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Article

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THE ELECTRICAL AND ELECTRONIC PRODUCTS CONSUMERS' SUSTAINABLE BEHAVIOUR IN THE CONTEXT OF CONSOLIDATING THEIR FUNDAMENTAL RIGHTS

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Abstract

In recent years, the concern for durable electrical and electronic products as well as the recovery and recycling of electrical and electronic waste has increased, simultaneously with new initiatives aimed not only at protecting the environment, but ensuring consumer's health, while consolidating their fundamental rights.

The research aims to identify the factors that influence the sustainable behaviour of the Romanian consumer of electrical and electronic products. In this sense, the ecological attitude, the purchasing behaviour of these goods, and also the recovery/recycling attitude of electrical and electronic waste were taken into account. Data were collected through an online questionnaire from 421 Romanian respondents and processed with the lavaan software package version 0.6-12 of R for structural equation modelling.

The novelty of the article lies in how variables such as propensity to recover/recycle, tendency of purchasing durable goods, ecological behaviour, are put in a new context, combining environmental and consumers' protection. The research makes theoretical contributions by proposing and testing specific consumer protection constructs, which do not appear in the literature. From the environmental public policies point of view, the work highlights the factors that can contribute to the development of a responsible behaviour of both the population and public authorities, to stimulate the purchase of sustainable goods, and to ensure an increase in the collection rate of electrical and electronic products in Romania.

Keywords: electrical and electronic products (EEP), the sustainable consumer behavior, consumer's rights, electrical and electronic equipment waste (WEEE), recycling/recovering.

JEL Classification: C10, D18, M31, Q53, L31, L38

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Introduction

The environmental crisis is an undeniable reality manifesting itself at the planetary level, directly proportional to economic development, to the expansion of the consumer society and globalisation (Munteanu, 2022). For this reason, in recent years, concerns about sustainable development have increased, but also the field of strengthening the fundamental consumers' rights experienced unprecedented growth, which leads us to conclude that there is a close relationship between the environmental protection policies and the consumer protection policies (Leua, 2012). The population has become increasingly aware of the negative impact of excessive consumption patterns on the environment; therefore, it has started to adopt ecological attitudes (Yu, 2014). At the same time, the EU legislation in the field of consumer protection has been revised with EU Directive 2019/771 regarding certain aspects related to contracts for the sale of goods, to ensure correct and credible information, both through sales sources (about the lifetime of the product, the availability of repair services, the provision of spare parts, the existence of repair manuals), as well as through various initiatives in the field of consumer rights. The aim is to strengthen the consumer's fundamental rights both at the time of purchasing and consuming such products and to change people's attitude towards the environment, according to the sustainability principles (EU Directive 2019/771).

The aim of the research is to identify the factors that influence the sustainable behaviour of the Romanian consumer of electrical and electronic products. Through the statistical analysis, we intend to obtain information regarding the identification and the establishment of the impact of some factors that can influence the Romanian consumer's behaviour when purchasing sustainable and ecological electric and electronic products, their ecological behavior, and their intention to recycle obsolete products. For this purpose, we resorted to the identification of some relationships between aspects related to the consumer protection and propensity towards durable goods consumption issues, respectively, the impact that people's information/awareness level and the tendency to purchase green goods have on the purchasing and recycling intention.

The work brings to the fore two determining factors (constructs) from the consumer protection field, which may influence their propensity toward purchasing sustainable and environmentally friendly electrical and electronic goods, namely: *consumers' awareness of their rights*, on the one hand, and *the measures taken by the authorities to strengthen their fundamental rights through the legislative system*, and not only, on the other hand. To measure and test these relationships, a scale of propensity to purchase durable electrical and electronic products and their recovering/recycling was applied, highlighting constructs such as the characteristics sought in electrical and electronic products (EEP); motivation for purchasing sustainable products; the circles close to consumers that can influence the decision to recycle electrical and electronic equipment waste (WEEE); the impact of legislation, public policies and NGOs on consumers' attitudes; people's preferences when purchasing EEP focusing on aspects such as sustainability, energy efficiency and environmental impact; consumers' awareness of the effects of disposal of defective or outdated EEPs on the environment and consumers health; consumers' awareness of their rights in relation to producers and traders, and the extent to which consumers are prepared to act in order to protect their health and the natural environment.

The work in its logical approach refers to a review of the specialized literature focused on two levels, respectively, the impact of WEEE on the environment and consumers and the

factors that influence the sustainable consumer behaviour, followed by a section in which the research methodology is presented and the investigated hypotheses are elaborated, after which the obtained results are specified and discussed, so that finally the research conclusions are highlighted.

1. Literature review

1.1. Aspects regarding the impact of electrical and electronic waste on the environment and consumers

WEEE is considered extremely dangerous both for nature and for the population's health because they are made of materials with a high content of toxic substances: mercury, lead, arsenic, cadmium, chromium, cobalt, copper, nickel, zinc, etc. (Nageswara Rao, 2014). Randomly abandoning used EEP in the midst of nature, or throwing them into household waste bins is extremely dangerous (Airward and Tripathi, 2021; Ankit et al., 2021). If they remain in nature with other municipal waste, they risk polluting the soil (Zhang et al., 2012), as well as the air and the groundwater (Sivakumar, 2011). For this reason, it is imperative to manage this waste properly and, implicitly, to recover and recycle it, which can be achieved, as Prakash et al. (2015) underlined, by empowering people in their capacity as consumers.

