Juhász J. (ed) 2022: Proceedings of the European Union's Contention in the Reshaping Global Economy. University of Szeged, Doctoral School in Economics, Szeged, https://doi.org/10.14232/eucrge.2022.20

An examination of obesity in terms of eating behavior and self-control

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Obesity has become a pandemic that has been spreading for decades now. The treatment of diseases caused by obesity places a burden on the economy, with health care expenditures and even with indirect costs. Eating behaviour and self-control are considered to be the most important factors regarding the treatment and prevention of obesity. This study is looking for the answer to what level of self-control young consumers have, and how this affects their eating behavior and, through it, their body weight. Based on the results, it is concluded that the respondents do not necessarily judge their weight realistically. Self-control has a prominent role to play in preventing obesity. According to this research, individuals with weak self-control are most characterized by emotional eating and eating for external influences, while those with strong self-control are characterized by restrained eating.

Keywords: self-control, eating behavior, obesity

1. Introduction

Obesity has become a pandemic that has been spreading for decades now (Rurik et al. 2016). More and more adults and children are overweight, and their rate is gradually increasing (OECD 2017a). Among the countries of the European Union, Hungary ranks first in terms of the obesity rate per adult population (61.6%) (OECD 2017b). This is mainly due to a sedentary lifestyle and poor eating habits. Many diseases can be a source of malnutrition and consequent obesity. The treatment of these diseases also places a burden on the economy, accounting for 5–7% of health care expenditures, but this is even associated with indirect costs (Finkelstein et al. 2005).

Nutrition affects our entire life, from the beginning of our childhood. Our eating habits develop very early on and affect our health. Improper nutrition can affect our entire life or even shorten it. Therefore, it is important to pay attention to the development of appropriate eating habits already in childhood (Huszka–Dernóczy, 2015).

A healthy diet, paying special attention to the consumption of fruits and vegetables, helps to get the right amount and quality of nutrients into our body, along with filling it with vitamins. However, unfortunately, the diet of all age groups differs from the recommended: they consume less vegetables and fruits, but more energy-rich, poor-quality foods (Black et al. 2017).

One of the consequences of malnutrition is obesity, which is becoming more common with advancing age. 20.3% of Hungarian men aged 15–17 are overweight or obese, compared to 46.2% in the 18–34 age group. The situation is similar for women: 9.9% of 15–17-year-olds and 32.3% of 18–34-year-olds are overweight or obese (KSH 2020).

The first signs of many chronic diseases (such as cardiovascular disease, diabetes, and obesity) can be detected as early as childhood (Black et al. 2017). In

addition, psychological illnesses such as depression are also associated with obesity, which means an even worse quality of life for the person (Vazquez–Torres-Iglesias 2012). According to a study involving children and young people between the ages of 2 and 19, obesity that begins at a young age is much more likely to cause fatal illness than if obesity develops only in adulthood. In this case, the chances of type 2 diabetes, hypertension, and cardiovascular disease also increase significantly (Park et al. 2012). However, not only long-term but also short-term consequences can be expected, as pathological obesity already causes health problems in the short term (Reilly–Kelly 2011).

It is difficult to study health as a value in economics because it is a typical goods that has a definite price or market value. In the same way, it is not possible to quantify the number of healthy years spent and the extra years of life (Lippai 2012).

The level of health care expenditures is increasing year by year. Examining the data on domestic health expenditure, we can see that households are spending more and more money on it in Hungary as well, especially for medicines, medical aids and other medical goods (KSH 2017).

The study of healthy eating for the young age group is of paramount importance as they will be the workers and consumers of the future. Although they do not yet have their own earnings, they make their own decisions about their daily diet and some of them are old enough to even cook for themselves. This study is looking for the answer to what level of self-control young consumers have, and how this affects their eating behavior and, through it, their body weight.

