ECONOMICS
& Sociology

ASSESSMENT OF FACTORS INFLUENCING PRO-CIRCULAR BEHAVIOR OF A POPULATION

Aknur Zhidebekkyzy
Al-Farabi Kazakh National University,
Almaty, Kazakhstan
E-mail: Aknur.zh@gmail.com
ORCID 0000-0003-3543-547X

Aisulu Moldabekova
Institute of Economics of the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan,
Almaty, Kazakhstan
E-mail: kazsocium01@gmail.com
ORCID 0000-0003-4330-5595

Birganym Amangeldiyeva
Al-Farabi Kazakh National University,
Almaty, Kazakhstan
E-mail:
Amangeldiyeva.birganym@gmail.com
ORCID 0000-0003-3466-5871

Justas Streimikis
Lithuanian Centre for Social Sciences, Institute of Economics and Rural Development, Lithuania
Faculty of Management and Finances, University of Economics and Human Science in Warsaw, Poland
Justas.streimikis@gmail.com
ORCID 0000-0003-2619-3229

ABSTRACT. Circular economy is one of the best alternatives to the existing linear economy. Nowadays, environmental problems are widely discussed not only by scientists but also by politicians and business representatives. However, a number of barriers hinder the transition to a circular economy. Therefore, this paper aimed to determine the factors influencing the pro-environmental behavior of population, which directly affects the implementation of circularity principles. A quantitative approach based on the paradigm of positivism/realism was applied in this study. In the empirical part, the survey included an online questionnaire filled out in 16 regions of the Republic of Kazakhstan, which made for a total of 3448 respondents. The collected data were processed using the SPSS 25 software, and the hypotheses were tested using the Smart PLS 3 program. The results show that circular mindset, circular awareness, and external incentives significantly affect the pro-circular behavior of individuals and encourage shared consumption. This article contributes to the development of the theoretical basis of circular economy concepts and puts forward practical recommendations.

Introduction

Environmental issues are becoming exceedingly vital and humanity should think about a reasonable approach to production and consumption to save our planet (Brundtlandt, 1987; EMAF, 2013; Harris et al., 2020).

The circular economy is becoming more global for many reasons - climate change, pollution, annual increases in population and waste, etc. (EC, 2022). The term *circular economy* refers to sustainable development, which has its peculiarities, principles, and characteristics (Geissdoerfer et al., 2017). S*ustainable development* is defined as the balanced integration of various indicators (economic, environmental, social) that are interlinked with current and next generations. *The circular economy* is a regenerative system in which waste and consumption are minimized by slowing, closing, and narrowing loops. According to EMAF (2013), a circular economy focuses on circularity and is regenerative and restorative.

Following other scholars' definitions, the circular economy can be understood as the ability of humanity to solve global environmental and social problems that have arisen due to the current linear economy (Moreau et al., 2017; Zhidebekkyzy et al., 2022). Ghisselini et al. (2016) suggested that the principles of CE can be implemented at different levels: micro-level (consciousness of consumers, manufacturers, eco-design of products, etc.), meso level (network of companies, institutions), and macro level (actions by the countries, cities, regions – laws, projects, etc.). Boorová (2020) claimed that the linear model of the economy does not have the potential for sustainability, cannot ensure human and environmental well-being, and does not meet the needs of modern society in the long term. The volume of natural resources is limited, which is why, from the point of view of ecology and economic development, it is important to find an environmentally sound way of using them.

The goal of the circular economy is to transform the linear economy by creating a circular system of production and consumption with minimal losses (EMAF, 2013). Resources must be managed efficiently throughout their life cycle, from production and consumption to disposal and recycling, creating additional value from existing resources while reducing the amount of waste generated. Circularity allows enterprises to decrease costs, increase growth potential, improve corporate image and reduce the environmental impact. Therefore, the transition to a resource-efficient circular economy is crucial, in which the focus is on: reuse, repair, and return to the circulation of existing materials and goods (OECD, 2021).

According to Armaghan et al. (2020), the transition to a circular economy requires changes along the entire value chain of a product, starting from its design to the formation of consumer habits. In the case of new and existing products, the main focus lies on the development of a complete life cycle with an emphasis on the choice of sustainable materials, quality (long service life, reparability) of products, optimization of the distribution chain, recycling and reuse (versatility, the ability to separate components). In addition to smart design solutions, environmental innovation and technology development play a substantial role in changing the economy.

Considerable changes are necessary for the consumption of goods and services. The everyday choices of millions of consumers have a significant impact on the environment. Increasing consumer awareness and creating demand for sustainable products contribute to an economy that respects nature.

Vasileios Rizos & Julie Bryhn (2022) stated that the role of the government in the transition to a circular economy is to create favorable conditions for the implementation of the circular economy's principles and remove barriers to it.

Although it is known that CE is one of the best alternatives to a linear economy, there are some barriers to achieving its goals. Many works are dedicated to this topic.