In recent years, the population had more accessibility to small and cheap EEP, whose life cycle was getting shorter, with repair options being more limited (Prakash et al., 2015). In response to this trend with adverse effects on the environment and consumers health, the European Union developed rules to stimulate the production of sustainable goods with less energy consumption, but also easier to recover (Oancea, 2021). In this context, the European Commission has proposed an action plan for a cleaner and more competitive Europe, which involves not only the revision of EU legislation in the field of consumer protection, but also insuring the consolidation of their fundamental rights (EU Directive 2019/771). The proposed circular economy action plan specifically mentions combating planned obsolescence through the "Right to repair", meaning consumer products must be easily patched and updated. That is why alongside the fundamental consumers' rights stipulated by legislation and already well known (Jacobs et al., 2010), new rights have been formulated for purchasing EEP to strengthen the consumers' rights, as well as to encourage the sustainable consumption behaviour through the purchase of sustainable (Prakash et al., 2015) and ecological goods.

1.2. Factors influencing the sustainable behaviour of electrical and electronic products consumers

This paper aims to highlight the sustainable behavior of EEP consumers, starting from three aspects: their ecological attitude, their tendency to purchase sustainable goods, and the WEEE recovering and recycling propensity.

Regarding the first aspect, Corsini et al. (2020) validated in their analysis the ecological attitude as a factor influencing the consumer's sustainable behaviour. The degree in which people are aware of the environmental issues, the feeling that one's ecological behaviour positively influences the natural environment, and the importance of recycling from the consumers' perspective affect the ecological attitude when purchasing durable goods (Oskamp, 1991; Yu, 2014; Shevchenko et al., 2019; Corsini et al., 2020). A highly analytical

work on ecological consumerism is the research of Wijekoon and Sabri (2021) who analyzed the consumers „green” purchasing behavior over six years (2015-2021) highlighting the obstacles they encounter in the process of buying environmentally friendly products, and the main determinants of ecological attitude. This work with a generalizing character managed to concentrate dozens of influencing factors, including the degree of awareness of environmental and health issues, ecological attitude, purchase criteria (quality, price, perceived value, utility, reparability, sustainability, etc.) and numerous other factors from the consumers internal and external environment that influence their sustainable behavior (Wijekoon and Sabri, 2021).

Regarding the purchase of organic products, the propensity in this direction is determined by a functional value (given by price, quality, and performance) and by a social value highlighting the perceived utility by associating these purchases with pressures from different social groups (Danish et al., 2019; Siringo et al., 2020; Shukla, 2021). The consumers’ ecological attitude is a key factor in the propensity to purchase ecological goods, the influence of social, economic, and emotional factors being overwhelming (Joshi et al., 2021). The degree of awareness of environmental issues has a positive impact on the consumers ecological attitude (Amoah and Addoah, 2020), but the level of awareness worldwide is considered low (Awasthi and Li, 2018; Ravindra and Mor, 2019). Consumer’s inclination towards sustainable consumption is subjective and differs from one consumer to another depending on the influencing factors. Psychological factors show that people can either have a favorable position towards this process, or an unfavorable one (Coşkun, 2022).

Consumers are also interested in the second aspect, namely the purchase of durable goods. The issues of using recycled materials, extending the product’s life cycle, and allowing easier repair, maintenance, dismantling, reuse, and recycling, are new tools required by the EU, aiming to reduce the impact of WEEE on the environment and human health, but also to change the purchasing habits in the direction of buying sustainable and ecological goods (EU Directive 2019/771).

In the literature, there is a lack of research papers analyzing the recycling/reuse process in relationship with the repairing of durable goods (Bovea et al., 2018; Jayaraman et al., 2018; Liu et al., 2019; Islam et al., 2021). These tendencies increase when sustainable behaviour is appreciated by people in the environment where the consumer lives. This tendency is defined by the term “social identity value” (Kumar and Ghodeswar, 2015).

The first work in the field of the consumers’ behaviour regarding WEEE was developed by Oskamp in 1991, in which the author examined different types of variables that influence the recycling attitude, of which for our analysis the degree of awareness of environmental issues is of interest, and the family, friends, colleagues, neighbours tendency to recycle (Oskamp, 1991). These factors were also validated by Perez-Belis et al. (2015).

Some authors such as Târțiu et al. (2019) consider legislation, the environmental policies and practices in the field of recycling as being primary factors that influence the consumers’ behaviour toward WEEE recovery, and Siringo et al. (2020), White et al. (2019), Mohanty et al. (2021), Tummers (2019) appreciates that social norms can increase people’s awareness regarding environmental issues, encouraging waste recycling, but also public policies, respectively, the governments initiatives have a positive effect on the sustainable behaviour of the population.

Based on the analyzed specialized literature, we propose the research model (Figure no. 1), which shows the relationship between the factors with a potential impact on the consumers' behaviour toward WEEE recycling, aiming to also test the impact of strengthening the fundamental rights of the consumers and the purchase criteria on the propensity to buy sustainable and ecological goods.