2. Obesity, an economical issue

Obesity is an increasingly serious problem for both society and the economy. More and more adults and children are overweight, and their rate is gradually increasing (OECD 2017a). Comparing current data with those of two decades earlier, it can be shown that the number of overweight children has doubled, while the number of young people in obese adolescence has tripled (Vazquez–Torres 2012). Among the countries of the European Union, Hungary ranks first in terms of the obesity rate per adult population (OECD 2017b). This is due to the lack of exercise and the fatty, low-fiber dishes of Hungarian cuisine. Vegetable and fruit consumption, which is the basis of a healthy lifestyle, is also very low in Hungary (Pfau et al. 2018).

The factors affecting a person's health can be divided into two groups. The uncontrollable risk factors include innate genetic attributes, characteristics gained over the years, gender and age. The factor we can control is lifestyle. Health is determined in the highest proportion by lifestyle (43%), followed by genetic factors (27%), environmental effects (19%), and healthcare (11%) (Lalonde 1974). Among lifestyle factors, nutrition is crucial from the perspective of our health. Our eating habits develop as early as our childhood, and they influence our later state of health. Malnutrition may affect our whole life and even shorten it. Therefore, it is important to pay attention to the evolvement of proper eating habits from children's early age (Huszka et al. 2015).

Eating is largely due to our consumption decisions. Healthy eating actually means choosing the right foods, so it is an area of examination relevant to consumer behavior. A consumer with healthy eating habits pays special attention to the consumption of vegetables and fruits and follows the recommendations for healthy

eating rates in their diet. However, unfortunately, the diet of all age groups differs from that recommended: they consume few vegetables and fruits, but many energy-rich, poor-quality foods (Black et al. 2017). Differences from healthy eating behavior often stem from a lack of awareness, as for many, a healthy lifestyle is synonymous with dieting, and it is believed that the complete elimination of sugar from the diet is healthy (Gál et al. 2017).

2.1. Economic consequences of obesity

Treatment of obesity-related diseases accounts for 5–7% of health care expenditures, but this is even associated with indirect costs, such as lost work or expenditures outside the health care system (Finkelstein et al. 2005). Examining the data on domestic health expenditures, we can see that households are spending more and more money on it in Hungary as well, especially for medicine, medical aids and other medical goods (KSH 2017). 52% of the population (according to their own self-report) suffer from some chronic disease (KSH 2015). According to a study conducted in 2010, health is the most important value for the Hungarian population, but during the implementation it is already lower in the order of importance, as in this case it was only in the 14th place (Hofmeister-Tóth 2016). In Hungary, health awareness is more common among those with higher education and income, those living in big cities, and women. However, these differences become smaller the younger the person is (Malota et al. 2019).

The costs associated with obesity can be divided into three categories. Direct costs include patient care, rehabilitation, health care, emergency care, administration, research. and education related to obesity (Sonntag et al. 2015). This includes the costs of treating comorbidities as well as non-medical expenses such as diet and sports equipment (Iski–Rurik 2014).

For the overweight, there are also indirect costs associated with psychosocial problems, such as school bullying in childhood, and poorer school performance, which can also lead to lower productivity in adulthood. In addition, parents are more likely to be absent from work due to more common illnesses in obese children (Sonntag et al. 2016). An additional indirect cost is the cost of morbidity, which results from incapacity for work due to being overweight and related diseases, reduced work capacity, lower productivity, and their frequency is 17% higher than in the case of people of normal weight (Tóth–Nagy 2009). Mortality costs cover lost future income from early death (Iski–Rurik 2014).

The intangible costs incurred at the individual level are difficult to quantify, as they approach the harms of obesity from a spiritual point of view (Iski–Rurik 2014).

The cost of obesity-related illnesses in the course of public funding (in 2012) was HUF 207 billion, to which the cost incurred at the individual level is added, which amounted to nearly HUF 22 billion. This amount corresponds to 0.73% of domestic GDP. The real costs may be even higher than this, with some estimates accounting for up to 15-18% of total health expenditure and at least 1% of GDP (Iski–Rurik 2014).

