INCOME, PERCEIVED SCARCITY AND EATING BEHAVIOR

Perceived scarcity as an explanation for the unhealthy eating behavior of lower income groups

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Preface

Dear reader,

Before you lies my Master thesis, the result of seven months of hard work with many ups as well as downs. After five years of studying Health and Society at Wageningen University & Research, this is the final product of the knowledge that I acquired.

I was always interested in health psychology, and especially eating behavior, so I was immediately enthusiastic about the topic of perceived scarcity and eating behavior. During the analysis of my data, I was somewhat less enthusiastic – SPSS is not, and will never be, my best friend. However, I learned a lot from conducting this research and I am proud of the result.

Firstly, I would like to thank my supervisors, Kirsten Verkooijen and Sofie van Rongen for guiding me during this process. Thank you for your constructive feedback and for always being willing to help when I needed it. I learned a lot from you both.
Also, I want to thank Auke, Cheryl, Martin and Steffie for being my thesis buddies. Working in the same room as you made thesis writing a whole lot more fun. Finally, I want to thank Marije for always being there and supporting me.

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Abstract

People in lower income groups generally have worse health than people in higher income groups. This can partly be explained through their unhealthy eating pattern. Previously proposed explanations have not been sufficient to explain this unhealthy eating pattern. Therefore, in the current research, another explanation is proposed: perceived scarcity. The aim of this research was to gain insight into perceived scarcity as the explanation for the unhealthy eating behavior of people with a lower income. This research was based on the scarcity theory by Mullainathan and Shafir (2003), who propose that people who assess their own resources as insufficient to afford their needs and wants experience scarcity. People who experience scarcity are focused on their monetary problems, which decreases their cognitive capacity. This means that less cognitive capacity is available to make deliberate decisions about healthy eating, which leads to an unhealthy eating pattern. Two studies were conducted in order to meet the aim of the research. Study 1 was a cross-sectional study among a sample of 149 people from different income levels. Respondents' income, perceived scarcity, food cravings and food intake were measured. Study 2 was an experimental study among 156 students from a higher vocational education or university level. Participants were randomly assigned to a scarcity or a no-scarcity condition. After the manipulation, their food cravings and food choice were measured. It was found that people with a lower income experience more scarcity. However, no evidence was found for an effect of perceived scarcity on eating behavior. Future research is recommended to test these conclusions.

Key words: low income, perceived scarcity, cognitive capacity, eating behavior

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1. Introduction

It is well-known that health inequalities exist between different groups in society. Especially lower income groups experience worse health than higher income groups. Chetty et al. (2016) found a life expectancy gap of 14.6 years between the richest 1% and the poorest 1% of men in the US. For women, this gap was 10.1 years. This inequality in life expectancy has increased over the years: for men and women in the highest 5% of the income distribution, life expectancy increased by 2.34 years and 2.91 years respectively between 2001 and 2014. In the lowest 5%, however, life expectancy only increased by 0.32 years for men and 0.04 years for women (Chetty et al., 2016). The evident health inequalities between low and high income groups can partly be explained by differences in overweight and obesity prevalence between these groups. An individual is considered overweight when their Body Mass Index (BMI) lies between 25 and 29.9. A BMI that equals or exceeds 30 indicates obesity (Van Binsbergen et al., 2010). In most countries, the prevalence of overweight and especially obesity are higher among people with a low education level or socioeconomic status (James, 2004). In the Netherlands, approximately 25% of people who only finished primary school are obese, compared to 6% of people with a university degree (CBS, 2015). In America, counties with poverty rates higher than 35% have 145% higher obesity rates than prosperous counties (Levine, 2011).

Overweight and obesity are caused by an imbalance between energy intake and energy expenditure (Berenson, 2012). This occurs when a person has an unhealthy eating pattern where too many calories are consumed. Therefore, a healthy eating pattern is imperative for maintaining a healthy weight. Diet quality increases with income (Drewnowski & Specter, 2004); people in low-income families eat significantly less vegetables and whole grains than people from higher income families (Guenther et al., 2008). This means that the higher prevalence of overweight and obesity in lower income groups can be explained by dietary patterns.

1.1. Explanations for the unhealthy eating behavior of the poor

Several explanations that could account for the relatively unhealthy eating behavior of people with a lower income have been proposed. One of these is that people with a lower income lack knowledge about what a healthy diet entails. Research by Eikenberry & Smith (2004) has shown that only 35.5% of people in lower income groups mention both fruits and vegetables when asked what a healthy diet should include, compared to 46.8% of people in higher income groups. However, the evidence on the influence of nutrition knowledge specifically on food intake is inconclusive. Positive associations between nutrition knowledge

and food intake are often weak and only apply to certain aspects of food intake. Also, few studies have used valid measures for nutrition knowledge and food intake (Spronk, Kullen, Burdon & O'Connor, 2014). Therefore, a lack of knowledge alone may not be enough to explain the unhealthy eating pattern of lower income groups.

Another explanation is the high cost of healthy food. Dry foods with a long shelf life are usually cheaper than fresh products like fruits, vegetables and lean meat (Drewnowski & Specter, 2004). People with a low income have to limit their grocery expenses, and will therefore buy products that provide more energy at a lower price. These energy-dense food products often contain relatively more refined grains rather than whole grains, added sugar and fat (Drewnowski & Specter, 2004). However, healthy food is only more expensive when the price is calculated per calorie. When the price is calculated per 100 edible grams or per portion size, fruits, vegetables, dairy and grains are cheaper than foods with high levels of saturated fat, added sugars and/or sodium (Carlson & Frazão, 2012). Therefore, the cost of healthy food is not a satisfactory explanation for the unhealthy eating behavior of lower income groups.

Since the previously mentioned explanations are not likely to fully explain the unhealthy eating behavior of people with a lower income, another explanation is proposed in the current research. The previous explanations suggest that certain consequences of poverty lead to unhealthy eating behavior: a lack of knowledge or a lack of budget for grocery shopping. In the current research, it is proposed that the mere experience of poverty can influence behavior. According to Shah, Mullainathan, & Shafir (2012), adverse behavior can be caused by the perception of resource scarcity. This perceived scarcity stems from an assessment of how much resources someone has and how much they can afford with these resources (Mullainathan & Shafir, 2013). This assessment is influenced by the norms and expectations of the society that someone lives in, as different views exist of what is seen as 'sufficient' in different societies. For example, in our current western society, it may be seen as acceptable to be able to afford to have dinner in a restaurant once every two weeks. If someone cannot live up to this standard, this increases feelings of scarcity and deprivation (Bratanova, Loughnan, Klein, Claassen & Wood, 2016). Perceived scarcity in people with a low income could help to explain the relatively unhealthy eating behavior of this group, which will be further explained in Chapter 2. The current research aims to examine whether perceived scarcity relates to unhealthy eating behavior.

1.2. Scientific relevance

A recent experimental study on perceptions of poverty and calorie intake was conducted by Bratanova et al. (2016). They found that induced perceived poverty led to a higher calorie

intake, which indicates that perceived scarcity could indeed explain unhealthy eating behavior. However, their research was conducted among university students, thereby limiting the generalizability to different socioeconomic ranks. Therefore, the current research includes a correlational study with participants from different socioeconomic ranks. This will test whether people with a lower income have a higher level of perceived scarcity, and whether people with a higher level of perceived scarcity have an unhealthier eating pattern. The current research also aims to extend findings from the same experimental study by Bratanova et al. (2016), where eating behavior was investigated by measuring participants' calorie intake in a lab setting. In the current research, an experimental study is included where eating behavior is measured with the concepts of food cravings and food choice in a questionnaire. This will help to investigate the effect of perceived scarcity on different aspects of eating behavior.

