

An Examination of The Intention to Dispose of Electronic Waste Within The Framework of The Theory of Planned Behaviour: The Role of Environmental Awareness, Attitude and Subjective Norm¹

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Abstract

This research investigates the influence of cognitive, emotional, and social factors on individuals' intentions for disposing of electronic waste, a significant global environmental and economic concern. The Theory of Planned Behaviour (TPB), a prevalent framework in social psychology, has been augmented in this research by incorporating environmental awareness as a variable. Data obtained from 396 participants through convenience sampling were analyzed utilizing Structural Equation Modeling. The research findings indicated that the most significant predictor of e-waste disposal intention is subjective norm, succeeded by attitude and environmental awareness. It was determined that environmental awareness substantially and positively affects both behavioral intention and the cultivation of a favorable attitude towards this process. The findings indicate that, alongside individual awareness initiatives, social pressure and norms should be used as strategic instruments to enhance public engagement in e-waste management.

Keywords: E-waste, Theory of Planned Behaviour, Environmental Awareness, Attitude, Subjective Norm.

Planlanmış Davranış Teorisi Çerçevesinde Elektronik Atık Bertaraf Niyetinin İncelenmesi: Çevresel Farkındalık, Tutum ve Subjektif Normun Rolü

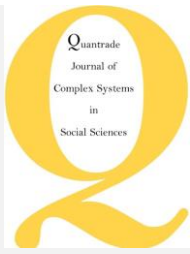
Özet

Bu araştırma, küresel ölçekte önemli bir çevresel ve ekonomik sorun olan elektronik atıkların bertarafına yönelik bireylerin niyetleri üzerinde bilişsel, duygusal ve sosyal faktörlerin etkisini incelemektedir. Sosyal psikolojide yaygın olarak kullanılan bir çerçeve olan Planlı Davranış Teorisi (TPB), bu çalışmada çevresel farkındalığın bir değişken olarak dahil edilmesiyle genişletilmiştir. Kolayda örnekleme yöntemiyle 396 katılımcıdan elde edilen veriler, Yapısal Eşitlik Modeli kullanılarak analiz edilmiştir. Araştırma bulguları, elektronik atık bertaraf etme niyetinin en önemli belirleyicisinin öznel norm olduğunu, bunu tutum ve çevre bilincinin izlediğini göstermiştir. Çevre bilincinin hem davranışsal niyeti hem de bu sürece yönelik olumlu bir tutumun geliştirilmesini önemli ölçüde ve anlamlı olarak etkilediği belirlenmiştir. Bulgular, bireysel

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farkındalık girişimlerinin yanı sıra, elektronik atık yönetimine halkın katılımını artırmak için sosyal baskı ve normların stratejik araçlar olarak kullanılması gerektiğini göstermektedir.

Anahtar Kelimeler: E-atık, Planlanmış Davranış Teorisi, Çevresel Farkındalık, Tutum, Subjektif Norm.

1. Introduction

The technological transformation of the twenty-first century has placed electronic devices at the center of daily life and industrial activities; as an inevitable consequence of this development, the “e-waste” problem has become a global crisis. The rapid technological obsolescence of devices and changes in consumption habits have led to electronic waste increasing at a much faster rate than other types of solid waste (Rautela et al., 2021; Çizer and Kırcova, 2025). This massive volume of waste, on the one hand, threatens the ecosystem and public health by releasing heavy metals into the environment, while, on the other hand, it represents the waste of valuable raw material resources that could be recovered (Vargas et al., 2024). Therefore, integrating e-waste into a sustainable cycle is a strategic priority for both environmental safety and economic efficiency.

The effectiveness of e-waste management systems hinges on institutional and technical infrastructure; however, the predominant factor is consumer behavior, as they constitute the most prevalent stakeholders in these systems. For the process to work, people must send their old devices to official recycling centers instead of throwing them away or keeping them at home. The Theory of Planned Behavior (TPB), extensively utilized in social psychology to elucidate environmental actions, offers a structured framework for examining the core motivators of intentions (Ajzen, 1991; Wang et al., 2016). However, elucidating the disposal process of e-waste—a technology-oriented waste category—exclusively through fundamental psychological variables may be inadequate. Consequently, the necessity to integrate external elements, such as “environmental awareness,” into the process has arisen to augment the model's comprehensiveness (Nordin et al., 2024; Vegirawati, 2024).