However, there is a lack of studies about the factors affecting consumers' pro-circular behavior. Thus, this paper aims to assess the influencing factors on the pro-circular behavior of the population. It refers to the micro level of the circular economy's principles. This study contributes to the current literature by increasing the materials for further research and strengthening the empirical knowledge about influencing factors on pro-circular behavior. We reviewed the existing works, conducted a survey, and identified factors impacting consumer behavior in the case of the Republic of Kazakhstan.

1. Literature review

The theory of planned behavior

Several theories study consumer behavior. Ajzen's theory of planned behavior (TPB) is one of the well-known theories in this field (Ajzen, 1991). TPB is an advancement of Fishbein & Ajzen's theory of reasoned action (TRA), which was developed in 1975. According to Ajzen (2012), the root of any behavior is - intention. It can shift customers' behavior in different decision-making areas, like behavior in employment relations and keeping a positive attitude towards enterprise (Bilan et al., 2017; Samoliuk et al., 2022), readiness to use credit services (Hernández-Mejía et al., 2021) or to interact under the conditions of pandemic threats (Rybaczewska et al., 2021), etc.

According to the TPB, intentions can be determined by three main variables: 1 – personal attitudes (feelings, attitudes, and knowledge), 2 – subjective norms (one's perception/view of another's attitude towards behavior), 3 – perceived behavioral control (the degree to which one believes he/she can control his/her behavior) (Ajzen, 1991).

Previous research shows a positive relationship between purchase intention and personal attitude (Hussain, Ahmed, 2020; Priede-Bergamini et al., 2020). For instance, Müller et al. (2021) argued that perceived control over purchases, environmental consciousness, and moral commitment directly affect purchase intention.

Londoño-Roldan et al. (2017) examined the TPB on purchase intention. They concluded that the most effective variables for explaining purchase intention were personal attitude and subjective norms. Perceived behavioral control (PBC) was not effective in that study.

Paul et al. (2016) highlighted that subjective norms do not influence purchase intention for green products in India. They also found that environmental concern has an equal effect on personal attitudes and PBC.

The pro-environmental behavior

Rashid and Mohammad (2012) tried to explain the process of the pro-environmental behavior spillover phenomenon. According to their study, it can be created in three stages:

1) formation of the pro-environmental attitude at the workplace (which was previously substantiated by The Social Identity Theory and Place Attachment Theory);

2) according to the theory of cognitive dissonance, a person feels the need to maintain the behavior and norms that he/she has acquired, even while being outside the workplace or home;

3) a person begins to show himself with environmentally friendly behavior as a responsible member of the society in which he/she lives.

Thøgersen and Noblet (2012) conducted a survey study in the USA and found promoting green behavior can lead to the acceptance of substantial changes in the future. This effect is due to the increase in the environmental responsibility of customers (Holotová et al., 2020; Musova et al., 2021).

Thøgersen (1999) and Truelove et al. (2014) interpreted the spillover effect as a phenomenon in which an intervention aimed at reinforcing one targeted behavior may lead to an increase or decrease in other, non-targeted behaviors.

According to the theory of cognitive dissonance (Festinger, 1957), eco-buying attitude can be explained as follows: positive pro-environmental attitude and belief will lead to positive pro-environmental action.

Self-determination theory (SDT) (Ryan et al., 1997) shows that people's behavior is interrelated with motivation to grow and change. It explains the three basic inner psychological needs in changing behavior: needs for competence, needs for autonomy, and needs for relatedness.

McAdams & St. Aubin (1995) examined "environmental altruism" on the individual's level. According to their research, generative concern and action are related to personality traits, life satisfaction/happiness, and the ego development of a human being. The more satisfied or happy a person is – the more he/ she is concerned about the environment. This concept was applied to eco-consumption behavior and intentions by Urien & Kilbourne (2011). They found the relation between the individual's behavior and his/her attitude to the environment. Thus, the level of generativity and self-enhancement values were taken as variables. Those who score high on generativity tend to be more environmentally responsible than those who got high scores on self-enhancement values.

As the literature review shows, the problems of environmental behavior have been widely studied. However, there is a gap in researching the external factors and socio-cultural aspects that affect it. We attempted to fill this gap in this article. We also complemented ecological behavior with the principles of a circular economy, formed a set of statements on pro-circular behavior, and identified the influencing factors by different variables. In our opinion, pro-circular behavior is directly reflected in actions on circular sharing.

It can be concluded that people's behavior is influenced by many factors, among which we highlighted knowledge, awareness, familiarity with waste sorting, and the recycling system. We identified the following manifestations of pro-circular behavior to evaluate these variables: storage, disposal, repair and reuse, and recycling. Sub-variables of this research can be defined as follows: independent variable – circular awareness, circular mindset, external factors, dependent variable – pro-circular behavior, circular sharing.