1.3. Societal relevance

If perceived scarcity is the explanation for the unhealthy eating behavior of people with a lower income, this knowledge can be used to evaluate the effectiveness of current interventions and to set up new interventions. For example, interventions targeting nutrition knowledge have little use when it is not a lack of knowledge that is causing unhealthy eating behavior. Findings from the current research may help to guide the focus of future interventions aiming to improve the diet of people with a lower income.

1.4. Aim and research questions

The aim of this research was to gain insight into perceived scarcity as the explanation for the unhealthy eating behavior of people with a lower income. This was achieved by investigating whether people with a lower income experience more scarcity, and whether perceived scarcity leads to unhealthy eating behavior. The aim led to the following two research questions, which were answered by conducting two studies.

1. Do people with a lower income experience more scarcity than people with a higher income, and how does this relate to their eating behavior?

The aim of study 1 was to investigate whether a lower income correlates with a higher level of perceived scarcity, and whether a higher level of perceived scarcity is associated with unhealthier eating behavior.

2. Does perceived scarcity result in more unhealthy eating behavior?

The aim of study 2 was to investigate whether perceived scarcity leads to unhealthy eating behavior.

2. Theoretical framework

According to Shah et al., (2012), unhealthy behavior can be caused by the sole experience of having too little of a certain resource, like time or money. This perception of having too little of something is called resource scarcity. In the current research, the focus is on money as a scarce resource: people with a lower income show more unhealthy eating behavior. Scarcity of money will be referred to as 'income scarcity'.

This type of scarcity is not the same as the term scarcity that is used in economics. In economics, income scarcity applies to everyone, because nobody has an infinite amount of money (Mullainathan & Shafir, 2013). Therefore, nobody can buy everything. The scarcity theory by Mullainathan & Shafir (2013) states that although physical income scarcity is present everywhere, the feeling or perception of scarcity is not.

Perceived scarcity depends on both objective and subjective factors. Objective physical limits, like the amount of money that a person makes and the bills they have to pay, play a role. However, the subjective judgement of what matters to us counts as well. Every individual has different things that they desire to buy. This results from different factors like genetics, upbringing and the society that they live in. Someone who wants to buy a lot of (expensive) things will be more likely to experience scarcity than someone who does not. Therefore, it can occur that two people earn exactly the same monthly income, but one of them experiences scarcity and the other does not. Perceived scarcity stems from an individual's *own assessment* of the adequacy of their resources. Scarcity is experienced when someone has "less than they feel they need" (Mullainathan & Shafir, 2013, p. 4). An individual's perception of income scarcity therefore does not have to be related to the real amount of money that they have, but comes from their own perception of whether this amount of money is enough to satisfy their needs and desires. This subjective perception of an individual's income adequacy is different from relative income, where individuals compare their own income to that of someone else (Ferrer-i-Carbonell, 2005). Resource scarcity exists if a person does not possess enough resources to fulfill their own needs and wants (Mullainathan & Shafir, 2013), regardless of how their income compares to that of other people.

2.1. Cognitive capacity

Shah et al. (2012) propose a mechanism through which perceived scarcity influences behavior. They argue that experiencing resource scarcity creates a certain mindset, which causes people to look at problems in another way and make decisions differently. The focus of their theory is on the mental processes that poverty requires: people with income scarcity

have to make ends meet with very little means, and therefore have to make difficult choices and tradeoffs. These processes are always present in their mind, even when they do not have to make a financial decision at that specific moment. When someone is experiencing scarcity, they become absorbed by it. They think about it all the time, because our mind automatically focuses on our unfulfilled needs (Mullainathan & Shafir, 2013). This happens on a subconscious level, and not deliberately.

When someone has (more than) enough money, daily expenses like groceries and rent can easily be afforded. Therefore, these expenses do not require much attention and not much time is spent thinking about them. However, when money is scarce, daily expenses can be problematic. Because of the lack of resources, each expense feels more pressing and seems bigger than it would have if resources were abundant. Therefore, more attention is paid to these problematic expenses. This is the most important mechanism from the theory that Shah et al. (2012) propose: having less resources generates a greater focus, because it captures attention. This means that perceived resource scarcity causes people to focus more on the problems in the area where resources are lacking, causing cognitive load.

Humans have limited cognitive capacity (Baddeley & Hitch, 1974; Mullainathan & Shafir, 2013). This means that the cognitive load that poverty imposes on people diminishes their cognitive resources: being poor alone impacts an individual's cognitive capacity more than an entire night without any sleep (Mullainathan & Shafir, 2013). This lack of cognitive resources makes it difficult for people with a low income to focus on other issues than their financial situation. This is especially true if these other issues lie further in the future: long-term problems seem less pressing than short-term problems (Shah et al., 2012). An example of a long-term issue is health. Health goals are long-term because the consequences of unhealthy behavior often present themselves a long time after the actual behavior has taken place. For example, eating a lot of unhealthy snacks can eventually lead to many health problems, but does not necessarily show much effect on the short term. Since cognitive resources are needed to be aware of what and how much you eat, and how healthy it is, eating healthily is more difficult for people who experience financial scarcity. It has been shown that eating behavior is indeed influenced by cognitive load and the depletion of cognitive resources. People under cognitive load consume more calories and make less healthy food choices (Zimmerman & Shimoga, 2014) and consume less fruits and vegetables (Byrd-Bredbenner et al., 2016). This means that people with a low income do not make unhealthy food choices because of certain inherent traits, but because of the cognitive load that poverty imposes on them.

2.2. Scarcity in the current research

The aim of the current research is to explain unhealthy eating behavior of people with a low income. Therefore, the focus will be on the influence of perceived income scarcity on eating behavior. Income scarcity in the current research is the feeling that one does not have enough resources to fulfill not only their needs, like food and housing, but also their desires: being able to do and buy things for fun. It is expected that when this perceived income scarcity occurs, cognitive load is imposed on people, and they will make less healthy eating choices because of their preoccupation with their financial problems.

3. Methodology

3.1. Study 1

3.1.1. Respondents and procedure

For study 1, the target group existed of a convenient sample of Dutch adults from different income groups. Respondents were recruited through personal networks and Facebook groups. In order to attract respondents, two gift cards worth €10 of a popular online shop, Bol.com, were raffled among respondents who completed the questionnaire. Initially, there were 200 respondents, but 149 (26% male) remained after the exclusion of incomplete responses, with an average age of 34 (SD = 12.997). Respondents were asked to fill in a short online questionnaire with general questions about their age, education level and income, questions about their satisfaction with their income, and questions about their eating behavior. The questionnaire can be found in Appendix B.

3.1.2. Measures

<u>Demographics</u>

Respondents were asked about their gender with the answer options male, female or other. They were asked how old they were, and what their highest level of qualification was.

<u>Income</u>

Respondents were asked what their monthly net household income was. There were 11 answer categories, ranging from €0 - €500 to €5001 or more. Respondents were also asked about the number of people in their household, so that their household income could be adjusted for household size. The total household income cannot be simply divided by the

number of people in the household, since the needs of each additional member of a household do not increase proportionally (OECD, n.d.). For example, housing and electricity costs will not double when a second person moves into a one person household. Therefore, the following equation was used to adjust household income for household size: $W = D/S^E$. The letter W stands for the adjusted income, D is the total household income, S represents the household size, and E stands for the equivalence elasticity (Kawachi & Kennedy, 1997). The equivalence elasticity is a number between 0 and 1, where 0 stands for no adjustment for household size, and 1 stands for per capita income. In this study, an E of 0.5 is chosen, since this is used more often (Kawachi & Kennedy, 1997). Hence, the following equation was used in this study: $W = D/S^{0.5}$. Since household income was measured in categories, the mean of each income category was used in the formula for D.

