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The zero waste concept from the young consumer's perspective. Does gender matter?

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Abstract

Theoretical background: Sustainable development is a new widely desirable course in the economy of the 21st century. Its goals can be met by consumers implementing a zero waste concept understood as a lifestyle that assumes the maximum reduction of household waste production.
Purpose of the article: The paper sheds a light on consumer awareness of the zero waste concept among young people, who face a long consumption life, and identifies the gender role in the process of applying this concept in practice.

Research methods: To achieve the research goal, a survey was carried out among consumers aged 19–24, and the original consumer zero waste sensibility scale was proposed and employed to obtain results.
Main findings: The outcomes suggest that the zero waste concept is more widely known among women, who show a higher level of consumer zero waste sensibility than men.

Introduction

Nowadays, sustainable development is a new widely desirable course in the economy of the 21st century. One of the challenges facing sustainable development is to reduce overconsumption and the waste production directly connected to it. In the past, this latter issue has been mostly a business problem, but today it seems to have become a consumer issue as well. The new consumption approach proposes the implementation of the zero waste concept (ZWC) saving the planet from excess garbage. Consumers can directly contribute to this idea by changing their habits and creating new consumption patterns. Thus, this paper sheds a light on both the consumer awareness of the ZWC among young people, who face a long consumption life, and the identification of the gender role in the process of applying this idea in practice.

Literature review

Increasing populations, economic growth, rapid urbanization and the rising standard of living have accelerated the generation of waste in the world, especially in developing countries (Guerrero et al., 2013). The term "zero waste" (ZW) was first used by Palmer in 1973 in the context of recovering resources from chemicals (Palmer, 2004). In later years, the ZWC was implemented in many enterprises, where it was mainly related to production and the supply chain (Song et al., 2015). The ZWC is close to the circular economy, i.e. the general term covering all the activities that reduce, reuse and recycle materials in production, distribution and consumption processes (Murray et al., 2017).

Recently, the ZWC has begun to be seen as a new consumer trend. It can be assumed that it will play a crucial role in the next stage of sustainable consumption development, defined at the Oslo Symposium in 1994 as "the use of goods and services that respond to basic needs and bring a better quality of life, while minimising the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardise the needs of future generations" (NME, 1994).

The ZWC suggests planning for the elimination of waste rather than managing it (Sheehan, 2000). It is "a lifestyle according to which a man tries to generate as little as possible waste, and thus not pollute the environment" (PSZW, 2018). The holistic approach of a ZW lifecycle has appeared as part of a cultural shift and an innovative manner of thinking about the age-old problem of waste and the economic obsession with endless growth and consumption (Lehmann, 2010). Living without

waste comes down to the application of rules called the 5Rs (PSZW, 2018): refuse, reduce, reuse, recycle, rot. Sometimes these rules are extended with another 'R': repair, recover, renew, rethink and remember. At the beginning, a major trend in sustainable consumption was recycling, focusing on what should be done with waste. Currently, an emphasis on activities leading to the production of less waste or their total elimination from production has been observed.

Previous research proposes that female respondents showed some evidence of pro-environmental behaviour patterns compared to the male ones (i.e. Xiao & McCright, 2014), but others suggest that such relations between gender and pro-ecological attitudes have yet to be observed (Vicente-Molina et al., 2018).

Research methodology

The aim of this research is to identify young consumers' general attitudes towards the ZWC. The specific investigation goal is to define consumer zero waste sensibility (CZWS) among young people. The research further aims to find the answer to the following questions: what is the level of the consumer zero waste sensibility indicator (CZWSI) for young people, and does the gender factor affect young consumers differently in this aspect? The following hypothesis is proposed: the consumer zero waste sensibility is related to gender, so that women show a higher level of consumer zero waste sensibility than men.

The detailed research topics included:

- verifying the ZWC awareness among young consumers;
- determining a tendency to follow the ZWC during shopping and consumption;
- defining the ZWC factors encouraging consumers in shopping and consumption;
- examining the implementation of the ZWC actions in practice;
- defining the consumer zero waste sensibility scale (CZWSS) and valuating the CZWSI.