It should be noted that such research has not been carried out previously in Kazakhstan.
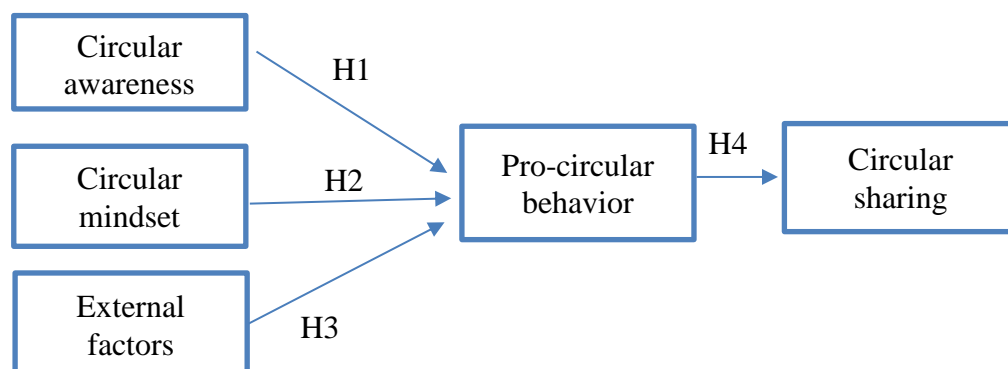

Figure 1. Conceptual model of the study
Source: *own compilation*

The research question of this study is "What factors influence various aspects of the pro-circular behavior and circular sharing of the population"?

Based on the conceptual model, we formulated the following hypotheses:

H1. The level of circular awareness has a positive effect on the pro-circular behavior of the population.

H2. A circular mindset positively influences the pro-circular behavior of the population.

H3. External factors determine the pro-circular behavior of the population.

H4. Pro-circular behavior has a positive effect on circular sharing.

2. Methodological approach

A quantitative approach based on the paradigm of positivism/realism was applied to study the factors of pro-circular behavior of the population, where the research goals are descriptive and causal analysis (Kasim & Antwi, 2015). In general, quantitative research involves collecting primary data to quantify the parameters of the problem under study and subjecting it to statistical processing to support or refute the research hypotheses put forward (Marvasti, 2018).

Correlation-regression research design involves assessing the relationship between variables of different factors and the pro-circular behavior of the population. The research model was tested during the study. Our paper aims to carry out research in two empirical stages: (1) to study the influence of circular awareness, circular thinking, and other external factors on pro-circular behavior; (2) the impact of pro-circular behavior on circular sharing.

Data were collected via an online survey using the Google forms platform. The link to the survey was shared on social networks like Telegram and Instagram and also circulated via WhatsApp groups. Data collection was carried out in Spring 2022. The total number of valid questionnaires is 3448. Each item in the survey was measured on a 5-point Likert scale (1 = Strongly disagree; 5 = Strongly agree). Additional information about variables is available in Appendix A. Collected data for this study were processed by SPSS 25 software, and hypotheses were tested by the Smart PLS 3 program.

3. Conducting research and results

3.1. Socio-demographic information of respondents

Primary data collection yielded a total of 3448 responses to the questionnaire. Table 1 shows the main demographic characteristics of the interviewed respondents. 48.8% of men and 51.2% of women participated in the survey, which corresponds to the country's official statistical breakdown for the proportion by gender. The share of young people is predominant: 19-29 years old - 45.1% and 30-45 years old 43.9% respectively. More than 64% of them have a university degree. Almost half of the respondents (49.8%) have an income of 101 000-300 000 tenge.

Table 1. Demographic information of respondents

Characteristics	Indicator	Percentage
Gender	Man	48,8
	Woman	51,2
Age	Under 18 years	3,3
	19-29 years	45,1
	30-45 years	43,9
	46-55 years	6
	56-65 years	1,7
	66 years and more	0,1
Education	Secondary general education	7,7
	Secondary specialized (technical school, college, etc)	15,9
	Incomplete Higher	12,4
	Higher (including bachelor's and master's degrees)	64
Income	Under 60 000 tenge	17,2
	61 000 – 100 000 tenge	15,8
	101 000 – 200 000 tenge	28
	201 000 – 300 000 tenge	21,8
	301 000 – 400 000 tenge	9,8
	More than 401 000 tenge	7,4
Locality	City of republican significance	42,9
	City of regional significance	24,1
	City of district significance	12,8
	Village	20,2

Source: *own calculation*

3.2. Measurement model

The following calculations were made by the Smart PLS 3 program to determine the reliability of the proposed research model. Convergent validity tests if the research made by a researcher is reliable. Table 2 demonstrates the variables and their results on convergent validity. According to Cronbach's Alpha, constructs higher than 0.70 should be considered reliable. Circular awareness (α=0.877), pro-circular behavior (α=0.852), circular mindset (α=0.946), circular sharing (α=0.887), and external factors (α=0.819) display convergent validity. Cronbach's alpha evaluates the internal consistency of variable statements in a model.