Perceived scarcity

Perceived scarcity was measured with six items, based on the methods of Bratanova et al. (2016). They measured 'self-assessed ability to afford', which reflects whether respondents regard their own resources as scarce or sufficient. In the current study, the first four items measured how often respondents could afford to buy certain things or undertake certain activities (e.g. "How often can you afford to buy the food that you want?"; "How often can you afford to buy the clothes that you like?"). Answers were given on a Likert scale ranging from 1 (very rarely) to 7 (always). The other two items, adopted and translated from Bratanova et al. (2016), measured respondents' general satisfaction with their income (i.e. "I can afford to buy most of the things I want"; "I am generally satisfied with how much money I have"). Answers were given on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The six items were averaged to compute a composite measure of perceived scarcity. This measure was highly reliable (Cronbach's $\alpha = 0.946$).

Eating behavior

Respondents' eating behavior was measured with two concepts: food cravings and food intake.

Food cravings

Food cravings embody a strong incentive to consume a certain desired food (Gendall, Joyce, Sullivan, & Bulik, 1998). Food cravings are significantly associated with food intake (Martin, O'Neil, Tollefson, Greenway, & White, 2008). For example, cravings for fat are associated with a higher consumption of snacks that are high in fat, like potato chips. Food cravings are also associated with a higher Body Mass Index, especially fat cravings (White,

Whisenhunt, Williamson, Greenway, & Netemeyer, 2002; Gendall et al., 1998). Therefore, food cravings were used as a proxy for eating behavior.

Respondents' food cravings were measured with the General Food Cravings Questionnaire – Trait (G-FCQ-T) by Nijs, Franken, & Muris (2007). This questionnaire was developed to measure food cravings in individuals or populations and measures general food cravings, rather than cravings for one particular type of food. Measuring general food cravings suited this study, because there is not one specific food that every respondent would like equally. In this study, a Dutch version of the G-FCQ-T was used (van Alphen & van Hove, 2014). It consists of four subscales with corresponding statements: preoccupation with food (*It feels like I have food on my mind all the time*), loss of control (*If I eat what I'm craving, I often lose control and eat too much*), positive outcome expectancy (*Eating what I crave makes me feel better*), and emotional craving (*When I'm stressed out, I crave food*). Respondents indicated to what extent they agreed with the statements on a 7-point Likert scale, ranging from 1 (completely disagree) to 7 (completely agree). The items were averaged to compute a highly reliable measure for food cravings (Cronbach's $\alpha = 0.930$).

Food intake

Food intake was measured with five short questions from the Voedingscentrum [Netherlands Nutrition Center] (n.d.), which were slightly adjusted. The questions measured respondents' average daily food intake, including their consumption of vegetables, fruit, sugary beverages, snacks between meals, and bread. These questions provided a concise overview of the important aspects of respondents' daily food intake (e.g. "*How much vegetables do you eat per day*?").

Every question had four answer options, ranging from 'healthy' (1) to 'unhealthy' (4). In the case of vegetables, for instance, respondents could choose between eating at least 200 grams of vegetables (almost) every day, eating between 100 and 200 grams of vegetables (almost) every day, eating between 50 and 100 grams of vegetables (almost) every day, or (almost) never eating vegetables. For each question, the most healthy answer provided a score of 1 point. The second healthiest answer was awarded with a score of 2 points, the third healthiest answer had a score of 3 points, and the least healthy answer scored 4 points. For every respondent, the scores for all four answers were added up to compute a measure of food intake. Hence, a total score of 5 points was the most healthy score, and a total score of 20 points was the least healthy score.

3.1.3. Data analysis

The analyses of the data generated in study 1 were conducted with IBM SPSS Statistics 23.

To test if a lower income correlated with more perceived scarcity, and if more perceived scarcity correlated with more unhealthy eating behavior, three multiple linear regressions were conducted in SPSS. A visual representation of the relationships that were investigated can be found in Figure 1.

Figure 1: Visual representation of the variables in study 1

First, the assumptions for linear regression were assessed. The data were checked for outliers with a histogram and a boxplot. Three outliers were identified in the variable food intake, and these were removed. Removing the three outliers in the dataset did not significantly change the results. Normality was checked with Q-Q plots and histograms. Linearity and homoscedasticity were checked by looking for patterns in a scatterplot of the values of the residuals against the values of the outcome predicted by the model. Multicollinearity was checked in the correlation matrix by looking for correlation coefficients bigger than 0.7 between the independent variables. All of the assumptions for linear regression were met.

The first hierarchical regression was conducted with income as the independent variable of interest, age, gender and education level as control variables, and perceived scarcity as the dependent variable. The independent variables were added into the model in two steps. First, age, gender and education level were entered into the model, followed by income. The change in R^2 was assessed to examine if income had added predictive value to perceived scarcity beyond age, gender and education level.

The second hierarchical regression was conducted with perceived scarcity as the independent variable of interest, income, age, gender and education level as control variables, and food craving as the dependent variable. First, age, gender and education level were entered, followed by income, and finally perceived scarcity. The change in R^2 was assessed to examine whether perceived scarcity would add predictive value to food craving, beyond age, gender, education level and income.

The third hierarchical regression was conducted with the same independent variables, but with food intake as the dependent variable. The independent variables were entered into the model in the same way as explained above, followed by food intake. The change in R^2

was assessed to analyze whether perceived scarcity added predictive value to food intake, beyond age, gender, education level and income.

3.1.4. Results

Descriptives and correlational analyses

First, an overview of the sample was retrieved. The characteristics of the sample can be found in Table 1. Every education level was represented in the sample, but most respondents had an intermediate or higher vocational education level. Every income category was represented in the sample, with most respondents having an income between €1501 and €3500. Respondents' household size varied from one up to nine, with a mean household size between two and three people. For every dependent variable, scores were evenly distributed with even the very low and high scores represented.

Table 1: Characteristics of the sample for study 1

		N	% of total	Minimum	Maximum	Mean	Std. Deviation
Education level	None VMBO HAVO VWO/Gymnasium MBO HBO Academic bachelor Academic master	149	4 11.4 4 0.7 38.3 23.5 2.7 15.4	1	8	5.16	1.889
Household income	€0 tot €500 €501 tot €1000 €1001 tot €1500 €1501 tot €2000 € 2001 tot €2500 €2501 tot €3000 €3001 tot €3500 €3501 tot €4000 €4001 tot €4500 €4501 tot €5000 €5001 or more	149	5.4 8.7 10.7 19.5 10.7 10.7 12.8 6.7 4.0 4.0 6.7	1	11	5.44	2.722
Household size		149		1	9	2.53	1.441
Perceived Scarcity		149		1	7	3.427	1.574
Food Cravings		149		1.33	6.52	3.513	1.096
Food Intake		149		5	15	9.178	2.324

A correlation matrix was computed to obtain an overview of the bivariate correlations between the variables in the three regressions (see Table 2 for the correlations between all

variables). Perceived scarcity correlated with age, gender, education level, income and food intake. Food intake correlated with gender, education level and income. Education level correlated with gender, and income correlated with both gender and education level. The effect sizes were weak to moderate, except for the correlation between income and perceived scarcity, which was stronger.