The health systems of today's societies focus primarily on the treatment of diseases, with healing and restoring health as their main task (Lippai 2012). Yet it can be said that prevention could do a great deal at both social and individual levels, not to mention improving an individual's quality of life, which is priceless.

3. Eating behavior

Eating behaviour is considered to be the most important factor regarding the treatment and prevention of obesity and related illnesses (Danielsen et al. 2013). Before examining eating behavior, it is very important to note that food is not a medication, so it is not suitable for self-medication (Lockwood 2007). Individual foods are not healthy or unhealthy. To achieve their positive or negative effects, we need to consume them regularly. We will not experience an immediate effect, as with medicine. The same is true for obesity. There are no "fattening" or fat-burning foods, weight gain is the result of a very simple formula: if you put more calories into your body than you burn, you will gain weight in the long term (Dovey 2010).

Examining eating behavior includes motivation to choose food, eating practices, diet, and related problems such as obesity and eating disorders. It aims to help treat and prevent nutrition-related obesity and disease (LaCaille 2013).

3.1. Types of eating behavior

Numerous types of different eating behavior (also known as eating styles) are distinguished in the literature, of which the following three categories – perhaps the most widely examined – are interesting from our perspective: emotional eating, restrained eating, and disinhibition (Herman–Mack 1975, Herman–Polivy 1975, Stunkard–Messick 1985; van Strien et al. 1986). The characteristics of these three eating behaviors are presented below. As a preface, it is important to note that these different eating behaviors (eating styles) represent specific behavior that is not exclusive, i.e., a person may engage in multiple eating behaviors and have them often interacting with each other (see emotions and cognitive control).

3.1.1. Eating under the influence of emotions

Eating not only satisfies our physiological needs but often also affects our emotions, i.e. eating a single meal can also improve our mood. According to psychosomatic theory, those who eat triggered by emotions (fear, anger, anxiety) do not recognise this stimulus, and therefore they eat too many calories. They are called emotional eaters (Kaplan–Kaplan 1957). Emotional eaters have an additional component according to food (Dovey 2010). 75% of overweight people are struggling with this problem. Emotional eaters often choose food high in fat and sugar, and therefore tend to have higher risk of diabetes and heart disease (Frayn–Knäuper 2018). Obese emotional eaters often reduce anxiety by eating and become more obese as a result (Kaplan–Kaplan 1957). Special types of eating under the influence of emotions are binge eating under stress or depression and eating at night. These "episodes" occur regularly in the more stressful stages of life (Mendelson et al. 1961) and often occur in secret (Loro and Orleans 1981). Obsessive-compulsive disorder can also affect three-quarters of obese individuals and is more common among women (Ganley 1989).

3.1.2. Restrained /controlled eating

According to the restrained eating theory of Herman and Polivy (1975), normal eaters rely on their physiological needs only during nutrition, i.e. they eat only as much as they need to cover their energy use. They only eat when they are hungry and only eat until they feel it has been enough. Nothing can shock them out of this. However, controlled eating should not simply be seen as a diet (Heaven et al. 2001). The theory of restraint says that during diet the individual consciously restrains food consumption to reduce or maintain weight, which leads to metabolic processes slowing down and reducing the feeling of hunger. However, as soon as self-control decreases (for example, as a result of alcohol or negative emotions), cognitive restraint decreases and eating behaviour turns into the opposite direction, leading to excessive food intake. Furthermore, as a result of restrained eating, the individual may lose control over the feeling of hunger and the feeling of satiety, which leads to eating based on emotional or external effects (Herman–Polivy 1975).