However, Cronbach's Alpha may under- or overestimate scale reliability. Therefore, composite reliability is preferred among the Smart PLS-based researchers. According to studies (Chin, 1998; Höck & Ringle, 2006; Henseler, Ringle, & Sarstedt, 2012; Daskalakis & Mantas, 2008), composite reliability is acceptable when reliability is equal to or higher than 0.70 and 0.80. As Chin (1998) and Höck & Ringle (2006) discussed in their study, AVE (Average variance extracted) is acceptable when the level is higher than 0.50. In our study, 3 out of 5 constructs were higher than 0.50, while the other two resulted in 0.454 (pro-circular behavior) and 0.428 (circular sharing).

Table 2. Convergent validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Circular awareness	0.877	0.879	0.910	0.670
Pro-circular behavior	0.852	0.863	0.881	0.454
Circular mindset	0.946	0.958	0.958	0.821
Circular sharing	0.887	0.894	0.905	0.428
External factors	0.819	0.830	0.881	0.651

Source: *own compilation*

Table 3 describes the Fornell–Larcker discriminant validity criterion. It means that research is adequately constructed when for any latent variable, the square root of AVE is higher than its correlation with any other constructs. In our research, the square root of every construct's AVE resulted higher than its correlation with any other constructs: CA=0.819 (highest), CM=0.906 (highest), EF=0.807 (highest), CB=0.674 (highest), SHR=0.654 (highest).

Table 3. Discriminant validity

	Circular awareness	Pro-circular behavior	Circular mindset	Circular sharing	External factors
Circular awareness	0.819				
Pro-circular behavior	0.472	0.674			
Circular mindset	0.233	0.442	0.906		
Circular sharing	0.246	0.439	0.339	0.654	
External factors	0.257	0.480	0.678	0.491	0.807

Source: *own compilation*

3.3. Structural model

H1 contented that the level of circular awareness positively impacts the pro-circular behavior of the population. As can be seen from the Structural model and path coefficients (Figure 2), circular awareness's direct impact on pro-circular behavior intentions was positive and significant ($\beta = 0.405$, $p < 0.001$).
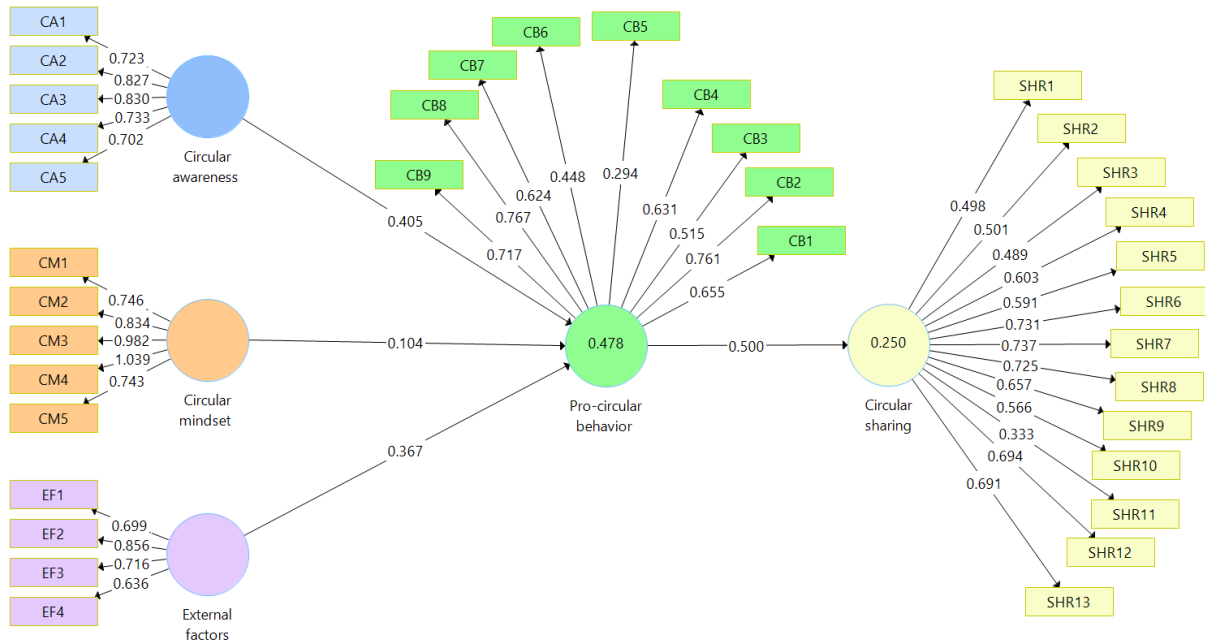
Figure 2. Structural model and path coefficients
Source: *own compilation*

According to H2 and H3, circular mindset (β = 0.104, p <0.005) and external factors (β = 0.367, p <0.001) positively impacts the pro-circular behavior of the population. Also, pro-circular behavior is related to circular sharing (β = 0.500, p <0.001). Therefore, all hypotheses were supported (Table 4). It should be noted that circular awareness influences pro-circular behavior more than other factors.