Table 2: Bivariate correlations between variables in the analysis

	Perceived Scarcity	**Age**	**Gender**	**Education Level**	**Income**
Age	0.159*				
Gender	0.212**	0.009			
Education Level	-0.346**	-0.058	-0.253**		
Income	-0.597**	0.045	-0.301**	0.354**	
Food Cravings	0.028	-0.131	0.047	0.061	0.042
Food Intake	0.297**	0.056	0.215**	-0.309**	-0.253**

*= significant at a *p*-value of < 0.05
** = significant at a *p*-value of < 0.01

Main analysis

The results of the first regression, with perceived scarcity as the dependent variable, can be found in Table 3. The first model had some predictive value ($F(3, 145) = 8.931$, $p < 0.001$), $R^2 = 0.156$. In this model, education level was a significant negative predictor of perceived scarcity ($\beta = -0.305$, $p < 0.001$). When income was added to the model, the predictive value of the model increased significantly ($F(1, 144) = 61.371$, $p < 0.001$), $\Delta R^2 = 0.252$. This indicates that income was a significant negative predictor of perceived scarcity, independent of age, gender and education level ($\beta = -0.554$, $p < 0.001$). Education level dropped in predictive value, but was still a significant predictor ($\beta = -0.138$, $p = 0.049$) and age became a significant positive predictor ($\beta = 0.176$, $p = 0.007$).

Table 3: Hierarchical regression analysis of predictors of Perceived Scarcity

		β	t	Sig.	R^2	ΔR^2	F Change	Sig.
Model 1	Age	0.140	1.830	0.069	0.156	0.156	8.931**	0.000
	Gender	0.134	1.694	0.092				
	Education level	-0.305**	-3.856	0.000				
Model 2	Age	0.176**	2.729	0.007	0.408	0.252	61.371**	0.000
	Gender	0.008	0.124	0.901				
	Education level	-0.138*	-1.981	0.049				
	Income	-0.554**	-7.834	0.000				

*= significant at a *p*-value of < 0.05
** = significant at a *p*-value of < 0.01

In the second regression with food cravings as the dependent variable, the first model did not have any significant predictive value, as can be seen in Table 4. Adding income to the model did not add any significant predictive value in the second model, indicating that income was not a predictor of food cravings. Adding perceived scarcity to the model did not add predictive value either; the third model still did not have any significant predictive value.

Table 4: Hierarchical regression analysis of predictors of Food Cravings

		β	t	Sig.	R^2	ΔR^2	F Change	Sig.
Model 1	Age	-0.128	-1.555	0.122	0.024	0.024	1.196	0.313
	Gender	0.066	0.781	0.436				
	Education level	0.070	0.824	0.411				
Model 2	Age	-0.131	-1.588	0.114	0.026	0.002	0.327	0.569
	Gender	0.078	0.891	0.374				
	Education level	0.054	0.608	0.544				
	Income	0.052	0.572	0.569				
Model 3	Age	-0.155	-1.840	0.068	0.038	0.011	1.683	0.197
	Gender	0.077	0.880	0.380				
	Education level	0.073	0.813	0.418				
	Income	0.128	1.189	0.236				
	Perceived Scarcity	0.138	1.297	0.197				

*= significant at a *p*-value of < 0.05
** = significant at a *p*-value of < 0.001

The results of the third linear regression with food intake as the dependent variable can be found in Table 5. The first model had significant predictive value ($F(3, 142) = 6.306$, $p < 0.001$), $R^2 = 0.118$. In this model, education level was a significant negative predictor for food intake ($\beta = -0.271$, $p = 0.001$). The second model did not have significantly more

predictive value than the first model, which indicates that income did not have any significant added predictive value for food intake. Education level decreased in predictive value, but still was a significant predictor (β = -0.230, *p* = 0.007). The third model did not have significantly more predictive value than the second model, which means that perceived scarcity did not have any significant added predictive value for food intake. Education level remained a significant predictor, again with decreased predictive value (β = -0.205, *p* = 0.018).

Table 5: Hierarchical regression analysis of predictors of Food Intake

		β	**t**	**Sig.**	**R^2**	**ΔR^2**	**F Change**	**Sig.**
Model 1	Age	0.032	0.400	0.690	0.118	0.118	6.306**	0.000
	Gender	0.150	1.846	0.067				
	Education level	-0.271**	-3.332	0.001				
Model 2	Age	0.040	0.510	0.611	0.135	0.018	2.867	0.093
	Gender	0.118	1.428	0.156				
	Education level	-0.230**	-2.724	0.007				
	Income	-0.145	-1.693	0.093				
Model 3	Age	0.019	0.237	0.813	0.149	0.014	2.353	0.127
	Gender	0.113	1.366	0.174				
	Education level	-0.205*	-2.400	0.018				
	Income	-0.054	-0.517	0.606				
	Perceived Scarcity	0.160	1.534	0.127				

*= significant at a *p*-value of < 0.05
** = significant at a *p*-value of < 0.01

3.1.5. Discussion

The results of the first regression indicate that income was the most important negative predictor for perceived scarcity, which means that an increase in income corresponds with a decrease in perceived scarcity. The second regression showed that perceived scarcity was not a predictor for food cravings, which indicates that the level of food cravings that people experience in daily life are unrelated to their general level of perceived scarcity. The results of the third regression show that perceived scarcity was not a significant predictor for food intake, which indicates that daily food intake is unrelated to perceived scarcity.

In this cross-sectional study, it was found that a lower income was associated with a higher level of perceived scarcity. However, no association between perceived scarcity and eating behavior was found.

3.2. Study 2

3.2.1. Participants and procedure

Participants in study 2 were from a convenient sample of Dutch students from a Higher Vocational Education or University level. Participants were recruited through personal networks and Facebook groups. Two Bol.com gift cards of €10 were raffled among everyone who completed the questionnaire, in order to attract more participants. There were 273 participants, of which 156 (24% male) remained after excluding incomplete responses, with an average age of 22 (SD = 2.492).

Participants were asked to fill in a short online questionnaire, which can be found in Appendix C. A manipulation was built in the questionnaire in order to manipulate participants' perceived scarcity level. This manipulation was based on the methods of Bratanova et al. (2016). The manipulation consisted of reading a paragraph about people in the Netherlands living either in poverty (in the scarcity condition), or in wealth (in the no-scarcity condition). These paragraphs can be found in Box 1. The randomization option in the program Qualtrics was used to ensure that participants were randomly assigned to either the scarcity or no-scarcity condition. After reading the paragraph, participants in both conditions were asked to write a few sentences on what they had in common with the people in the text that they read. It has been shown that finding similarities between oneself and another increases the salience of these similarities. This leads to assimilation to the other (Mussweiler, 2003). Therefore, the manipulation was designed to make participants think about their own experience with living in financial scarcity, or in financial abundance, and make them identify themselves with the people in the text.

Scarcity condition
In Nederland moet 1 op de 10 huishoudens rondkomen van een laag inkomen. Deze huishoudens hebben weinig reserves: als bijvoorbeeld de wasmachine kapot gaat en vervangen moet worden heeft dat een flinke impact. De dagelijkse boodschappen moeten worden gedaan met een beperkt budget. Sporten en muziekles volgen is niet altijd mogelijk. Mensen kunnen niet altijd de kleding kopen die ze het liefste zouden willen, maar moeten naar goedkopere winkels gaan. Leuke extra's zitten er niet altijd in: uitstapjes met vrienden moeten regelmatig worden afgeslagen omdat er geen geld voor is. Ook bioscoopbezoeken, uit eten gaan en andere leuke uitjes kunnen niet zo vaak als gewenst ondernomen worden. Op vakantie gaan is een grote uitgave en zit er niet altijd in.

No-scarcity condition
Het gemiddelde inkomen van Nederlandse huishoudens ligt ruim boven de armoedegrens. Dit betekent dat de meeste huishoudens in welvaart leven. Deze huishoudens hebben genoeg reserves om onverwachte uitgaven, zoals bijvoorbeeld het vervangen van een kapotte wasmachine, goed op te kunnen vangen. De vaste lasten kunnen gemakkelijk betaald worden en er hoeft niet bespaard te worden op boodschappen. Er kan meer dan genoeg leuke nieuwe kleding worden gekocht. Ook een abonnement op de sportschool of muziekles kan er gemakkelijk vanaf. Er is ook ruim voldoende geld om leuke dingen te kunnen doen, zoals regelmatig naar de bioscoop of uit eten gaan. Er kunnen leuke dingen ondernomen worden met vrienden, en er kan minstens een keer per jaar een leuke vakantie betaald worden.