Westenhoefer et al. (2013) found that this phenomenon may also occur due to the existence of two types of controlled eating: rigid and flexible. Strictly controlled eating is characterized by a kind of "all or nothing" eating behavior, i.e., strict in terms of diet, it does not allow fluctuations. Surprisingly, however, this type is characterized by undulation, i.e., often the strict period is followed by a period that allows the consumption of fatter and fattening foods. Flexible controlled eating, on the other hand, is a much more successful way to diet or maintain weight, as in this case, fatty, sugary foods are not prohibited, they can only be consumed in smaller amounts. Strict controlled eating is much more prone to various eating disorders such as anorexia or bulimia due to oscillations, while flexible controlled eating suggests high self-control and results in successful weight management. Unsurprisingly, strict controlled eating behavior correlates with higher BMI, while flexible controlled eating behavior may be associated with lower BMI (Westenhoefer et al. 2013).

3.1.3. Uncontrolled eating

Disinhibition, i.e. the loss of inhibition indicates an eating behavior where the individual loses control for some reason, or is disturbed by something, so they eat more food. One classic example is when we eat a lot more snacks than we really need or drink a liter of soft drinks while watching a movie. This is because the action (in this case, watching the film) distracts us, so we do not realize how much we eat (Dovey 2010).

Impulsivity, a form of behavior in which an individual does not consider the weight and consequences of his or her actions is an important factor in uncontrolled eating. Impulsive people are less likely to have eating habits that are necessary for a healthy diet, such as eating meals, eating at regular intervals, and are more likely to reach for high-fat meals in such cases (Lyke–Spinella 2004).

Eating externally is a special form of eating behavior associated with loss of control that results from a response to food-related (external - smell and internal - hunger) signals (Heaven et al. 2001). External theory has a similar position, claiming that the external environment determines eating behaviour and the vision and smell of food generate an overly strong reaction in overweight people (Schachter–Rodin 1974).

3.2. Measuring eating behavior

Eating behaviors and attitudes have been the subject of numerous studies, and several measurement methods have been developed to investigate it. Garner and Garfinkel's (1979) Eating attitude test (EAT) can be used to examine mainly eating disorders. With the Herman and Polivy (1980) Restriction Scale, we can measure how consciously an individual limits food intake to limit their weight. This questionnaire provided the basis for the Three Factor Eating Behavior Questionnaire (TFEQ) (Stunkard–Messick 1985) and the Dutch Eating Behavior Questionnaire (DEBQ) (Van Strien et al. 1985). Both examine three eating behaviors: TFEQ distinguishes between uncontrolled eating, cognitive restriction, and emotional eating, and DEBQ distinguishes between restrained eating, emotional eating, and eating for external influences.

Dutch Eating Behavior Questionnaire (DEBQ) is a questionnaire designed to measure eating behavior that was developed in 1986 by van Strien et al. The questionnaire, originally consisting of 46 items, was later reduced to 33 questions, which have since been validated in several countries (including Brazil, China, Spain, France) (Moreira et al. 2017, Wu et al. 2017, Cebolla et al. 2013, Bailly et al. 2012).

The questionnaire examines eating behavior using three subscales. The *external eating* scale examines consumption under the influence of external stimuli associated with food, regardless of an individual's sense of hunger. The *restrained eating* scale measures whether an individual intentionally restrains their food intake to lose weight or prevent being overweight. The third, *emotional eating* scale, examines the effect of emotions (e.g., anger, tension, nervousness) on nutrition (Van Strien et al. 1986).

4. Consumer rationality in relation to nutrition

Classical economic models also assume rational consumers who try to maximize their benefits. This is true of homo sapiens, which satisfies only the means of sustenance, but the motives of a "well-to-do" person's actions are more in the sense of emotion (Székely 2003). The reason for assuming rationality is that this makes economic interactions easier to examine. According to Friedman (1986), if we look at these interactions in an aggregate way, the irrational behavior of each actor does not affect the results, so we may be able to make assumptions about the future (Friedman 1986).