Table 4. Hypotheses testing

		Original Sample (O) (Path coeff.)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Supported (Yes/No)
H 1	Circular awareness -> Pro-circular behavior	0.405	0.406	0.026	15.738	0.000	Yes
H 2	Pro-circular behavior -> Circular sharing	0.500	0.503	0.029	17.235	0.000	Yes
H 3	Circular mindset -> Pro-circular behavior	0.104	0.101	0.044	2.341	0.020	Yes
H 4	External factors -> Pro-circular behavior	0.367	0.370	0.048	7.658	0.000	Yes

Source: *own compilation*

Further, the mediating role of pro-circular behavior between different factors and circular sharing was validated; the total and specific indirect effects were examined (Table 5). In general, circular awareness, circular mindset, and external factors positively influence pro-circular behavior and circular sharing. Except for the relation of circular mindset with pro-circular behavior and sharing, all indicators are significant at p < 0.01.

Table 5. Total effects

	Original Sample (O) (Path coeff.)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Circular awareness -> Pro-circular behavior	0.405	0.406	0.026	15.738	0.000
Circular awareness -> Circular sharing	0.203	0.204	0.016	12.630	0.000
Pro-circular behavior -> Circular sharing	0.500	0.503	0.029	17.235	0.000
Circular mindset -> Pro-circular behavior	0.104	0.101	0.044	2.341	0.020
Circular mindset -> Circular sharing	0.052	0.051	0.022	2.374	0.018
External factors -> Pro-circular behavior	0.367	0.370	0.048	7.658	0.000
External factors -> Circular sharing	0.183	0.187	0.029	6.313	0.000

Source: *own compilation*

Our previous conclusion is confirmed while assessing the specific indirect effect of variables on circular sharing through pro-circular behavior. Circular awareness ($\beta = 0.203$) and external factors ($\beta = 0.183$) have a positive impact on circular sharing and have a significance level of $p < 0.01$.

Table 6. Specific indirect effects

	Original Sample (O) (Path coeff.)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Circular awareness -> Pro-circular behavior -> Circular sharing	0.203	0.204	0.016	12.630	0.000
External factors -> Pro-circular behavior -> Circular sharing	0.183	0.187	0.029	6.313	0.000
Circular mindset -> Pro-circular behavior -> Circular sharing	0.052	0.051	0.022	2.374	0.018

Source: *own calculation*

This study proposed a conceptual model of the relationship between circular awareness, external factors, circular mindset, pro-circular behavior and circular sharing. Analysis of the coefficients showed that all directions of influence are significant. Particularly noteworthy are the relatively high coefficients of circular awareness and external factors influencing pro-circular behavior. In turn, pro-circular behavior also has a positive effect on sharing. Wang et al. (2021) claimed that pro-environmental preference positively impacted self-determination needs and satisfaction, then eco-friendly behavior intentions. Also, in the Assessment of Circular Economy within Portuguese Organizations, Fonseca et al. (2018) found that the adoption level of the circular economy was positively influenced by the state of EMS (environmental management system) certification, the willingness to improve environmental performance, and achieve a sustainable business model.

Thus, the implementation of the circular economy principles determines the pro-circular behavior at the firm's level. At the population's level, circular awareness and external factors

are more influential: state support in developing environmental infrastructure and stimulating eco-friendly behavior are cases in point. Also, the level of awareness is not always a trigger for pro-circular behavior. Liu & Bai (2014) showed that firms had a relatively good understanding of the circular economy and a strong desire to operate according to its values. However, it did not always result in enthusiastic behavior. There was a striking gap between the firm's awareness and its actions. It is important to eliminate objective reasons for such gaps by creating favorable conditions.

Conclusion

The research model for the influence of circular awareness, circular mindset, and external factors on pro-circular behavior and circular sharing was evaluated in this study based on empirical data. The results showed that the circular mindset, circular awareness, and external factors significantly affect pro-circular behavior and circular sharing.

The statistical analysis allows us to make the following conclusions:

1) the development of a circular economy begins with the formation of the pro-circular behavior of the population. For instance: purchase of environmentally friendly products and energy-efficient goods, waste sorting, donation for ecology funds, reuse of household items and clothes, reduction of consumption, etc.;

2) factors for the formation of pro-circular behavior are knowledge of waste recycling, selection of green products and packages, awareness of the circular economy, familiarity with the circularity principles such as reuse, recycling, consumption reduction, etc.;

3) the pro-circular behavior of the population affects their attitude towards joint consumption/use of services in the following positions: rental of real estate (housing, apartments), vehicles, bicycles, a workplace for a certain time, freelance work, food, and book exchange, etc.

