



## Research article

# Consumer perception towards electronic products from recycled components in the current geopolitical context: A structural equation modelling approach

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## ABSTRACT

Russia's invasion of Ukraine had a negative impact worldwide, causing a severe energy crisis that also affected EU countries, which are now involved in combating the growing energy prices while also speeding up the deployment of renewable energy sources. This armed conflict impacted the electronic components supply chain, causing high prices and disruption for different raw materials, resulting in material shortages for electronic components and affecting electronic product (EP) manufacturing. Since the start of the geopolitical crisis due to the Russo-Ukrainian War, (dis)information has been disseminated via social media, affecting users' cognition, attitudes, and behavioral intentions.

Therefore, this paper aims to assess the impact of social media usage, Russo-Ukrainian war fear, consumers' green values, perceived quality, usage enjoyment, and product image on consumers' purchase intention toward recycled electronic products. Based on the Stimulus-Organism-Response (SOR) approach, the authors propose a conceptual model highlighting the factors that enhance consumers' purchase intentions towards recycled electronic products. The model is tested empirically via quantitative-based research, with data collected from Romania, a close neighbor of the armed conflict, and assessed employing with structural equations modeling via SmartPLS 3.0.

Results confirm that social media usage, consumers' green values, and the Russo-Ukrainian war fear do enhance consumers' image of recycled electronic products, thus leading to their increased purchase intention. The novelty of this paper consists in extending the SOR-based research regarding consumers' behavioral intentions toward buying recycled electronic products in the context of the Russo-Ukrainian war. The study highlights important managerial implications for both the electronic industry and retailers selling such goods.

## 1. Introduction

The electrical and electronic equipment (EEE) market worldwide has increased recently due to larger production capacities and consumer demand. The growth was determined by both systematic economic, social, and cultural factors (globalization being the most

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important as a process of interacting and integrating people, companies, NGOs, and states at a global scale) and situational factors, namely epidemics, wars, or a change in consumer preferences [1].

The Russian Federation's invasion of Ukraine in February 2022 generated significant geopolitical consequences globally, which manifested more severely within the European Union, engendering an energy crisis that imposed the adoption of urgent measures to ensure resilience among member states. Taking account of the European Union's energy reliance on the Russian Federation [1], an obvious solution was to increase the energy independence of the member states by increasing the securing of energy supply and stock [2].

By covering the results of the investigations regarding recycling behaviors (as a type of pro-environment behavior), researchers shifted the focus from a general recycling behavior [3] to specific purchasing of recycled products [4]. Interest in the stimulants of purchasing behavior of recycled products is reflected not only in the global market size of green products and services, estimated at EUR 4.2 billion [5], but also in the importance of purchase behaviors of recycled products in creating closed-loop supply chains. If electronic products (henceforth EP) made from consumer electronic waste are not purchased, these supply chains can no longer be formed, and a circular economy remains an unattainable goal. Analyzing the purchase behavior of products made recycled from consumer electronics is particularly relevant in countries and regions where this type of market is in an initial state due to consumers' relatively low interest in this process.

In this context, studying consumer behavior regarding electronic products of recycled components (henceforth EPRC) may constitute an important step in overcoming these challenges. Due to a lack of knowledge in the literature regarding consumer behavior in this niche, this paper aims to identify successive antecedents that determine purchase intention. Since Romania is an emerging market for EPRC and a close neighbor to the armed conflict, our research on Romanian consumers' purchasing intentions is conducted in the current geopolitical context of the Russo-Ukrainian War. Therefore, this study has an important theoretical contribution by extending the Stimulus-Organism-Response approach to the EPRC market and considering the role of social media usage as a stimulus and war fear as an important organism reaction that can affect consumers' perceptions and behavior intentions toward EPRC. Moreover, such results are relevant to other countries where the EPRC market is incipient, especially under conditions of regional geopolitical instability.

The paper is structured as follows: the literature review presents the Stimulus-Organism-Response (SOR) Approach, but also the hypothesis and conceptual model development. Section 2 continues with the research methodology and the data analysis, while section 3 contains the findings and their discussions. Theoretical contributions along with managerial implications, research perspectives, and limitations conclude the paper.

## 2. Literature review: deducing hypotheses and the conceptual model

### 2.1. The Stimulus-Organism-Response (SOR) approach

The socio-psychological model [6] ascertains that an external stimulus (S) triggers a response (R) from an organism (O) with the help of subsequent emotions, feelings, and other internal states. The SOR approach has been proven to be useful in describing changes in behavior driven by various marketing stimuli and cognitive elements [7]. The versatility of SOR is its primary advantage [8], as it offers opportunities to study a variety of internal and external stimuli, tangible and intangible stimuli, including emotion, perception, beliefs and values, motivation, and thinking, as well as several response factors, such as action intention. As a result, the SOR approach is a crucial theoretical framework for understanding human behavior in general [7] and for assessing the influence mechanisms of consumers' purchasing intentions in a variety of marketplaces [9], including EPRC.