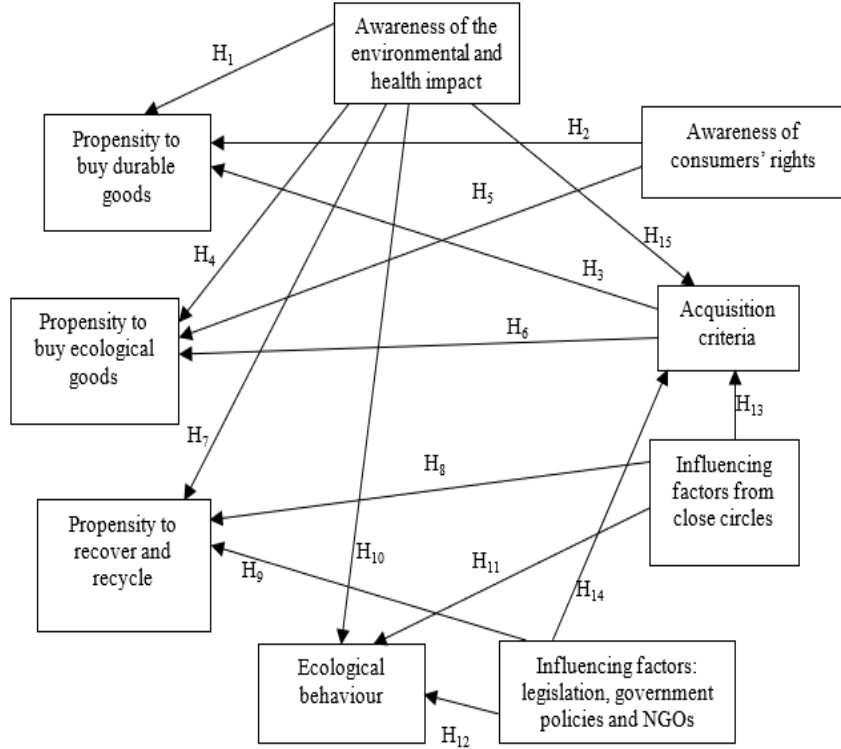


Figure no. 1. The theoretical research model

2. Research methodology

2.1. Research design and deriving hypotheses

In order to establish the relationships between the influencing factors of the Romanian consumer's sustainable behavior of EEP and, at the same time, how they influence the consumer's attitude towards the environment, we started from the research theoretical model from figure no. 1. Also, when deducing the hypotheses, we grouped these factors as follows:

- Factors influencing the purchase behaviour of the Romanian EEP consumers, defined through three latent variables: purchase criteria, the propensity to buy durable and ecological goods, formulating the hypothesis from H₁ to H₆, respectively, H₁₃ and H₁₄;
- Factors influencing the Romanian EEP consumer's recovery/recycling propensity, formulating hypotheses H₇, H₈ and H₉;

• Factors influencing the Romanian EEP consumers' ecological attitude, formulating hypotheses H_{10} and H_{11} .

WEEE through the substances they contain have a harmful impact on the environment and health. One way to reduce this waste is to increase the products life cycle. This can be achieved as a result of the consumer's pressure exerted on producers when opting to purchase sustainable goods. A consumerist movement has also emerged worldwide to encourage the consumption of durable consumer goods, which is called the Right to Reparation Movement (Shukla, 2021). Starting from the above-mentioned considerations, we state the hypothesis:

H1: Awareness of the environmental and health problems caused by the WEEE management positively influences consumers' propensity to acquire durable goods.

In this way, the fundamental EEP consumers' rights began to be strengthened (Prakash et al., 2015; EU Directive 2019/771). The right to repair (covering accessibility to spare parts, to repair and maintenance manuals, information on product reparability at the sale point) and the right to access reliable information about durability are just a few new elements proposed by the European legislation to strengthen the fundamental consumer's rights when purchasing EEP (EU Directive 2019/771). In this context, we postulate a new hypothesis:

H2: Consumers' awareness of their rights in relation to producers and traders has a favourable impact on the inclination to buy sustainable goods.

Shevchenko et al. (2019) and Islam et al. (2021) emphasised the need to change purchasing and consumption behaviour in the future because of its environmental impact. Because of that, any EEP consumer will have to decide which purchases to make based on the following three criteria: the quality of the good, the guarantees offered, and the duration of use (Danish et al., 2019; Siringo et al., 2020). We propose the following hypothesis:

H3: Acquisition criteria (quality, durability, guarantees offered) favourably impact consumers' purchasing of durable goods.

The production and consumption future behaviour must change not only in the direction of sustainable goods, but also of ecological ones (Oskamp, 1991; Yu, 2014; Shevchenko et al., 2019; Corsini et al., 2020; Joshi et al., 2021). Starting from the results of Oskamp (1991), Yu (2014), Shevchenko et al. (2019), Amoah and Addoah (2020), and Corsini et al. (2020), according to which the level of awareness of environmental issues can influence the consumers ecological attitude, we intend to test the following hypothesis for the Romanian consumers:

H4: Awareness of the environmental and health problems caused by the WEEE management influences the propensity to purchase green goods.

The following hypotheses have not been addressed in the literature, but have both theoretical importance (development of new models), as well as a practical one in the process of substantiating legislative projects, public policies related to consumer rights, consumer information, and education policies, regarding the characteristics that the EEP offered must have to fall within the quality standards:

H5: Strengthening the consumers' fundamental rights positively influences their propensity toward purchasing ecological goods.

