake of foods. However, prior research related to healthy food choices often only included the consumption of fruit and vegetables in questionnaires and left out other nutrition groups (Brug, Debie, van Assema & Weijts, 1995; De Irala-Estevez, Groth, Johansson, Oltersdorf, Prattala & Martinez-Gonzalez, 2000). But, Dutch guidelines suggest that a healthy diet reflects an optimal combination of food products and nutrients (Het Voedingscentrum, 2016). A food intake index that combined more relevant nutrition groups was designed by The British Heart Foundation (2009) and was used as a tool for company employees and healthcare professionals to assess the nutritional value of their diet supplemented with nutrition information that would help them to consider changes in their diet. The questionnaire consists of seven nutrition groups (e.g. fruits/vegetables, fat, starch, sugars, salt, drinks/alcohol and eating habits) that are similar to the nutrition groups that were provided by Het Voedingscentrum and this questionnaire was therefore suitable for the present study.

2.3 Motivational factors in food selection

To date, many studies have attempted to identify factors that have influence on people´s food choice decisions (Gibson, 2006; Gardner, Wansink, Kim, & Park, 2014; Keller, and Siegrist, 2015; Ares, and Gambaro, 2007; Swan, Bouwman, Hiddink, & Aarts, 2015). What these studies found was that people´s life course experiences such as ideals, personal factors, resources, social contexts and the food context have major influences on food selection. Therefore, people develop a framework for food choice that fits their personal values. The first multidimensional scale for motivational factors related to food choice was designed by Steptoe and Pollard (1995). The scale, called the Food Choice Questionnaire, assesses a wide range of considerations that might be taken into account by individuals when choosing what to eat.

The multidimensional scale consisted of nine constructs, health-related and non-health related that influence food choice at the individual level: health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity, and ethical concern. The scale was later revisited by Lindeman and Vaananen (2002) who divided the motivational construct of ethical concern into three new predictors: ecological welfare, political motives and religion. However, since the factor political motives and the factor religion are not relevant to the Dutch context both factors are excluded from the present study and will not be discussed in the theoretical framework. Also, the construct of convenience was split up into two predictors: convenience and availability. Due to more recent literature, the author added two more concepts relevant for food choice behavior in the Dutch context: subjective norm and organic concern. So, twelve different concepts related to food choice will be discussed in the next section: convenience, availability, natural content, weight benefits, sensory appeal, ecological welfare, price, familiarity, health concern, mood, subjective norm and organic concern.

Convenience

In order to adjust to the faster societal pace consumers are living in they are demanding for meals that are easy to prepare. This has resulted in the development of more convenient food products in order to save the customer time for cooking and meal prepping (Gofton, 1995; Jekanowski, 1999) and also supermarkets are offering much more washed, packaged, pre-cut vegetables and pre-cooked meals (Jabs & Devine, 2006). Therefore, convenience foods such as ready-prepared food or fast foods become more popular (Bowers, 2000; Gleick, 1999). Convenience foods are defined by Capps, Tedford, and Haylicek (as cited in Jabs & Devine, 2006) as “fully prepared or partially prepared food items where some or all of the preparation time, culinary skills, or energy inputs are provided by the food processor–distributor rather than in the home-maker's kitchen”. As a consequence groceries have become one stop shopping locations where people can buy washed, packaged, pre-cut vegetables and pre-cooked meals (Jabs & Devine, 2006). However, they argue in their study that these food choices are associated with less healthful diets and may contribute to obesity and chronic health problems such as cardiovascular disease, diabetes, and cancer since prepared foods do not often meet health and nutrition goals compared to home-cooked meals. Therefore, the following hypothesis was formulated:

H1. A higher score for the factor ‘convenience’ will result in a lower score on the healthy diet index

Availability

The motivational factor ‘availability’ underlines the importance of the extent to which food products are obtainable within the consumer’s habitat. Noteworthy, the factor is not about the actual availability of foods but rather about the importance of purchasing foods in the nearby area. This means that consumers who score high on this factor are not willing to cover a longer distance to buy, for instance, healthy foods. So, consumers with this point of view are dependent on what is offered in stores nearby their houses or in college cafeterias. Studies showed that the food context could expand or constrain food choice possibilities by specific food supply factors in the environment such as types of food, food sources and availability of foods in the shops, including seasonal or market factors (Furst, Connors, Bisogni, Sobal & Falk, 1996). As a result, larger sized food stores have been shown to be more likely to stock healthful foods in contrast to smaller stores (Sallis, Nader, Rupp, Atkins & Wilson, 1986). Consumers that value the comfort of purchasing food at shops in their environment therefore depend on the availability of healthful foods in stores. However, the lack of a variety of healthful foods in local area stores, schools, cafeterias and restaurants could affect dietary patterns and contribute to the risk of obesity (Powell, Slater, Mirtcheva, Bao & Chaloupka 2007). So, prior literature suggests that depending on the food supply in the local area the motivational factor ‘availability’ could affect the intake of healthy foods.

H2. A higher score for the factor ‘availability’ will result in a lower score on the healthy diet index

Natural content

In the past two decades, consumers have an increased interest in environmental awareness which has led to concerns about the use of natural ingredients and packaging that may have an impact on food choice decisions (Steptoe & Pollard, 1995).

Foods that contain only natural content are free of additives and artificial ingredients.

Steptoe and Pollard (1995) found a positive correlation between age and natural content, which means that the older the consumer the more important this factor becomes. However, for the purpose of this study the selected subjects are young adults in the age of 18 till 25 years old. Therefore, this factor may not be of great importance for this target group, although, Millennials are demanding for more healthful and fresh ingredients (The NPD Group, 2014). Also, concern for natural content is strong associated with concern for health (Steptoe & Pollard, 1995). This means that consumers who seek for products that only contain natural ingredients are also concerned for products that benefit the body, hair, skin and so forth. Pohjanheimo (2010) found in a study on relationships between personal values and food choice motives that traditional consumers (e.g. older consumers) were more concerned about natural content in foods than hedonistic consumers (e.g. younger consumers). However, on the other hand Millennials are demanding for more healthful and natural foods (The NPD Group, 2014). The following hypothesis was formulated:

H3. A higher score for the factor 'natural content' will result in a higher score on the healthy diet index

Weight benefits

Efforts to prevent weight gain usually require some degree of control for food decisions. Researchers claim that "the Millennial generation has poor health habits, including inactivity and poor nutrition, which contribute to the early development of overweight and obesity" (Barkin, Heerman, Warren & Rennhoff, 2010, p. 240). Marcia Greenblumm (2014) explains that Millennials acknowledge the importance of healthy eating but they admit also that they do not always eat as healthfully as they would like. Therefore, they may not base their food decisions on whether it is beneficial for their weight but rather on other motivational factors. However, when consumers take into account weight benefits in choosing what to eat they choose merely for food that is low in fat or calories and thus helps them control their weight (Steptoe & Pollard, 1995). In a study among young Dutch adults it was investigated what they usually do to control their weight (Wammes, French & Brug, 2006). Results showed that almost 73 per cent of the young adults engaged in a certain weight gain prevention strategy over the last month.

Limiting sweets and snacks was most often mentioned as a strategy. Also, weight gain prevention strategies related to diet were far more popular than strategies related to physical activities. Noteworthy, however, the focus of the study was specifically on weight gain prevention strategies after occasions of overeating instead of weight control as a more general motivational factor for food decisions. Furthermore, in a study among American consumers the factor 'weight benefits' resulted in the lowest score of importance when choosing what to eat preceded by 'taste', 'cost', 'nutrition' and 'convenience' (Glanz, Basil, Maibach, Goldberg & Snyder, 1998). They also found that the more a consumer is living a healthy lifestyle the more one will take into account the nutrition and weight benefits in choosing what to eat. Additionally, the most health oriented group in the study appeared to have a higher food intake of fruits and vegetables (Glanz *et al. 1998)*. This stresses out that concern for weight benefits may result in a higher healthy diet score.

H4. A higher score for the factor 'weight benefits' will result in a higher score on the healthy diet index.

Sensory appeal

The factor sensory appeal consists of four statements related to appearance, smell and taste. Prior research has shown that sensory appeal is the most important influencer on food choice among consumers (Glanz *et al.,* 1998*;* Honkanen & Frewer, 2008). This means that appearance, smell and taste of food products are important in choosing what to eat. However, this does not suggest that this leads to healthy food choices but it could be used in order to make healthy food choices more appealing to consumers. In a Dutch survey (Brug, Debie, van Assema, & Weijts, 1995) it was found that 'good taste' was an essential condition for the consumption of fruit and vegetables. Further, a qualitative study among adolescents, using focus groups, revealed that their food choices are primarily influenced by hunger and food cravings, appeal of food (primarily taste), time considerations (of adolescents and parents), and convenience of food (Neumark-Sztainer, Story, Perry & Casey, 1999). Adolescents also suggested in this study that it would make it easier for them to eat more healthful foods if these foods would taste and look better.