Environmental cues might influence an organism's emotional state and, consequently, the organism's approach or avoidance behaviors [6]. Exposure to different stimuli about the Russo-Ukrainian war during social media usage can be regarded as stimuli (S), such as (dis)information, influences an individual's emotional state, generates fear among SM users positively, affects green consumer values regarding EPRC recycled electronic products, enjoyment of using EPRC, quality of EPRC, and EPRC image (O), and impacts consumers' behavioral intentions toward buying EPRC (R).

These internal states result from the external stimulus's conscious or unconscious evaluations and determine an *approach* response if the person feels comfort, enjoyment, or joy, or an *avoidance* response if the external stimuli trigger boredom or displeasure and influence behavior. Environmental pollution is undeniable, aggravated in part by the consumer electronics industry. Systematic and intensive dialoguing regarding pollution and climate change has contributed to environmental knowledge and raised consumers' awareness of Earth's challenges, engendering environmental concerns [10]. Higher levels of awareness and environmental concern do not automatically determine active behavior for environmental protection. Although 79% of consumers state that environmental concern is important, only 11% purchase eco-products, and just 6% buy green products [11].

The top environmental knowledge and environmental concern is the consumer's "green trust", "green consciousness", and "green attitude" [12]. Green trust refers to the openness of consumers to green products, and their use indirectly protects the environment [10]. Environmental awareness refers to the desire to protect the environment [5]. Attitude refers to persistent enjoyment or antipathy towards an object due to a positive or negative evaluation of subsequent engagement in a certain behavior [13]. Attitude measures the favorability of a behavioral alternative toward an individual [14]. An individual's green trust and environmental consciousness mostly overlap with their behavioral attitude. There is a correlation between attitude and behavior: the more intense an individual's attitude towards a behavior, the higher the chances are that the individual acts upon that behavior [15]. Conceptualized as a predisposition or a mental state of preparation affecting individuals' responses to all possible situations [14], attitude precedes and anticipates proper behavior, including the purchase of "green" products [16]. At the same time, the offset between attitude and behavior may lead to

consumers having a strong pro-environment attitude without engaging in purchasing green products.

Personal values and consumer preferences influence attitudes and consumer behaviors [17]. Based on sharing and a circular economy, green values boost consumers' quality of life, fostering a life in harmony with nature and a democratic and nonviolent society [18]. Green values are not contrary to personal and/or consumer values from the linear economy; they are contrary to excessive "take, make, and dispose of" [19]. Analyzing reselling behaviors on peer-to-peer platforms shows that the governing values of such sustainable economic transactions—the recreational, generative, social benefit, challenging, economic, and practical values—are portrayed as green instances of corresponding values: emotional, conditional, social, epistemic, and functional [17].

The idea that the greenest consumers have an intrinsic motivation to adopt green conduct, including that of purchasing products made of recycled components, is largely accepted by the literature [20], which opines whether different types of incentives, including financial incentives, influence pro-environment behaviors or not. Economic stimuli, at best, produce a foot-in-the-door effect or a spillover effect. These extrinsic incentives may hasten the manifestation of pro-environment behaviors only in consumers already inclined to adopt them. They would have no positive influence on consumers without intrinsic motivation in this respect [21].

Social media communication has ambivalent effects, engendering a reason for optimism and precaution in peer interaction. Social media (henceforth SM) contributes to forming subjective norms, namely the modeling of perceived social pressure from third parties or reference groups to actuate a certain behavior [22]. Social pressure [23] stems less from family, coworkers, or neighbors and more from SM and online communities [15]. Subjective norms may guide their conduct in the context of military conflicts or a project to mitigate environmental issues by purchasing products made of recycled components. This guiding effect should not be automatically considered beneficial since subjective norms have a composite nature, made of different sources, not necessarily of the highest quality. Oftentimes, the pressure felt from subjective norms is detrimental to our interests and even society.

## 2.2. Generating fear of regional armed conflict through news disseminated on social media

Social media channels quickly and easily deliver news and updates on any important event, mostly perturbing [22]. Incontestably newsworthy, natural disasters (volcanic eruptions, earthquakes, flooding) and social events (mass unemployment, insurrections, armed conflicts) instantly arouse public interest and are broadly promoted, thus topping the public agenda of political decision-makers [24]. In drastic situations, SM users jam communication with conventional media channels. Feeling entitled to convey their opinions regarding all aspects of personal and social life without any expertise, they uncritically take information from unverified sources [25], personalize it to fit their idiosyncrasies [26], and share it in their echo chambers [27]. They rephrase it in harsher language (after encountering reactions to their posts) and reshare it in their online communities [25] in yet another communication cycle, seeking gratification [28].