H6: *Acquisition criteria (quality, durability, guarantees offered) favourably impact consumers' propensity to purchase ecological goods.*

Starting from the results of Oskamp (1991), Shevchenko et al. (2019), Siringo et al. (2020), and Corsini et al. (2020), who emphasize the importance of awareness of environmental issues on the propensity to recover and recycle WEEE, we hypothesize:

H7: *Awareness of environmental and health problems caused by WEEE management favourably influences the recovering and recycling propensity.*

The studies of Oskamp (1991), Perez-Belis et al. (2015), White et al. (2019) and Siringo et al. (2020) highlight the fact that the WEEE recycling process is positively correlated with the influencing factors in the circles close to consumers (family, friends, colleagues). Thus, we postulate the hypothesis:

H8: *The recovering and recycling propensity is influenced by the neighbours, colleagues, and/or friends' behaviour.*

Starting from the results of Târțiu et al. (2019), Tummers (2019), Mohanty et al. (2021) according to which the extent to which consumers are aware of recycling legislation and practices influences the propensity to recycle, we state de hypothesis:

H9: *The recovering and recycling propensity is influenced by legislation, government environmental policies, and/or the activity of NGO's.*

Oskamp (1991), Ravindra and Mor (2019), Amoah and Addoah (2020), and Corsini (2020) emphasized that the way people are aware of the environmental issues has a positive impact on their ecological attitude. In this context, we postulate the following hypotheses:

H10: *Consumers' awareness of environmental and health problems caused by WEEE management positively influences their ecological behaviour.*

H11: *Neighbours, colleagues and friends' attitudes about WEEE recycling influence people's ecological behaviour.*

This presumption can also be extended to external influencing factors, such as legislation and NGO's activity (Târțiu et al., 2019; Tummers, 2019; Mohanty et al., 2021), to deduce whether the ecological and recycling attitude is influenced (or not) by the public policies, by the legislative environment or by the action of the civil society. In this context, we formulate the hypothesis:

H12: *Legislation, governmental environmental policies, and NGO's activity influence the ecological behaviour of the individuals.*

It is important to find out to what extent the different internal/external factors and the increase of the consumers' awareness influences the acquisition criteria. That is why we formulate the following hypotheses:

H13: *The neighbours, friends, and colleagues' attitude influences the criteria on which individuals decide to purchase EEP.*

H14: *Legislation, government environmental policies, and NGO activity favourably influence individuals' criteria to purchase EEP.*

H15: Consumers' awareness of environmental and health problems caused by WEEE management favourably influences the criteria on which individuals decide to purchase EEP.

2.2. Description of data collection and analysis methods

To collect the necessary data, an online questionnaire was implemented and operationalized in accordance with the specialized literature, as shown in Table no. 1. The questionnaire was created in Google Forms and was distributed via direct mail and social media. Respondents rated the questions on a 7-point Likert scale. Data collection was carried out between May and July 2022, and the sample was built using the "snowball sampling" method, the respondents being asked to distribute the questionnaire to other people. The data set includes 421 respondents. The main socio-demographic characteristics of the sample refer to gender (66.75% female and 33.25% male), domicile (urban 76.72% and rural 23.28%), studies (high school 52.73% and university 47.27%), age (19-30 year old having the highest share with 64.85% and 30-50 year old with 23%), and in terms of income the highest share it is held by those with over 1,200 euros per month, respectively, 32.30%.

Data were analysed using a structural equation modelling with the weighted robust least squares method (WLSMV) to estimate the model parameters, which is recommended for ordinal variables (Brown, 2015; Li, 2016). The lavaan 0.6-12 package from R software was used for modelling. The present analysis followed a two-step approach. In the first stage, the assessment of the measurement models was used to determine the reliability of the indicators and the validity of the constructs (Table no. 1). In the second stage, the structural model was evaluated to validate the relationships between the constructs (Hair et al., 2021).

3. Results and discussion

3.1. Evaluation of measurement models

The results (Table no. 1) reveal an internal consistency corresponding to the model in Figure no. 1. The loadings of the items vary between 0.773 and 0.980, being above the minimum limit recommended in the literature, respectively 0.7 (Hair et al., 2010; Brown, 2015; Hair et al., 2021), which highlights that the items are representative for the investigated study. The Cronbach's Alpha indicator shows good reliability of the internal consistency of the identified factors (DeVellis, 2012), with a value higher than 0.8 for each construct. The composite reliability (CR) and average variance extracted (AVE) exceed the minimum limits of 0.7 and 0.5, respectively, which shows that the factors have convergent validity and reliability (Chin, 1988; Hair et al., 2010).

Table no. 1. Validation of factors/constructs and questionnaire scales

Construct	Item	Measurement	Loading	α/CR/AVE
Acquisition criteria (AC) Adapted after Wijekoon and Sabri, 2021	AC 1	Product quality	0.911	0.880/0.829/ 0.758
	AC 2	Guarantees offered	0.840	
	AC 3	Duration of use	0.860	

Construct	Item	Measurement	Loading	α/CR/AVE
Propensity to buy durable goods (PBDG) Oskamp, 1991; Liu et al., 2019; Islam et al., 2021	PBDG 1	I used to buy ... durable EEP, for which I can easily find spare parts	0.947	0.898/0.926/ 0.822
	PBDG 2	... durable EEP, which can be easily repaired	0.959	
	PBDG 3	...durable EEP, whose functionality can be improved by specialised personnel in the event of new technologies appearing on the market	0.807	
Influencing factors from close circles (IFCC) Oskamp, 1991; White et al., 2019; Corsini et al., 2020	IFCC 1	My decision to recycle EEP is influenced by ... neighbours	0.841	0.897/0.916/ 0.822
	IFCC 2	... friends	0.894	
	IFCC 3	... colleagues	0.979	
Influencing factors: legislation, government policies and NGOs (IFLGPNGO) Târțiu et al., 2019; Tummers, 2019; Mohanty et al., 2021	IFLGPNGO	My decision to recycle EEP is influenced by ... legislation	0.908	0.873/0.894/ 0.766
	IFLGPNGO	... government environmental policies	0.937	
	IFLGPNGO	... the activity of NGOs involved in recycling of EEP	0.773	
	IFLGPNGO			
Propensity to recover and recycle (PRR) Shevchenko et al., 2019; White et al., 2019; Siringo et al., 2020	PRR 1	Always, when I decide to no longer use a EEP ... I am concerned about the recovery and recycling of the old equipment	0.849	0.900/0.920/ 0.819
	PRR 2	... I am looking for the nearest collection centre to my house.	0.926	
	PRR 3	... I deliver the old product to electrical and electronic collection centres	0.937	
Propensity to buy ecological goods (PBEG) Corsini et al., 2020; Wijekoon and Sabri, 2021; Joshi et al.,	PBEG1	When I purchase EEP, I want to save money and energy, so I prefer ... products that have an eco-label	0.924	0.881/0.902/ 0.786
	PBEG 2	... products that minimise the impact on the environment through efficient packaging	0.938	
	PBEG 3	... to participate in take-back initiatives, which involve returning the product to the retailer from whom I bought it	0.789	