This article contributes to the theoretical basis of pro-circular behavior, circular awareness, circular mindset, and circular sharing concepts, which can be further expanded to ecological consumption and the pro-environmental behavior of the population. We also propose the following practical recommendations to policymakers and entrepreneurs: tax incentives, placement of containers for waste sorting, issuing coupons for returning used goods, guaranteeing recycling after use, developing ecological packaging for products, etc. The limitation of this study is that the survey was conducted online, and the vast majority of the respondents were people aged 19-45 years. In the future, it is necessary to organize a paper survey to collect and examine the opinion of an older category. The prospect of this research is to develop targeted recommendations for a circular economy in Kazakhstan by conducting expert interviews among representatives of the business environment, government bodies, and international researchers.

Acknowledgement

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211. Retrieved from https://doi.org/10.1016/0749-5978(91)90020-T

Ajzen, I. (2012). The theory of planned behavior. *Handbook of theories of social psychology*, 438-459. Retrieved from https://doi.org/10.4135/9781446249215.n22

An official website of the European Union (2022). Retrieved from https://research-and-innovation.ec.europa.eu/research-area/environment/circular-economy_en

Arminda, D.P., Helena, A., Chris, S. and Walter L.F. (2014). An analysis of the measurement of the construct buying behaviour in green marketing. *Journal of Integrative Environmental Sciences*, 11(1), 55-69. Retrieved from https://doi.org/10.1080/1943815X.2014.894082

Aubin, E.d.S., McAdams, D.P. (1995). The relations of generative concern and generative action to personality traits, satisfaction/happiness with life, and ego development. *J Adult Dev* 2, 99–112. Retrieved from https://doi.org/10.1007/BF02251258

Boorová, B. (2020). Circular economy as a way of sustainable production and consumption. *SHS Web of Conferences*. 83. 01004. Retrieved from https://doi.org/10.1051/shsconf/20208301004.

Bilan, Y., Mishchuk, H., & Dzhyhar, T. (2017). Human capital factors and remuneration: analysis of relations, modelling of influence. *Business: Theory and Practice*, *18*, 208 - 214. DOI: https://doi.org/10.3846/btp.2017.022

Chizaryfard, A., Trucco, P. & Nuur, C. (2021). The transformation to a circular economy: framing an evolutionary view. *J Evol Econ* 31, 475–504. Retrieved from https://doi.org/10.1007/s00191-020-00709-0

Chin, W. W. (1998). The partial least squares approach for structural equation modeling. In G. A. Marcoulides (Ed.), *Modern methods for business research* (pp. 295–336). Retrieved from https://www.researchgate.net/publication/311766005_The_Partial_Least_Squares_Approach_to_Structural_Equation_Modeling

Daskalakis, S., and Mantas, J. (2008). Evaluating the impact of a service-oriented framework for healthcare interoperability. *Studies in health technology and informatics*, 136, 285-90. Retrieved from https://doi.org/10.3233/978-1-58603-864-9-285

EMAF (Ellen MacArthur Foundation), Towards the Circular Economy, London (2013). Retrieved from https://ellenmacarthurfoundation.org/towards-the-circular-economy-vol-1-an-economic-and-business-rationale-for-an

Festinger, L. (1957), A Theory of Cognitive Dissonance, Stanford University Press.

Fonseca, L. M., Domingues, J. P., Pereira, M. T., Martins, F. F., & Zimon, D. (2018). Assessment of circular economy within Portuguese organizations. *Sustainability*, *10*(7), 1–24. https://doi.org/10.3390/su10072521

Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. Retrieved from https://doi.org/10.2307/3151312

Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). The Circular Economy – A new sustainability paradigm? *Journal of Cleaner Production*, 143, 757–768. Retrieved from https://doi.org/10.1016/J.JCLEPRO.2016.12.048

Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner Production*, 114, 11–32. Retrieved from https://doi.org/10.1016/J.JCLEPRO.2015.09.007

Hamid, M.R., Sami, W., Mohmad Sidek, M.H. (2017). Discriminant Validity Assessment: Use of Fornell & Larcker criterion versus HTMT Criterion*, Journal of Physics: Conference Series*, 890, 012163. Retrieved from https://doi.org/10.1088/1742-6596/890/1/012163

Harris, S., Martin, M., and Diener, D. (2021). Circularity for circularity's sake? Scoping review of assessment methods for environmental performance in the circular economy.