The dramatic event of the 2022 Russo-Ukrainian war allowed for a serious collision between governmental communication through traditional media and SM [24]. Unequally motivated by a desire to properly inform the public and possessing a questionable level of competence regarding important topics, SM users often create confusion and disorientation [25]. Oscillating between different media channels [29] intensified the confusion, favoring public distrust and anxiety among SM users, as observed during the COVID-19 pandemic [30] and the beginning of the Russo-Ukrainian war [31]. The information disseminated on SM often appeals to emotion [26] to determine user engagement in SM. Therefore, we postulate that:

**H<sub>1</sub>:** SM usage generates fear of the Russo-Ukrainian war among SM users.

Armed conflict anxiety triggers one's survival instinct, especially economically [32]. During crises, individuals tend to refrain from spending, entering a vicious cycle of economic decline [33]. Individuals tend to purchase basic goods excessively, contributing to an alarming price increase [34]. Many consumers reduce spending on fair-trade products and services during economic recessions [5]. If wars are as dramatic as economic recessions, especially when combined, trade may be restricted during the Russo-Ukrainian war [32]. The literature [33] proves the negative impact of an uncertain and unstable political and economic environment on consumer behavior, which leads to reduced demand or the purchase of cheaper basic goods. Since these behaviors do not match those of a green consumer, it is worth exploring alternative manifestations of pro-environment behaviors, even in cases of economic insecurity and anxiety, to boost the energy security and resilience of EU member states [1]. The EEE market has been perturbed since the COVID-19 pandemic of 2020 due to supply chain disruptions [35]. The war in Ukraine aggravated an existing problem. Online education and teleworking overload electric and electronic equipment. Most broke down and could not be replaced, which favored the adoption of behaviors about the sharing economy [36]. Considering incentives and barriers to the sharing economy, we postulate that:

**H<sub>2</sub>:** Fear of the Russo-Ukrainian war positively influences enjoyment of the shared use of EP.

Customers' subjective assessments of a product's superiority or excellence [37] do not seem to apply to recycled products [13]. Due to certain psychological factors, some consumers experience a feeling of contamination, feeling disgusted not only by touching waste but also by contact with recycled products [38]. Some individuals lack understanding of the recycling process and reject waste and recycled products. The misconception is that recycled products are contaminated and of lower quality, contributing to environmental issues [39].

Despite negative perceptions, recycled products can be associated with superiority and excellence in the perception of green consumers who exhibit a strong pro-environment attitude. If raw materials are scarce and the supply chain is disrupted, then products are of even higher quality [40]. If damaged EP cannot be easily replaced with new ones, if the recycled components do not pose

functional, aesthetic, or safety issues [4], and if shared usage is perceived as enjoyable and significantly positive within the community [41], then it is plausible that a warfare context such as Ukraine may contribute to an increase in the perceived quality of EPRC. Therefore, we consider that:

**H<sub>3</sub>:** Fear of the Russo-Ukrainian war positively influences the perceived quality of the EPRC.

### 2.3. The green values of modern consumers

As the sharing economy intertwines with the circular economy to achieve sustainable development [42], it is plausible that green values can be assumed and internalized by the consumer EPRC as a guarantee of securing utilities [41]. Once internalized, consumers note the superiority and excellence of EPRC, whose perceived quality can be correlated with their utility [43] and their image, which has a positive impact on the environment and society [39]. EPRCs are perceived as eco-friendly, green, and ecological [44] since recycled products reduce waste, reuse waste, and require less energy and resources to manufacture them [45,46]. This positive image is strengthened by consumer convictions that producing and merchandising substantially mitigate environmental issues [39]. Therefore, we propose the following hypotheses:

**H<sub>4</sub>:** Consumers' green values positively influence their enjoyment of EPRC.

**H<sub>5</sub>:** Consumers' green values positively influence the perceived quality of EPRC.

**H<sub>6</sub>:** Consumers' green values positively influence the EPRC image.

### 2.4. Consumer behavior regarding EPRC

Consumers experience a „flow state” or an „optimal experience” both online and offline [47] when they „act with complete engagement” to reach a goal, thus receiving instant feedback [48]. Time spent on the web, hypermedia presence rather than offline presence, high levels of perceived challenge, and a sense of self-efficacy online [47] are antecedents of the flow state. Perceived enjoyment is fundamental to the flow state [49].

A flow state resulting from the purchasing and usage of EPRC entails gratification through a green attitude, a pleasant feeling of self-sufficiency in a context marked by war, a pandemic, and supply chain disruptions, a sense of belonging to a community with high standards and values concerning the environment, the satisfaction of active involvement towards a green circular economy within the EU, and the consumption experience [43]. The flow state positively influences the EPRC image and perceived quality, strengthening green behavior. Therefore, we propose the following hypotheses:

**H<sub>7</sub>:** Felt enjoyment of EPRC has a positive influence on EPRC's image.

**H<sub>8</sub>:** Felt enjoyment of EPRC determines the perceived quality of EPRC.

The perceived quality of EPRC is susceptible to influence EPRC image [39,50] and purchase intention [51]. Previous studies identified predecessors of purchase intention concerning ecological products: demographic factors (age, income, gender) [52], psychosocial factors (social norms, green trust, self-identity, own values, benchmark group), or contextual factors (perceived price, incentives, green media, and marketing) [5]. Therefore, we consider that:

**H<sub>9</sub>:** The perceived quality of EPRC positively influences EPRC image.

**H<sub>10</sub>:** The perceived quality of EPRC positively influences the purchase intention of EPRC.

**H<sub>11</sub>:** The EPRC image determines the purchase intention of EPRC.

## 3. Research methodology

### 3.1. Research context

As the EEE market is expanding, EEE (large and small household appliances, IT and telecommunications equipment, lighting, and consumer equipment, etc.) results in mounting waste due to shorter innovation cycles and frequent equipment replacement, driving the EU to pass legislation [53] regarding the disposal of waste electrical and electronic equipment (WEEE). It requires over 60% collection rates in member states [53]. In Romania, EEE production is the second largest driver of export, with a cumulative value of 2 billion euros [54]. Domestically, the sales of EEE rose in the first two months of 2021 by 73% (and by 55.8% for office equipment) as compared to 2020 [55]. Unfortunately, sustained growth of the EEE market led to an exponential increase in WEEE (e-waste) worldwide [56]. From almost 60 million tons of WEEE generated at an annual rate of 2 million tons, only 17.4% was recycled. In 2022, 347 million tons of WEEE have been spread across the earth [57]. The alarming increase in WEEE is not only an environmental issue, but it also poses risks to the survival of humanity [3].

### 3.2. Sampling methods and data analysis

A quantitative approach based on a self-administered online survey was employed among Romanian consumers during the summer

of 2022 to assess the behavioral antecedents of the purchase intention of EPRC in the current geopolitical context, specifically the war in Ukraine. As there is no official information regarding EP consumers, snowball convenience sampling was employed, considering its ease of accessibility, availability of respondents, and frequent use in quantitative studies [58].

Data collection (1629 valid responses) consisted of an invitation to participate in the study sent via e-mail to student groups and on SM (Facebook, Instagram, LinkedIn); participants were asked to share the survey via social media. Preliminary data analysis involved verifying the completion time and eliminating duplicates or incomplete responses. The survey filtered respondents through a filter question about whether they were EP consumers. The respondents (see Table 1) were mostly women (61.8%) from urban areas (66.4%), high school and college graduates (87.7%), and aged between 18 and 50 (85.1%) with an average monthly income (56.4%). Most respondents (49.4%) purchase EP several times a year, and the majority (68.8%) reported that the average spend on EP from their total expenses is 20%.

The survey was designed to measure variables and subsequent items, taking account of the specialized literature [59], employing a 5-point Likert scale from total disagreement (1) to strong agreement (5) (see Table 2). The conceptual model from Fig. 1 was tested with the help of structural equations in SmartPLS 3.0 [60] by a two-step approach: firstly, evaluating the measurement model needed for the testing of validity and internal consistency for the operationalization of constructs from Table 2; secondly, assessing the relations between the independent and dependent variables, followed by confirmatory factor analysis. As observed in Table 2, all constructs have internal consistency, with item loadings exceeding the 0.7 value recommended by the literature [61–63].

As observed in Table 2, each construct was verified through reliability indicators that exceeded the minimum threshold of stringency for Cronbach  $\alpha$ , AVE, and CR. The analysis involved testing the discriminant validity with the help of the Fornell-Larcker criterion (see Table 3) and Heterotrait-Monotrait ( $>0.9$ ) [62,63].

For a complete analysis of the structural model, the collinearity of constructs was examined with the help of the variance inflation factor (VIF), ranging between  $1704-2612 < 3,3$  [62,63]. The VIF values of the inner model are  $<3.3$ , which indicates no collinearity between constructs (the highest VIF value is 2084 for  $IP \rightarrow PC$ ), exhibiting a strong predicting power [61] of the structural model (see Fig. 2). The purchase intention of EPRC explains 62% ( $R^2 = 0.620$ ) of the variance of REPI and QREP. Furthermore, the predictive relevance of the model was also measured with the blindfolding algorithm. With a  $Q^2$  value of 0.529 for PIRE and 0.457 for REPI, the model depicts a large predictive power [63].

#### 4. Results and discussions

To test the hypotheses, a bootstrap procedure evaluated the effects between latent constructs, and the t-statistics validated the 11 hypotheses (see Table 4).

Hypothesis 1 ( $H_1$ ) assumed that SMU generates RUWF. Table 4 results ( $\beta$ : 0.375;  $t$ -test: 17.261;  $p < 0,000$ ) confirm the significant impact of SMU on RUFW; respondents are aware of the severity of the armed conflict. Thus, the first hypothesis is accepted. Another possible explanation of this influence is that SM abounds in Russo-Ukrainian war-related content, engaging in the so-called *online info war* going viral [68]. Content from official sources posted on SM contains strong emotional impact (blood, death, bombings), which may trigger fear. Snipped, fake, or misleading content relating to disruptive events [49] is hugely disseminated on SM to persuade, manipulate, or trigger a strong emotional reaction from users [25,26].

Hypothesis 2 ( $H_2$ ) investigated the impact of RUWF on EUEP (Table 4). Results ( $\beta$ : 0.155;  $t$ -test: 6.227;  $p < 0,000$ ) suggest a weak yet significant influence, thus validating  $H_2$ . Respondents worry about the long-term effects of the war. Aware that their economic situation might degenerate, they consider having to resort to repairing EP instead of purchasing new merchandise. Additionally, EU discussions concerning energy resilience and energy-saving measures [2] might contribute to a sense of purpose—that they can contribute to a collective effort toward betterment.