Construct	Item	Measurement	Loading	α /CR/AVE
2021				
Awareness of environmental and health Impact (AIEH) Corsini et al., 2020; Shevchenko et al., 2019; Ravindra and Mor, 2019; Amoah and Addoah, 2020	AIEH 1	As consumer, I am aware that if I dispose WEEE in nature or household waste bins, I will harm ... the soil, the water, the air, with the acidity and toxicity of the heavy metals	0.973	0.975/0.977/ 0.933
	AIEH 2	... plants, trees, crops, animals	0.977	
	AIEH 3	... and unbalance an entire ecosystem	0.975	
	AIEH 4	... and accentuate the greenhouse effect and global warming.	0.955	
	AIEH 5	... my health and that of others	0.951	
Knowledge (awareness) of consumer's rights (KCR) own development	KCR 1	I know the rights that I have in relation with manufacturers and traders, rights that allow me from the moment of purchasing a product ... to have the legal guarantee of 2 years in which I can repair, exchange the product, or get the money back in case of product failure	0.950	0.911/0.914/ 0.844
	KCR 2	... to be able to request the replace or repair of the product in the event of nonconformity	0.980	
	KCR 3	... to be able to request a price reduction or contract termination if the situation requires it	0.818	
Ecological behaviour (EB) Amoah and Addoah, 2020; Joshi et al., 2021; Coşkun, 2022	EB 1	To protect my life, health, and the environment, I choose to ... reduce electrical and electronic waste pollution	0.949	0.899/0.911/ 0.812
	EB 2	... contribute to reducing the carbon footprint	0.920	
	EB 3	... inform myself about all aspects that appear in the EEP sales contracts	0.830	

Notes: α – Cronbach Alpha > 0.7; AVE-Average Variance Extracted>0.5 and CR-Composite Reliability > 0.7 (Chin, 1988; Hair et al., 2010; DeVellis, 2012; Brown, 2015)

To analyse the discriminant validity of each construct, the Fornell-Larcker (1981) criterion was used, which requires the square root of the average variance extracted to be higher than the absolute value of the correlation coefficients. As table no. 2 shows, the requirement is met for all the latent variables.

Table no. 2. Discriminant validity analysis (Fornell and Larcker, 1981)

Construct	AC	PBDG	IFCC	IFLGPNGO	PRR	PBEG	AIEH	KCR	EB
AC	0.871								
PBDG	0.646	0.907							
IFCC	0.173	0.119	0.907						
IFLGPNGO	0.534	0.395	0.475	0.875					
PRR	0.446	0.383	0.178	0.476	0.905				
PEEG	0.639	0.484	0.083	0.377	0.700	0.887			
AIEH	0.676	0.443	-0.072	0.240	0.443	0.544	0.966		
KCR	0.563	0.518	0.016	0.395	0.399	0.606	0.704	0.919	
EB	0.583	0.528	0.066	0.444	0.653	0.770	0.704	0.563	0.901

Notes: **AC**: acquisition criteria (quality, guarantees offered, and duration of use); **PBDG**: propensity to buy durable goods; **IFCC**: influencing factors from close circles (neighbours, friends, colleagues); **IFLGPNGO**: external influencing factors (legislation, government policies and NGOs); **PRR**: propensity to recover and recycle; **PBEG**: propensity to buy ecological goods; **AIEH**: awareness of the environmental and health impact; **KCR**: knowledge/awareness of consumer's rights; **EB**: ecological behaviour. Values on the diagonal represent the square root of the average variance extracted indicators.

3.2. Evaluation of the structural model

The variables' collinearity was tested using variance inflation factors (VIF) to validate the structural model. The maximum value obtained is 2.08 (KCR → PEEG and KCR → PBDG), below the maximum limit of 3 specified in the literature (Diamantopoulos & Siguaw, 2006), highlighting the fact that there are no problems related to multicollinearity.

Given the ordinal scale of the variables, structural equation modelling analysis using the robust weighted least squares method for estimating model parameters (WLSMV) was used to test the hypotheses (Brown, 2015; Li, 2016). The results of the model are presented in figure no. 2 and table no. 3. The indicators show that the model is well chosen and suitable for the study. Thus, the robust values of the Comparative Fit Index (CFI) and the Tucker and Lewis's Reliability Coefficient (TLI) are 0.988 and 0.986, above the minimum value of 0.95 recommended in the literature, the robust value of the Root Mean Square Error of Approximation (RMSEA) is of 0.067, with a confidence interval of 0.063-0.072, and the Standardized Root Mean Square Residual (SRMR) is 0.059, below the maximum value of 0.08 recommended by the literature (Brown, 2015).

