INTERGENERATIONAL ANALYSIS OF CONSUMER ATTITUDES ON THE ECOLOGICAL DENTAL SUPPLIES MARKET

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Abstract: This paper deals with the analysis of consumer attitudes on the ecological dental supplies market. The main goal is to identify and describe the attitude differences between distinct age groups (Generation Y and Generation Z). The study is based on a survey using the method CAWI. The differences are also described using individual functions of attitudes, where the most significant difference was identified in the social adaptation function. Based on the findings the age categories have many effects on consumer behaviour (experience with different types of ecological dental supplies, shopping factors importance). This article also attempts to identify the main barriers to switching to an ecological version of the product.

Keywords: Ecology, attitudes, consumer behaviour, dental supplies, generation Y, generation Z, e-shop, Czech market

JEL Classification: M31, C83, C40

INTRODUCTION

This research is going to take place on the ecological dental supplies market in the Czech Republic, which will serve as a ground for conducting of the study. Willingness to reduce use of plastic products is influencing many markets including the dental supplies market. The ecological dental supplies market is growing fast, the classic toothpaste is being replaced by the toothpaste tablets, which is the fastest growing segment. Another important product is the bamboo toothbrush, which is replacing the plastic version. So-called “zero waste” products are particularly popular with Generations Y and Z, who are the most concerned about the state of the environment (Fairfield Market Research, 2021).

This paper focuses on searching how consumer attitudes differ across the mentioned age groups. Generation Y, people born between 1986 and 1995 are a bit less interested in ecology than the younger generation. This is also due to associations between sustainability and femininity, where many men are avoiding buying eco-friendly products as they feel that they are something that is seen as feminine and typical for the opposite gender (Gazzola, 2020). The younger generation is more willing to pay for the sustainable products and their attitudes to ecology are influenced by their environment including their family and friends (Jaciow & Wolny, 2021).

1. LITERATURE REVIEW

1.1 Consumer attitudes

Attitude, as a construct which was originally examined in the field of social psychology, occupies a prominent place in different consumer behaviour theories. Ajzen and Gilbert Cote (2008, p. 289) define attitudes as „dispositions to respond with some degree of favorableness or unfavorableness to a psychological object". Hoyer, MacInnis & Pieters (2018) state that attitudes are learned and tend to persist over time. They reflect overall evaluation of a certain object, and this reflection is based on the association that are linked to the object. In the field of consumer behaviour, attitudes are examined as a factor that can influence consumer's intention to behave in some way. Attitudes can predict the intention to buy some product with higher probability, when there is higher level of engagement, higher importance of emotions, consumer has enough information, and his or her attitudes are specific and steady.

Eagly & Chaiken (1993) state that attitudes consist of three components:

- cognitive component involves knowledge, information, and beliefs that an individual has about the certain object, and it divides the objects into desirable and undesirable,
- affective component represents individual's pleasant and unpleasant feelings and emotions about the certain object,
- behavioural component means that individual acts or has the intention to act in some way in relation to the certain object.

Theories that investigate this relationship are e.g., theory of reasoned action (Fishbein & Ajzen, 1975) and lately theory of planned behaviour (Ajzen, 1991). Theory of planned behaviour extended the theory of reasoned action of specific variable named perceived behavioural control (Ajzen, 1991; Ajzen, 2002) and so the theory, in contrast to the original one, can describe also that type of behaviour which is not under the volitional control of an individual (Conner & Armitage, 1998). Except two variables described above (attitudes toward the behaviour and perceived behavioural control), theory of planned behaviour works with one more variable, that is called subjective norm. This variable express, what is the influence of important others on the individual's intention to behave in some way (Manning, 2009).

Attitudes are created based on acquired life experience (Hewstone & Stroebe, 2021) and they have an affective character. It means that certain evaluative reaction (positive or negative) is already contained in the attitude. Expectancy-value model represents this fact. According to it the attitude toward the behaviour includes both the evaluation of the results of the given behaviour and the subjectively determined probability with which these results will be achieved. According to Ajzen (2012) this model can be expressed by the equation

$$A = \sum_{i=1}^{n} b_i e_i \ , \tag{1}$$

where A represents attitude toward the behaviour, b_i represents subjectively determined probability (belief) that the behaviour will lead to the result i, e_i represents the evaluation of the result i, and n represents the number of possible results.