The third hypothesis ( $H_3$ ), which assumed that RUFW positively influences QREP, was confirmed (Table 4). The values ( $\beta$ : 0.121;  $t$ -

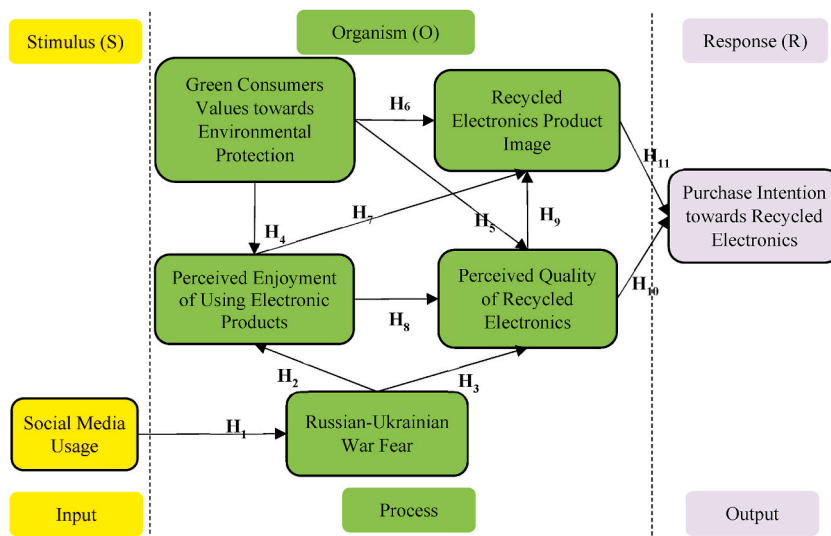
**Table 1**  
Socio-demographics of the sample.

Dimension	Variable	n (%)
<b>Gender</b>	Female	1007 (61.8)
	Male	622 (38.2)
<b>Area of residence</b>	Urban	1081 (66.4)
	Rural	548 (33.6)
<b>Education level</b>	Elementary	8 (0.50)
	Secondary school	52 (3.2)
	Vocational/post-secondary school	140 (8.6)
	High school	706 (43.3)
	Tertiary education	551 (33.8)
<b>Age</b>	Doctoral and postdoctoral studies	172 (10.6)
	<30	802 (49.2)
	30–50	585 (35.9)
<b>Income</b>	>50	186 (14.9)
	Low	524 (32.2)
	Mid	919 (56.4)
	High	186 (11.4)

**Table 2**  
Constructs and items.

Item	Measurement	Loa-ding	$\alpha$ /AVE/CR
<b>Green consumer values regarding recycled electronic products (GCV) [64].</b>			
GCV1	It is important that electronic products do not harm the environment.	0.809	0.881/0.628/0.910
GCV2	People should be interested in the environmental impacts of purchased electronic products.	0.732	
GCV3	When I decide, I consider the environmental impact of my actions.	0.845	
GCV4	My purchasing habits are influenced by my environmental concerns.	0.831	
GCV5	I am worried about our planet’s resource waste.	0.792	
	Everyone should stop increasing their electronic product usage so natural resources last longer.	0.739	
<b>Enjoyment of Using Electronic Products (EUEP) [65].</b>			
EUEP1	Shared usage of electronic products with friends, coworkers, and relatives brings true enjoyment.	0.893	0.909/0.786/0.936
EUEP2	Shared usage of electronic products with friends, coworkers, and relatives is enjoyable.	0.915	
EUEP3	I use electronic products collaboratively with friends, coworkers, and relatives.	0.842	
EUEP4	Using electronic products collaboratively with friends, coworkers, and relatives is fun.	0.894	
<b>Russo-Ukrainian War Fear (RUWF) [66].</b>			
RUWF1	I fear a Russo-Ukrainian war escalation.	0.870	0.922/0.761/0.941
RUWF2	I feel uncomfortable about the thought of the Russo-Ukrainian war escalation.	0.868	
RUWF3	I am stressed thinking about the war in Ukraine.	0.913	
RUWF4	I fear losing my life because of the Russo-Ukrainian war.	0.849	
RUWF5	When I see news of the Russo-Ukrainian war on social media, I become angry/anxious.	0.860	
<b>Social Media Usage (SMU) [67].</b>			
SMU1	I would hate for my social media account to be closed.	0.733	0.825/0.586/0.876
SMU2	I feel disconnected from the world when I am not logged on to social media.	0.784	
SMU3	I feel proud when I tell others I am a member of a particular social media channel.	0.803	
SMU4	I follow user comments on social media and blogs.	0.768	
SMU5	I often post comments on blogs and social media platforms.	0.739	
<b>Quality of Recycled Electronic Products (QREP) [39].</b>			
QREP1	I believe electronic products made from recycled products are of good quality.	0.901	0.857/0.778/0.913
QREP2	Electronic products made of recycled components offer the desired quality.	0.903	
QREP3	Electronic products made of recycled components are of similar quality to those unrecycled.	0.840	
<b>Recycled Electronics Product Image (REPI) [39].</b>			
REPI1	I hold a positive view of electronic products made of recycled components.	0.882	0.843/0.761/0.905
REPI2	Consumers of electronic products made of recycled components know that their purchase is smart.	0.880	
REPI3	Electronic products made of recycled components benefit from a positive/favorable image among consumers.	0.856	
<b>Purchase Intention Towards Recycled Electronics (PIRE) [39].</b>			
PIRE1	I will again purchase electronic products made of recycled components.	0.930	0.918/0.859/0.948
PIRE2	I will likely purchase electronic products made of recycled components.	0.919	
PIRE3	I will keep purchasing electronic products made of recycled components.	0.932	