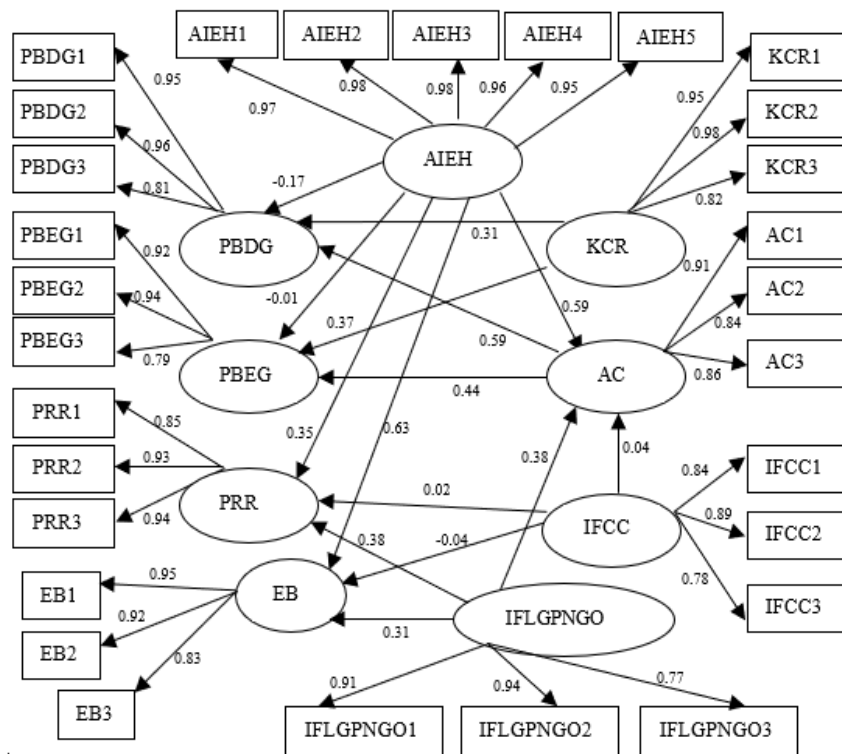


Figure no. 2. The structural model

Table no. 3. Analyses of hypotheses validity

Effects	Coefficient	Standard deviation	Z value	p-value	Hypotheses
AIEH→PBDG	-0.171	0.083	-1.990	0.047**	H ₁ - supported
KCR→PBDG	0.306	0.071	4.268	0.000***	H ₂ - supported
AC→PBDG	0.589	0.075	8.107	0.000***	H ₃ - supported
AIEH→PBDE	-0.011	0.071	-0.152	0.879	H ₄ - not supported
KCR→PBDE	0.366	0.065	5.440	0.000***	H ₅ - supported
AC→PBDE	0.440	0.067	6.640	0.000***	H ₆ - supported
AIEH→PRR	0.353	0.041	7.572	0.000***	H ₇ - supported
IFCC→PRR	0.022	0.052	0.434	0.664	H ₈ - not supported
IFLGPNGO →PRR	0.381	0.046	7.706	0.000***	H ₉ - supported
AIEH→EB	0.626	0.031	19.939	0.000***	H ₁₀ - supported
IFCC→EB	-0.037	0.053	-0.788	0.431	H ₁₁ - not supported
IFLGPNGO→EB	0.312	0.051	6.365	0.000***	H ₁₂ - supported
IFCC→AC	0.036	0.058	0.676	0.499	H ₁₃ - not supported
IFLGPNGO→AC	0.376	0.051	7.400	0.000***	H ₁₄ - supported
AIEH→AC	0.589	0.041	13.312	0.000***	H ₁₅ - supported

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$. AC: acquisition criteria (quality, guarantees offered, and duration of use); PBDG: propensity to buy durable goods; IFCC: influencing factors from close circles

(neighbours, friends, colleagues); *IFLGPNGO*: external influencing factors (legislation, government policies and NGOs); *PRR*: propensity to recover and recycle; *PBEG*: propensity to buy ecological goods; *AIEH*: awareness of the environmental and health impact; *KCR*: knowledge/awareness of consumer's rights; *EB*: ecological behaviour.

For the first hypothesis, **H₁**, the results ($\beta = -0.171$; Z -value = -1.990 and $p < 0.05$) reflect the correlation between the awareness of the impact of WEEE on the environment and health (AIEH) and the propensity to purchase durable goods (PBDG), as proven by previous research (Bovea et al., 2018; Jayaraman et al., 2018; Liu et al., 2019; Corsini et al., 2020; Islam et al., 2021). For this reason, hypothesis **H₁** is borderline accepted, with the p -value of 0.047 being very close to the acceptance threshold. It is worth noting the negative influence of the two analysed factors. A possible explanation could be the sample structure, where young people have a more significant proportion in the sample compared to the total population.

Hypothesis **H₂** ($\beta = 0.306$; Z -value = 4.268 and $p < 0.001$) shows the existence of a significant favourable influence between the consumers' awareness of their fundamental rights (KCR) and the propensity to purchase durable goods (PBDG). This hypothesis has not been validated so far in the specialised literature, but thanks to the data mentioned above, it is statistically supported, which is why this hypothesis is accepted.

The basis of hypothesis **H₃** is the assumption that the propensity to purchase durable goods (PBDG) is influenced by acquisition criteria (AC) such as quality, guarantees offered, and duration of use ($\beta = 0.589$; Z -value = 8.107 and $p < 0.001$). This hypothesis has been validated in the literature based not only on the three criteria chosen in this paper, but based on multiple purchase criteria such as price, utility, design, performance, perceived value, perceived risk, etc. (Bovea et al., 2018; Jayaraman et al., 2018; Liu et al., 2019; Islam et al., 2021). The test result is statistically significant, and the size of the estimated coefficient leads us to accept hypothesis **H₃**.