Sustainable Production and Consumption, 26, 172–186. Retrieved from https://doi.org/10.1016/J.SPC.2020.09.018

Henseler, J., Ringle, C.M. and Sarstedt, M. (2016). Testing measurement invariance of composites using partial least squares, *International Marketing Review*, 33 (3), 405-431. Retrieved from https://doi.org/10.1108/IMR-09-2014-0304

Hernández-Mejía, S., García-Santillán, A. & Moreno-García, E. (2021). Financial literacy and the use of credit cards in Mexico. *Journal of International Studies, 14*(4), 97-112. doi:10.14254/2071-8330.2021/14-4/7

Höck, M., and Ringle, C. (2010). Local strategic networks in the software industry: An empirical analysis of the value continuum. *International Journal of Knowledge Management Studies - Int J Knowl Manag Stud*. 4. Retrieved from https://doi.org/10.1504/IJKMS.2010.030789

Holotová, M., Nagyová, Ľ., & Holota, T. (2020). The impact of environmental responsibility on changing consumer behaviour – sustainable market in Slovakia. *Economics and Sociology, 13*(3), 84-96. doi:10.14254/2071-789X.2020/13-3/6.

Hussain, S., Ahmed, R.R. (2020). Smartphone Buying Behaviors in a Framework of Brand Experience and Brand Equity. *Transformations in Business & Economics*, 19(50), 220-242.

Kasim, H., and Antwi, S. K. (2015). Qualitative and Quantitative Research Paradigms in Business Research: A Philosophical Reflection. *European Journal of Business and Management*, 7(3). www.iiste.org

Londoño-Roldan, JC., Davies, K. and Elms, J. (2017). Extending the Theory of Planned Behavior to examine the role of anticipated negative emotions on channel intention: The case of an embarrassing product, *Journal of Retailing and Consumer Services*, 36, 8-20. Retrieved from https://doi.org/10.1016/j.jretconser.2016.12.002

Liu, Y., and Bai, Y. (2014). An exploration of firms' awareness and behavior of developing circular economy: An empirical research in China. *Resources, Conservation and Recycling*, *87*, 145–152. https://doi.org/10.1016/j.resconrec.2014.04.002

Marvasti, A. (2018). Research methods. *The Cambridge Handbook of Social Problems*, 1(3), 23–37. https://doi.org/10.1017/9781108656184.003

Moreau, V., Sahakian, M., Griethuysen, P., Vuille, F. (2017). Coming full circle: why social and institutional dimensions matter for the circular economy. *J. Ind. Ecol*., 21 (3), 497-506 Retrieved from http://doi.wiley.com/10.1111/jiec.12598

Müller, J., Acevedo-Duque, Á., Müller, S., Kalia, P., Mehmood, K. (2021). Predictive Sustainability Model Based on the Theory of Planned Behavior Incorporating Ecological Conscience and Moral Obligation. *Sustainability*, 13(8), 4248. Retrieved from https://doi.org/10.3390/su13084248

Musova, Z., Musa, H., & Matiova, V. (2021). Environmentally responsible behaviour of consumers: Evidence from Slovakia. *Economics and Sociology, 14*(1), 178-198. doi:10.14254/2071-789X.2021/14-1/12

Organisation for Economic Co-operation and Development's background report prepared for the 2021 G20 Presidency of Italy. Towards a more resource-efficient and circular economy: The role of the G20 (2021). Retrieved from https://www.oecd.org/env/waste/OECD-G20-Towards-a-more-Resource-Efficient-and-Circular-Economy.pdf

Paul, J., Modi, A., and Patel, J. (2016). Predicting green product consumption using theory of planned behavior and reasoned action. *Journal of Retailing and Consumer Services*, 29, 123–134. Retrieved from https://doi.org/10.1016/J.JRETCONSER.2015.11.006

Priede-Bergamini, T., Lopez-Cozar-Navarro, C., Benito-Hernandez, S. (2020). Cooperation Behavior towards Innovation: Examining Differences between Family and Non-Family Businesses. *Transformations in Business & Economics,* 19 (51), 310- 328.

Rashid, N. R. N. A., and Mohammad, N. (2012). A Discussion of Underlying Theories Explaining the Spillover of Environmentally Friendly Behavior Phenomenon. *Procedia - Social and Behavioral Sciences*, 50, 1061–1072. Retrieved from https://doi.org/10.1016/J.SBSPRO.2012.08.106

Report of the World Commission on Environment and Development: Our Common Future (1987). Retrieved from https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf

Richard, M.R., and Edward L.D. (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist*, University of Rochester, 68-78. Retrieved from https://selfdeterminationtheory.org/SDT/documents/2000_RyanDeci_SDT.pdf

Rizos, V., and Bryhn, J. (2022). Implementation of circular economy approaches in the electrical and electronic equipment (EEE) sector: Barriers, enablers and policy insights. *Journal of Cleaner Production*, 338, 130617. Retrieved from https://doi.org/10.1016/J.JCLEPRO.2022.130617

Rybaczewska, M., Kłopocka, A. M., Kuszewski, T., & Sułkowski, L. (2021). Consumers' response to pandemic threat: Purchase behaviour in convenience stores. Evidence from British panel data. *Journal of International Studies, 14*(4), 251- 269. doi:10.14254/2071-8330.2021/14-4/17