Based on prior literature, sensory appeal is an important determinant in food choice but literature has also acknowledged that appealing foods are, however, not perceived as the healthful ones. Therefore, the following hypothesis is formulated:

H5. A higher score for the factor 'sensory appeal' will result in a lower score on the healthy diet index.

Ecological welfare

The motivational factor ecological welfare is derived from consumer's concern for nature, environment and animal welfare. To date, this concern is often addressed by suppliers by the use of quality marks (e.g. Fairtrade) that can be found on, for instance, the packages of meat, eggs and fish. Hallstrom, Carlsson, and Borjesson (2015) have studied the impact of a healthy diet (e.g. reducing the amount of animal products and meat) on the environment (e.g. reduce GHG emissions). Results showed that diets in which all animal products (vegan) and meat (vegetarian) were removed had the lowest GHG emissions. Additionally, research has confirmed that ecological concern also lead to a healthier diet. Amato and Partridge (1989) say in their book that health practitioners who base their diet on plant foods (instead of meat) have shown as a group to have fewer health problems and lived longer than meat-eaters. They also acknowledged that all essential nutrients were present in a plant based diet. Therefore, it is expected that:

H6. A higher score for the factor 'ecological welfare' will result in a higher score on the healthy diet index.

Price

Time and costs are perceived barriers for consumers to make healthy food choices (Williams, Thornton & Crawford, 2012). Healthy foods are in general more expensive than higher energy-density foods that are perceived as less healthful (de Mul, Waterlander, Steenhuis & Seidell, 2009). A study that examined the effect of price reduction strategies on food choices showed that during the price reduction period sales of fresh fruit increased four-fold (French, 2013). Also, larger packages of food products were relatively cheaper than smaller packages, but this also encouraged the consumption of greater quantities which might potentially lead to weight gain (Wansink, 1996).

So, when price is the most important factor for food choice the likelihood to engage in poor eating habits increases. A legitimate question is whether someone's level of income plays a role when the factor price is important in the food selection process. Millennials, for instance, are often students in college or just starting their career and will leave their parental house to live on their own and may therefore not have a high level of income (Anker, 2016). So, the likelihood that young adults prefer to buy cheaper foods increases. In addition, Irish adolescents also claim that they perceive costs as a major barrier to healthy eating practices even despite their level of income (Fitzgerald, Heary, Nixon & Kelly, 2010). This proves that healthful foods are more expensive than unhealthful foods. Young adults suggested that price incentive strategy could be useful for both healthy foods, by adding a price incentive, as for unhealthy foods, by removing the price incentive. So, the factor price basically measures the extent to which it is important for consumer to buy cheaper foods which are often higher energy-density foods, therefore the following hypothesis is formulated:

H7. A higher score for the factor 'price' will result in a lower score on the healthy diet index.

Familiarity

Consumers can be sometimes reluctant to try novel foods or foods that are unfamiliar to them (Raudenbush & Frank, 1999). They merely choose products that are familiar to them and this could result in a lack of diversity in their diet. But, diversity and eating varied nutrients is important in relation to a healthy diet (Het Voedingscentrum, 2016). The avoidance of, or reluctance to consume, novel foods is called food neophobia (Aldridge, Dovey & Halford, 2009) which is the opposite of food neophilia that is defined as the willingness to try novel foods (Raudenbush & Capiola, 2012). The willingness to try and like novel foods could be increased through exposure, increasing familiarity towards that food (Aldridge, Dovey & Halford, 2009). Consumers who perceive familiarity as the most important predictor for food choice may experience challenges in altering their dietary intake to engage in a healthy lifestyle.

The following hypothesis is formulated:

H8. A higher score for the factor 'familiarity' will result in a lower score on the healthy diet index.

Health concern

The motivational factor health concern was measured by Steptoe and Pollard (1995) by using statements related to the prevention of chronic disease (e.g. high in fiber and roughage) and to general nutrition and well-being (e.g. nutritious and 'keeps me healthy'). In a study about the perceived healthiness and willingness to try functional foods the researchers found that young people had a positive attitude towards functional foods (Ares & Gámbaro, 2007). Functional foods are foods where ingredients are added or removed in order to improve the healthfulness of the product (Voedingscentrum, 2016). For instance, a manufacturer adds extra fibers to its bread to stimulate a better functioning of the intestines. Furthermore, they found that young people have a preference for sugary foods with added functional ingredients (e.g. marmalade with extra fibers) instead of non-sugary foods such as yoghurt (Ares & Gámbaro, 2007). The factor health concern is also about the importance of the beneficial effects of foods for skin, teeth, hair and nails and prior research claims that concern for appearance may lead to healthy food choices (Hayes & Ross, 1987). The research suggests that some health behaviors are practiced because consumers are concerned with their appearance. For instance, women with a lower waist-to-hip ratio were judged to be more physically healthy and further, facially attractive people may be physically healthier than unattractive people (Shackelford & Larson, 1999). So, foods that are beneficial for the body and skin could increase one's attractiveness and perceived physical health and these foods might therefore be appealing to consumers. The following hypothesis is formulated:

H9. A higher score for the factor 'health concern' will result in a higher score on the healthy diet index.

Mood

Consumers may have the urge to buy specific food in order to feel better and thus mood can be a predictor for food choice. Shepherd and Raats (2006, p.113) define mood as a "psychological arousal state lasting at least several minutes and usually longer with interacting dimensions related to energy, tension and pleasure".

Individuals in a positive mood have evaluated healthy foods more favorably than snacks or fast-food because they are believed to put more emphasis on higher-level benefits such as future well-being (Gardner, Wansink, Kim & Park, 2014). As a result, consumers in a positive mood are more likely to buy food that are low in sugar and fat whereas those in a negative mood are more likely to eat foods that have a short-term effect (e.g. energy boost) that often contain more sugar and fat. However, in this study the focus is on the more negative emotions that may lead to food choices that make consumers cope with stress, helps them relax or keeps them awake. Based on previous literature, it is hypothesized that:

H10. A higher score for the factor 'mood' will result in a lower score on the healthy diet index.

Subjective norm

Subjective norm is defined by Ajzen (1985) as an individual's perception about the particular behavior, which is influenced by the judgment of significant others (e.g. parents, spouse, friends, teachers). It means that an individual's food selection process is influenced by for instance the behaviors of others. Because food is commonly consumed in social contexts, the social cues presented may affect eating behavior such as the amount of food consumers choose and the type of food items they select (Gal & Wilke, 2010; White & Dahl, 2006). Previous studies, for instance, have examined the impact of other people on decision-making in supermarket settings. As a result Argo, Dahl and Manchanda (2005) found that even non-interactive social presence (e.g. the mere presence of a stranger) in a retail setting can influence product choice. When other individuals were present, consumers selected more expensive, higher quality brands than when they were by themselves (Argo *et al., 2005*). Castro (2000) has found evidence that people increase their food intake with 33 per cent when eating with one other person and the food intake increases even more when there are more people present. Also, when people are in company of an overweight person their unhealthy food intake increase and their healthy food intake reduced (Shimizu, Johnson & Wansink, 2014).

Therefore, the following hypothesis is formulated:

H11. A higher score for the factor 'subjective norm' will lead to a lower score on the healthy diet index.

Organic concern

Another trend in food selection is caused by the rising popularity of organic food products. When choosing what to eat consumers then only select products that benefit society. For instance, the Amsterdam-based company Marie Stella Maris that reserves an amount of money for every sold product for funding water projects worldwide. This goes beyond the concern for health, because that is generally perceived as a egocentric motive because the individual's benefit is dominant in the selection process while organic concern is regarded as an altruistic motive because the benefits for society are placed above the personal benefits (Magnussen, Arvola, Hursti, Aberg, and Sjoden, 2003). The findings of a study among Swedish consumers the results showed that younger respondents are more likely to be positive towards organic foods than older respondents (Magnusson et al. 2003). There, the following hypothesis is formulated:

H12. A higher score for 'organic concern' will result in a higher score on the healthy diet index.

2.4 Moderation effects on food choices

Studies also found evidence that some demographical factors have a moderating effect on food choices. This means that the relationship between a motivational factor for food choice, such as 'price', and a score for the healthiness of one's diet is explained by a third variable, for instance education level. Two moderation effects are discussed in the following paragraphs.

Education level

Research found a relationship between education level and food choices (Johansson & Andersen, 1998; Van Rossum & Geurts, 2013). A higher education often leads to a higher consumption of the recommended intake of fruits and vegetables, and also for fibers and fish. Furthermore, educational level or income is often mentioned in relationship with poor health habits (Lynch, Kaplan & Salonen, 1997; Ross & Wu, 1995).

Unhealthy food choices that may lead to overweight or obesity are more often found in the lower income groups with a lower education level (Klohe-Lehman *et al.,* 2006).

Individuals with a higher education, income and social status have a higher consumption of fruit and vegetables than those with lower education, income and social class status (Johansson & Andersen, 1998). Studies among Dutch consumers have found the same results for the consumption of fruit and vegetables, but also for the consumption of fibers and fish (van Rossum & Geurts, 2013). Therefore, the following hypothesis is formulated:

H13. A young adult's educational level has a moderating effect on all twelve predictors for food choice

Body Mass Index

Body Mass Index (BMI) is one of the most commonly used measures of obesity. It is calculated by dividing the body weight with the square of height (kg/m2). For example, a participant with a height of 1.80 meters and a weight of 75 kilogram has a bmi score of 23.1 (e.g. healthy body weight). The interpretation of the bmi scores are explained in Table 1.

