

Segmenting Generation Y based on TFEQ and DEBQ for clustering



Abstract

Investigating the youth, especially members of Generation Y, is a challenge for theoretical and practical researchers, too. An epidemic of the 21st century is overweight and obesity, which is a consequence of inappropriate eating habits and a sedentary lifestyle. Overweight and obesity is a serious problem for young people, since the ratio of obese young people (below 35) is constantly increasing in the developed regions of the world. In an empirical research 589 adults under 35 were questioned. The aim of the research was to segment Generation Y based on their eating behaviour measured on TFEQ (16 items) and DEBQ (33 items). Relying on the results of TFEQ 16 (386 people) three main consumer groups can be distinguished, namely functional eaters (49.2%), Carpe diem and YOLO (31.1%) and emotional eaters (19.7%). The authors identified almost the same groups in the case of DEBQ (154 people), where they distinguished functional (45.5%), emotional (13.6%), conscious (20.8%) and delighted eaters (20.1%). Clustering people based on their eating behaviour is useful for food producers, restaurants and diet experts to offer a special products for young people belonging to Generation Y.

Keywords: DEBQ (Dutch Eating Behaviour Questionnaire), Generation Y, eating styles, segmentation, TFEQ (Three Factor Eating Questionnaire)

INTRODUCTION

Analysing the customer behaviour of generations is a current topic of marketing researchers. Each generation has unique expectations, experiences, generational history, lifestyles, values and demographics that influence their buying behaviours (Williams-Page, 2010). Members of a generation were born in the same time that is why they share the same experiences, adventures and values. (Törőcsik, 2011, 175) Investigating the youth, especially members of Generation Y, is a challenge for theoretical and practical researchers, too, since they represent an essential consumer group worldwide. What is more they will determine the behaviour and shopping habits of the future generation.

Overweight and obesity is an epidemic that appears in the developed countries of the world but also in developing countries. This phenomenon can be explained by inappropriate eating habits and sedentary lifestyle. Relying on

statistical data overweight and obesity is a serious problem for young people, since the ratio of obese young people (below 35) is constantly increasing in the developed regions of the world. Investigating eating styles and habits is an important topic all over the world. Considering the national health survey of KSH (Central Statistical Office) from 2014 (European Health Interview Survey, 2014) Generation Y follows an unhealthier lifestyle than older generations. The majority (96%) of population over 15 eats fruits and vegetables daily. Two thirds of the population eat fruits and vegetables more times in a day, 72% of females and 62% of males. 79% of people over 65 and 60% of the youngest people (between 15 and 17 years old) eat fresh fruit and vegetables regularly and more often. Hence there is a strong correlation between eating styles and obesity so it is worth to look at the BMI indices over generations. The ratio of obese and overweight people in Generation Y (age between 18 and 34) is the following: 39.3% in the case of males and 23.4% in the case of females, however, the survey found that women underestimate their weight and overestimate their height, because the establishment of body mass index was based on self-declaration. Underweight is more typical for women (11%) than for men (2.9%). Considering tendencies a slight drop among young men and a slight increase among young women could be observed over the 21st century.

The analysis of the relation between obesity and eating habits were mainly published in psychological and sociological studies both in international and in domestic literature. A relatively few scientific publications deal with the management of BMI and eating styles from a marketing viewpoint. The aim of present research is to segment Generation Y based on their eating behaviour measured in the shorter version of Three Factor Eating Questionnaire including 16 items and on the Dutch Eating Behaviour Questionnaire. Since the two scales are measuring almost the same eating styles we are interested in whether the same consumer groups can be identified or not.

1. THEORETICAL BACKGROUND

Distinguishing each generation is not so obvious since different researchers use different age categories. Multi-generational marketing is a popular topic in national marketing literature (Törőcsik, 2011). This study is focusing on the eating behaviour of Generation Y, born between 1980 and 1994 and are currently aged between 23 and 37. Considering the most up-to-date statistical data (<http://www.ksh.hu/interaktiv/korfak/orszag.html>) the population of Hungary is 9 830 485 people (100%) and the ratio of Generation Y is 19.13% (1 880 291 people). It can be said that this generation makes up one fifth of the whole population.