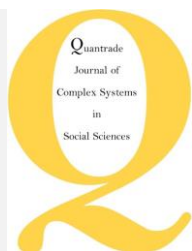
This study seeks to examine individuals' intentions concerning e-waste recycling by utilizing an enhanced theoretical model, addressing existing gaps in the literature. The study analyzes the influence of environmental awareness on individual attitudes and the expectations of social reference groups (subjective norms). The research model formulated in this context seeks to illustrate, via empirical data, the pivotal influence of individual sensitivities and social pressures in the management of technological waste. The results are anticipated to yield both scholarly and practical advancements in fostering a recycling culture within society and in formulating more effective public policies.

2. Theoretical Framework

2.1. Electronic Waste and Its Management

Since the early 2000s, the unprecedented pace of industrialization, urbanization, and technological innovation has made electrical and electronic equipment an integral part of daily life (Rautela et al., 2021). Today, we lead lives dependent on these devices in virtually every sector, from households to educational institutions, healthcare systems, and industrial production lines. However, this massive increase in demand and the increasingly short product lifespans have brought with them a waste burden that is difficult to manage on a global scale (Michael et al., 2024; Vargas et al., 2024). This concept, referred to as “e-waste” in the academic literature, encompasses all technological devices that have lost their functionality, are no longer needed, or have been discarded by users (Nordin et al., 2024). E-waste continues to exert significant pressure on the environment as one of the waste categories with the highest annual growth rates today (Çizer and Kırcova, 2025).

When viewed through the lens of global data, the scale of e-waste production is truly alarming. If the current upward trend is not brought under control, the annual waste volume is projected to reach the critical threshold of 74 million tons in the near future (Bhutto et al., 2023). The even more alarming aspect is that only a very limited portion of this massive volume can be incorporated into the recycling system through official channels. The vast majority of the remainder is either left to sit idle in household storage areas or disposed of informally, posing a threat to both the environment and human health (Dhir et al., 2021).



The two-sided character of the materials used to make electronic waste is the main obstacle to its proper disposal. Toxic chemicals like cadmium, mercury, and brominated flame retardants can contaminate water and soil sources irreparably if not handled properly (Rautela et al., 2021). It is well-documented that exposure to these chemicals can lead to serious health problems for humans, including respiratory problems, neurological disorders, and kidney failure (Kumar et al., 2017). Within the context of the "urban mining" field, e-waste is found to include reserves of valuable secondary raw materials like gold, silver, copper, and rare earth elements (Cesaro et al., 2018). According to Cui and Zhang (2008), recycling electronic trash is a win-win for the environment and the economy.

However, it would be an incomplete approach to assume that success in e-waste management relies solely on advanced technological infrastructure or strict legal regulations. Perhaps the most critical and decisive actor in the process is the consumer, who is the ultimate owner of electronic devices (Çizer and Kircova, 2025). The consumer's separation of waste at the source and its delivery to authorized collection points constitutes the first and most important link in the reverse logistics chain (Vargas et al., 2024). Current studies indicate that infrastructure deficiencies and lack of information are the greatest barriers to consumer participation in this process. Therefore, a thorough analysis of the psychological and social dynamics shaping individuals' waste-disposal intentions is essential for developing sustainable and feasible waste-management policies.

2.2. The Theory of Planned Behavior

Among the many models used to explain people's actions, intentions, and choices in relation to their surroundings, TPB (Ajzen, 1991) is among the most often referenced in the field of social psychology. According to Şaşmaz and Tengilimoğlu (2024), the biggest indicator of the probability of displaying a particular behavior is an individual's intention to do so.

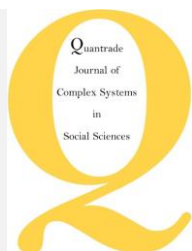
A person's attitude, perceived behavioral control, subjective norms, and purpose all play a role in shaping their behavior intentions, as stated in the TPB (Ajzen, 1991). Subjective norms reflect the pressure from one's social environment, whereas attitude denotes one's favorable or negative judgment of the behavior's performance. In contrast, perceived behavioral control is defined as the confidence an individual has in their ability and opportunity to regulate the behavior (Şahin and Alkaya, 2017). According to Pan and Liu (2024), the TPB has a strong ability to predict and explain several eco-friendly actions, including recycling e-waste, making green purchases, conserving energy, and segregating garbage.