Table 1. Interpretation BMI scores (Stratton, Green, and Elia, 2003; Sorkin, Muller, and Andres, 1999).

< 18.9	underweight
19.0 – 24.9	Healthy weight
25.0 – 29.9	Overweight
30.0 <	Obese

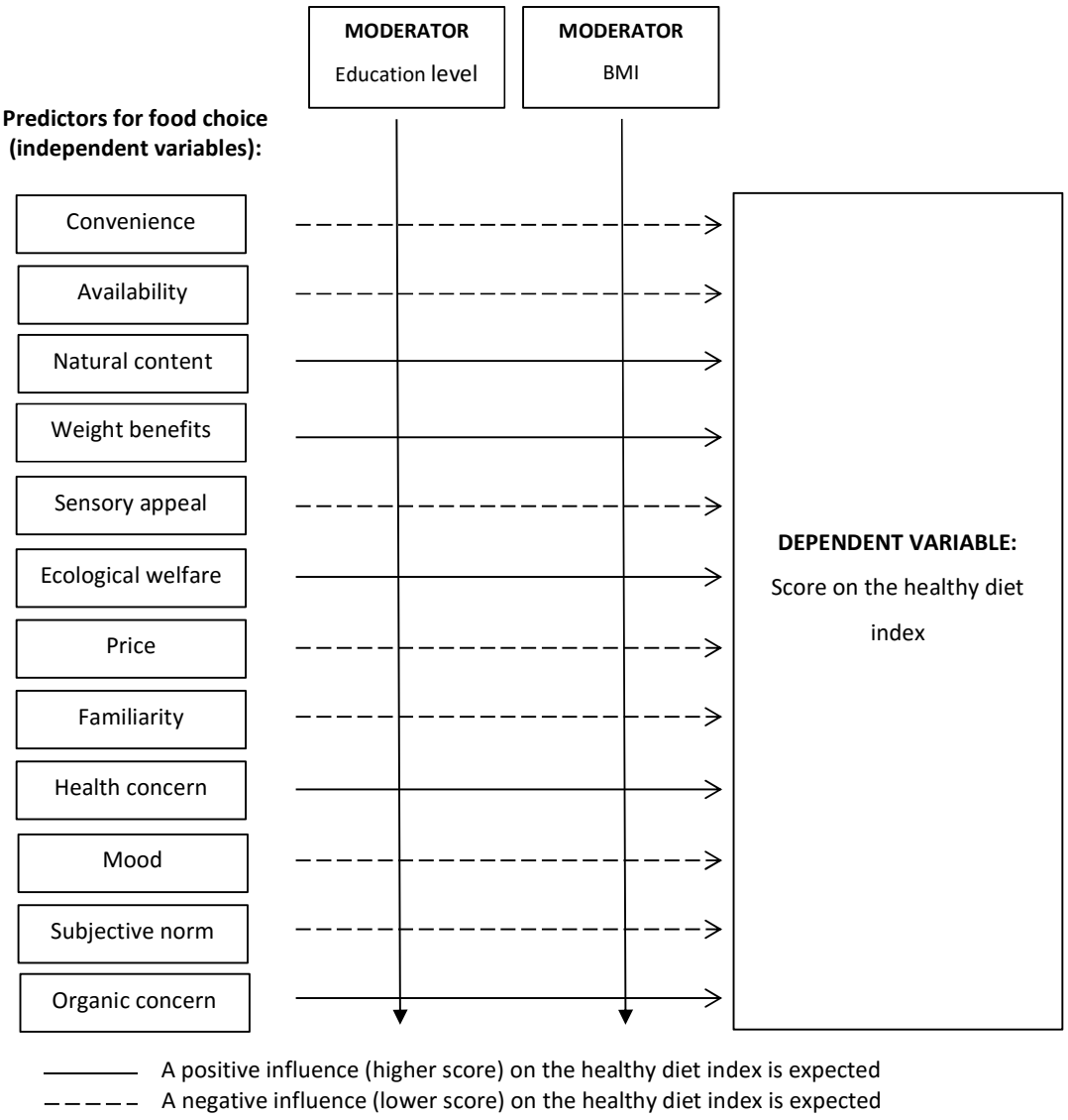
Research showed that food intake has impact on one's body mass index. Overweighed teenagers reported significantly higher intakes of sugary and higher fat foods than normal weighed teenagers (Fuller, Levy, Dehamer & Young Hong, 2014). Despite the popularity of this measurement some claim this instrument is an inaccurate measure because it does not take into account muscle mass, bone density and overall body composition say researchers from the Perelman School of Medicine, University of Pennsylvania (As cited by Nordqvist, 2013). They therefore suggest to use also additional measurements, such as waist circumference, in studies on a person's body health. The following hypothesis is formulated:

H14. A young adult's body mass index has a moderating effect on all twelve predictors for food choice

2.5 Conceptual framework

Based on these theoretical findings and hypotheses the following conceptual framework (Figure 1) was designed for this study.

Figure 1. Conceptual framework 'Predictors for food intake'



3. Method

In the present study the underlying motives for food selection are examined for young adults, whereas the twelve predictors for food selection are expected to have influence on the healthiness of their dietary intake. In order to test which predictors for food selection lead to a healthy diet a questionnaire was developed that collected data about the importance of the described twelve predictors for food selection and data regarding the food intake of young adults. A part of the questionnaire was originally designed by Steptoe and Pollard (1995) and was re-translated in Dutch and back translated in English by two independent translators to ensure accuracy and maximize linguistic equivalence. For the purpose of this research a pretest was conducted in a small focus group with three females ages 21, 23, and 24. They were assigned to check the spelling, readability and logic of the questionnaire. The survey has been more applied to the target audience. Furthermore, all predictors that influence food choices were discussed and that led to the exclusion of the two concepts of 'religion' and 'political motives' (from the original multidimensional scale from Steptoe and Pollard) due to irrelevance for the target group of young adults. So, both concepts were not used in this study. Information about the procedure, the research instrument, subjects and statistical analysis is further elaborated in this chapter.

3.1 Procedure

For this quantitative study a digital questionnaire, created in Qualtrics, was used. Subjects were mostly approached via social media (e.g. Facebook) and e-mail or were recruited from the Novio Research Panel. Subjects were provided with an URL link to the questionnaire. The questionnaire consists of three parts. In the first part subjects were asked about their age, gender, level of education, length and weight. Also, it was made clear that participation was anonymous and that there are no false or right answers. In the second part the participants were asked to endorse the statement "It is important to me that the food I eat on a typical day…" for each of the 43 items by choosing between seven responses ranging from not at all important – very important, scored 1 to 7.

The scale covered the following 12 predictors for food choice: convenience, availability, natural content, weight benefits, sensory appeal, ecological welfare, price, familiarity, health concern, mood, subjective norm and organic concern. The third part of the survey the participant's eating practices were assessed by examining their average consumption, based on the national recommended guidelines according to the Voedingscentrum (2016), of the following seven nutrition groups: fruits/vegetables, fat, starch, sugars, salt, drinks/alcohol, eating habits. These questions could be answered by yes or no (e.g. dichotomous scale). After finishing the questionnaire the participant was thanked for his or her participation.

3.2 Instrument

The two scales that were used in the questionnaire are discussed in this paragraph. The first scale measures the motives underlying the selection of food and was designed by Steptoe and Pollard (1995) and was later revisited by Lindeman and Vaananen (2000). However, two concepts from the existing scale were removed (political motives and religion) and two concepts were added (subjective norm and organic concern). So, the scale that was used in the present study covered twelve predictors for food choice: convenience, availability, natural content, weight benefits, sensory appeal, ecological welfare, price, familiarity, health, mood, subjective norm and organic concern. The items of the scale and the reliabilities of the predictors (Cronbach's alphas) are presented in Table 2.

Table 2. Predictors for food choice - items and Cronbach's alpha scores

Motivational factors and items	Cronbach's alpha
It is important for me that the food I eat on a typical day:	
1. Convenience (Steptoe & Pollard, 1995)	0.87
- Is easy to prepare	
- Can be cooked very simply	
- Takes no time to prepare	
2. Availability (Lindeman & Vaananen, 2000)	0.63
- Can be bought in shops close to where I live or work	
- Is easily available in shops and supermarkets	
3. Natural content (Steptoe & Pollard, 1995)	0.87
- Contains no additives	
- Contains natural ingredients	
- Contains no artificial ingredients	
4. Weight benefits (Steptoe & Pollard, 1995)	0.80
- Is low in calories	
- Helps me control my weight	
- Is low in fat	
5. Sensory appeal (Steptoe & Pollard, 1995)	0.66
- Tastes good	
- Smells nice	
- Has a pleasant texture	
- Looks nice	
6. Ecological welfare (Lindeman & Vaananen, 2000)	0.91
- Has been produced in a way that animals have not experienced pain	
- Has been prepared in an environmentally friendly way	
- Has been produced in a way that animals' rights have been respected	
- Has been produced in a way which has not shaken the balance of nature	
- Is packaged in an environmentally friendly way	
7. Price (Steptoe & Pollard, 1995)	0.72
- Is not expensive	
- Is good value for money	
- Is cheap	
8. Familiarity (Steptoe & Pollard, 1995)	0.53
- Is familiar	
- Is like the food I ate when I was a child	
9. Health concern (Steptoe & Pollard, 1995)	0.79
- Is high in fiber and roughage	
- Is nutritious	
- Contains a lot of vitamins and minerals	
- Keeps me healthy	
- Is high in protein	
- Is good for my skin/teeth/hair/nails, etc.	