In Hungary psychologist Tari (2010) dealt with Generation Y in more detail. According to her these youths have been socialised in the world of computer and internet that is why they are better informed than their parents or older bosses. Success, professional career and money are the most important things

for them since they know that these are the values in the world of consumption. They are longing for safety in this hard and self-confident world and they create the illusion and adventure of belonging and society. They mainly use the internet and social media, blogs or online games that are based on networks for socialisation. Considering their consumer behaviour they live for the day (“carpe diem”) and they spend a lot of money, saving is not important for them. They are looking for unique products but at the same time they are sensitive to social problems. Hedonism and adventure are important factors when they go shopping and they are looking for special and prestige products. They are interested in fashion and music (Williams-Page, 2010). They travel a lot and have gained huge experience from the world; they are culturally open to different nations, they are happy to try out dishes from different cultures. They prefer try out a new restaurant than buy a new pair of shoes. They are interested in festivals offering culinary pleasures more than music events or concerts (<http://corporate.univision.com/2014/12/millennials-the-foodie-generation/>). They are emotional and sensitive people and this may have an effect on their eating behaviour. The British ELIOR research institute published a report on the eating preferences of Generation Y in 2015. They are late eaters, they skip breakfast and prefer a mid-morning snack and for lunch they choose easy-access, high-quality fast-food solutions since they think “the easier the better”. They follow hectic lives and like snacking so emotional eating is typical for them. Millennials are the members of the digitally connected generation. They like sharing their eating-out experience on social media tools. The majority of Generation Y claims they eat or at least intend to eat healthy food however their food choices would suggest otherwise. They prefer home cooking and plan to eat out less in the future. “They tend to serve up the same meals they order in restaurants.” (<https://www.eliorgroup.com/press/press-releases/generation-y-and-their-meals-new-eating-habits-18-30-year-olds>)

More international quantitative studies have proved the unhealthy eating behaviour of the youth. Lee and his co-authors (2006) compared the eating behaviours of Korean university students and their parents in a complex empirical study. They identified the preferred dishes of the two generations and analysed the calorie intake. They found that young people follow a western style diet (fast food, frozen and canned food) and they consume more fat than their parents. All in all they follow a more unhealthy diet, which increases the risk of overweight and obesity. A Greek study highlighted that young students living alone and leading their own household have more unhealthy diet than those who live together with their parents (Papadakia et al., 2007).

More studies analysed the eating behaviour of generation Y in Malaysia (Kavitha et al., 2011; Pawan et al., 2014; Ying et al., 2013). The food preferences of generation Y are determined by intrinsic (health, perceptive attractiveness, price) and extrinsic (mood, comfort, similarity) factors (Kavitha et al., 2011). Intrinsic factors have higher impact on food choice than extrinsic ones. The authors high-

lighted that the knowledge of a healthy lifestyle of generation Y is much deeper than their actual behaviour. The research of IFIC (International Information Council) came to the same conclusion. Millennials recognize the importance of eating healthfully but all admit they do not always eat as healthfully as they would like. "The Millennial generation has poor health habits, including inactivity and poor nutrition, which contribute to the early development of overweight and obesity." (Barkin et al., 2010, 240) They prefer red meats and fried foods and don't consume enough fruit or vegetables. Millennials lack time and money but they are social, so they obtain digital or online information on nutrition. This generation likes eating out more than any other (older) generations. They are adventurous in trying new foods and places with their unique eating habits (Pawan et al., 2014). The authors conducted a quantitative study and questioned 310 Malaysian youths age ranging between 16 to 33 years old. The authors identified factors influence to dine out: (1) social eating behaviour, (2) price and value, (3) healthy choice, (4) convenience, (5) emotional eating. They found that emotions affect the amount of eating, eating more in a bad mood, comfort, snacking in the case of boredom, association between food and success, and dining out in the case one is upset. Ying and his co-authors (2013) identified how Malaysian Generation Y made the decision when they purchased healthy fast food. Their results showed that quality of service, eating behaviour and consumer lifestyle are the most important factors. The youth look at the freshness and quality of the products when they want to choose a fast food. Due to the rapid increase in diseases such as high blood pressure, heart attacks and obesity, consumers look for other varieties of fast food, such as soups, salads and any other healthy dishes.