Hypothesis **H₄** aims to indicate the existence of a positive influence between the awareness of the impact of WEEE on the environment and health (AIEH) and the propensity to purchase ecological goods (PBEG), but the values resulting from the analysis ($\beta = -0.011$; Z -value = -0.152 and $p > 0.05$) indicate that this hypothesis is not supported. This means that the awareness of the impact of WEEE on the environment and health does not change the respondent's behaviour in opting for ecological goods. A possible explanation for this result is that most respondents (53.21%) are people younger than 25, and it is known that young people are less concerned about health. If we analyse this result in correlation with **H₃** and **H₆**, we see that the respondents have a series of acquisition criteria that lead to purchasing ecological and sustainable goods. As a result, there is a concern for the environment and indirectly for health, but maybe this is not very well known.

H₅ shows a positive influence of knowledge and awareness of fundamental consumers' rights (KCR) on the propensity to purchase green goods (PBDE). In the specialised literature, this hypothesis has not been tested, but the estimated value of the effect coefficient ($\beta = 0.366$) and the test results (Z -value = 5.440 and $p < 0.001$) lead us to accept it in the context of our research.

Hypothesis **H₆** presumes that acquisition criteria (AC) favourably impact consumers' propensity to purchase ecological goods (PBEG). This hypothesis has been validated in the

literature, and the estimated results ($\beta=0.440$; Z -value= 6.640 and $p<0.001$) lead us to accept it. The propensity to purchase ecological EEP is positively and significantly influenced by the acquisition criteria and by strengthening consumers' fundamental rights. Moreover, the correlation between PBEG and AC is also relatively high.

The basis of hypothesis **H₇** ($\beta=0.353$; Z -value= 7.572 and $p<0.001$) is the supposition that there is a close relationship between the awareness of the impact of WEEE on environment and health (AIEH) and the propensity towards recovery and recycling (PRR). This hypothesis has been validated in the specialised literature (Oskamp, 1991; Perez-Belis et al., 2015; Siringo et al., 2020) and is confirmed in our research. Therefore, hypothesis **H₇** is accepted.

Influencing factors from consumers' close circles (neighbours, colleagues, friends) (IFCC) could impact the propensity to recover and recycle (PRR), which would lead us to sustain hypothesis **H₈** (Oskamp, 1991; White et al., 2019; Corsini et al., 2020). Although the estimated coefficient ($\beta=0.022$) is reduced in magnitude, the test values (Z -value= 0.434 and $p=0.664$) show that this hypothesis is not confirmed, so, it is rejected. A possible explanation could also be the age of the participants. Young people tend to get information from official sources (legislation, government, NGOs), which shows hypothesis **H₉**. At the same time, this result is at least partially consistent with the results of the studies that highlight, on the one hand, the need of family skills to protect the environment and to collect the waste selectively (Oskamp, 1991; Corsini et al., 2020) and, on the other hand, the implementation of tools that can stimulate responsible behaviour regarding the purchase and generation of WEEE (Shevchenko et al., 2019).

The statement of hypothesis **H₉** suggests a proportional relationship between the external factors influencing recycling attitudes, such as legislation, government policies and NGOs' activity (IFLGPNGO), and the propensity to recover and recycle (PRR). Estimated results, $\beta=0.381$; Z -value= 7.706 and $p<0.001$, confirm this assumption, which reinforces the research of Târțiu et al. (2019), Tummers (2019), Mohanty et al. (2021), hypothesis **H₉** being accepted. This result can also be considered a solid argument for this factor to be more intensively addressed and exploited in environmental and waste management public policies.

Hypothesis **H₁₀** states that awareness of the WEEE impact on the environment and health (AIEH) influences the ecological behaviour of consumers' (EB). The estimated results ($\beta=0.626$; Z -value= 19.939 and $p<0.001$) confirm the fact that the population is aware of the harmfulness and toxicity of WEEE, thus having a positive influence on human behaviour toward nature, which is also reflected in the works of Yu (2014), Prakash et al. (2015), Awasthi and Li (2018), Ravindra and Mor (2019), Amoah and Addoah (2020), respectively Coşkun et al. (2022). In this context, hypothesis **H₁₀** is accepted.

Hypothesis **H₁₁** suggests a direct relationship between the neighbours', colleagues', and friends' influence on the recovering/recycling behaviour (IFCC) and on the ecological behaviour (EB). The estimated results indicate a negative coefficient ($\beta=-0.037$), reduced size, and an insignificant effect (Z -value= -0.788 and $p=0.431$), which invalidates our supposition and leads us to reject hypothesis **H₁₁**. The possible explanation is similar to that of **H₈**, supported by hypothesis **H₁₂**.

Hypothesis **H₁₂** claims that external factors that influence recycling attitude, such as legislation, government policies, and the activity of NGOs (IFLGPNGO), have a favourable impact on the ecological behaviour (EB), which means that the population is open to the

governmental environmental policies, and interested in the activity of the civil society. This analysis, but from another angle, has been addressed and validated in the literature by Prakash et al. (2015), Tummers (2019), Mohanty et al. (2021) and the values obtained in our examination $\beta=0.312$; $Z\text{-value}=6.365$ and $p=0.000$ lead us to accept the hypothesis.

Hypothesis **H₁₃** starts from the supposition that neighbours, colleagues, friends (IFCC) positively influence the acquisition criteria (quality, guarantees offered, and duration of use) (AC). This hypothesis has not been tested in the literature. The estimated values, $\beta=0.036$; $Z\text{-value}=0.676$ and $p=0.499$, leads us to reject this hypothesis. The possible explanation is similar to that of **H₈**, supported by hypothesis **H₁₄**.