Note: AVE: Average Variance Extracted >0.5; Cronbach Alpha( $\alpha$ ) > 0.7; CR: Composite Reliability >0.7 [61,62].



**Fig. 1.** Conceptual model of the research based on the S-O-R approach.

**Table 3**  
Discriminant validity analysis.

Construct	EUEP	GCV	PIRE	QREP	REPI	RUWF	SMU
<b>Fornell-Larcker Criterion</b>							
EUEP	0.887						
GCV	0.249	<b>0.792</b>					
PIRE	0.431	0.425	<b>0.927</b>				
QREP	0.426	0.393	0.733	<b>0.882</b>			
REPI	0.406	0.416	0.746	0.765	<b>0.873</b>		
RUWF	0.191	0.161	0.209	0.230	0.225	<b>0.872</b>	
SMU	0.268	0.046	0.143	0.198	0.157	0.375	<b>0.766</b>
<b>Hetertrait-Monotrait Criterion</b>							
EUEP							
GCV	0.276						
PIRE	0.470	0.472					
QREP	0.481	0.450	0.825				
REPI	0.464	0.481	0.847	0.827			
RUWF	0.204	0.181	0.229	0.259	0.257		
SMU	0.313	0.064	0.162	0.235	0.184	0.415	

Note: GCV: Green consumer values; PIRE: Purchase Intention Towards Recycled Electronics; EUEP: Enjoyment of Using Electronic Products; QREP: Quality of Recycled Electronic Products; REPI: Recycled Electronics Product Image; RUWF: Russo-Ukrainian War Fear; SMU: Social Media Usage.

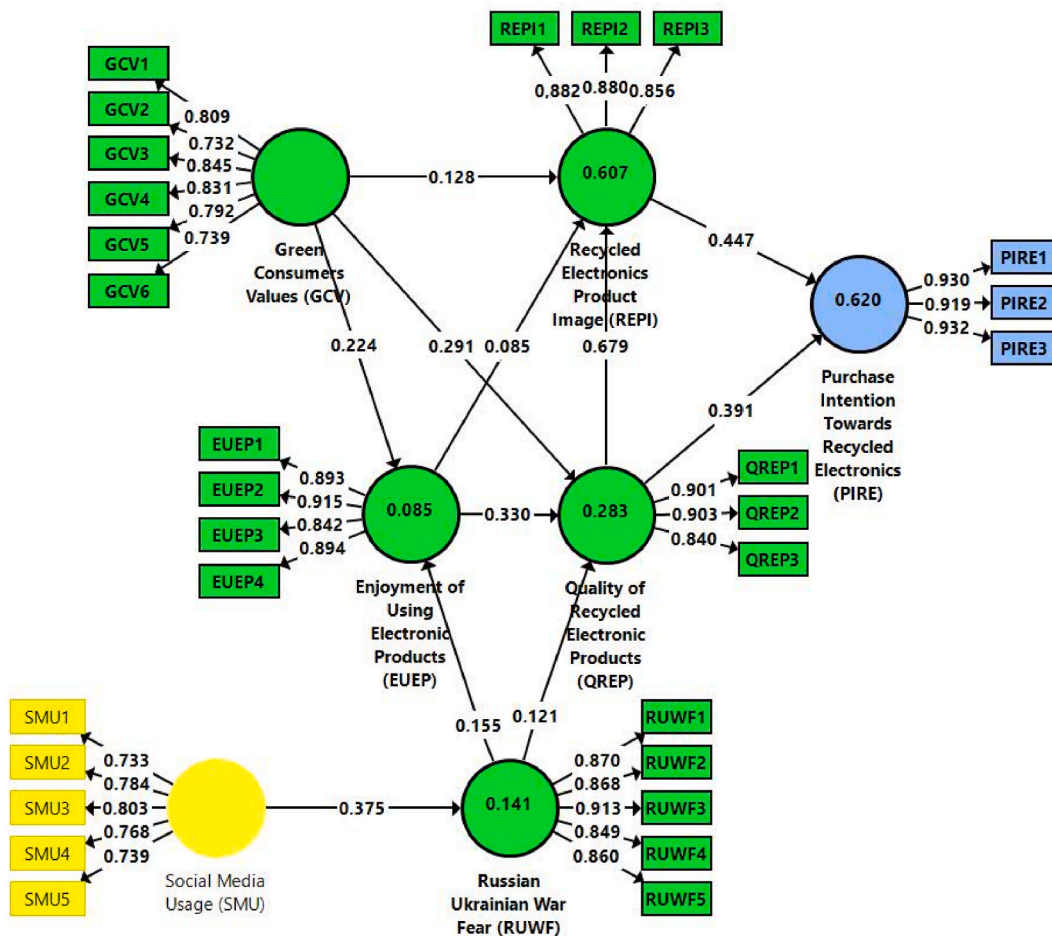


Fig. 2. Structural model: Antecedents of purchase intention of EPRC.