Psychologists have developed more measuring methods for the analysis of obese people and individuals with normal body weight: latent obesity survey (Pudel et. al., 1975), eating attitudes test (Garner-Garnfinkel, 1979), restraint scale (Herman-Polivy, 1980). In the present study the authors deal with the Three Factor Eating Questionnaire (TFEQ) developed by Stunkard and Messick (1985) and the Dutch Eating Behaviour Questionnaire (DEBQ) containing 33 items and elaborated on by van Strien and her colleagues in 1986. In the domestic literature mainly the TFEQ - Three Factor Eating Questionnaire - was used by psychologists and marketing experts (Czeglédi-Urbán, 2010; Szabó et al., 2014). In previous research the Hungarian adaptation possibilities of TFEQ 16, TFEQ 20 and the DEBQ were analysed (Dernóczy-Polyák-Keller, 2015). Szabó et al. (2014) examined the health behaviour on a nationally representative sample of 1000 people from the Hungarian adult population. Based on the TFEQ 18 and the 'Body Attitude Test' they executed the determination of factor structure, and then they conducted cluster analysis and they classified the Hungarian population into five consumer groups. They distinguished 'uncontrolled emotional eaters', 'tense dissatisfied people', 'unconcerned people', 'overweight impulsive eaters' and 'conscious eaters'. This segmentation could be really useful to food producers and experts working on the field of health management since they could

target their audience with special unique products or services. For example ‘overweight impulsive eaters’ (13%) would like to lose weight but they can be characterised by emotional and uncontrolled eating. 20% of the population belong to the group ‘conscious eaters’ and they are the most important target audience of healthy food. They are not emotional eaters and have high income they can afford premium category products.

2. THE EMPIRICAL RESEARCH

The aim of this complex research is to segment the Hungarian youth belonging to Generation Y based on the previously introduced TFEQ 16 and DEBQ scales and to identify homogenous consumer groups based on the results of factor analysis, the original factor structure, and characterize them based on some important dimensions. The following research questions were defined: Is it possible to segment customers of Generation Y based on the TFEQ 16 and DEBQ scale? Is it possible to distinguish the same consumer groups?

Relying on the literature review the assumption is that people can be classified into homogeneous customer groups and they can be definitely profiled. Moreover we assume that Hungarian customers can be classified based on the formerly identified Hungarian eating styles, namely emotional, cognitive control eating and uncontrolled eating. The properly defined segments are a competitive advantage for companies.

2.1. MEASUREMENT AND SPECIFICATION OF SCALES

To examine eating styles the TFEQ 16 and the original DEBQ (Ercsey et al., 2015) were used. The 16 item questionnaire contained three scales measuring emotional eating (6 items e.g., ‘When I feel anxious, I find myself eating.’), cognitive control eating (3 items e.g., ‘I do not eat some foods because they make me fat.’), and uncontrolled eating (7 items e.g., ‘When I see a delicious food or I can smell it, I find it very difficult to keep from eating, even if I have just finished a meal.’) on a four point Likert scale.

The 33-item questionnaire contained three scales measuring emotional eating (13 items e.g., ‘Desire to eat when you are emotionally upset’), restrained eating (10 items e.g., ‘Eat less than usual in the following days when you have eaten too much’), and external eating (10 items e.g., ‘It is difficult to resist delicious food’). Response categories ranged from 1 ‘totally agree’ and 4 ‘totally disagree’.