Recyclable electronic waste is an example of a complex, multidimensional activity that may be difficult to describe using the traditional TPB paradigm. The need to include more variables to improve the model's explanatory power is a common theme in the literature. Integrating antecedent factors, such as "Environmental Awareness," into the model enables a more thorough examination of the individual's intention-formation process, which is especially important given the growing understanding of environmental challenges (Lansang and Dimaculangan, 2025). This study seeks to provide a comprehensive examination of the factors influencing people's intentions to dispose of electronic waste by adding an environmental awareness variable to the traditional TPB model.

3. Literature Review and Hypothesis Formulation

Environmental awareness is a multidimensional concept encompassing individuals' level of knowledge regarding environmental issues, their causes, and potential consequences, as well as their sensitivity toward contributing to solutions for these issues (Ham et al., 2016).

To a large extent, one's understanding and familiarity with a subject determine how one feels about a given action. Nguyen et al. (2018) found that people's attitudes toward recycling change when they learn about the dangers posed by harmful compounds in electronic trash to humans and the environment. Environmentally conscious people see protecting the environment as their duty and see such measures as either helpful or essential, according to studies (Li and Shan, 2025; Trinh and Sakurai, 2025; Sevin and Onurlubaş, 2025).



A number of empirical studies have shown that people's attitudes toward eco-friendly products and recycling behaviors are influenced by their level of environmental awareness and anxiety. These studies include Garcia-Salirrosas et al. (2024), Kement et al. (2021), Laheri et al. (2024), Lansang and Dimaculangan (2025), Onurlubaş (2018), Sancak (2022), and Vegirawati (2024). As an example, consumers' conviction in recycling's environmental benefits grows in tandem with their awareness of the dangers posed by e-waste (Singhal et al., 2021). Similarly, Sehar et al. (2025) found that people's positive, consistent views of the environment were associated with higher levels of environmental knowledge. That is why people's perspectives on e-waste disposal are thought to be significantly influenced by their level of environmental consciousness.

In this context, the first hypothesis of the study is formulated as follows:

H1: *Environmental awareness significantly influences attitudes toward e-waste disposal.*

Environmental awareness does not merely shape attitudes. It can also directly influence individuals' intentions to take action (Vegirawati, 2024). Individuals with a high level of awareness regarding the pollution, resource waste, and health risks caused by the improper disposal of e-waste () are more willing to engage in recycling to prevent these negative outcomes (Michael et al., 2024). In the literature, the direct effect of environmental awareness on green purchasing intentions and recycling intentions is supported by numerous studies (Alhamad et al., 2023; Lansang and Dimaculangan, 2025; Li and Shan, 2025; Michael et al., 2024; Nguyen et al., 2019; Vegirawati, 2024; Wang et al., 2016).

Garcia-Salirrosas et al. (2024) found that environmental awareness increases individuals' intention to pay for green products. Similarly, Nordin et al. (2024) noted in their study that knowledge and awareness of e-waste separation significantly influence the intention to engage in recycling behavior. Prado et al. (2025), on the other hand, stated that knowledge and awareness evoke a sense of capability and responsibility in individuals and trigger their intention. Furthermore, an examination of the findings from the study by Onurlubaş and Çakırlar (2025) reveals that an increase in concern about environmental issues strengthens consumers' intentions toward sustainable consumption and disposal.

In this context, the second hypothesis of the study is formulated as follows:

H2: *Environmental awareness significantly influences behavioral intention toward e-waste disposal.*

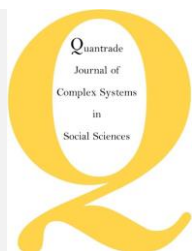
The subjective norm refers to the pressure an individual feels from their social environment (family, friends, coworkers, society) regarding whether or not to engage in a specific behavior, as well as the expectations of that environment (Chin, 2016). Individuals are social beings and tend to exhibit behaviors approved by significant others in their environment and avoid those that are not approved. In behaviors with high societal benefits, such as e-waste recycling, social pressure and norms play a critical role (Nawaz et al., 2025).