Behavioral economics examines the consumer's characteristic that rationality is often missing in real economic decisions. The reason for this is essentially in the decision process, which consists of many factors such as perception, influence, motivation and preference (McFadden 1999). Consumers often do not choose the optimum because they make mistakes, are uninformed, or do not have self-control for rational decision-making (Mulvaney–Lee 2017). Herbert Simon, who won a Nobel Prize for his theory of limited rationality, says that we do not have to deal with how the actors of the economy should behave, but how they actually act (Simon 1986). The theory of limited rationality does not want to abolish the models of rationality of neoclassicals but rather complement it (Simon 1986, Golovics 2015), since limited rationality also presupposes that people act rationally, but their cognitive and emotional properties influence their decisions (Jones 1999).

In case of nutrition, rational behavior would be the choice of healthy alternatives, but consumers do not always choose them. As we can see from the discussions above, they do not necessarily act irrationally, they only decide on the limits of their cognitive and emotional attributes.

4.1. Intertemporal decisions

Such a limit may be by choosing unhealthy food as the problem of consumer self-control, as unhealthy food is often finer, more desirable, or even cheaper and easier to access. Thus, the benefits of eating unhealthy food are immediately realized by the consumer, while related expenditures (problems) occur only in later years. "Intertemporal situations are often formulated in economic researches as a choice between 'attractive at short-term/ hurtful in long-term' and 'hurtful in short-term/ useful in long-term' alternatives" (Lippai 2008, 6). These decisions are choices that will have an impact in the future (Berns et al. 2007).

For nearly 80 years, economists have used the discounted utility model to examine intertemporal decisions. The model assumes that people value the joy and pain of their decisions in the same way that financial markets value profits and losses, exponentially discounting the value of the outcome depending on how late it occurs in time (Berns et al. 2007). The discounted utility model attempts to model the psychological factors behind intertemporal decisions, where the discount rate is constant (Bölcskei 2009). Ainslie (1975) was the first to question the validity of the discounted utility model. According to him, the discount rate should be exponential. The most accepted model is the hyperbolic discounting model, which explains intertemporal decisions much better in the light of self-control problems (Bölcskei 2009). According to Elster (2001, in Lippai 2008, 55), "consumer self-control can be defined as one of the possible explanatory principles for anomalies in intertemporal consumer decisions relative to the expected (rational) outcome, which is basically two irrational forms of consumer behavior (?) / Heuristics. (?) refers to: myopia and procrastination. This approach also requires correction of the homo oeconomicus human image but leaves its basic axioms unchanged."

To describe the self-control problem explained by the hyperbolic model, Fudenber-Levine (2006) developed the double self-model. The point is that individuals are both forward-thinking planners and short-sighted actors. A planner self seeks to maximize benefits in the long run, while acting in my selfish and short-sighted way. The source of the conflict is the conflicting interest. The planner self, however, seeks to encourage the acting self by using incentives to change the preferences of the acting self, or by setting and controlling rules. For example, in case of dieting, this person checks how much weight they have lost every month. In case of dieting or dieting, it can also be a solution if the planner self does not limit the possibilities of the acting self to a single action but only limits or reduces them (Bölcskei 2009).

Also, the model created to explain self-control problems associated with intertemporal decisions is a model of desire for commitment. The essence of Gul-Pesendorfer's (2001) model is that the individual limits their choices, thus trying to exercise self-control and resist temptation. If one has high self-control, one will choose the alternative that has higher utility in the long run.

The willpower model is also used to model self-control problems related to intertemporal decisions (Ozdenoren et al. 2006). The model is explained by a simple example of cake consumption. Using the discounted utility model, the individual consumes the cake at a steady rate. In reality, however, this often happens when an individual consumes an increasing amount of cake, but this cannot be explained by either the hyperbolic or the double self-model, only the willpower model. This model simultaneously explains present-biased preferences, preference change, need for commitment, and preferences for a growing line of consumption (Bölcskei 2009). According to the model, earlier cognitive exertion has an effect on later consumption as willpower decreased. But it is also conceivable to leave the best to the end, so a negative preference is realized. Also, the individual often tends to link two actions that require self-control, such as quitting smoking and eating. They give up smoking, but in the meantime they allow themselves to be seduced and eat more than they need to. "The consumer exerts their willpower when it has the lowest opportunity cost, that is, when it has a large willpower and before it runs out over time, so the indirect marginal benefit of increased consumption increases over time" (Bölcskei 2009, 1032. o.).