10.	Mood (Steptoe & Pollard, 1995)	0.84
-	Cheers me up	
-	Helps me cope with stress	
-	Keeps me awake/alert	
-	Helps me relax	
-	Makes me feel good	
-	Helps me to cope with life	
11.	Subjective norm	0.69
-	When I eat with others, I usually eat the same as they eat	
-	In general, I eat the same food as the people who are important to me *(Fishbein & Azjen, 1975)*	
12.	Organic concern	0.90
-	I prefer to eat organic	
-	I buy food that has an organic label or certification on the package	
-	I eat organic and I am willing to pay more for it	

In the second part the participant's eating practices were assessed by examining their average consumption, based on the national recommended guidelines according to the Voedingscentrum (2016), of the following seven nutrition groups: fruits/vegetables, fat, starch, sugars, salt, drinks/alcohol, eating habits. For the purpose of this study, the questions were adapted to the Dutch guidelines. For instance, instead of 'do you regularly eat wholegrain cereals without adding sugar?' the question was edited because the suggestion of 'regularly' could raise questions, therefore it was changed to 'I prefer to eat wholegrain cereals such as granola and muesli without added sugars'. If there was scientific data available from the Voedingscentrum that provided more quantified recommendations, than the question was also changed (original question 'do you regularly eat cakes, sweets and chocolates?', new question 'I eat more than three times a week cakes, sweets and chocolates?). In total, the food intake questionnaire consisted of 27 questions and for each question the participant could score 1 point if they answered 'yes' and for some questions they received 1 point if their answer was 'no'. So, the higher the score the more healthful the diet and the food choices were perceived. The complete rationale for dietary scoring is presented in Table 3. The variable 'total dietary score' was computed by taking the sum of the self-reported intake regarding the seven nutrition groups. The total dietary scores ranged from the lowest 0 to the highest 27. The higher the total dietary score the more the participant complies with the Dutch dietary recommendations regarding the seven nutrition groups.

Table 3. The Healthy Diet Index

Nutritional groups:		**Score:**
1.	Fruits/vegetables	
-	daily basis: at least 5 portions of fruit and/or vegetables	Yes=1, No=0
-	weekly basis: more than 4 different kinds of fruit	Yes=1, No=0
-	weekly basis: more than 4 different kinds of vegetables	Yes=1, No=0
2.	Fat	
-	I prefer to eat products that are low in fat	Yes=1, No=0
-	I prefer to eat baked, steamed or grilled food instead of fried food	Yes=1, No=0
-	I choose for lean meat or remove the visible fat	Yes=1, No=0, NA=1
-	I eat at least once a week fat fish like mackerel, tuna or salmon	Yes=1, No=0, NA=1
3.	Starch	
-	As a basis for my meals I choose potatoes, whole-wheat bread, whole-wheat pasta or brown rice or alternatives like quinoa or buckwheat.	Yes=1, No=0
-	I prefer to eat whole-wheat bread instead of white bread	Yes=1, No=0, NA=1
-	I prefer to eat wholegrains cereals for breakfast with no sugars added	Yes=1, No=0
-	I eat at least once a week legumes such as beans and lentils	Yes=1, No=0
4.	Sugars	
-	On a weekly basis I eat more than two times sugared cereals or I add sugar to my cereals	Yes=0, No=1
-	I add sugar to my tea or coffee	Yes=0, No=1
-	On a weekly basis I drink more than 6 glasses of soda or sweet-ened juices	Yes=0, No=1
-	On a weekly basis I eat more than 3 times a piece of cake, candy or chocolate	Yes=0, No=1
5.	Salt	
-	I add salt to my food when I am cooking	Yes=0, No=1
-	I add salt to my food at the table	Yes=0, No=1
-	I eat more than 3 times a week a portion of pretzels, potato chips or salted nuts	Yes=0, No=1
-	I eat more than 2 times a week a ready-made meal	Yes=0, No=1
-	I eat more than 2 times a week processed meat	Yes=0, No=1, NA=1
-	According to my doctor I have a high blood pressure	Yes=0, No=1
6.	Drinks and alcohol	
-	I drink at least 6-8 glasses of water	Yes=1, No=0
-	<u>For women:</u> on a weekly basis I drink not more than 5 glasses of alcohol.	Yes=1, No=0
	<u>For men:</u> on a weekly basis I drink not more than 10 glasses of alcohol.	Yes=1, No=0
7.	Eating habits	
-	I skip my breakfast more than once a week	Yes=0, No=1
-	I skip my lunch more than once a week	Yes=0, No=1
-	I skip my diner more than once a week	Yes=0, No=1
-	I skip meals on a regular basis and eat a snack instead	Yes=0, No=1

3.3 Respondents

The survey was completed by 495 respondents. However, some surveys were incomplete or the subject did not fit the age requirements of 18 to 25 years old. So, finally a total of 364 participants were suitable for the analysis. The mean age of the participants was 21.88 (SD = 2.85) with a minimum age of 18 and a maximum age of 25. Of the participants, 283 (77.7%) were female, and 81 (22.3%) were male. Furthermore, more than two third of the respondents (68.4%) had a higher degree in education or a university degree. Table 4 shows the demographic information of the participants.

Table 4. Respondents' characteristics

Measure	Items	Mean	Std. dev.
Age		21.9	2.6
BMI		22.4	3.7
		Frequency	Percent
Gender	Male	81	22.3
	Female	283	77.7
Education level	High school	60	16.5
	Middle- level applied education (MBO)	55	15.1
	Higher professional education (HBO)	120	33.0
	Scientific education (WO)	129	35.4
Total respondents		364	

3.4 Statistical analysis

Data were analyzed using SPSS 21.0 for Windows. In this part, the statistical analyses that were used are described. First, the Cronbach's alpha scores for the internal consistency of the twelve food choice motives were measured and the results are presented in Table 3.

The individual motivational factors consisted of at least two items with all an internal reliability coefficient (Cronbach's alphas) that ranged from the lowest Cronbach's α = .63 to the highest Cronbach's α = .91. Noteworthy, a Cronbach's alpha of .7 is acceptable (Nunnaly, 1978).The Cronbach's alphas for familiarity and availability were .53 and .63 respectively and therefore far below acceptable level. But, since these concepts only consist of two items the factors were not removed and have been used for the data analysis. Second, the mean scores for the twelve food choice motives were calculated. A 7-point Likert scale was used so therefore the mean scores lie somewhere between 1 and 7. Third, a regression analysis was performed to see which factors have statistical significant influence on the score for healthy eating practices. To see whether the factors education level and body mass index have a moderating effects on food choices also a regression analysis with moderator was executed. Fourth, the correlations between the food choice motives were calculated by using the Spearman's rank correlation coefficient. The results of the performed tests are described in the next chapter.

4. Results

In this chapter the statistical analysis will be presented and it becomes then clear if the 14 hypotheses can be confirmed. Furthermore, the correlations coefficients between the different motivational factors are reported.

4.1 Mean scores for the food choice motives

Availability (*M* = 5.3) and sensory appeal (*M* = 5.2) were by far the most important determinants of food choice among young adults. These findings correspond with previous findings among Russian consumers (Honkanen & Frewer, 2009). Also, in the existing literature, the motivational factor of sensory appeal was found to be most decisive for food choice, often followed by the motive availability. Furthermore, the factor health (*M* = 4.9) and price (*M* = 5.1) were indicated as important motives for food selection. The least important motives for food choice among young adults were organic concern (*M* = 3.5) and familiarity (*M* = 3.5).

Table 5. Mean values for the food choice motives among Dutch young adults

Food Choice Motives	means	standard deviations
Availability	5.32	0.98
Sensory appeal	5.20	0.84
Price	5.05	0.94
Health concern	4.90	0.88
Convenience	4.64	1.15
Subjective norm	4.52	1.28
Mood	4.39	1.00
Weight benefits	4.38	1.22
Natural content	4.16	1.38
Ecological welfare	3.99	1.28
Organic concern	3.54	1.40
Familiarity	3.50	1.23

4.2 Test of the hypotheses

A multiple regression analysis was performed with the score on the healthy diet index as dependent variable and convenience, availability, natural content, weight benefits, sensory appeal, ecological welfare, price, familiarity, health concern, mood, subjective norm and organic concern as independent variables. A *p* value of .05 was set at the significance level. Table 6 shows the results of the multiple regression analysis of the twelve predictive factors in the hypotheses.