When examining social influence theories and extended models of the Theory of Planned Behavior (TPB), it becomes evident that the social environment not only directly influences behavior but also shapes the individual's personal evaluations of that behavior (Yla-Mella et al., 2015). When an individual observes that people they value place importance on e-waste recycling, appreciate this behavior, or practice it themselves, they develop a more positive attitude toward this behavior (Pakpour et al., 2014).

Research indicates that social norms and societal expectations help individuals internalize their attitudes toward the environment (Alamsyah et al., 2024; Bhutto et al., 2023; Laeequddin et al., 2022; Sehar et al., 2025). Especially in collectivist cultures, group norms are a decisive factor in shaping individual attitudes (Tanrikulu, 2015). Thanks to social support, e-waste recycling has ceased to be a burdensome task for individuals and has become a necessity for being part of society (Nordin et al., 2024). This interaction demonstrates that attitudes are shaped by social norms.

In this context, the third hypothesis of the study is formulated as follows:

H3: *The subjective norm significantly influences attitudes toward e-waste disposal.*



A key tenet of the TPB is that subjective norms have an immediate impact on people's intentions to act in a certain way (Ajzen, 1991). Various studies in the field of electronic trash have shown that subjective norms have a favorable impact on recycling intentions (Ang et al., 2023; Bhutto et al., 2023; Echegaray and Hansstein, 2016; Nduneseokwu et al., 2017; Nguyen et al., 2019; Yılmaz and Arı, 2022; Yılmaz and Doğan, 2016). According to Yılmaz and Arı (2022), people are more likely to recycle e-waste if they feel pressured by their social circle or if they see others around them recycling.

One of the most powerful indicators of e-waste recycling intention is subjective standards, according to research by Wang et al. (2018). Similarly, Bhutto et al. (2023) found that societal pressure strongly increases the intention to recycle e-waste among Generation Y customers. Strong motivators that drive people toward intention and action include the need to be accepted by others and the fear of being left out (Laurett et al., 2021). The intentions of Generation Z to recycle electronic garbage are influenced by societal standards, according to Ang et al. (2023). People often follow societal norms when disposing of their electronic waste (Alamsyah et al., 2024).

In this context, the fourth hypothesis of the study is formulated as follows:

H4: *Subjective norm significantly influences behavioral intention regarding e-waste disposal.*

According to Chin (2016), an individual's attitude can be defined as their favorable or negative assessment of how well an activity was executed. Attitude, as it pertains to electronic waste management, is defined as the degree to which an individual considers recycling electronic garbage to be advantageous, essential, reasonable, or environmentally helpful (Papaoikonomou et al., 2020). Ajzen (1991) cites the TPB, stating that attitude is a powerful and direct predictor of intention. According to Yılmaz and Doğan (2016), people are more likely to participate in recycling e-waste if they think it will help the environment, save resources, and reduce pollution.

Previous research by Bhutto et al. (2023), Echegaray and Hansstein (2017), Papaoikonomou et al. (2020), Yılmaz and Arı (2022), and Yılmaz and Doğan (2016), among others, has shown that having a positive attitude toward recycling electronic waste is significantly and positively linked with the intention to recycle. One of the most important elements impacting the intention to recycle e-waste is mindset, according to a study by Nguyen et al. (2018). In a similar vein, Laheri et al. (2024) highlighted the importance of a green mentality in relation to intentions to purchase and recycle.

When consumers hold positive beliefs about the outcomes of e-waste recycling, the formation of intention naturally follows (Dhir et al., 2021). This relationship has also been observed in the purchase behavior of environmentally friendly products. Accordingly, a positive attitude toward a product or action directly increases purchase intention (Alhamad et al., 2023). Since attitude reflects an individual's internal motivation, it plays a critical role in the formation of intention independent of external factors (Ajzen, 1991).

Based on these theoretical and empirical foundations, the fifth hypothesis of the study is formulated as follows:

H5: *Attitude significantly influences behavioral intention toward e-waste disposal.*

4. Method and Findings

The research model, developed from the theoretical study and literature review, is presented in Figure 1.