4.2. The relationship between consumer self-control and nutrition

The relationship between nutrition and self-control has also been addressed by a number of researchers, with the main focus on obesity. Looking at the past 50 years, we can see that due to the development of technology, food prices have been falling, while the intensity of exercise has fallen due to more and more sedentary work. Obesity is mainly due to these causes (Lakdawalla–Philipson 2002). Thanks to technology, work has also become more productive, allowing more and more tasks to be performed with less and less intensity and calorie burning, which also promotes obesity (Finkelstein et al. 2005). Although obesity can have a health cause, it can be seen that the main factor influencing being overweight is an individual's personal lifestyle. Consequently, "the self-control variable can play a very important role in the development of a form of behavior where consumers, who are fully aware of the benefits of exercise and the disadvantages of unhealthy eating, still lead unhealthy lifestyles" (Lippai 2008, 77).

According to Stutzer and Frey (2006), the cause of obesity is poor self-control and short-sightedness in the individual. It can be shown that if someone gets rid of more weight, it is easier to control their behavior. The source of the problem is that people come across too many opportunities with low immediate marginal costs but high long-term marginal benefits. Because of their lack of self-control, they turn to these opportunities with short-sightedness. They may be able to resist some temptation, but they have difficulty controlling their decisions because of too many options. This is related to the willpower model mentioned above (Ozdenoren et al. 2006).

Self-control can play a role in several phases of a decision situation. In problem identification, there may be a contradiction between the short and long term when defining future goals. But self-control is also needed to make the right choice when searching for and evaluating information. The consumer needs time to gather information and the lack of time often leads to impulse buying (Lippai 2008).

Examining consumer self-control and examining consumer motivations can help create a preventive health policy that strengthens self-control in consumers about healthy eating. Thus, health care expenditures could be reduced in the future, as well as the burden on taxpayers.

5. Material and methods

In my empirical study, I have examined the level of self-control of young people as well as their eating behavior in Hungary. I hypothesize that those with less self-control are more likely to eat for emotional or external influences, while those with higher levels of self-control are characterized by restrained eating.

To measure self-control, I have used the Tangney et al. (2004) self-control scale, which is based on a psychological method to examine personality traits characteristic of self-control. The self-control scale of Tangney et al. (2004) consists of 36 items. It examines five dimensions of self-control (self-discipline, non-impulsivity, healthy habits, work ethic, and reliability). This self-control scale is widely known and has been adapted in many languages (French: Brevers et al. 2017; Chinese: Unger et al. 2016; German: Bertrams 2009). It was first adapted to Hungarian language by Lippai (2010). The respondent should indicate on a 5-point Likert scale how true the statement is of them. Each statement is inversely coded, so this should be considered in the analysis. Adding the points given to the answers gives the self-control score of the given person.

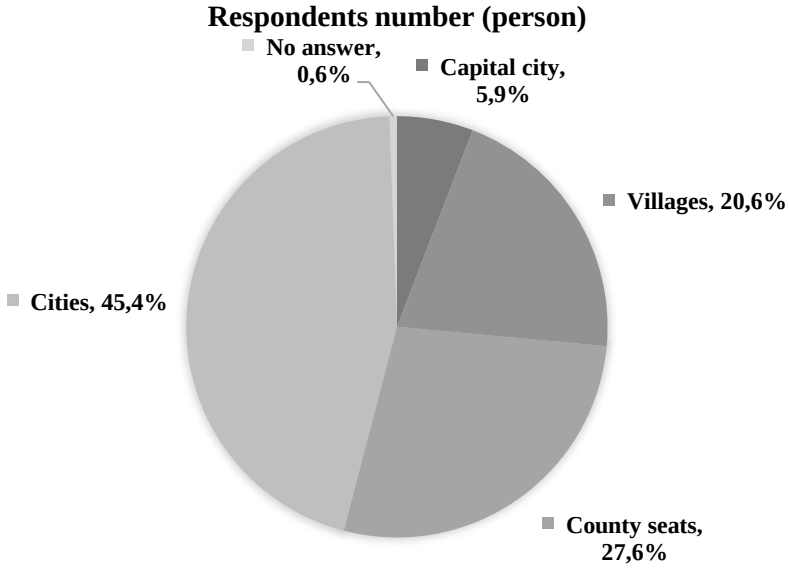
To measure eating behavior, I have used the above-mentioned Dutch Eating Behavior Questionnaire (DEBQ) to measure eating behavior.