2.2. SAMPLE DESIGN AND SAMPLING

To answer the research question the authors chose a single cross-sectional research method. The authors used the quota sampling design. They planned to follow

proportional sampling based on gender (50% of males and 50% of females). The empirical research was conducted in March 2015. The researchers used the self-reported online and PAPI method. Students and the authors themselves participated in the process of questioning. Finally 589 people, specifically 393 with TFEQ 16 and 196 with the DEBQ could be reached with the survey and were willing to fulfil the whole questionnaire. The ratio of males (49.4%) and females (50.6%) was almost equal in the case of TFEQ 16. However in the case of DEBQ the ratio of females and males was 60% to 40%. The sample was not a representative one that is why the authors would like to emphasise that this study is an exploratory one.

2.3. STRATEGY FOR DATA ANALYSIS

The data analysis was conducted with the help of SPSS 23.0 software. The research question was tested with multivariate statistical analysis. To test the research questions the authors used the method of cluster analysis, especially the method of Ward's hierarchical cluster analysis, namely the agglomerative clustering (Malhotra, 2010). Since the aim was to emphasize the main differences we used square Euclidean distance to measure the distances. After investigating the pre-conditions, the researchers considered different cluster solutions, but finally they decided to apply the three cluster solution. In the next step they considered these three clusters as nominal variables.

3. RESULTS

The simple mathematical means of items belonging to one factor that is belonging to one eating style (Hair et al., 2005) were the bases of cluster analysis. Since this type of multivariate analysis is really sensitive to outstanding values (Malhotra, 2010) the first step was to identify these respondents. Excluding missing values 386 and 154 respondents were analysed. Ward's agglomerative clustering was used and the square Euclidean distance was considered. Relying on the results of the Elbow criterion and agglomeration schedule the three cluster solution was chosen in the case of TFEQ 16. In the case of DEBQ four segments were distinguished. Count and frequency in the case of TFEQ 16 clusters are the following: 1st cluster 190 people (49.2%), 2nd cluster 120 people (31.1%) and the 3rd cluster 76 people (19.7%). Count and frequency in the case of DEBQ clusters are the following: 1st cluster 70 people (35.7%), 2nd cluster 21 people (10.7%) 3rd cluster 32 people (16.3%), and the 4th cluster 31 people (15.8%).

In order to make a typology for the different clusters the analysis of the means is necessary. The method of one-way ANOVA was used to check the category means of eating styles in the case of each cluster and significant differences. There are

significant differences between groups in the case of all variables. To test the homogeneity of variables Post-Hoc tests (Dunnett T3 and LSD) were conducted. Relying on the results there are statistically significant differences among variables.

Based on the results it can be stated that there are distinguished groups belonging to a special cluster on the basis of the examined eating styles. Thus it is possible to distinguish homogeneous consumer groups based on TFEQ 16 and DEBQ.

3.1. TYPOLOGY OF CLUSTERS

To characterise each cluster based on their eating styles the mean of original factor items were considered. In the first group of young people none of the eating behaviours are true for the respondents. They are not influenced by any of the eating styles. They are *functional eaters* and they represent 49.2% of the sample. They eat to live and consider eating as a basic need and the researchers suppose that they can be influenced by rational reasons when it comes to food choice.

In the second group (31.1%) there are people who can be characterized by uncontrolled eating, however emotional and cognitive control eating is not typical at all for them. They live for the day and do not care about the consequences. They are hedonic their motto is *Carpe Diem*, and they can be referred to as *YOLO* (You Only Live Once).

People in the third cluster (19.7%) eat due to negative feelings and can be characterized by uncontrolled eating. They eat due to negative feelings and food is a kind of bonus for them. They are the *emotional eaters*. The profiling of each cluster based on TFEQ 16 is summarised in table 1.