Box 1: Scarcity manipulation

The manipulation was followed by a manipulation check, adopted from Bratanova et al. (2016). The manipulation check existed of two items where participants had to indicate on a Likert scale to what extent they felt poor or rich (1 = completely disagree, 7 = completely agree). The item where respondents had to indicate to what extent they felt rich was reversed and the two items were averaged into a composite measure (Cronbach's α = 0.641). After the manipulation and the manipulation check, participants answered 15 items about their food cravings and completed a short food choice task. In the end, they could choose to fill in their e-mail address if they wanted to receive more information about the purpose of the research.

3.2.2. Measures

Demographics

Participants were asked about their age, gender and education level.

Eating behavior

Two measures were used to assess participants' eating behavior: food cravings and food choice.

Food cravings

Food cravings were measured with the General Food Cravings Questionnaire – State (G-FCQ-S). This questionnaire was designed with the aim of assessing food cravings in specific situations. The Dutch version of the G-FCQ-S was used in this study (van Alphen & van Hove, 2014). The G-FCQ-S has five subscales: an intense desire to eat *(I'm craving tasty food),* anticipation of relief from negative states and feelings as a result of eating *(If I ate something, I wouldn't feel so sluggish and lethargic),* craving as a physiological state (*I feel weak because of not eating*), obsessive preoccupation with food or lack of control over eating (*My desire to eat something tasty seems overpowering*), and anticipation of positive reinforcement that may result from eating (*Eating something tasty would make things just perfect*). Participants answered on a 7-point Likert scale, ranging from 1 (completely disagree) and 7 (completely agree). The 15 items were averaged to compute a mean food cravings measure (Cronbach's α = 0,914).

Food choice

As a second measure for eating behavior, participants completed a short food choice task. They were presented with pictures of ten food items, of which five were deemed healthy and five were deemed unhealthy. Participants were asked to choose three food items based on

their current preferences. The number of unhealthy items that participants chose was used as the food choice measure (ranging from 0 to 3).

Hunger level

Participants' hunger level was measured with one item: *How hungry do you feel right now?* Answers were given with a slider on a scale from 1 up to 100.

Food allergies

Participants were asked if they had any food allergies and if they did, to which foods they were allergic.

3.2.3. Data analysis

The analyses of the data generated in study 2 were conducted with IBM SPSS Statistics 23. First, the possible covariates age, gender, education level and hunger level were assessed by checking their correlations with the dependent variables food cravings and food choice. A scatterplot matrix was conducted to assess if these potential confounders had a linear relationship with food cravings and food choice for both the scarcity and no-scarcity group.

Descriptive statistics were obtained to acquire an overview of the data and assumptions for ANCOVA were assessed. Independence of observations was ensured by the random assignment of participants to the scarcity and no-scarcity condition. The data of the variables hunger level and food cravings were checked for outliers with histograms and boxplots. Normality was checked for the variable food cravings within both groups by assessing Q-Q plots and histograms. Linearity between food cravings within each group of the independent variable was checked by creating a scatterplot matrix. Multicollinearity was checked in the correlation matrix by looking for correlation coefficients bigger than 0.7 between the dependent variables. Homogeneity of variance/covariance and homogeneity of regression slopes were checked by running a custom ANCOVA. None of the assumptions for ANCOVA were violated.

An ANCOVA test was conducted to test whether condition had an effect on food cravings. The ANCOVA was run with condition as the independent variable, food cravings as the dependent variable, and hunger level as the covariate. The overview of the ANCOVA analysis can be found in Figure 2.

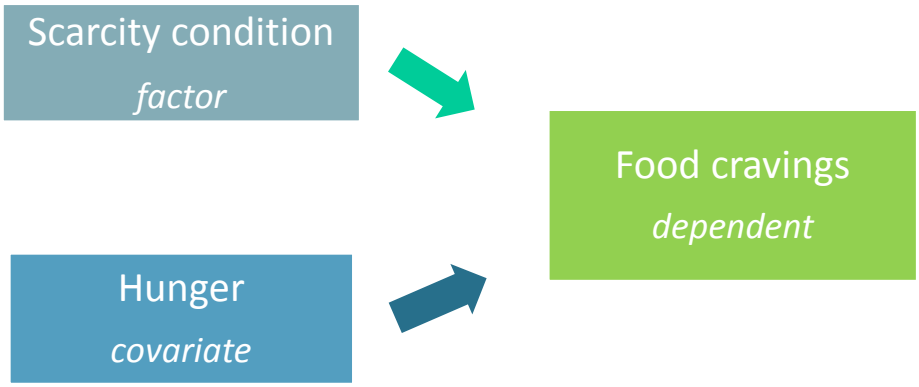

Figure 2: Visual representation of the variables in the ANCOVA analysis

3.2.4. Results

Preliminary analysis

Random assignment check

The demographic characteristics of the sample can be found in Table 6. Participants in the two conditions did not differ significantly on age (t(154) = -0.930, p = 0.354), gender (t(154) = -1.027, p = 0.306), education level (t(154) = 0.070, p = 0.945), or hunger level (t(154) = 0.498, p = 0.619).

Table 6: Demographics of the sample for study 2

		Scarcity	**No Scarcity**	**t-test for Equality of Means**	**Sig. (2-tailed)**
Age	Age (mean)	21.83	22.20	-0.930	0.354
Gender	Male (%)	27.3	20.3	-1.027	0.306
	Female (%)	72.7	79.7		
Education level	Higher Vocational Education (%)	10.4	17.7	0.070	0.945
	Academic bachelor (%)	48.1	34.2		
	Academic master (%)	41.6	48.1		
Hunger level	Hunger level (mean)	32.87	30.96	0.498	0.620

Covariates

Hunger level strongly correlated with food cravings (r = 0.709, p < 0.001), but not with food choice, which can be seen in Table 7. Hunger level had a linear relationship with food cravings for participants in both conditions. Therefore, hunger level was considered a covariate for the effect of condition on food cravings.

Table 7: Correlations between variables in the analyses

	Age	Gender	Education level	Hunger level	Food cravings
Gender	-0.257**				
Education level	0.224**	0.030			
Hunger level	-0.056	-0.050	-0.027		
Food cravings	-0.106	-0.025	-0.099	0.709**	
Food choice	0.077	-0.015	-0.137	0.056	0.247**

*= significant at a *p*-value of < 0.05
** = significant at a *p*-value of < 0.01

Manipulation check

Participants in the scarcity and no-scarcity condition did not differ significantly on perceived scarcity (F(1) = 0.006, *p* = 0.936). Many participants in the scarcity condition did not complete the manipulation assignment correctly (N = 22). Therefore, the results of the manipulation check were also compared between participants in the scarcity condition who did complete the manipulation assignment correctly (N = 55) and participants in the scarcity condition who did not. A significant difference between these two groups was found (F(1) = 12.550, *p* = 0.001). Participants in the scarcity condition who completed the manipulation correctly experienced more scarcity (M = 3.89) than participants in the scarcity condition who did not (M = 2.84). However, still no significant difference in perceived scarcity was found between participants in the scarcity condition who completed the manipulation correctly (N = 55) and participants in the no-scarcity condition who completed the manipulation correctly (N = 72): F(1) = 2.695, *p* = 0.103.

Main analysis

Condition did not have a significant main effect on food cravings. Hunger level had a highly significant main effect on food cravings (F(1) = 154.163, *p* < 0.001).