Pilot testing was conducted. To obtain the results, a survey technique was applied using a paper questionnaire (PAPI). In this study, the selective quota sampling procedure was employed. The study covered students of the Faculty of Management at the University of Gdańsk and Gdańsk University of Technology. The survey was conducted between December 2017 and November 2018. The paper questionnaires were distributed and finally collected from 180 students. Two questionnaires were rejected (respondents aged over 24). The characteristics of the respondents are presented in Table 1.

Table 1. The respondents' demographic data by gender and housing situation

Gender						
	Female		Male			Total
no.	111		67			178
%	62.4		37.6			100
Housing situation						
	living with parents	living alone	living with a life partner	living with a roommate	living with a sibling	Total
no.	67	15	23	70	3	178
%	37.6	8.4	12.9	39.3	1.7	100

Source: Authors' own study.

The process of a comparative analysis of the studied respondent groups consisted of two stages: firstly, a statistic descriptive analysis was conducted to get to know the characteristics of those groups and secondly, the level of the CZWSI was valuated. To measure the requested level of the CZWS, a specific scale was proposed, the so-called CZWSS. This obtained the following eight items of the research construct:

– restricting buying products to the minimum necessary and only buying the necessary products;

– buying good quality products that will last longer;

– buying reusable products;

– paying attention to what the products are packed in and choosing those that do not generate rubbish;

– taking own reusable bag for shopping;

– repairing products instead of throwing them away and buying new ones right away;

– consuming products by their sell-by-date;

– wasting and throwing away expired food.

The positive sounding statements were verified by the respondents using a five-point Likert scale ranging from "definitely agree" (1) to "definitely disagree" (5). Considering the defined scale values, it suggests that the lower the amount of the respondents' declaration, the higher level of the CZWSI (the scale was revised for the eighth item). Within the CZWSS, the respondents were able to obtain a minimum score of 8 and a maximum of 40. Within the scale, five result sections of CZWSI were specified accordingly as follows: the section A (8.00–14.40) for the definitely ZW sensible consumers; B (14.41–20.08) for the ZW sensible ones; C (20.09–27.20) for neither the ZW sensible nor non-ZW sensible ones; D (27.21–33.60) for the non-ZW sensible ones and E (33.61–40.00) for the definitely non-ZW sensible ones. The results obtained by each person in all eight statements were then summed up. At this stage, all the respondents whose answers for any of the eight statements contained deficiencies or for whom no gender was indicated were rejected. Finally, 176 of the young respondents were selected (110 female and 66 male). The average results and standard deviations for the gender groups were valuated.

Results

The first part of the study concerned verifying the ZWC awareness among the young consumers. The following structured question was posed: "Have you ever heard about the zero waste concept?". The alternative scale in the form of the "yes" or "no" particle has been extended to the answer "I don't know". The results suggest that more than half of the respondents (56.74%) were not familiar with the ZWC. Its knowledge was confirmed by almost a third of the respondents (32.02%). Furthermore, 10.67% neither confirmed nor denied the knowledge of the concept. One person (0.56%) did not answer the question.

According to the obtained data, the women more often declared the knowledge of the ZWC than the men. Their declarations of knowing were 33.33% and 29.85%, respectively. The female respondents also pointed out their ignorance of the topic less frequently than the male ones (54.95% vs. 59.70%). A similar percentage of the answers "I don't know" were declared by both gender groups.

Table 2. The structure of the respondents' answers regarding the knowledge of the ZWC

Items	Female (n = 111)		Male (n = 67)		Total (n = 178)	
	answer					
	no.	%	no.	%	no.	%
yes	37	33.33	20	29.85	57	32.02
no	61	54.95	40	59.70	101	56.74
I don't know	13	11.71	6	8.96	19	10.67
lack of data	0	0.00	1	1.49	1	0.56
Total	111	100.00	67	100.00	178	100.00

Source: Authors' own study.