Ryan, R. M., Kuhl, J., Deci, E. L. (1997). Nature and autonomy: Organizational view of social and neurobiological aspects of selfregulation in behavior and development. *Development and Psychopathology*, 9, 701-728. Retrieved from https://selfdeterminationtheory.org/SDT/documents/2000_RyanDeci_SDT.pdf

Samoliuk, N., Bilan, Y., Mishchuk, H., & Mishchuk, V. (2022). Employer brand: key values influencing the intention to join a company. *Management & Marketing. Challenges for the Knowledge Society, 17*(1), 61-72. https://doi.org/10.2478/mmcks-2022-0004

Thøgersen, J., and Noblet, C. (2012). Does green consumerism increase the acceptance of wind power? *Energy Policy*, 51, 854–862. Retrieved from https://doi.org/10.1016/J.ENPOL.2012.09.044

Thoøgersen, J. (1999). Spillover processes in the development of a sustainable consumption pattern. *Journal of Economic Psychology*, 20(1), 53–81. Retrieved from https://doi.org/10.1016/S0167-4870(98)00043-9

Truelove, H. B., Carrico, A. R., Weber, E. U., Raimi, K. T., & Vandenbergh, M. P. (2014). Positive and negative spillover of pro-environmental behavior: An integrative review and theoretical framework. *Global Environmental Change*, 29, 127–138. Retrieved from https://doi.org/10.1016/J.GLOENVCHA.2014.09.004

Urien, B. and Kilbourne, W. (2011). Generativity and self-enhancement values in eco-friendly behavioral intentions and environmentally responsible consumption behavior. *Psychology & Marketing*, 28: 69-90. Retrieved from https://doi.org/10.1002/mar.20381

Wang, J., Yang, X., Bailey, A., & Wang, J. (2021). Positive spillover of consumers' sustainable behaviors: The mediating role of self-determination need satisfaction. *Journal of Cleaner Production*, *317* (December 2019), 128436. https://doi.org/10.1016/j.jclepro.2021.128436

Zhidebekkyzy, A., Temerbulatova, Z., & Bilan, Y. (2022). The improvement of the waste management system in Kazakhstan: impact evaluation. *Polish Journal of Management Studies*, 25(2), 423-439. Retrieved from https://doi.org/10.17512/pjms.2022.25.2.27

Appendix A

Construct variables	Questions
Circular Awareness (CA)	I know more about recycling than the average person (CA1) I can select products and bags that reduce waste (CA2) I understand the environmental labels on the product packaging (CA3) I know what "circular economy" is (CA4) I am familiar with the principles of the circular economy, such as: reuse, recycling, consumption reduction, etc. (CA5)
Circular Mindset (CM)	I am concerned about environmental degradation (CM1) It is important to me that the products I use do not harm the environment. (CM2) I think about how the quality of the environment can be improved (CM3) I would call myself an environmentally responsible person (CM4) For me, the meaning of the Kazakh words "obal bolady" ("you are responsible for your consumption"), "nandy baspa" ("respect the bread"), "ysyrap zhasama" ("do not consume too much"), etc. are very important. (CM5)
External Factors (EF)	I am ready to donate old clothes/old appliances/cars if there is a discount on a new product, tax credits/coupons or other incentives in return (EF1) I am willing to buy a product at a higher price if the manufacturing company guarantees recycling after use (EF2) I am ready to sort the garbage if there are sorting containers for separate waste near the house (EF3) I will sort my waste if there will be enforcement measures from the state (fines, punishments, etc.) (EF4)
Circular Behavior (CB)	I always buy organic food (CB1) I always try to buy energy efficient products and appliances (for example, high-efficiency light bulbs to save energy) (CB2) I always sort the garbage/waste (CB3) I am always ready to donate money for the environment (CB4) I am always ready to buy used goods: clothes (CB5) I am ready to buy used goods: household appliances (CB6) I am always ready to participate in environmental protests, meetings (CB7) I try to reduce consumption where possible. (CB8) I try to repair as much as possible, rather than buying a new one (CB9)
Circular sharing (SHR)	Real estate for rent (residential house, apartments) (SHR1) Vehicle rental (SHR2) Electric scooter/bike rental (SHR3) Renting a workplace for a certain time (SHR4) Freelance work (remote short-term work with different customers) (SHR5) Educational services (courses, seminars) (SHR6) Food (grocery exchange) (SHR7) Books (book exchange) (SHR8) Clothes (secondhand, social stores) (SHR9) Rent of household appliances, furniture, goods (SHR10) Money (loans) (SHR11) Crowdfunding (fundraising for ideas, businesses, creative and charitable projects) (SHR12) Passenger car ride (fellow travelers travel together in the same car and share the costs) (SHR13)