Table 6. Multiple regression analysis including all predictors for a healthy diet score (*N* = 343)

Predictors:	*B*	*SE B*	β	*t*	*p* value
(Constant)	13.581	1.548		8.772	.000**
1. Convenience	-.328	.203	-.099	-1.616	.107
2. Availability	.412	.226	.106	1.823	.069
3. Natural content	-.128	.207	-.046	-.615	.539
4. Weight benefits	.735	.165	.234	4.444	.000**
5. Sensory appeal	.079	.227	.017	.347	.729
6. Ecological welfare	.289	.241	.097	1.196	.232
7. Price	-.351	.208	-.086	-1.687	.093
8. Familiarity	-.687	.158	-.221	-4.337	.000**
9. Health concern	1.158	.280	.268	4.138	.000**
10. Mood	-.632	.202	-.164	-3.129	.002*
11. Subjective norm	-.144	.139	-.048	-1.034	.302
12. Organic concern	.479	.215	.176	2.233	.026*

* Significance at the level of < .05
** Significance at the level of < .001.

The results of the regression indicated that the 12 predictors explained 35.6% of the variance in the score on the healthy diet index (R^2 = .36, F(12,343)= 15,818, p < .000).

Confirmed hypotheses

The results also show that a participant will score higher on the healthy diet index when they score high on the factor weight benefits (β = .23), this increase in the diet score was statistically significant at the level of .001. Statistical evidence was also found for the factor health concern (p < .000), a higher score for health concern predicts a higher score on the healthy diet index (β = .26). And this study confirmed that a higher score on the factor organic concern will lead to a higher score on the healthy diet index (β = .17, p < .02).

The results showed that a higher score on factor familiarity predicted a lower score on the healthy diet index (β = -.22) and this finding was statistically significant at the level of .001. Furthermore, a higher score on the factor mood leads to a lower score on the healthy diet index (β = -.164), this finding was statistically significant at the level of .05.

Not confirmed hypotheses

The results showed that a higher score on the factor convenience does lead to a lower score on the healthy diet index (β = -.09) but was not statistically significant ($p < .10$). A higher score for the factor availability results in a higher score on the healthy diet index (β = .10), but was not statistically significant ($p < .06$). The factor natural content was assumed to have positive influence on the healthy diet score but a negative beta coefficient of -.04 was found instead, however this effect was not significant ($p < .53$). Furthermore, the factor sensory appeal appears to have nearly no influence on a participant's diet score (β = .01), but no significance evidence was found to confirm this ($p < .72$). Ecological welfare had a positive influence on the healthy diet score (β = .09), but this was not statistically significant ($p < .23$). A higher score on the factor price has a negative influence on a participant's diet score (β = -.08), however, no statistical evidence was found ($p < .09$). And, no evidence was found for that a lower score on the factor subjective norm would lead to a higher score on the healthy diet index (β = -.04, $p < .30$).

Based on the results, a higher score on the factors weight benefits, health and organic concern will lead to a higher score for healthy eating practices. A higher score on the factors familiarity and mood will lead to a lower score for healthy eating practices.

4.3 Correlations between motivational factors

The correlations for the significant predictors were calculated by using the Spearman's rank correlation coefficient. The correlations determine the strength of the relationship between the factors where coefficients between .10 and .29 represent a small association; coefficients between .30 and .49 represent a medium association to large association; and coefficients above .50 represent a large associate or relationship (Kendall & Gibbons, 1990). As an example, If a strong positive association is found the ranking score for both factors will be the same, on the other hand if a negative association is found a high ranking score on 'factor 1' relates to a low ranking score on factor 2 (Van der Zee, 2015). Table 7 presents the correlation coefficients and the significance level of the predictors for food choice.

Table 7. Spearman's correlation coefficients R_s for between the 12 ranked predictors for food choice.

N = 356	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
1. Convenience	-											
2. Availability	.58**	-										
3. Natural content	-.09	-.01	-									
4. Weight benefits	-.01	0.08	.39**	-								
5. Sensory appeal	.09	.22**	.08	.07	-							
6. Ecological welfare	-.08	-.02	.68**	.24**	.19**	-						
7. Price	.39**	.43**	-.05	-.06	.24**	-.00	-					
8. Familiarity	.36**	.12*	.03	.10*	.23**	.10	.13**	-				
9. Health	-.07	.13**	.62**	.48**	.19**	.48**	.05	.01	-			
10. Mood	.17**	.15**	.29**	.28**	.29**	.31**	.12*	.29**	.38**	-		
11. Subjective norm	.09	.15**	-.07	.12*	.14**	.02	.24**	.03	.01	.18**	-	
12. Organic concern	-.10*	-.10	.68**	.22**	.05	.78**	-.10*	.09	.41**	.27**	-.01	-

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

The Spearman's Rho revealed some strong associations between the motivational factors. The factor convenience showed high positive correlations with the factors availability (R_s [356] = .58, p < .000), price (R_s [356] = .39, p < .000) and familiarity (R_s [356] = .36, p < .000). Furthermore, high positive correlations were found between weight benefits and the factors natural content (R_s [356] = .39, p < .000), ecological welfare (R_s [356] = .68, p < .000), health (R_s [356] = .62, p < .000) and organic concern (R_s [356] = .68, p < .000). A very strong association was found between the factors ecological welfare and organic concern (R_s [356] = .78, p < .000). And participants who had a high rank for the factor health appear to would also have a high rank for the factors mood (R_s [356] = .38, p < .000) and organic concern (R_s [356] = .41, p < .000).

Small positive associations were found between the factor convenience and the factors mood (R_s [356] = .17, p < .001) and organic concern (R_s [356] = .10, p < .04).

For the factor availability there were small associations found with the factors sensory appeal (R_s [356] = .22, p < .000), familiarity (R_s [356] = .12, p < .02), health (R_s [356] = .13, p < .009), mood (R_s [356] = .15, p < .003), and subjective norm (R_s [356] = .15, p < .003). A small association was found for the factor natural content and mood (R_s [356] = .29, p < .000). Furthermore, the factor weight benefits was small correlated with the factors ecological welfare (R_s [356] = .24, p < .000), familiarity (R_s [356] = .10, p < .04), mood (R_s [356] = .28, p < .000), subjective norm (R_s [356] = .14, p < .02), and organic concern (R_s [356] = .22, p < .000). There were small positive association found between the factor sensory appeal and the factors ecological welfare (R_s [356] = .19, p < .000), price (R_s [356] = .24, p < .000), familiarity (R_s [356] = .23, p < .000), health (R_s [356] = .19, p < .000), mood (R_s [356] = .29, p < .000), and subjective norm (R_s [356] = .14, p < .008). The factor price had a small positive association with the factor familiarity (R_s [356] = .13, p < .008) and mood (R_s [356] = .12, p < .017).

A significant negative association was found between organic concern and the factor price (R_s [356] = -.10, p < .04) and convenience (R_s [356] = .10, p < .04).

4.4 Moderation effects

Educational level and body mass index were predicted to have a moderating effect on all twelve predictors for food choices. For instance, a higher score on the factor health concern and a higher educational level will lead to a higher score on the healthy diet index. To see whether there are interaction effects between the twelve predictors and the moderator factors body mass index and education level a regression analysis with moderator was performed. The formulated hypotheses were:

H13. A young adult's educational level has a moderating effect on all twelve predictors for food choice

H14. A young adult's body mass index has a moderating effect on all twelve predictors for food choice