Belief, through which attitude is formed, is always a summary of opinions that an individual holds about a certain issue. Each individual has many opinions in every situation of course. However, Ajzen a Gilbert Cote (2008) state that only a few of them are active at any given moment and they refer to them as accessible beliefs. Beliefs can take on different intensity (strength) according to probability or importance that an individual attaches to them.

To investigate consumer attitudes and purchasing intention in the area of green products, the theory of planned behaviour can be applied as well as in other purchasing situations. Leonidou et al. (2022) applied this theory to purchasing of organic goods, while in addition they investigated the role of drivers, outcomes, and moderators of consumer intention. Sarumathi (2014) proposed the green purchase behaviour model as

a reaction to the fact, that original theory of planned behaviour was weak in regard of correlation between positive attitudes and actual buying behaviour of green products. High predictive value of green purchase behaviour model was then proved in framework of Zaremohzzabieh et al. (2021).

1.2 Functions of attitudes

Also, different functions of attitudes can be described. According to Shavitt (1989) there are:

- knowledge function, that helps an individual to understand and organize the environment,
- utilitarian function connected with utility that comes from a certain object in sense of positive, or negative outcomes,
- social identity function which means that attitudes may symbolize an individual's social identity and play role in getting social approval,
- self-esteem maintenance function which can be represented by expressing an individual's values or self-association with successful others.

Similarly, Sharma & Chan (2017) distinguish the functions of attitudes into value-expressive, social-adjustive, ego-defensive, knowledge, and utilitarian.

1.3 Characteristics of Ecological dental supplies market

The most promising and growing submarkets on the ecological dental supplies market are toothpaste tablets and bamboo toothbrush markets. The value of global toothpaste tablets market was around 45,6 million dollars in 2020. The estimated market value in 2030 could reach over 90 million dollars. The biggest market is the North America, and the fastest growing market is the Latin America. The biggest companies on the submarket are Colgate-Palmolive Company, The Humble Co., Lush Cosmetics Company, DENTABBS GmbH a Georganics (Allied Market Research, 2021). In 2019, the value of global bamboo brush market was 23,5 million dollars. 60 % of bamboo brushes was sold in stone shops, with Walmart, Aldi, Target and SPAR being the key players. The other 40 % of bamboo toothbrushes was mostly sold on Amazon, Alibaba and Flipkart. The biggest market is the North America, and the fastest growing market is Asia. The biggest players on market are Colgate-Palmolive Company, The Humble Co., Ecolife Innovations LLC or Brush with Bamboo (Grand View Research, 2020).

2. RESEARCH METHODOLOGY

2.1 Research method

Online survey is an appropriate method for this paper as it explores consumer attitudes in the dental market, including the online market. It is commonly used in the descriptive research as it can be helpful to describe the consumer behaviour and their attitudes. Due to the age of the respondents, it is assumed that they know the online environment well and can be easily approached. It is also possible to reach a larger number of respondents by this means and to achieve a greater telling value of the obtained information (Malhotra, 2017).

2.2 Sampling design

As a sampling approach there was chosen non-probability sampling. As a most appropriate method was selected the quota sampling. This method will ensure representativeness of the sample and all the required characteristics of the base sample will be represented in the sample. Respondents were divided into generation Y and Z according to their age, so as the first quota variable was chosen the age and the second chosen variable was gender. Based on the data from the Czech Statistical Office the required number of respondents from each category was defined.

2.3 Sample size and structure

Sample size was 319 respondents, and its structure can be seen in (Tab. 1). Because of the use of on-line survey as data collecting method the sample was not balanced according to the two key segmentation variables. Due to the imbalance of the data, it was weighted using SPSS Statistics and all analyses were subsequently done using the weighted data. According to the Tahal (2017) as a Generation Y were defined

people born between 1986 and 1995 who were aged from 27 to 36 years at the time of the research. As a Generation Z were defined people born from 1996 and their age was from 15 to 26 years because of the type of these products that people aged less than 15 years usually do not buy.

Tab. 1. Sample Structure According to the Gender

Gender	Age	Population	Sample	Value of weights
Men	15-26 years	23,4 %	17,3 %	1.36
	27-36 years	28,1 %	11,6 %	2.42
Women	15-26 years	22,1 %	61,1 %	0.36
	27-36 years	26,3 %	10,1 %	2.62

Source: Own elaboration

2.4 Data analysis

Data collected from respondents were firstly edited and coded. Subsequently it was analysed using the statistical package of IBM SPSS Statistics version 27. Some of the variables obtained from questions were nominal and were analysed by non-parametric test. Chi square statistic was used to test statistical significance (see Tab. 4, 6) between two nominal or ordinal variables. If the null hypothesis was rejected, there was a relationship between, for example, age and answer to a given question (Malhotra, 2017). First variable was for example the experience with the different types of ecological dental supplies and the second variable was always the age category.