The direct relationship between external factors influencing recycling attitudes (IFLGPNGO) and purchasing criteria (AC) is suggested by hypothesis **H₁₄**. The estimated values $\beta=0.376$, $Z\text{-value}=7.400$ and $p=0.000$ indicate the acceptance of this hypothesis, even if it has not yet been validated in the literature.

The last hypothesis, **H₁₅**, suggests a possible link between WEEE environmental and health impact awareness (AIEH) and acquisition criteria (AC) (Yu, 2014; Joshi et al., 2021). The estimated results ($\beta=0.589$; $Z\text{-value}=13.312$ and $p=0.000$) indicate the validity of this hypothesis, which means that the population is ready to change its purchasing behaviour to a sustainable one, realising that ecological balance and human health depend on the choices of each of us.

The recovering and recycling tendency (Oskamp, 1991; Perez-Belis et al., 2015; Siringo et al., 2020), the consumers' ecological behaviour (Yu, 2014; Danish et al., 2019; Siringo et al., 2020; Shukla, 2021; Wijekoon and Sabri, 2021) and the acquisition criteria (quality, guarantees offered, and duration of use) (Yu, 2014; Bovea et al., 2018; Jayaraman et al., 2018; Liu et al., 2019; Islam et al., 2021) are influenced by awareness of the environment and health. Our analysis also confirmed all these assumptions. However, our approach does not reveal any connection between awareness of the effects on nature and the propensity to purchase ecological goods. This result, in our opinion, could be influenced by the structure of the sample, in which young people have a substantial proportion. A future research direction could be to verify this hypothesis on a sample with a different age structure. Age sampling of the surveyed population will probably confirm the research results of Dabija et al. (2019), which emphasized that new generations have different behaviour than their parents because young people are more sustainability oriented towards green and implicitly new products.

Factors that closely influence consumers' recycling behaviour, such as neighbours, colleagues, and friends (Oskamp, 1991; White et al., 2019; Corsini et al., 2020) have no impact on the recovering/recycling propensity, on ecological behaviour, and on acquisition criteria. Conversely, external factors influencing recycling attitudes, such as legislation, government policies and NGO activity, have a significant effect on the recovering/recycling propensity, which confirms the results of Târțiu et al. (2019), Tummers (2019), Mohanty et al. (2021), likewise on consumers' ecological behaviour (Prakash et al., 2015), and on acquisition criteria, even if this influence has not been validated in the specialised literature.

The acquisition criteria have a unique role in stimulating the purchasing of sustainable and ecological goods. These two vectors have not been tested in the literature, so we consider

them to be an original contribution to the field. The degree to which consumers know and are aware of their fundamental rights depends on their propensity to purchase sustainable and ecological goods. These determinants have not been validated in the literature, so they contribute to the originality of our approach. The way the constructs are arranged in the research model and the links between them are the results not only of the authors who have already addressed and validated them in the specialised literature, but also of our vision of the entire research.

Conclusions

The aim of our approach was to analyse the impact of some factors with a potential effect on the sustainable behaviour of Romanian consumers' toward purchasing durable and ecological EEP and on their waste recycling or recovering attitude in the context of raising awareness and strengthening the fundamental consumer's rights. The obtained results confirm those concluded by other contemporary authors like Oskamp (1991), Yu (2014), Awasthi and Li (2018), Târțiu et al. (2019), Ravindra and Mor (2019), Shevchenko et al. (2019), Amoah and Adoah (2020), Corsini et al. (2020), Coşkun et al. (2022). The research also validated new constructs which are not found in the specialty literature, as is the fact that the studies in this field (Shevchenko et al., 2019; Corsini et al., 2020; Wijekoon and Sabri, 2021; Mohanty et al., 2021), are not related to the issue of strengthening the fundamental consumer's rights.

Also, an original contribution consists in bringing to the fore the factors related to the consolidation of consumer rights, but also the way in which the correlations between all the constructs were built, particularizing the research in an emerging country such as Romania. At the same time, the research validated three acquisition criteria not tested in the literature: quality, guarantees offered, and duration of use, which influence the propensity towards purchasing durable goods.

Therefore, from the point of view of theoretical implications, this paper is a novelty because it harmoniously combines the environmental protection issue with consumer protection, both fields being considered by us inseparable.

As far as managerial implications and public environment policies are concerned, the research highlights the importance of legislation, government policies, and NGOs acting in the consumer protection field in stimulating consumers' attitudes toward purchasing sustainable goods and towards the WEEE recovering/recycling process. From this perspective, a consumer who is well informed and interested in his rights in the EEP market will have a favourable position towards recovering and recycling WEEE, and towards purchasing durable goods.

The research has some limitations. On the one hand, the investigation could not be extended at national level to include all geographical areas of Romania because of regional differences in how consumers perceive recycling, on the other hand, the sample was not analyzed by age groups (young people having a very high share of 64.85%) on education level, gender, residential environment, or criteria that could be relevant for the present research.

Strengthening the consumers' fundamental rights regarding EEP must be a common, global, collaborative strategy, whose implementation must be carried out not only by governments

through various environmental and consumer protection policies/legislation, but also by the civil society, the mass media, and, last but not least, the producers, which have to design for the future durable EEPs, and not disposable goods.

The essence of the paper is to prove that an educated and informed consumer, aware of their fundamental rights both at the time of purchasing EEP and when disposing of this waste, can influence favourable the WEEE recovery and recycling process and, implicitly, the entire environment.

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