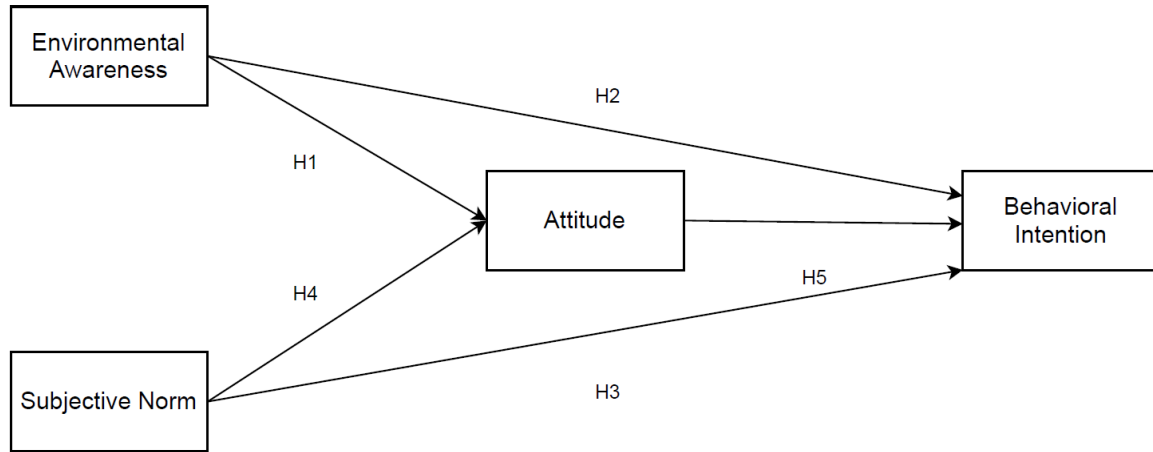


Figure 1. Research Model

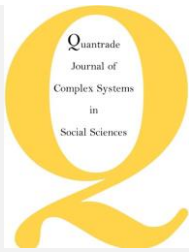
The study population consists of individuals aged 18 and older in Türkiye. A total of 389 data points were collected via convenience sampling, and all data were included in the analysis. Data collection took place between January 2026 and March 2026; the data were collected online via Google Forms. Permission for the study was obtained from the Scientific Research and Publication Ethics Committee of Kastamonu University's Faculty of Social and Humanities Sciences via Decision No. 12/13 dated 11/06/2025. Additionally, permission to administer the scales used in the study was obtained via email from the scale owners.

The scales used in the study were developed by drawing on previous studies examining e-waste recycling and disposal intentions. The environmental awareness scale was adapted from statements on environmental awareness and the environmental impacts of e-waste from studies by Wang et al. (2016) and Yin et al. (2014). The attitude scale was developed by considering the e-waste recycling attitude items used in the studies by Wang et al. (2016) and Papaoikonomou et al. (2020). The subjective norm scale was prepared using statements measuring the influence of the social environment, family, friends, and neighbors from the studies by Papaoikonomou et al. (2020) and Wang et al. (2016). The behavioral intention scale was adapted from statements measuring the intention to participate in e-waste recycling, support recycling programs, and exhibit recycling behavior in the future, as found in studies by Wang et al. (2016), Papaoikonomou et al. (2020), and Nduneseokwu et al. (2017). The scale items were translated into Turkish in line with the study's objectives and adapted to the context of e-waste disposal. Additionally, the necessary permissions to use the scale items in the study were obtained via email from the authors of the relevant scales. During this process, care was taken to preserve the original structure of the scales. The scale items are set out in Appendix 1.

The demographic profile of the 396 participants reached within the scope of the study and their attitudes toward unused electronic devices are summarized in Table 1.

Table 1. Demographic Findings

Gender	f	%
Female	117	29,5
Male	279	70,5
Age	f	%
18-35	128	32,3
35-55	155	39,1
56-65	105	26,5



66 and older	8	2,0
Education	f	%
Secondary Education	13	3,3
Associate Degree	15	3,8
Bachelor's	344	86,9
Graduate	24	6,1
Vocational	f	%
Public	92	23,2
Private	145	36,6
Open	40	10,1
Small Business Owner	22	5,6
Housewife	15	3,8
Retired	13	3,3
Student	69	17,4
What Happens to Unused Electronic Devices	f	%
I Give Them to My Children/Relatives	15	3,8
I keep it at home	314	79,3
I take it to the recycling center	11	2,8
I throw it away with mixed waste	23	5,8
For Sale	33	8,3
Total	396	100,0

When examining the gender distribution of the sample, the vast majority of participants are male (70.5%, $n=279$), while female participants account for 29.5% ($n=117$).