The questionnaire survey was preceded by a small sample (30 person) trial survey, thus ensuring that the questions were understandable to everyone. The questionnaire was completed by a total of 529 people, the respondents were young people aged 18 to 23, all of them university students.

The questionnaire was conducted both offline and online. Data collection lasted for 3 months. During this time, more than 700 answers were received. The questionnaire was distributed to as many young people as possible with the help of university lecturers, who helped to distribute the questionnaire among the students. The respondents were screened for 18–23-year-olds. After data cleansing, 529 people remained in my sample.

29.9% of the young people in the sample were men and 70.1% were women. 88.3% of them live in cities and only 12% of them live in a village or municipality (Figure 1.)

Figure 1 Permanent residence of the sample



Source: Own construtions

6. Results

To examine the self-control scale, all variables were brought into the same form so that a higher score meant greater self-control everywhere and a lower score meant less self-control. I then examined the correlation of the variables with Cronbach's Alfa. Cronbach's Alpha was 0.833, indicating that the variables were consistent.

The minimum value measured by the self-control scale is 49 and the maximum is 134. The mean of the scores is 81.45 and the standard deviation is 14 (Table 1).

Table 1 Mean and standard deviation of self-control scores

Self-control scores	Respondents number (person)	Minimum score	Maximum score	Mean	St. dev.
	529	49.00	134.00	81.4556	14.00806

Source: Own construtions

Three categories were developed from the self-control scale. Values in the +/-1 standard deviation range from the mean were in the middle group, those with a lower score were in the weak self-control group, and those with a higher score were in the strong self-control group. With this grouping, 81 people have weak, 365 people have normal, and 83 people have strong self-control. The distribution of women and men is evenly distributed among each self-control category (Table 2).

Table 2 Distribution of the sample by self-control categories

Self-control categories	Respondents number (person)	Distribution (%)
Weak	81	15.3
Normal	365	69
Strong	83	15.7
Total	**529**	**100**

Source: Own construtions

Furthermore, from the questions of the DEBQ scale, I was able to create factors determined on the basis of the original scale, i.e. emotional eating, eating for external influences, and restrained eating factors with the help of factor analysis. Here, however, it is important to mention that, based on the responses of our respondents, I was only able to create these artificial variables without including some of the statements from the original variables in the factor analysis (Table 3).

We also examined the Cronbach's Alpha value for the scales that make up each factor to see how well the variables correlate. Cronbach's Alpha was 0.953 for the emotional eating scale, 0.895 for the restrained eating scale, and 0.851 for the external effect scale, indicating that the variables are consistent.

Table 3 Results of principal component analysis

DEBQ scale	
KMO	0.931
Bartlett test sig. value	<0.05
Cumulative variance ratio (%)	59.036
Number of factors created (db)	3

Source: Own construtions

The self-control scale was then compared with eating behavior factors (Table 4). Positive values in the table indicate that those in the given self-control group are more affected by the given factor than all respondents in general, while negative values indicate that they are less affected by the given eating factor compared to the average. The greater the deviation from zero, the more significant this effect is. Thus, we can see that in the analysis, in line with our expectations, the eating habits of those with poor self-control are most affected by emotions and external stimuli. In contrast, individuals with strong self-control are not characterized by eating under the influence of either emotions or external influences, while restrain eating characterize only them.