The ANCOVA was also run for a subsample including only participants who correctly completed the question with the manipulation. This did not change the results significantly. Hunger still had a significant effect on food cravings (F (1) = 139.211, *p* < 0.001), and condition did not.

A Pearson Chi-square test of independence was conducted to test if participants in the scarcity condition and participants in the no-scarcity condition scored differently on food choice. First, the specific assumptions for Pearson's Chi-Square were checked. At least 80% of the contingency cells should have an expected count above 5. This assumption was met,

since only 12.5% of the contingency cells had an expected count below 5. Pearson's Chi-Square was not significant: χ^2 (3) = 0,900 (p = 0.825). Therefore, participants in the scarcity and no-scarcity condition did not differ significantly on food choice.

The Pearson Chi-square test was also conducted for a subsample including only participants who correctly completed the question with the manipulation. In this analysis, 25% of the contingency cells had an expected count less than 5. This means that only 75% had an expected count higher than 5, so the assumption for Pearson's Chi-Square was violated. Therefore, not the Pearson Chi-Square value but the Likelihood Ratio value was interpreted. No significant effect of condition on food choice was found: G (3) = 1.659 (p = 0.646).

3.2.5. Discussion

Participants in the scarcity condition did not feel poorer than participants in the no-scarcity condition. This means that the manipulation did not have the intended effect of eliciting feelings of scarcity in participants in the scarcity condition. This is likely to be a consequence of the fact that many participants did not complete the manipulation task correctly.

No effect of condition on food cravings or food choice was found: participants in the scarcity condition did not experience more food cravings and did not pick more unhealthy food products than participants in the no-scarcity condition. These results did not change significantly if only participants who completed the manipulation task correctly were included in the analysis. This indicates that induced perceived scarcity did not influence eating behavior.

4. General discussion

4.1. Interpretation of results

The aim of this research was to gain insight into perceived scarcity as the explanation for the unhealthy eating behavior of people with a lower income. A cross-sectional study (study 1) and an experimental study (study 2) were conducted.

In study 1, it was found that income was a predictor of perceived scarcity: when income decreased, perceived scarcity increased. This confirms that although perceived scarcity does not *have* to be related to real income, income does play a role (Mullainathan & Shafir, 2013). These results correspond with the results of a longitudinal study by Venn & Strazdins (2017). They found that only 54% of participants with a low income, reported to feel poor, which indicates that perceived scarcity is not always linked with real income. However, participants with a low income did feel poor more often than participants who did

not have a low income, suggesting that real income does play a role in perceiving scarcity. This means that in general, the poor experience more scarcity than the wealthy: they feel that they have less than they need. This corresponds with the theory of Mullainathan & Shafir (2013), who propose that the poor perceive scarcity and therefore have diminished cognitive capacity, which can lead to adverse behaviors. However, in study 1, no evidence was found in for perceived scarcity as a predictor of eating behavior. This corresponds with the results of Venn & Strazdins (2017), who conducted a two-year longitudinal study to examine the association between income scarcity and unhealthy lifestyles. They found that the perception of poverty increased calorie intake and decreased the intake of fruits and vegetables, but only when participants experienced scarcity for an episode of two years. A period of two years of income scarcity had almost twice the impact on unhealthy behavior compared to one year of income scarcity. Since study 1 was a cross-sectional study, no time effect of perceived scarcity could be studied, and it is unknown for how long respondents had been experiencing scarcity. This might explain why no association between perceived scarcity and eating behavior was found.

In study 2, only hunger level had an effect on food cravings. This was to be expected: participants with a higher hunger level experienced more food cravings. No evidence was found for an effect of scarcity condition on eating behavior. This does not correspond with the scarcity theory by Mullainathan & Shafir (2013): they argue that an increase in perceived scarcity should lead to a decrease in cognitive capacity and therefore a decrease in the ability to make healthy decisions. The results of study 2 also contradict the results of Bratanova et al. (2016), who did provide evidence for a link between perceived scarcity and food intake; they found that participants who were induced to feel poor consumed 54% more calories. An important difference between this study and the current study is the measure for eating behavior. Bratanova et al. (2016) measured participants' actual calorie intake in a lab setting, whereas in the current study, eating behavior was measured with a food craving questionnaire and a food choice task. It is possible that diminished cognitive capacity does influence actual food intake, but not food cravings. According to Mullainathan & Shafir (2013), perceived scarcity decreases the ability to make healthy decisions. This means that people living in scarcity may not necessarily experience more food cravings than other people, they just are less able to suppress these food cravings. Their lack of cognitive capacity makes it more difficult to override their impulses, like cravings for unhealthy food, and make an effort to choose a healthy food.

No effect of perceived scarcity was found on food choice either. This contradicts the result of Briers & Laporte (2013), who conducted an experimental study about the effect of financial (dis)satisfaction on food choice. Participants were assigned to a financial satisfaction or dissatisfaction condition and were presented with ten food pairs. These food

pairs all existed of two food products that were equal in tastiness, but not equal in calories. Participants who were induced to feel financially dissatisfied more often preferred high-calorie dishes than participants who were induced to feel financially satisfied. A reason for the contradicting results could be that participants in the study by Briers & Laporte (2013) chose between two products that were both considered unhealthy. Therefore, participants did not base their choice on which food product they deemed more healthy. In the current study, participants chose from ten food products of which five were clearly considered healthy and five unhealthy. This may have triggered participants to consciously think about the healthiness of the products, which might have caused them to choose more healthy products than they would have in real life.

The fact that no significant effect of perceived scarcity on food choice was found could also be a result of the fact that participants were explicitly asked which food products they would prefer at that specific moment. Therefore, they completely focused on choosing food products. However, in lab studies where participants' calorie intake is measured, participants often are not informed about the true purpose of the research. For example, participants in the study by Bratanova et al. (2016) thought that the purpose of the study was to evaluate the taste of certain snacks: they were not aware that the amount of food that they ate was actually what the researchers were interested in. Therefore, they probably did not pay attention to how much they were eating. This means that people living in scarcity can make deliberate decisions about what they eat when they have the opportunity to direct their attention to choosing between healthy and unhealthy food products. However, when their attention is directed somewhere else, they cannot make healthy decisions about eating anymore. This corresponds with the scarcity theory by Mullainathan & Shafir (2013): since people who experience scarcity have less available cognitive capacity, they cannot make deliberate decisions about their food intake while they are directing their attention somewhere else.

4.2. Methodological issues and future directions

A methodological issue of the current research is that in both studies, eating behaviour was measured indirectly through questionnaires. Considering the time limit, questionnaires were chosen as the data collection instrument, since they were the most efficient way to measure respondents' eating behaviour. However, this instrument has some disadvantages. For example, the questions about respondents' daily food intake might have been sensitive to socially desirable answers. Social desirability is when respondents give an answer that differs from their true answer, because they think that this creates a more favourable image of themselves (Lavrakas, 2008). In the case of food intake in study 1, respondents might have reported a healthier daily food intake than they actually have. Also, questionnaires are

susceptible to a lack of conscientious responses (Lavrakas, 2008). Since respondents filled in the questionnaire digitally, without the researcher present, there is no way to be sure that they were focused on the task and gave every question enough thought. In study 2, where respondents had to complete the question with the manipulation, this was a problem: many respondents did not do what they were asked to do. Also, respondents could have been influenced by stimuli in their environment while they were filling in the questionnaires.