Table 1 Typology of each cluster based on TFEQ 16, n=386

		Functional eaters	Carpe Diem and YOLO	Emotional eaters
Size	(%)	49.2	31.1	19.7
Emotional eating	mean STD	3.6868 0.3895	2.8375 0.5096	1.9386 0.5563
Cognitive control	mean STD	3.0333 0.9095	2.7472 0.7633	2.3772 0.8766
Uncontrolled eating	mean STD	3.2511 0.4390	2.4333 0.4739	1.9192 0.4788

Source: Own research

In the first group of young people none of the eating behaviours are true for the respondents. They are not influenced by any of the eating styles. They are functional eaters and they represent 45.5% of the sample. This group of people could be identified with the TFEQ method.

In the second group (13.6%) people eat due to negative feelings and can be characterised by external eating. They eat due to negative feelings and food is a kind of bonus for them. Emotional eaters also appeared with a similar ratio in the TFEQ method.

The third group of youths (20.8%) are conscious because they can be characterized by restrained eating habits. They take care of food intake and controlling weight is an important factor for them. This group of people could not be identified with TFEQ clustering.

People in the fourth cluster (20.1%) refuse restrained eating and they can be influenced by external factors such as the smell and the taste of food. They are the *delighted eaters*. The profiling of each cluster based on the DEBQ is summarised in table 2.

Table 2 Typology of each cluster based on DEBQ, n=154

		Functional eaters	Emotional eaters	Conscious eaters	Delighted eaters
Size	(%)	45.5	13.6	20.8	20.1
Emotional eating	mean	2.2846	1.5458	3.4928	3.4615
	STD	0.3920	0.471	0,41944	0.45854
Restrained eating	mean	2.4386	3.0000	2.2469	3.5129
	STD	0.3979	0.6410	0.4641	0.3989
External eating	mean	2.5817	1.7963	3.1476	2.7527
	STD	0.2981	0.2683	0.3305	0.5643

Source: Own research

Summing up the results of the empirical research the authors define that Millennials can be grouped into homogeneous groups based on their eating styles. With the use of TFEQ 16 three groups of people (1) functional eaters, (2) Carpe Diem and YOLO, (3) and emotional eaters can be distinguished. Based on DEBQ scale four groups of youths could be identified: (1) functional, (2) emotional, (3) conscious and (4) delighted eaters. Functional eaters could be distinguished in the case of both scales and they make up the majority of Millennials. They cannot be characterised by any of the investigated eating styles. Emotional eaters could be identified in both scales. These are the youths who eat due to negative emotions. In the case of TFEQ 16 we could not identify the group who can be characterized by cognitive controlled eating style. However in the case of DEBQ almost one fifth of the sample belongs to the conscious eaters' category. They put an emphasis on eating and consider weight concerns an important factor when it comes to eating. Finally there are people who can be characterised by uncontrolled eating in the case of TFEQ and external eating who eat due to external stimulus in the case of DEBQ. We called them Carpe Diem and YOLO since they are hedonic and love eating without paying attention to calorie intake. Delighted eaters are also one

fifth of the DEBQ sample as they cannot stand stimuli to their senses (smell, taste, vision). They have to eat when they see or smell something delicious and they do not think of the consequences.

4. DISCUSSION

The TFEQ and DEBQ scales are measuring eating styles especially emotional eating, cognitive control or restrained and uncontrolled or external eating habits (Stunkard-Messick, 1985, Karlsson et al., 2000; van Strien et al., 1986). The scales are widely used by researchers specialized in psychology, sociology and social studies (Harden et al., 2009; Lesdéma et al., 2012). However measuring eating style is a popular and very up-to-date topic in the 21st century only a few studies focused on the segmentation of customers based on their eating styles (Szabó et al., 2014). Investigating the youth, especially members of Generation Y is a challenge for theoretical and practical researchers, too, since they represent an essential consumer group worldwide (Kavitha et al., 2011, Ying et al., 2013). More national (Czeglédi-Urbán, 2010; Czeglédi et al., 2011) and international (Lesdéma et al., 2012; Nurkkala et al., 2015) studies have investigated the eating behaviour of the youth based on TFEQ and DEBQ.