Table 4 Comparison of self-control level categories with eating behavior categories

Self-control categories	**Eating behavior**		
	Emotional eating	Restrain eating	External eating
Weak	**+0.438**	–0.119	**+0.369**
Normal	+0.023	–0.044	+0.005
Strong	–**0.554**	**+0.323**	–**0.401**

Source: Own construtions

Those with moderate self-control also achieved the results we expected. The diet of those in this group is affected by both emotions and external influences, however, these effects do not appear much stronger than the average for either factor.

Based on these results, it can be said that (as has been suspected) individuals with weak self-control are more likely to eat under the influence of emotions or external factors, and individuals with strong self-control easily resist delicious and tasty looking food and are really successful at dieting.

The same relationship was studied between BMI categories and eating behaviour types (Table 5). The results show that eating under the influence of emotions is most characteristic of obese people, as well as the overweight. Moderate eating is most characteristic of the obese. This may be due to the fact that moderate eating can be strict and flexible, which is linked to the success of the diet (Westenhoefer et al. 2013). So obese people can be characterized by moderate eating, because they are constantly trying to diet (but this, as their weight shows, does not work for them).

Table 5 Comparison of BMI categories with eating behaviour types

BMI categories	**Eating behaviour**		
	Emotional eating	Restrain eating	External eating
Skinny	–0.104	–**0.514**	+0.067
Normal weight	–0.050	–0.007	+0.026
Overweight	+0.137	+0.251	–0.174
Obese	**+0.543**	**+0.401**	–0.047
Total	–0.002	–0.002	+0.001

Source: Own construtions

7. Conclusion

Classical economics assume a rational consumer who always weighs the choices and always chooses the most optimal one. In practice, however, this is not the case. An individual's decisions are also influence by their emotions, in our case, when making eating decisions.

When making eating decisions, we are often confronted with the problem of intertemporal bias, especially when it comes to consuming unhealthy foods. The individuals evaluate their current situation and decide on it, they do not take into account the negative effects of their decisions in the future. These decisions can also be influenced by their eating behavior, as they have poor self-control, they tend to consume more food due to emotions or external factors.

In my study, I have sought the answer to the question whether there is a correlation between young people's level of self-control and their eating behavior. To answer this question, I have conducted a questionnaire survey based on the Tangney et al. (2004) self-control scale and the Dutch Eating Behavior Questionnaire (DEBQ). I have created three self-control level categories (weak, moderate, strong), which I have compared with the three categories of eating behavior (emotional eating, restrained eating, and eating under external influence). The results show that individuals with poor self-control are much more likely to consume more food as a result of heightened emotions, and when they see food that is desirable to them, they consume it regardless of whether their body is hungry or needs the extra calories. In contrast, individuals with strong self-control are not characterized by eating under the influence of either emotions or external influences, while restrain eating characterize only them.

The results of a previous study on a smaller sample showed a similar result in the case of weak self-control, but in the case of strong self-control they were found not to be characterized by restrained eating (Pető–Lipták 2020). According to Kuijer et al. (2008), restrained eating can only be associated with poor dietary decisions when coupled with poor self-control.

The results of this study may be useful for obesity prevention campaigns. In my opinion, it would be worthwhile to introduce consumers to the theory of types of eating behaviors, because if they were aware of the effects that affect them personally in their diet, they could easier pay attention to prepare for such situations and practice greater self-control. It would be worthwhile to take an online software-based self-filling test to help everyone find out which types of eating behaviours are most typical of them.

The limitation of this study is the unrepresentative sample, the respondents do not describe the population studied, but it provides a good starting point for the examination of correlations.

Acknowledgments

The research was funded by the EFOP-3.6.1-16-2016-00008 tender entitled "Developing smart life science technologies, methodologies and applications and creating innovative processes and services built on the knowledge base of Szeged".

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