Before the respondents started answering the next question, they had been asked to familiarize themselves with the original authors' ZWC definition: "Zero waste is a lifestyle that assumes the maximum reduction of household waste production. Restricting the generation of waste begins at the purchasing stage (e.g. packaging food into their own reusable containers), through the use of products (e.g. proper storage of food, consumption by sale-by-date) to manage leftovers and old products (e.g. giving items a second life)".

After the respondents became acquainted with the above definition, they were asked to determine whether they were willing to implement the ZWC principles during their purchase and consumption processes. The respondents were able to choose only one of the proposed answers to this structured question. Thus, following the collected data, 23.03% of the respondents declared bringing the ZWC into action. Among them were 36.6% of those respondents who previously declared the knowledge of the ZWC (8.4% of all the respondents). In contrast, 63.4% of the respondents, despite the lack of the prior knowledge of the concept name, confirmed acting with the ZWC accordingly in practice on a daily basis. More than half of the

young respondents (57.87%) declared not following the ZWC, however, they would consider acting in this way in future. On average, every tenth person admitted that they were not following the ZWC and would not consider acting in this way in future. The other respondents (7.30%) had no opinion on this topic.

Investigating the data, a higher percentage of women than men declared that they are currently following the ZWC (26.13% vs. 17.91%). Similarly, more female respondents than male ones declared their consideration to follow the concept in future (61.26% vs. 52.24%). In addition, less women than men did not take into account following the ZWC in future than men (9.01% vs. 16.42%). The willingness to implement the ZWC principles is presented in Table 3.

Table 3. The structure of the respondents' answers regarding the willingness to implement the ZWC principles after familiarizing themselves with the original authors' ZWC definition

Items	Female (n = 111)		Male (n = 67)		Total (n = 178)	
	answers					
	no.	%	no.	%	no.	%
Yes, I currently follow the zero waste concept	29	26.13	12	17.91	41	23.03
No, I currently do not follow the zero waste concept, but I would consider it in future	68	61.26	35	52.24	103	57.87
No, I currently do not follow the zero waste concept, and I would not consider it in future	10	9.01	11	16.42	21	11.80
I do not know / I have no opinion	4	3.60	9	13.43	13	7.30
Total	111	100.00	67	100.00	178	100.00

Source: Authors' own study.

The respondents who expressed a positive or neutral attitude towards the ZWC were asked to indicate the factors that would motivate them to follow the ZWC in shopping and consumption. For the respondents, selecting a maximum two out of the most important motivating factors was a must, however, some respondents chose more possibilities. Finally, for the analysis, all the answers were taken into further consideration. Thus, the obtained data resulted in a total of 310 indications. The most frequently indicated factors encouraging respondents to follow the ZWC nowadays or in the future were the financial savings (due to the reduction in consumption) and natural environment protection (97 and 92 indications, respectively). The next popular determinants were saving waste storage space (to lower the frequency of taking out the rubbish) and saving storage space for purchased products (45 and 36 indications, respectively).

For the women, the first motivator to follow the ZWC in shopping and consumption processes was a financial saving due to the reduction in consumption and the second one was saving waste storage space (68 and 58 indications, respectively). Among the men, the first motivator derived from the need to protect the natural

environment, but the financial saving took second place in their motivators' ranking (34 and 29 indications, accordingly). The motivating factors encouraging respondents to follow the ZWC in shopping and consumption are presented in Table 4.

Table 4. The structure of the respondents' answers regarding motivating factors that would encourage the respondents to implement the ZWC principles in shopping and consumption

Items	Female (n = 101)		Male (n = 56)		Total (n = 157)	
	no. of indications	rank	no. of indications	rank	no. of indications	rank
financial saving due to the reduction in consumption	68	1	29	2	97	1
saving storage space for purchased products	23	4	13	4	36	4
saving waste storage space (to lower the frequency of taking out the rubbish)	27	3	18	3	45	3
protection of the natural environment	58	2	34	1	92	2
lifestyle based on minimalism	20	5	11	5	31	5
others	5	6	4	6	9	6

Source: Authors' own study.

The next part of the research referred to the valuation of the CZWSI using the CZWSS. To establish the CZWSI, eight items concerning the implementation of the ZWC actions in practice were considered. All the items are presented in Table 5.