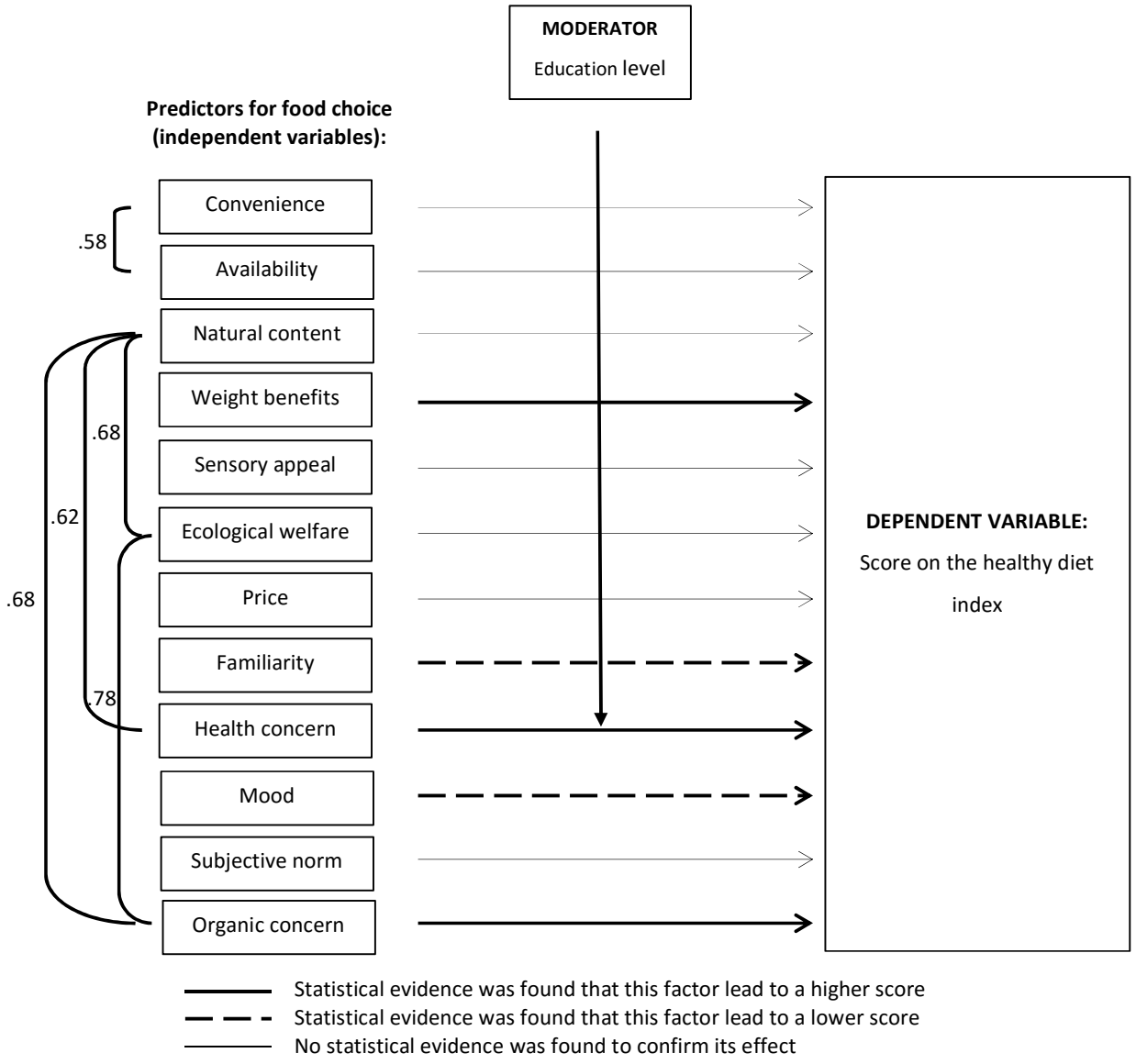
Educational level was examined as a moderator between the twelve predictors and a score on the healthy diet index. In the second model the moderator educational level was entered, and it explained a significant increase in variance in the healthy diet score, ΔR^2= .391, F (38, 317) = 5.354, p < .000.

An interaction effect was found between a high concern for health and a high education, which will lead to a higher score for healthy eating practices (β = .478, $p < .000$). The other eleven predictors did not show an interaction effect with education level.

Body mass index was also examined as a moderator between the twelve predictors and a score on the healthy diet index. However, no interaction effects were found.

To complete the statistical analysis section, the conceptual framework is presented in Figure 2 with the research findings included. For the correlations between the motivational factors only the coefficients that were equal or higher than .50 are included.

Figure 2. Conceptual framework 'predictors for food choice' with statistics included



5. Discussion

The aim of this study was to gain a better understanding about the underlying motives for food choices among young Dutch adults. To do so, twelve predictors for food choice were compared on the basis of their influence on the healthy eating habits of the respondents and two moderating effects were examined. A total of fourteen hypotheses were formulated in order to examine the significant influence of the twelve food choice predictors and the two moderating effects. The hypotheses were confirmed or rejected and the outcomes are presented below:

H1. A higher score on the factor 'convenience' will result in a lower score on the healthy diet index. (Rejected)

H2. A higher score on the factor 'availability' will result in a lower score on the healthy diet index. (Rejected)

H3. A higher score on the factor 'natural content' will lead to a higher score on the healthy diet index. (Rejected)

H4. A higher score on the factor 'weight benefits' will result in a higher score on the healthy diet index. (Confirmed)

H5. A higher score on the factor 'sensory appeal' will result in a lower score on the healthy diet index. (Rejected)

H6. A higher score on the factor 'ecological welfare' will result in a higher score on the healthy diet index. (Rejected)

H7. A higher score on the factor 'price' will result in a lower score on the healthy diet index. (Rejected)

H8. A higher score on the factor 'familiarity' will result in a lower score on the healthy diet index. (Confirmed)

H9. A higher score on the factor 'health concern' will result in a higher score on the healthy diet index. (Confirmed)

H10. A higher score on the factor 'mood' will result in a lower score on the healthy diet index. (Confirmed)

H11. A higher score on the factor 'subjective norm' will result in a lower score on the healthy diet index. (Rejected)

H12. A higher score on the factor 'organic concern' will result in a higher score on the healthy diet index. (Confirmed)

H13. A young adult's educational level has a moderating effect on all twelve predictors for food choice. (Partly confirmed)

H14. A young adult's body mass index has a moderating effect on all twelve predictors for food choice. (Rejected)

In this chapter the findings of the statistical analysis and the implications and limitations of this study will be discussed. Also, some recommendations will be given for future research.

5.1 General discussion

Concern for weight benefits turns out to be a predictor for healthier food choices. This outcome corresponds with prior research that indicated that consumers who endorse a healthy lifestyle are more concerned about weight benefits and appear to consume more fruits and vegetables (Glanz *et al.,* 1998). Products that are low in fat and calories are in this study perceived as foods that benefit bodyweight. However, it turned out that consumers rather focus on the hedonic attributes of food, such as tastefulness, that are mostly assigned to foods that are high in calories (Papies & Veling, 2013). Also, young adults indicated in this study that sensory appeal is important for them when choosing what to eat. So, in an attempt to help young adults making healthier food choices it is necessary to make healthy foods more appealing for young adults (e.g. change flavor or color).

The second factor that contributes to healthier food choices is concern for health which emphasizes the nutritional value of foods that protect consumers against diseases and that have positive effects for their physical appearance. According to literature, concern for physical appearance appears to be an important motivator to lose some weight among young adults (LaRose, Leahey, Hill & Wing, 2013). Also, with the popularity of social media, such as Instagram, the focus on body image by sharing visual images is increased. The heavy online presence of young adults can influence body image perceptions and body image disturbance that may encourage them to lose some weight or in worse cases could lead to eating disorders (Perloff, 2014). Concern for health also refers to nutrients that contain a lot of vitamins and minerals or are high in protein which give consumers more energy, a better health resistance and are beneficial for bones and muscles. Moreover, young adults are demanding for fresh and healthier foods which stress out the importance of concern for health among them.

The intake of micronutrients such as vitamins has dropped since 1987 for a part of the population in The Netherlands (TNO (1998) as was cited in van Rossum and Geurts, 2013), but producers are responding to this decrease by enriching the foods with supplements such

as vitamin C (Hulshof et al., 2004; Van Rossum et al., 2011). This suggests that society already has embraces tools to help consumers make healthier food choices by enriching foods with more vitamins or by emphasizing the beneficial ingredients in products on packages.

The third predictor for healthier food choices is organic concern. This predictor is, compared to weight benefits and health concern, not directly related to an individual's health but rather with concern for environment and society. That this food choice predictor leads to healthier food choices is an interesting finding because it suggests that concern for society and environment when choosing what to eat will result in healthy eating habits. This can be explained by prior literature that has shown that organic foods are more tasteful, have better quality, safety and impact on health and thus environment (Robinson, Segal, & Segal, 2016). On the other hand the willingness to buy organic foods is often limited due to perceived higher costs, the foods look less appealing and are likely to decay or go bad quickly or are not available in shops. Despite this, consumers' interest in organic food production and consumption is growing and so is the potential role of sustainability as a product attribute in consumers' evaluation of products (de Boer, Boersema and Aiking, 2009).

Noteworthy is that this study also found two predictors (e.g. familiarity and mood) that will lead to unhealthy food choices. Consumers who merely eat familiar foods may overcome a lack of dietary variety and the idea of trying novel foods could elicit anxiety and suspicion and because they only select foods they prefer this will lead more often to unhealthy food choices (Aldridge, Dovey & Halford, 2009). However, a study among Millennials indicates that they consider food an adventure and 40 per cent like to try novel foods from different cuisines and also new flavors are high of significance to Millennials (The Hartman Group's, 2015). The second predictor that leads to unhealthy food choices is mood and is perceived as a very difficult factor to manage or influence since mood is not continuous but rather inconstant an fickle. Consumers change their food preferences and choices, but especially when the emotions of boredom and aversion take place (Köster, 2003). In addition, consumers tend to choose foods they can emotionally resonate with (Porcherot *et al.*, 2010); as an example emotional stress could lead to emotional eating and may result in eating disorders (Polivy & Herman, 1999).

Moreover, young adults tend to make more spur-of-the-moment food decisions (Hartman Group, 2016). So, this confirms the increasing importance of emotions of the consumer when choosing what to eat.