A methodological issue in study 2 is the fact that the scarcity manipulation did not elicit the intended effect. Participants in the scarcity condition did not feel poorer than participants in the no-scarcity condition. This is likely to be due to the fact that many participants, especially in the scarcity condition, did not complete the question with the manipulation correctly. One explanation for this could be that participants in the scarcity condition who did not complete the manipulation correctly could not think about similarities because they did not have any experience with financial scarcity at all. Furthermore, it could be the case that these participants noticed the differences between themselves and the people described in the manipulation, rather than the similarities. Therefore, the scarcity manipulation might have made these people feel richer instead of poorer.

Considering the contradicting results of the current research and Bratanova et al. (2016), it would be useful to conduct more research on the topic of perceived scarcity and eating behavior. In future research, it can be useful to develop an effective scarcity manipulation that can be used in questionnaires, since the manipulation that was used in study 2 often was not understood or completed correctly by the respondents. Also, it can be interesting to use another measure of food intake, like an elaborated food frequency questionnaire. A more elaborated questionnaire on food intake is likely to measure food intake more accurately than the short measure that was used in study 1.

4.3. Conclusion

This research has provided insight into perceived scarcity as an explanation for the unhealthy eating behavior of people with a low income. Evidence has been provided for the negative relationship between income and perceived scarcity: people with a low income experience more scarcity than people with a high income. No evidence has been found for a relationship between perceived scarcity and eating behavior. This indicates that people with a lower income do experience more scarcity than people with a higher income, but this perceived scarcity does not necessarily lead to unhealthy eating behavior. Because of the contradicting findings between existing literature and the current research, these conclusions should be tested in future research.

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Appendix

A: Informed consent

Toestemmingsverklaring voor deelname onderzoek eetgedrag

Dit onderzoek wordt uitgevoerd voor een master thesis voor Wageningen University. Het bestaat uit een vragenlijst met algemene vragen en vragen over uw eetgedrag. Het duurt ongeveer 10 minuten om de vragenlijst in te vullen.

Hierbij bevestig ik dat ik wil participeren aan het onderzoek. Ook verleen ik toestemming aan de verantwoordelijke onderzoekers van Wageningen University & Research om de informatie die ik in de vragenlijst geef te gebruiken voor onderzoek.
Mijn gegevens worden alleen voor dit onderzoek gebruikt en zullen anoniem worden verwerkt. Ik weet dat meedoen aan dit onderzoek geheel vrijwillig is en dat ik elk moment kan beslissen om af te zien van deelname zonder een reden op te geven.

Voor vragen of meer informatie over het onderzoek kan ik contact opnemen met carlijn.hendriks@wur.nl

B: Questionnaire Study 1

Dit onderzoek wordt uitgevoerd voor een master thesis voor Wageningen University. Het bestaat uit een vragenlijst met algemene vragen over leeftijd, opleidingsniveau en inkomen, en vragen over uw eetgedrag. Het duurt ongeveer 10 minuten om de vragenlijst in te vullen. Hierbij bevestig ik dat ik wil participeren aan het onderzoek. Ook verleen ik toestemming aan de verantwoordelijke onderzoekers van Wageningen University & Research om de informatie die ik in de vragenlijst geef te gebruiken voor onderzoek.
Mijn gegevens worden alleen voor dit onderzoek gebruikt en zullen anoniem worden verwerkt. Ik weet dat meedoen aan dit onderzoek geheel vrijwillig is en dat ik elk moment kan beslissen om af te zien van deelname zonder een reden op te geven.
Voor vragen of meer informatie over het onderzoek kan ik contact opnemen met carlijn.hendriks@wur.nl

Ja/nee

1. **Wat is uw geslacht?**

Man
Vrouw
Anders

2. **Wat is uw leeftijd?**

3. **Wat is uw hoogste behaalde diploma?**

Geen
VMBO
HAVO
VWO/Gymnasium
MBO
HBO
Universitaire bachelor
Universitaire master

4. **Uit hoeveel personen bestaat uw huishouden?**

5. **Wat is het totale maandelijks netto inkomen van uw huishouden (dus na aftrek van af te dragen belastingen en verzekeringspremies?**

1: €0 tot €500
2: €501 tot €1000
3: €1001 tot €1500
4: €1501 tot €2000
5: € 2001 tot €2500
6: €2501 tot €3000
7: €3001 tot €3500
8: €3501 tot €4000
9: €4001 tot €4500
10: €4501 tot €5000
11: €5001 of meer

6. **De volgende vragen gaan over hoe vaak u het zich kan veroorloven om bepaalde activiteiten te ondernemen of bepaalde producten te kopen. Geef aan wat voor u van toepassing is door een getal van 1 tot en met 7 te kiezen, waarbij 1 staat voor 'heel zelden' en 7 voor 'altijd'.**

Hoe vaak kunt u het zich veroorloven om het eten te kopen dat u wil?
Hoe vaak kunt u het zich veroorloven om de kleren te kopen die u mooi vindt?
Hoe vaak kunt u het zich veroorloven om in een restaurant te eten?
Hoe vaak kunt u zich het veroorloven om activiteiten te ondernemen die u leuk vindt, zoals een bioscoop of concert bezoeken?

Antwoordschaal
1: Heel zelden
2: Zelden
3: Soms
4: Regelmatig
5: Vaak
6: Bijna altijd
7: Altijd

7. **De volgende statements gaan over hoe tevreden u bent met uw inkomen. Geef aan in hoeverre u het met de stellingen eens bent door een getal van 1 tot en met 7 te kiezen, waarbij 1 staat voor 'helemaal oneens' en 7 voor 'helemaal eens'.**

Ik kan het me veroorloven om de meeste dingen die ik wil te kopen.
Ik ben over het algemeen tevreden met hoeveel geld ik heb.

Antwoordschaal
1: Helemaal oneens
2: Oneens
3: Enigszins oneens
4: Neutraal
5: Enigszins eens
6: Eens
7: Helemaal eens

8. **De volgende stellingen gaan over uw zin in eten in het dagelijks leven. Geef aan in hoeverre u het met de stellingen eens bent door een getal van 1 tot en met 7 te kiezen, waarbij 1 staat voor 'helemaal oneens' en 7 voor 'helemaal eens'.**

Wanneer ik erge trek in iets heb, dan weet ik dat ik niet kan stoppen zodra ik begin met eten.
Wanneer ik eet waar ik trek in heb, dan verlies ik vaak de controle en eet ik teveel.
De trek in eten doet me constant denken aan wat ik zal gaan eten.
Het voelt alsof ik constant aan eten denk.
Ik vind dat eten mij erg bezighoudt.
Soms maakt eten de situatie gewoon perfect.
Wanneer ik eet waar ik trek in heb, dan voel ik me beter.
Ik krijg trek in eten wanneer ik me verveel of me boos of verdrietig voel.
Ik voel me minder gespannen nadat ik gegeten heb.
Als ik krijg waar ik trek in heb, dan kan ik mezelf niet bedwingen om het op te eten.
Wanneer ik eet waar ik zin in heb, dan voel ik me erg goed.
Wanneer ik eenmaal begin met eten, heb ik moeite met stoppen.
Ik kan niet stoppen met denken aan eten, hoe hard ik het ook probeer.
Ik besteed veel tijd aan bedenken wat ik zal gaan eten.
Wanneer ik gestrest ben krijg ik trek in eten.
Wanneer ik trek heb in eten, dan word ik overheerst door de gedachte om het ook te eten.

Mijn emoties leiden ertoe dat ik wil eten.
Wanneer ik naar een buffet ga, eet ik meer dan nodig.
Wanneer ik met iemand samen ben die teveel eet, dan eet ik zelf ook meestal te veel.
Wanneer ik eet, voel ik me op mijn gemak.
Ik heb trek in eten wanneer ik van streek ben.