The first research aspect examining the implementation of the ZWC actions in practice concerned the restriction of buying products to the minimum necessity and only buying the necessary products. Comparing both gender groups, it worth noting that more women than men declared that they restrict buying products to the minimum necessity and only buy the necessary products (69.09% vs. 56.06%). Furthermore, a higher number of men suggested that they do not do so (25.76% vs. 20.91%).

The second issue referred to buying good quality products that will last longer. The investigated men seem to be more focused on acting according to this idea. Such a view was shared by more men than women (87.88% vs.75.45%). More women than men neither agreed nor disagreed with such an opinion (20.00% vs. 6.06%).

The third issue of this research part concerned buying reusable products. Referring to the studied populations, the answers of both groups are characterized by a fairly similar distribution of the responses.

The fourth item of the study concerned paying attention to not generating waste packaging. Comparing both gender groups, the answers of both populations are characterized by a fairly similar distribution of the responses with a high number of the respondents who do not pay attention to what the products are packed in and choose those that do not generate rubbish (46.36% vs. 50.00%).

The fifth issue referred to the habits of taking a reusable bag for shopping. Confronting the gender data, it shows that more female respondents than males declared

Table 5. The structure of the respondents' answers regarding the implementation of the ZWC actions in practice

Item	Gender	Scale	no. of answers / % of respondents' answers / aggregated amount of respondents' answers (%)					
			1 – definitely agree	2 – rather agree	3 – neither agree nor disagree	4 – rather disagree	5 – definitely disagree	Total
I restrict buying products to the minimum necessity. I only buy the necessary products.	F	no.	18	58	11	18	5	110
		%	16.36	52.73	10.00	16.36	4.55	100.00
			69.09		10.00	20.91		
	M	no.	10	27	12	14	3	66
		%	15.15	40.91	18.18	21.21	4.55	100.00
			56.06		18.18	25.76		
I try to buy good quality products that will last longer.	F	no.	26	57	22	5	0	110
		%	23.64	51.82	20.00	4.55	0.00	100.00
			75.45		20.00	4.55		
	M	no.	22	36	4	4	0	66
		%	33.33	54.55	6.06	6.06	0.00	100.00
			87.88		6.06	6.06		
I buy reusable products.	F	no.	24	63	20	3	0	110
		%	21.82	57.27	18.18	2.73	0.00	100.00
			79.09		18.18	2.73		
	M	no.	8	44	11	3	0	66
		%	12.12	66.67	16.67	4.55	0.00	100.00
			78.79		16.67	4.55		
I pay attention to what the products are packed in and choose those that do not generate rubbish.	F	no.	3	16	40	39	12	110
		%	2.73	14.55	36.36	35.45	10.91	100.00
			17.27		36.36	46.36		
	M	no.	3	7	23	16	17	66
		%	4.55	10.61	34.85	24.24	25.76	100.00
			15.15		34.85	50.00		
I take my own reusable bag for shopping.	F	no.	53	33	9	10	5	110
		%	48.18	30.00	8.18	9.09	4.55	100.00
			78.18		8.18	13.64		
	M	no.	25	20	5	12	4	66
		%	37.88	30.30	7.58	18.18	6.06	100.00
			68.18		7.58	24.24		
I try to repair products instead of throwing them away and buying new ones right away.	F	no.	32	44	26	6	2	110
		%	29.09	40.00	23.64	5.45	1.82	100.00
			69.09		23.64	7.27		
	M	no.	17	24	18	7	0	66
		%	25.76	36.36	27.27	10.61	0.00	100.00
			62.12		27.27	10.61		
I try to consume the products before their expiration date.	F	no.	66	40	4	0	0	110
		%	60.00	36.36	3.64	0.00	0.00	100.00
			96.36		3.64	0.00		
	M	no.	38	25	3	0	0	66
		%	57.58	37.88	4.55	0.00	0.00	100.00
			95.45		4.55	0.00		

Sometimes I waste and throw away expired food.	F	no.	15	49	12	31	3	110
		%	13.64	44.55	10.91	28.18	2.73	100.00
			58.18		10.91	30.91		
	M	no.	15	34	7	9	1	66
		%	22.73	51.52	10.61	13.64	1.52	100.00
			74.24		10.61	15.15		

Source: Authors' own study.

that they do so (78.18% vs. 68.18%). In addition, fewer women than men do not take a reusable bag for shopping (13.64% vs. 24.24%).