Salient results

Some of the hypotheses were not statistically confirmed despite the fact that prior literature has proven otherwise. Concern for natural content in food decisions appeared to lead to unhealthy food choices, however, there was not enough evidence found to confirm this. But, hypothetically, seeking out for foods with merely natural ingredients will lead to unhealthy food decisions. This can be explained by the halo effect which is often demonstrated in regard to organic foods. It means that consumers perceive a food product as healthier when it claims to contain only natural ingredients, and consumers incorrectly think that they can eat it more often and in greater servings (Schuldt & Schwarz, 2010). This could be an explanation for the fact that young adults seem to choose for healthier food products but that overweight is still a growing threat among this group.

5.2 Implications

In this part of the article the theoretical and managerial implications of the research findings will be addressed.

Theoretical implications

A multidimensional scale with motivational factors for food choice was used in the study to see what factors contribute to healthy food choices. Although the majority of the factors from the multidimensional scale have already been used in prior research, the construct of organic concern was relatively new in this context and was added due to an increased growth of interest in this matter. It turns out that this construct is an important predictor for healthy food decisions. So, based on the popularity of concern for organic foods and the research findings it is recommended to take this construct into account in studies that use the multidimensional scale that was originally designed by Steptoe and Pollard (1995) and revisited by Lindeman and Vaananen (2000).

Furthermore, the findings suggest that concern for health, weight benefits and for organic foods lead to healthier food choices but can, however, also be applicable to the self-identification of young adults who endorse a healthy lifestyle. For instance, if a young adult chooses a lifestyle based upon an organic diet indicates how one wants to be seen by others (Bisogni, Connors, Devine, & Sobal, 2002). The motivational factor organic concern will then probably be the focus in more selection processes such as the kind of stores one visits, the transport vehicles he or she uses, and to what brands one wants to engage with. Also, when a young adult is focusing on the health and weight benefits of foods, he or she might also consider buying other products that show these benefits such as buying nice clothes to emphasize the body shape or to look nice or they might work out more to establish or maintaining a fit and healthy body. When these motivational factors for healthy food decisions are brought in a broader daylight they might be able to say a lot more about the group of young adults and how they establish a healthy lifestyle. An exploration to these motivators in relation to the root of health and the well-being in general could result in new ways to promote a healthier lifestyle for young adults (Von Essen & Englander, 2013).

Managerial implications

The findings can be demonstrated in many ways to help young adults making healthy food choices. First, it is highly recommended by the author to ensure that there are healthy food products available in school canteens, vending machines, supermarkets and other places where young adults like to come. Young adults see the lack of variety of healthful foods or the unavailability of healthful foods as a huge perk in their attempt to eat healthier (Powel, Slater, Mirtcheva, Bao & Chaloupka, 2007). The foods should be low in fat or calories to benefit the weight of young adults and/or should be nutritious, high in fiber and protein, contain a lot of vitamins and minerals and should be beneficial for skin, teeth, hair and nails so that it is in accordance with the interpretation of concern for health. Furthermore, it is important that the foods are organic. With these food attributes in mind supermarkets and college cafeterias could facilitate young adults in making healthier food decisions.

Second, it should be easy for young adults to find the healthy products among other products. A clear message with nutritional information on food packages is one way to stand out. The messages should be positive and encouraging, suggests a goal that young

adults believe is attainable, should be short and to-the-point and should reflect information they already know (Greenblum, 2014). The information provided should be appealing in a way that is more attractive to young adults (e.g. “this product is high in fibers which help you lose weight”). In a study among university students it was found that the sale of high calorie foods decreased whereas the sale of low calorie foods increased after the foods were labeled with the contained calories (Cioffi, Levitsky, Pacanowski and Bertz, 2015). Even restaurants could provide information about the nutritional value of their meals. Papies and Veling (2013) found for instance that diet reminders on the menu (e.g. these salads fit in a healthy diet) can change the food choices of those customers that are interested in weight benefits. Furthermore, it was found that Millennials look at factors such as nutritional value, ingredients and price rather than brand name and visual appearance (Havas Worldwide, 2016).

Third, a study found that consumers who seek for benefits of healthier food choices do not feel confident in the products and information provided by the major food companies (Havas Worldwide, 2016). When this is brought into relation with the halo effect of organic foods, this mistrust could be the result of choosing for healthy foods but still gaining weight. So, manufacturers and food brands could provide more information about proper portion sizes for young adults.

5.3 Limitations and suggestions for future research

The first limitation of this research concerns the construct of health concern. The construct is compiled of items that are related to nutrients that are good for the body, hair and nails and on the other hand also protect consumers for chronic diseases such as high blood pressure or heart problems.

However, young adults suggested that physical appearance could be a motivator to lose some weight (LaRose, Leahey, Hill and Wing, 2013) and therefore it might be better in future research to divide the factor health concern into two separate constructs, concern for appearance and concern for health. Whereas concern for appearance is more focused on foods that are beneficial for skin, teeth, hair and body and concern for health is more

focused on the motivation to choose foods that are good for health and organs and the prevention of diseases.

Second, the construct of subjective norm that was introduced for the first time related to food choice motives consisted of items that were in general related to the influence of others (e.g. it is important that I eat the same foods as my family), however, this caused some difficulties in interpreting the results since it was not clear if subjective norm was either good or bad regarding healthy food choices. Therefore, the author's advice for future research is to add new items to this construct that says, for instance, that it is important for the subject that his friends or relatives make healthy food choices so that it supports the subject to do the same. Because consumer's dietary choices tend to converge with their close social connections (Higgs and Thomas, 2016) and interesting to know is if these social norms contribute to healthier food choices.

Third, The Cronbach´s alphas for two of the twelve constructs were far below acceptable level but were, however, included in the study. The fact that the constructs consists of only two items may have caused the low internal consistency, because it is claimed based on the formula that the more items are added to a construct the higher the Cronbach´s alpha will be (Gliem and Gliem, 2003). The author did not delete the constructs from the study because they have both been used in prior research (Steptoe and Pollard, 1995) and the items were selected through factor analysis. However for the construct of 'familiarity', one item was removed in the present study because the participants in the pretest found that item too similar with one another but not without consequences for the alpha score. And although, the survey was re-translated to Dutch and back to English, this could have caused some bias. Translation could also be the reason for the low alpha score of the construct 'availability', but this construct with the same items included has also been used in prior research (Honkanen and Frewer, 2009). Future research should take a critical look at the constructs for food choices and see whether the internal consistency could be improved.

Finally, the young adults in the present study were mostly approached through social media and one fourth was reached via a market response agency. The subjects in this study were predominantly women and had at least a higher education. So, the sample does not

represent the real population and future research should compose a more representative sample.

5.4 Conclusion

The present study gives more insight in the motivational factors underlying food choices among young adults and how these factors contribute to healthy food decisions. The findings suggest that concern for health, weight benefits and for organic foods lead to healthier food choices. On the other hand, when young adults have a high concern for familiar foods and their current emotional state (e.g. mood) when selecting foods, it will lead to unhealthy food decisions. In order to facilitate young adults in making healthy food decisions the availability of healthy foods should be ensured at places where young adults buy their food (e.g. school cafeterias, supermarkets and restaurants). The healthy foods should stand out among other products by the use of appealing food labels that provide information regarding calories, nutrition and proper portion sizes. Further research should explore whether these motivators (weight benefits, health concern and organic concern) are applicable in a broader perspective on health and well-being among young adults.

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Appendix 1 – Questionnaire

Voedingskeuzes van jong volwassenen

Leuk dat je mee doet aan dit onderzoek. Dit onderzoek richt zich op de voedingskeuzes van jong volwassenen in de leeftijd van 18 t/m 25 jaar. De resultaten gebruik ik voor mijn masterscriptie die ik schrijf voor de Universiteit van Twente. Dit onderzoek: is anoniem richt zich op wat jij belangrijk vindt bij het maken van jouw voedingskeuzes en op jouw eetgewoontes. Omdat dit persoonlijk is, zijn er geen goede of slechte antwoorden bestaat uit drie onderdelen met stellingen en vragen duurt ongeveer 5 minuten Succes! ben je ook nieuwsgierig naar de resultaten? Neem contact met mij op via phyllis.maarsman@gmail.com

Q1 Wat is je leeftijd (in jaren)?

Q2 Wat is je geslacht?

- ***Man (1)***
- ***Vrouw (2)***

Q3 Wat is je lengte (in cm)?

Q4 Wat is je gewicht (in kg)?

Q5 Wat is je hoogst genoten opleiding?

- ***Basisonderwijs (1)***
- ***Middelbare school (2)***
- ***Mbo (3)***
- ***Hbo (4)***
- ***Wo (5)***

Q6 In dit deel zie je 43 stellingen Geef bij elke stelling aan hoe belangrijk de stelling voor jou is bij het kopen, maken en bereiden van jouw eten (1= zeer onbelangrijk en 7= zeer belangrijk) Met dagelijkse voeding wordt bedoeld: ontbijt, lunch, avondeten en tussendoortjes.