test: 5.058;  $p < 0,000$ ) suggest a weak yet significant influence between the two variables. Geopolitical instability and tension determine respondents to be prudent with their purchases. Therefore, recycling, refurbishing, and reusing existing products seems like a viable solution. Existing literature [32] indicates that war-related anxiety and economic downturns may cause individuals to reduce

**Table 4**  
The path coefficients of the structural equation model.

Paths	Path coefficients	Standard Deviation	t-value	p-value	Hypotheses
SMU→RUWF	0.375	0.022	17.261	0.000*	H <sub>1</sub> -Confirmed
RUWF→EUEP	0.155	0.025	6.227	0.000*	H <sub>2</sub> -Confirmed
RUWF→QREP	0.121	0.024	5.058	0.000*	H <sub>3</sub> -Confirmed
GCV→EUEP	0.224	0.024	9.309	0.000*	H <sub>4</sub> -Confirmed
GCV→QREP	0.291	0.027	10.870	0.000*	H <sub>5</sub> -Confirmed
GCV→REPI	0.128	0.019	6.711	0.000*	H <sub>6</sub> -Confirmed
EUEP→REPI	0.085	0.018	4.871	0.000*	H <sub>7</sub> -Confirmed
EUEP→QREP	0.330	0.026	12.531	0.000*	H <sub>8</sub> -Confirmed
QREP→REPI	0.679	0.019	36.072	0.000*	H <sub>9</sub> -Confirmed
QREP→PIRE	0.391	0.029	13.397	0.000*	H <sub>10</sub> -Confirmed
REPI→PIRE	0.447	0.029	15.457	0.000*	H <sub>11</sub> -Confirmed

Note: \* $p < 0.001$ ; GCV: Green consumer values; PIRE: Purchase Intention Towards Recycled Electronics; EUEP: Enjoyment of Using Electronic Products; QREP: Quality of Recycled Electronic Products; REPI: Recycled Electronics Product Image; RUWF: Russo-Ukrainian War Fear; SMU: Social Media Usage.

their spending and change their perception of EPRC.

GCV positively influences EUEP, a sign that respondents exhibit a strong inclination toward the environment by purchasing EP that strengthens their green behavior and thus contributes to reducing pollution. The results ( $\beta$ : 0.224;  $t$ -test: 9.309;  $p < 0.000$ ) indicate a median influence; thus, H<sub>4</sub> is confirmed. We opine that the Russo-Ukrainian war hastened the EU's transition towards a greener circular economy [2].

The effect of GCV on QREP (H<sub>5</sub>) has been investigated. Hypothesis 5 notes a positive, significant relationship between average intensity ( $\beta$ : 0.291;  $t$ -test: 10.870;  $p < 0.000$ ), confirming the hypothesis. Eco-conscious consumers perceive EPRC as of high quality since it is sustainable, and ecological, and promotes environmental values. Therefore, eco-conscious consumers relate to such brands [69] and perceive them to be of higher quality than competing brands. Previous studies concluded that green values allow consumers to perceive EPRC as superior [43], although contrary research exists [39]. Nevertheless, in the case of EPRC, conclusions are unclear. Our results extend the research on consumer perceptions regarding the quality of EPRC.

As for the influence of GCV on REPI (H<sub>6</sub>), the relation is positive and significant, but of relatively weak intensity ( $\beta$ : 0.128;  $t$ -test: 6.711 and  $p < 0.000$ ); the hypothesis is accepted (Table 4). The more eco-minded the consumer, favoring green products that preserve natural resources, the better and more positive the EPRC image [70]. Moreover, consumers who become eco-conscious want to purchase products that match their values. Studies show that eco-minded brands benefit from a better image and are perceived as innovative, qualitative, and more attractive than non-eco brands [39].

Hypothesis 7 (H<sub>7</sub>) investigated the relation between EUEP and REPI, which showed a strong and significant relation but of weak intensity ( $\beta$ : 0.085;  $t$ -test: 4.871;  $p < 0.000$ ); H<sub>7</sub> was accepted. An antecedent of respondents' views of EPRC is the enjoyment felt when using EP. One explanation would be that users identify with the brand and experience positive emotions [71]. If the brand is fundamental in constructing consumers' self-identity, these positive emotions can intensify, turning into passion or even brand love [72].

The study confirmed that EUEP positively influences QREP (H<sub>8</sub>), intensely and the relation is strongly significant ( $\beta$ : 0.330;  $t$ -test: 12.531;  $p < 0.000$ ). Confirming the hypothesis (H<sub>8</sub>) could mean that shared usage of EP fosters emotional value through positive emotions like enjoyment and pleasure [73], increasing the perceived utility of EP [74], which could influence perceived brand quality. Validating this hypothesis is a major contribution, as there is no known research confirming this relationship within the EPRC industry.