To determine the relationship between the demographic characteristics of the respondents and the level of agreement with the statements regarding their attitudes, ANOVA test was used (see Tab. 2) and worked at 0.05 level of significance. ANOVA tests the variability of variables in a sample of respondents and based on this it reveals whether there are differences between the ratings of the variables (Malhotra, 2017). In the case of significance lower than 0.05, the relationship between the age of respondents and the level of agreement was confirmed. ANOVA was also used for statements on factors that hinder the transition to the ecological option.

3. RESEARCH FINDINGS

Based on five defined functions of attitudes there were created two statements for each function, for which the respondents were expressing their level of agreement. As can be seen in (Tab. 2) the ANOVA test showed relationship between the age of respondents and their level of agreement with three of the aforementioned statements. By the statement that "using ecological dental products increases my self-esteem", the level of agreement was 50 % for Generation Y and only 35 % for Generation Z. Generation Y was also more likely to agree that these products are an indicator of social status, the level of agreement was almost 49 % and only 36 % for Generation Z. A third dependency was found for the statement that the respondent likes to inform his/her surroundings that he/she uses dental supplies that are eco-friendly. The level of agreement for Generation Y was 43 % while for the younger generation it was only 31 %.

The level of agreement was highest for the first statement, which refers to the impact of ecological dental needs on improving the state of environment, namely 77 % for Generation Y and 81 % for Generation Z. It was also high for the statement that these products are useful and take sufficient care of the oral cavity, with 76 % for Generation Y and 79 % for Generation Z. Thus, there is a significantly higher level of agreement for statements based on the utility function.

The lowest rate of agreement was for the statement that people like to inform their surroundings that they use eco-friendly dental supplies, this was only 43 % for Generation Y and 31 % for Generation Z. The level of

agreement for the statement that these products are an indicator of social status was 49 % for Generation Y and 36 % for Generation Z. The average level of agreement is therefore lowest for the social adjustment function.

Tab. 2. Level of Agreement with Statements Created According to the Attitude Functions Between Generations

		Gen. Y	Gen. Z	Sig.
U1	I consider eco-friendly dental supplies to be an effective solution for improving the state of the environment.	77 %	81 %	0.272
U2	I consider ecological dental supplies to be useful products that take sufficient care of the oral cavity.	76 %	79 %	0.274
VE1	Ecological dental supplies reflect the kind of person I am and values I hold.	55 %	61 %	0.179
VE2	Buying ecological dental supplies makes me feel better about myself.	59 %	63 %	0.443
K1	I can recognize which dental supplies are really ecological.	59 %	56 %	0.357
K2	I like to follow news and trends about ecological dental supplies.	49 %	40 %	0.065
ED1	Using ecological dental supplies increases my self-esteem.	50 %	35 %	0.000
ED2	I am proud of myself for buying ecological dental supplies.	58 %	51 %	0.101
SA1	Ecological dental supplies are an indicator of my social status.	49 %	36 %	0.004
SA2	I like to inform my surroundings that I use dental products that are eco-friendly.	43 %	31 %	0.007

Source: Own elaboration

As seen in (Tab. 3), statistically significant differences were identified for the determination of the importance of different product factors. The price of the product is the most important factor for both generations, which was mentioned in 74 % of responses from generation Z and 64 % of responses from generation Y. Another important factor is the previous experience with the product, which was mentioned in 63 % of responses from generation Z and 52 % of responses from genYers.

However, the most significant differences were identified by the importance of product packaging size. GenYers mentioned this factor in 28 % of responses, genZers only in 15 %. Also, the availability of product on the market was selected by genYers in 25 % of responses and by genZers in 45 % of responses. The impact of age category on the determination of importance of different product factors is statistically significant (see Tab. 4).