The sixth statement refers to repairing products instead of throwing them away and buying new ones right away. In this aspect as well, more of the investigated women than men stated that they did this (69.09% vs. 62.12%). Fewer women than men confirmed that they do not try to repair products instead of throwing them away and buying new ones right away (7.27% vs. 10.61%).

The seventh issue referred to the consumption of products by their sell-by-date. The answers of both these groups are characterized by a fairly similar distribution of the responses showing almost no differences. The vast majority of both respondents' groups agreed to try to consume the products by their sell-by-date (women 96.36% vs. men 95.45%).

The eight and last statement concerned wasting and throwing away expired food. Comparing the two groups, some significant differences are notable. The investigated women, in comparison with the men, less frequently agreed that they waste and throw away expired food (58.18% vs. 74.24%). Furthermore, more women than men disagreed that they waste and throw away expired food (30.91% vs. 15.15%).

Table 6. The results of the CZWSS analysis

Subgroup	No. of respondents	Average of results	SD	Minimal	Maximal	Type of sensibility
				result (reference min = 8; max = 40)		
Female	110	18.69	4.06	11	28	ZWSCs
Male	66	19.88	3.87	10	27	ZWSCs
Total	176	19.14	4.02	10	28	ZWSCs

Source: Authors' own study.

Section A (8.00–14.40) for the definitely zero waste sensible consumers (ZWSCs); section B (14.41–20.08) for the ZWSC; section C (20.09–27.20) neither the ZWSC nor non-ZWSC; section D (27.21–33.60) for the non-ZWSC; section E (33.61–40.00) for the definitely non-ZWSC.

The obtained results presented in Table 6 illustrate that the average level of CZWSI for the young people was 19.14. For women, the estimated indicator was lower and amounted to 18.69, while for the men it was 19.88. When comparing the results of both gender groups of the investigated respondents, the lower level of the indicator was obtained among the female respondents and differs by 1.19 points,

or 5.97%. The female answers were much more dispersed than the male ones (4.06 vs. 3.87). Thus, the women seem to act more strongly according to the ZWC principles than men. Referring to the proposed CZW scale and its sections, both of the examined gender groups were qualified to fall under category B, defined as ZWSCs with a higher level of sensitivity to new required consumption behaviour patterns.

Discussion and conclusions

The ZWC, which has appeared recently, seems to be a new consumer response to environmental issues. According to the collected data, even though this idea has been known only by every third person examined, the ZWC has been implemented in practice at least partly by the young consumers. Among the consumers, the knowledge of the idea is a little wider among the female respondents than the male ones. Furthermore, the data suggest that more women than men have already been following the principles of the concept and more of them are interested in considering acting accordingly to these rules in the future. As the data show, for both gender groups different motivators are behind the implementation of the idea on a daily basis. For the female respondents, the fundamental determinant is economic, while for the male ones it is environmental.

Finally, referring to the CZWSI, its level is lower for the female respondents than the male ones. That suggests that the investigated women seem to be more sensible to the ZWC than the men. Despite the fact that both gender groups have been defined as ZW sensible ones, the women show more sensitivity to the issue.

Therefore, considering the research hypothesis, it has been confirmed positively that the CZWS is related to gender and that women show a higher level of CZWS than men. Therefore, this study demonstrates that the gender issue should be considered while implementing the principles of the ZWC as a new consumption pattern. It especially matters in the case of the creation of new consumption habits that go along with highly desirable sustainable development, now and in the future.

In the subsequent research stage, it would be worthwhile finding answers to the causes of such an observed phenomenon. It would be interesting to determine the causes and factors moderating its occurrence. Initially, the authors suggest that these may lie in the social, cultural or environmental fields, which requires the conducting of in-depth qualitative research in the future, something that the authors intend to focus on next.

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