Q7 Ik vind het belangrijk dat wat ik dagelijks eet:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
goed is voor mijn huid/tanden/haar/nagels etc (1)	❍	❍	❍	❍	❍	❍	❍
mij opvrolijkt (2)	❍	❍	❍	❍	❍	❍	❍
Gemakkelijk te bereiden is (3)	❍	❍	❍	❍	❍	❍	❍
Makkelijk verkrijgbaar is in winkels en supermarkten (4)	❍	❍	❍	❍	❍	❍	❍
Geen toegevoegde stoffen bevat (5)	❍	❍	❍	❍	❍	❍	❍
laag is in calorieen (6)	❍	❍	❍	❍	❍	❍	❍
goed smaakt (7)	❍	❍	❍	❍	❍	❍	❍
gemaakt is op een manier waarbij dieren geen pijn lijden (8)	❍	❍	❍	❍	❍	❍	❍
niet duur is (9)	❍	❍	❍	❍	❍	❍	❍
bekend is bij mij (bijvoorbeeld omdat je het vaker eet) (10)	❍	❍	❍	❍	❍	❍	❍
veel vezels bevat (11)	❍	❍	❍	❍	❍	❍	❍
mij helpt omgaan met stress (12)	❍	❍	❍	❍	❍	❍	❍
bij voorkeur biologisch is (13)	❍	❍	❍	❍	❍	❍	❍
Simpel te koken is (14)	❍	❍	❍	❍	❍	❍	❍
Makkelijk verkrijgbaar is via internet (webshops) (15)	❍	❍	❍	❍	❍	❍	❍
bestaat uit natuurlijke ingredienten (16)	❍	❍	❍	❍	❍	❍	❍
weinig vet bevat (17)	❍	❍	❍	❍	❍	❍	❍

er lekker uit ziet (18)	❍	❍	❍	❍	❍	❍	❍
een fijne textuur heeft (19)	❍	❍	❍	❍	❍	❍	❍
gemaakt is op een milieuvriendelijke manier (20)	❍	❍	❍	❍	❍	❍	❍

Q8 Ik vind het belangrijk dat wat ik dagelijks eet:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
goedkoop is (1)	❍	❍	❍	❍	❍	❍	❍
vitaminen en mineralen bevat (2)	❍	❍	❍	❍	❍	❍	❍
mij helpt te ontspannen (3)	❍	❍	❍	❍	❍	❍	❍
gemaakt is met respect voor dierenrechten (4)	❍	❍	❍	❍	❍	❍	❍
Weinig of geen tijd kost om te maken (5)	❍	❍	❍	❍	❍	❍	❍
geen kunstmatige stoffen bevat (6)	❍	❍	❍	❍	❍	❍	❍
lijkt op wat ik als kind at (7)	❍	❍	❍	❍	❍	❍	❍
op een milieuvriendelijke manier verpakt is (8)	❍	❍	❍	❍	❍	❍	❍
voedzaam is (9)	❍	❍	❍	❍	❍	❍	❍
mij helpt om te gaan met het leven (10)	❍	❍	❍	❍	❍	❍	❍
mij gezond houdt (11)	❍	❍	❍	❍	❍	❍	❍
gemaakt is op zo'n manier dat het de natuur niet verstoord (12)	❍	❍	❍	❍	❍	❍	❍
een goede kwaliteit/prijs verhouding heeft (13)	❍	❍	❍	❍	❍	❍	❍
mij goed laat voelen (14)	❍	❍	❍	❍	❍	❍	❍

veel eiwitten bevat (15)	❍	❍	❍	❍	❍	❍	❍
mij helpt op gewicht te blijven (17)	❍	❍	❍	❍	❍	❍	❍
Verkrijgbaar is in winkels dichtbij mijn huis, studie of werk (18)	❍	❍	❍	❍	❍	❍	❍
lekker ruikt (19)	❍	❍	❍	❍	❍	❍	❍
voedsel is met een biologisch label of certificaat op de verpakking (20)	❍	❍	❍	❍	❍	❍	❍
mij wakker en scherp houdt (21)	❍	❍	❍	❍	❍	❍	❍
biologisch is (ook al betaal je daar bijvoorbeeld meer geld voor) (22)	❍	❍	❍	❍	❍	❍	❍

Q9 Geef aan in welke mate onderstaande stellingen van toepassing zijn op jou. 1= helemaal niet van toepassing op mij en 7= helemaal van toepassing op mij.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Als ik met anderen ben, dan eet ik doorgaans hetzelfde als wat zij eten (1)	❍	❍	❍	❍	❍	❍	❍
In het algemeen, eet ik hetzelfde als wat de mensen	❍	❍	❍	❍	❍	❍	❍

eten die voor mij belangrijk zijn (2)							

Q10 Je bent aangekomen bij het derde en laatste gedeelte van dit onderzoek. Dit deel bevat 27 vragen over jouw eetgewoontes. De vragen beantwoord je met 'ja' of 'nee'. Houd in gedachten dat het gaat om wat jij in een normale week zou doen. Als iets niet op jou van toepassing is, kies dan 'nee' tenzij anders is aangegeven.

Q11 Hoe ziet jouw eetpatroon eruit?

	Ja (1)	Nee (2)
Ik eet vrijwel elke dag minstens 5 porties fruit en/of groenten Een portie staat ongeveer gelijk aan een stuk fruit of een flinke opscheplepel met groenten (1)	❍	❍
Ik eet vrijwel elke week meer dan vier verschillende soorten fruit (2)	❍	❍
Ik eet vrijwel elke week meer dan vier verschillende soorten groenten (3)	❍	❍
Ik eet bij voorkeur producten die laag in vet zijn (4)	❍	❍
Ik eet bij voorkeur gebakken, gestoomd of gegrild voedsel in plaats van gefrituurd voedsel (5)	❍	❍
Ik baseer mijn hoofdmaaltijden op aardappelen en (volkoren) graanproducten zoals brood, pasta of rijst of alternatieven zoals quinoa of boekweit (6)	❍	❍
Ik eet minstens een keer per week peulvruchten zoals linzen en bonen (bijvoorbeeld in plaats van pasta of rijst) (7)	❍	❍

Ik eet meer dan 3 keer per week een koek, handje snoep of chocolade (8)	❍	❍
Ik doe zout bij mijn eten tijdens het koken (9)	❍	❍
Ik voeg zout toe aan mijn eten aan tafel (10)	❍	❍
Ik eet meer dan 2 keer per week gesuikerde ontbijtgranen (bijvoorbeeld krokante muesli of muesli met stukjes chocolade) of ik voeg suiker aan mijn cornflakes/muesli/havermout toe (11)	❍	❍
Ik doe suiker bij mijn thee of koffie (13)	❍	❍

Q14 Vervolg - Hoe ziet jouw eetpatroon eruit?

	Ja (1)	Nee (2)
Ik eet meer dan drie keer per week een bakje zoutjes zoals chips of gezouten noten (8)	❍	❍
Ik eet meer dan 2 keer per week kant-en-klaar maaltijden zoals pizza, lasagne of pasta (9)	❍	❍
Ik heb een hoge bloeddruk volgens mijn dokter (10)	❍	❍
Ik drink 6-8 glazen vocht verdeeld over de dag (11)	❍	❍
Voor vrouwen: ik drink maximaal 5 glazen alcohol per week Voor mannen: ik drink maximaal 10 glazen alcohol per week drink je geen alcoholische dranken? kies dan 'ja' (20)	❍	❍
Ik sla meer dan 1 keer per week mijn ontbijt over (17)	❍	❍

Ik sla meer dan 1 keer per week mijn lunch over (16)	❍	❍
Ik sla meer dan 1 keer per week mijn avondeten over (15)	❍	❍
Ik sla regelmatig maaltijden over en snack of snoep dan (14)	❍	❍
Ik drink meer dan 6 glazen frisdrank of gezoete vruchtensap per week Voorbeelden van frisdranken en gezoete vruchtensappen zijn Cola, Ice Tea en Coolbest (24)	❍	❍
Ik eet meer dan 2 keer per week bewerkt vlees Voorbeelden van bewerkt vlees (veelal gerookt of gezouten) zijn ham, salami, spek of worstjes (26)	❍	❍

Q15 Vervolg - Hoe ziet jouw eetpatroon eruit?

	Ja (1)	Nee (2)	Niet van toepas-sing (3)
Ik eet volkorenbrood (of spelt- of zuurdesembrood) in plaats van witbrood Eet je helemaal geen brood? Kies dan 'niet van toepassing' (2)	❍	❍	❍
Ik eet bij voorkeur volkoren ontbijtgranen (zoals muesli, havermout en granola) zonder toegevoegde suikers Eet je geen ontbijtgranen? Bijvoorbeeld vanwege een glutenintolerantie kies dan 'niet van toepassing' (3)	❍	❍	❍
Ik kies voor mager vlees of verwijder zichtbaar vet Voorbeelden van mager vlees zijn: kipfilet, tartaar, varkenshaas of biefstuk Eet je	❍	❍	❍

geen vlees? Kies dan 'niet van toepassing' (5)			
Ik eet minstens een keer per week vette vis Voorbeelden van vette vissen zijn (gerookte) zalm, haring en makreel. Eet je geen vis? Kies dan 'niet van toepassing' (6)	❍	❍	❍