Additionally, QREP significantly influences REPI ( $\beta$ : 0.679;  $t$ -test: 36.072;  $p < 0.000$ ) at a high intensity, confirming H<sub>9</sub>. A good quality of EPRC boosts brand awareness. EPRCs are expected to protect the environment [39] due to their durability. The literature indicates a link between perceived quality and brand image [50], although there is no research regarding EPRC. QREP has a great, positive, and statistically significant influence on PIRE ( $\beta$ : 0.391;  $t$ -test: 13.397;  $p < 0.000$ ), validating H<sub>10</sub>, corroborating the literature as the quality of EP generates purchase intention, with consumers interested in the components of EP [13]. If an EP is of low quality, then the purchase intention is low [51], even more so in the case of EPRC [39]. The last hypothesis (H<sub>11</sub>) investigated the influence of REPI on PIRE (Table 4), wherein the relation is significant and increased intensity ( $\beta$ : 0.447;  $t$ -test: 15.457;  $p < 0.000$ ), allowing the validation of H<sub>11</sub>. The results are following prior studies [51], indicating that consumers purchase EPRC as they conjure up a good brand image, since EPRC (known as "green products") benefit from a better brand image due to the energy efficiency in production [75], thus positively influencing purchase intention [51].

## 5. Conclusions

The purpose of this study was to assess how the use of social media during the Russo-Ukrainian War affected individuals' emotional states, instilled fear in SM users, positively influenced green consumer values regarding EPRC recycled electronic products, enjoyment of using EPRC, quality of EPRC, and EPRC image, and impacted purchase intention toward EPRC. From a theoretical perspective, this paper uniquely extends the literature based on the S-O-R model to investigate successive antecedents that determine the *purchase intention* of EPRC in the context of the Russo-Ukrainian war. The results obtained regarding the Romanian EPRC market are relevant to other EU countries affected by the war in Ukraine that proposed environmental policies (European Green Pact, REPowerEU) because



Romania is an emerging EU market for EPRC and a close neighbor to the armed conflict. The conceptual model follows the literature concerning the antecedents of purchase intention. The EP's specifications, price, brand, or certifications were not considered, only the "green product" label.

From a managerial perspective, the paper highlights that consumers' purchase intention for EPRC is influenced by a set of antecedents, such as *green values*, *SM usage*, *fear of the Russo-Ukrainian war*, etc. Business communication specialists might benefit from the results of this study because it explains the effect of social media usage on generating fear of the Russo-Ukrainian war among EPRC consumers. Also, the model indicates the importance of the current geopolitical context in the region for the EPRC market and potential opportunities. The statistically positive influence of SM users' fears about the Russo-Ukrainian war on customers' perceptions and their behavioral intentions represents an important business opportunity to design and (re)launch new EPRC products and extend this market.

Brand managers selling EP could use the tested model to elaborate efficient marketing policies to develop a more profitable EPRC market. Since green consumer values influence purchase behavior, marketers could promote environmental concern through SM and offline, enhance the perceived image of EPRC, and reduce the resistance to EPRC adoption. Moreover, positioned as a premium product, EPRC is aimed at eco-friendly, well-educated, and tech-savvy consumers, which could improve EPRC's image as a highly desirable product even for price-conscious consumers. Additionally, a possible business model is that of shared EP and equipment rentals. Since consumers need EP features, shared usage of certain devices (e.g., laptops and professional cameras) could be cost-efficient.

The study presents limitations as it was conducted in one country, Romania, and its results cannot be applied to other EU countries but are interpreted within its cultural context and generalized to other geographic areas. Due to a lack of data for probabilistic sampling, we have opted for convenience sampling, whose limitation involves a lack of consumer diversity and representation for EPRC in Romania. Future research could employ probability sampling, such as cluster or quota sampling, and could test the conceptual model in other EU states and even non-EU regions (Asia, America). The study's data are cross-sectional; therefore, they may not reflect the dynamic interactions among the variables in the proposed structural model. Future studies could use longitudinal studies to test the model during the Russo-Ukrainian War, which started in February 2022 and is still ongoing. Also, future studies might employ follow-up surveys to analyze temporal patterns in consumer preferences for EPRC products in the same sample group.

Moreover, future research should replicate the model and compare consumer perceptions of EPRC versus non-EPRC brands or investigate the purchase intention of EPRC among different generations (e.g., Baby Boomers versus Generation X versus Millennials). Future research should examine possible differences between users from the rural and urban environments, as there is a stark contrast in Romania regarding behavioral antecedents and purchase intention of EPRC.

## Data availability statement

Data available on request from the corresponding author.

## CRedit authorship contribution statement

**Daniel-Rareș Obadă:** Writing – review & editing, Writing – original draft, Visualization, Supervision, Resources, Investigation, Formal analysis, Data curation, Conceptualization. **Dan-Cristian Dabija:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Resources, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Gheorghe-Ilie Fărte:** Writing – original draft, Visualization, Validation, Resources, Investigation, Formal analysis.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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