Antwoordschaal
1: Helemaal oneens
2: Oneens
3: Enigszins oneens
4: Neutraal
5: Enigszins eens
6: Eens
7: Helemaal eens

9. **De volgende vijf vragen gaan over wat u daadwerkelijk eet en drinkt in het dagelijks leven.**

Hoeveel groente eet u per dag?

- (Bijna) elke dag 200 gram of meer (minstens 4 opscheplepels)
- (Bijna) elke dag 100 tot 200 gram (2 of 3 opscheplepels)
- (Bijna) elke dag 50 tot 100 gram (1 opscheplepel)
- Ik eet (bijna) nooit groente

Hoeveel porties fruit eet u gemiddeld per dag?

- (Bijna) elke dag 2 of meer porties fruit (200 gram)
- (Bijna) elke dag 1 stuk fruit (100 gram)
- Ik eet af en toe wat fruit
- Ik eet (bijna) nooit fruit

Hoeveel glazen (150 ml) suikerrijke dranken drinkt u gemiddeld per dag?
Voorbeelden zijn frisdrank, frisdrank met stevia, vruchtensap of -drank, zuiveldrank, sportdrank, energiedrank of aanmaaklimonade.

- Dit drink ik (bijna) nooit
- 2-3 glazen of 1 flesje van 0.5 liter
- 4-5 glazen
- 6 of meer glazen

Hoe vaak eet u wat tussendoor en wat eet u dan?

- Ik eet (bijna) altijd dingen uit de Schijf van Vijf, zoals een bruine boterham, volkoren cracker en fruit
- Ik eet én dingen uit de Schijf van Vijf, zoals een bruine boterham en fruit, maar ook koek, snoep en snacks
- Ik eet vooral koek, snoep en snacks tussendoor en af en toe wat uit de Schijf van Vijf zoals een bruine boterham of fruit
- Ik eet (bijna) alleen maar snoep, koek en snacks tussendoor

Wat voor brood eet u meestal?

- Ik eet (bijna) altijd bruin- of volkorenbrood
- Ik eet voor de helft bruin- of volkorenbrood, en voor de andere helft witbrood
- Ik eet meestal witbrood en (bijna) nooit bruin- of volkorenbrood
- Ik eet helemaal geen brood, of alleen witbrood

C: Questionnaire Study 2

Dit onderzoek wordt uitgevoerd voor een master thesis voor Wageningen University. Het bestaat uit een vragenlijst met algemene vragen en vragen over uw eetgedrag. Het duurt ongeveer 10 minuten om de vragenlijst in te vullen.
Hierbij bevestig ik dat ik wil participeren aan het onderzoek. Ook verleen ik toestemming aan de verantwoordelijke onderzoekers van Wageningen University & Research om de informatie die ik in de vragenlijst geef te gebruiken voor onderzoek.
Mijn gegevens worden alleen voor dit onderzoek gebruikt en zullen anoniem worden verwerkt. Ik weet dat meedoen aan dit onderzoek geheel vrijwillig is en dat ik elk moment kan beslissen om af te zien van deelname zonder een reden op te geven.
Voor vragen of meer informatie over het onderzoek kan ik contact opnemen met carlijn.hendriks@wur.nl

Ja/nee

1. **Wat is je geslacht?**

Man
Vrouw
Anders

2. **Wat is je leeftijd?**

3. **Wat is je huidige opleidingsniveau?**

HBO
Universitaire bachelor
Universitaire master

4. **Lees het onderstaande stukje tekst aandachtig door. Typ daarna 2 tot 5 zinnen over wat jij gemeen hebt met de mensen die beschreven zijn in het stukje wat je net hebt gelezen.**

Schaarste
In Nederland moet 1 op de 10 huishoudens rondkomen van een laag inkomen. Deze huishoudens hebben weinig reserves: als bijvoorbeeld de wasmachine kapot gaat en vervangen moet worden heeft dat een flinke impact. De dagelijkse boodschappen moeten worden gedaan met een beperkt budget. Sporten en muziekles volgen is niet altijd mogelijk.

Mensen kunnen niet altijd de kleding kopen die ze het liefste zouden willen, maar moeten naar goedkopere winkels gaan. Leuke extra's zitten er niet altijd in: uitstapjes met vrienden moeten regelmatig worden afgeslagen omdat er geen geld voor is. Ook bioscoopbezoeken, uit eten gaan en andere leuke uitjes kunnen niet zo vaak als gewenst ondernomen worden. Op vakantie gaan is een grote uitgave en zit er niet altijd in.

Geen schaarste
Het gemiddelde inkomen van Nederlandse huishoudens ligt ruim boven de armoedegrens. Dit betekent dat de meeste huishoudens in welvaart leven. Deze huishoudens hebben genoeg reserves om onverwachte uitgaven, zoals bijvoorbeeld het vervangen van een kapotte wasmachine, goed op te kunnen vangen. De vaste lasten kunnen gemakkelijk betaald worden en er hoeft niet bespaard te worden op boodschappen. Er kan meer dan genoeg leuke nieuwe kleding worden gekocht. Ook een abonnement op de sportschool of muziekles kan er gemakkelijk vanaf. Er is ook ruim voldoende geld om leuke dingen te kunnen doen, zoals regelmatig naar de bioscoop of uit eten gaan. Er kunnen leuke dingen ondernomen worden met vrienden, en er kan minstens een keer per jaar een leuke vakantie betaald worden.

5. **Geef aan in hoeverre je het eens bent met de volgende stellingen door een cijfer van 1 tot 7 te kiezen, waarbij 1 staat voor 'helemaal oneens' en 7 voor 'helemaal eens'.**

Op dit moment voel ik me arm
Op dit moment voel ik me rijk

Antwoordschaal:
1: Helemaal oneens
2: Oneens
3: Enigszins oneens
4: Noch mee eens, noch mee oneens
5: Enigszins eens
6: Eens
7: Helemaal eens

6. **Welke van de volgende voedselproducten hebben op dit moment je voorkeur? Kies er drie.**

7. **De volgende stellingen gaan over of je op dit moment trek hebt in iets lekkers. Geef aan in hoeverre je het eens bent met de stellingen door een cijfer van 1 tot 7 te kiezen, waarbij 1 staat voor 'helemaal oneens' en 7 voor 'helemaal eens'.**

Ik heb een intens verlangen om om iets lekkers te eten.

Ik heb erge trek in lekker eten.
Ik heb behoorlijk zin in lekker eten.
Als ik iets lekkers zou eten, zou dit de situatie perfect maken.
Als ik nu iets zou eten waar ik zin in heb, zou dit mijn stemming verbeteren.
Nu iets lekkers eten zou geweldig zijn.
Als ik nu iets zou eten, zou ik me minder sloom en traag voelen.
Als ik nu mijn trek zou stillen, zou ik me minder slechtgehumeurd en geïrriteerd voelen.
Ik zou me meer alert voelen als ik mijn trek zou stillen.
Als ik nu iets lekkers te eten had, zou ik moeilijk kunnen stoppen met eten.
Mijn verlangen om iets lekkers te eten lijkt overweldigend.
Ik blijf nu aan lekker eten denken totdat ik het daadwerkelijk kan eten.
Ik heb honger.
Als ik nu iets zou eten, zou mijn maag niet zo leeg aanvoelen.
Ik voel me slap omdat ik niets gegeten heb.

Antwoordschaal:
1: Helemaal oneens
2: Oneens
3: Enigszins oneens
4: Neutraal
5: Enigszins eens
6: Eens
7: Helemaal eens

8. **Hoe hongerig voel jij je op dit moment?**

Antwoordschaal:
1: Helemaal niet hongerig
2: Niet hongerig
3:
4: Neutraal
5: Een beetje hongerig
6: Hongerig
7: Heel erg hongerig

9. **Heb je een voedselallergie? Zo ja, waar ben je allergisch voor?**