In this study the researchers segmented Hungarian young people based on their eating styles. Based on TFEQ 16 three groups of customers can be distinguished, namely functional eaters (49.2%), Carpe Diem and YOLO (31.1%) and emotional eaters (19.7%). Based on DEBQ four groups of customers can be distinguished, namely functional eaters (45.5%), emotional eaters (13.6%), conscious eaters (20.8%) and delighted eaters (20.1%). Functional eaters consider eating as a basic need. They are the target of traditional marketing activities, however prevention (avoiding weight-gain) is an important factor. Emotional eaters eat due to negative feelings and can be characterized by uncontrolled or external eating. Carpe Diem and YOLO and delighted eaters are hedonic and they can be influenced by external stimuli such as the appearance, smell and taste of food. More international quantitative studies have proved the unhealthy eating behaviour of the youth (Lee et al., 2006; Papadakia et al., 2007). However the BMI of the respondents was not investigated in the paper the Millennial generation has poor health habits, including inactivity and poor development, which contribute to the early development of overweight and obesity (IFIC, ELIOR). Using the DEBQ scale for segmentation a new group of youths appeared namely the conscious eaters. They can be characterized by restrained eating habits and avoiding weight gain is an important aspect of their lives.

5. CONCLUSION

Segmenting customers based on their eating styles are really useful for restaurants and dieticians since they can plan their assortment based on customers' needs or plan a personal diet. Classifying customers based on their eating habits can mean a competitive advantage for companies because they can offer differentiated products or services for the different customer groups. Considering overweight and obesity the emotional and uncontrolled eating style is the most dangerous. These two eating styles are typical for Carpe Diem and YOLO or delighted eaters and emotional eaters. They represent 50.8% in the case of TFEQ and 33.6% in the case of DEBQ of Millennials. They should be a target audience of social marketing campaigns and convinced to eat and snack more healthy (not so calorie rich) food and eating is a kind of pleasure, however healthier alternatives, even of fast food do exist. Of course other alternative forms of happiness and reward should be emphasised for them such as adventures or sports, physical activity, not just eating. To make a healthy lifestyle (eating habits and physical activity) more popular and decrease the number of overweight and obese people is a global goal. We believe that social media campaigns would be effective in educating the young generation and highlight the risks of unhealthy eating styles.

The present work is not without limitations. First of all the non-representative sample has to be mentioned. The sample was slightly biased in terms of age. The authors mainly concentrated on younger members of Generation Y. Participants were recruited on social media platforms and university students were over-represented in this sample. The generalizability of the present findings to other samples needs to be assessed. Second, it should be mentioned that self-reported behaviour might be subject to tendencies of socially desirable answering patterns.

In the future the authors plan to profile each cluster based on demographics. This study was only an exploratory one and we focused on the measurement of eating styles. In order to verify this quantitative research the authors plan to extend the research and conduct a qualitative research, especially depth interviews or mini-focus groups. However they would like to conduct another quantitative research concentrating on the youth. The researchers plan is to investigate the eating attitude and behaviour of Generation Z since former studies (Williams-Page, 2010; Böröndi-Fülöp, 2012) and WHO statistics highlighted the ratio of overweight and obese people are continuously increasing among the youth. In domestic literature Böröndi-Fülöp (2012) analysed the behaviour regarding health of primary and secondary school pupils. Relying on her results it is worth concentrating on that generation and planning more up-to-date research. It is also worth comparing the eating styles of the youth and their parents, since eating behaviour is formed in childhood under the influence of parents and traditional cuisine (Lovrenović et al., 2015).

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