Tab. 3. Product Factors Importance According to the Age Groups

	Generation Y	Generation Z
Price	64 %	74 %
Packaging design	4 %	13 %

Product reviews	60 %	52 %
Previous experience	52 %	63 %
Brand awareness	20 %	16 %
Packaging size	28 %	15 %
Market availability	25 %	45 %

Source: Own elaboration

Tab. 4. Significance Test for Product Factors Importance

		Value	df	Asymp. Sig. (2-sided)
Age groups	Pearson Chi-square	25.226	7	0.001

Source: Own elaboration

Both generations also differ in the experience with the different types of ecological dental supplies. Data in (Tab. 5) show that respondents of both generations have the most frequent experience with an eco-friendly toothbrush, which was mentioned in 92 % of responses from Generation Y and 85 % from Generation Z. The second most used product was organic dental floss, which was mentioned in 27 % of responses from genYers and 18 % from genZers.

Respondents had the least experience with mouthwash tablets, Generation Y had no experience with this product at all, and it was mentioned in only 5 % of Generation Z responses. The similar outcome was by the eco-friendly tongue brush, which was only mentioned by Generation Z respondents in 6 % of their responses. The difference between age categories is statistically significant (see Tab. 6).

Tab. 5. Experience With Different Types of Ecological Dental Supplies According to the Age Groups

	Generation Y	Generation Z
Ecological dental brush	92 %	85 %
Toothpaste tablets	15 %	12 %
Mouthwash tablets	0 %	5 %
Ecological dental floss	27 %	18 %
Ecological tongue brush	0 %	6 %
Ecological interdental brush	12 %	18 %
Ecological toothpaste	8 %	7 %

Source: Own elaboration

Tab. 6. Significance Test for Product Types Experience

		Value	df	Asymp. Sig. (2-sided)
Age groups	Pearson Chi-square	21.066	7	0.004

Source: Own elaboration

In order to find out what is the biggest barrier to switching for the ecological version of the dental supplies, the respondents were asked to choose the biggest barriers in switching these products. Data in (Tab. 7) shows

that respondents were most likely to agree with the statement that there is a lack of awareness of ecological dental supplies, with agreement rates of 89 % for Generation Y and 83 % for Generation Z.
For two factors, the ANOVA test showed a relationship between the age of the respondents and their response to this question, namely for the concern about not meeting expectations (Sig = 0.015) and also for the aforementioned lack of awareness of products (Sig = 0.030). For concerns about not meeting expectations, the agreement rate of Generation Y was 71 % and of Generation Z it was only 63 %. For the other two statements no dependence was shown, but it is noticeable that the level of agreement is higher in all cases for Generation Y.

Tab. 7. Barriers to Switching to the Ecological Version of Dental Supplies

	Generation Y	Generation Z	Sig.
Lack of awareness	89 %	83 %	0.030
High price	83 %	80 %	0.126
Unawareness of the possibilities of purchasing	70 %	66 %	0.281
Concerns about not meeting expectations	71 %	63 %	0.015

Source: Own elaboration

4. CONCLUSION

Eco-friendly products are one way to reduce the amount of produced waste. The dental supplies sector has great potential, but these products are not yet widespread among consumers. This could change in the future if, for example, attitudes towards these products change.
In the case of statements made on the basis of attitudinal functions, statistically significant differences emerged for both statements formed based on the social adjustment function. Respondents of the younger generation were less likely to agree that these products are an indicator of social status and also do not like to boast to their surroundings that they use these products. This can be problematic as it makes information about these products less widespread. Similarly, for the statement related to the ego-defensive function, the level of agreement was lower among Generation Z and related specifically to the fact that using these products increases the consumer's self-esteem.
Statistically significant differences were identified by both questions regarding the consumer behaviour (experience with different types of ecological dental supplies and shopping factors importance). This could be a signal for both manufacturers and sellers to consider the fact that there are significant differences in consumer behaviour between the two generations when creating the product mix. There was also identified relationship between the age of respondents and identification of barriers to switching to eco-friendly version of these products. Generation Z is less worried that these products would not match their expectations and finds the lack of awareness of these products a bit lower. So, there is probably a greater chance that members of younger generation will be more willing to try these products as they are not that much worried about their expectations.
These products are still not widely spread on the Czech market and there is a potential for developing the market, which is globally growing. This topic could be further explored in the future and research could verify if the consumer attitudes towards these products have changed and whether they are used more by the Czech consumers. This research has certain limitations. Since it was focused on Generation Y and Z, every generation is specific and has its own characteristics, so there would naturally be different results if it was focused on some other generations.

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