The age distribution of the participants indicates that the sample comprises a dynamic age group. In this context, individuals aged 35–55 account for the highest proportion at 39.1%, followed by the 18–35 age group at 32.3%. The total proportion of participants aged 56 and older is approximately 28.5%. A careful examination of the education level data reveals that the sample possesses a very high educational profile. An overwhelming majority of participants—86.9%—hold a bachelor's degree; 6.1% have pursued graduate-level education. The combined proportion of high school and associate degree graduates remains limited at 7.1%.

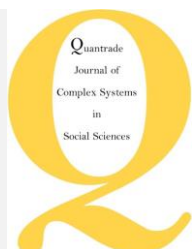
Regarding occupational distribution, 36.6% of participants work in the private sector, while 23.2% work in the public sector. Students (17.4%) represent a significant group within the sample, while self-employed individuals (10.1%), shop/business owners (5.6%), housewives (3.8%), and retirees (3.3%) are represented in lower proportions.

It was found that the vast majority of participants (79.3%, $n=314$) prefer to “keep” electronic devices they no longer use at home. In contrast, only 2.8% take their e-waste to a professional recycling center. When other methods were examined, it was observed that 8.3% of participants sold the products, 5.8% disposed of them with mixed waste, and 3.8% gave them to people in their immediate vicinity.

Before proceeding to the analyses of the hypotheses developed within the scope of the research, the measurement tools used in the study were comprehensively evaluated against the criteria of composite reliability, construct validity, and convergent validity.

The results of the exploratory factor analysis and descriptive statistical findings regarding the scales are presented in Table 2.

Table 2. Exploratory Factor Analysis and Descriptive Statistical Findings for the Scales



Environmental Awareness	Factor Loadings	Mean	Std. Dev.
EA1	,739	3,705	,6569
EA2	,784	4,035	,6512
EA3	,894	4,710	,6553
EA4	,671	3,987	,5801
KMO: 0.714 Chi-Square: 481.54 df:6 p.: 0.000 Total Var. Explained: 60.243%			
Attitude	Factor Loadings	Mean	Std. Dev.
AT1	0,897	4,553	,7393
AT4	0,704	4,051	,5442
AT5	0,938	4,588	,7006
AT7	0,919	4,571	,7239
KMO: 0.809 Chi-Square: 1107.638 df:6 p.: 0.000 Total Explained Variance: 75.584%			
Subjective Norm	Factor Loadings	Mean	Std. Dev.
SN1	0,823	3,667	,7564
SN4	0,94	4,273	,9969
SN6	0,836	4,439	,8881
KMO: 0.606 Chi-Square: 565.049 df:3 p.: 0.000 Total Var. Explained: 75.335%			
Behavioral Intention	Factor Loadings	Mean	Std. Dev.
BI1	0,844	4,407	,8532
BI4	0,904	4,389	,9142
BI5	0,937	4,407	,8881
BI6	0,836	3,836	,6251
BI7	0,805	3,869	,5978
KMO: 0.843 Chi-Square: 1560.262 df:10 p.: 0.000 Total Var. Explained: 75.093%			

The study's scales were subjected to an exploratory factor analysis to identify factor patterns and assess construct validity. The analysis recommended Principal Component Analysis for each dimension. Based on the analysis, it was concluded that all dimensions had Kaiser-Meyer-Olkin (KMO) values greater than 0.60, and the Bartlett's Test of Sphericity was statistically significant ($p < 0.001$). These results show that the dataset has sufficient variables for factor analysis (Meidute-Kavaliauskiene et al., 2021). Factor loadings on the Environmental Awareness Scale range from 0.671 to 0.894, accounting for 60.24 per cent of the overall variation. With a mean and factor loading of 4.71 on this scale, the statement "Everyone should contribute to environmental protection" is clearly the most important variable. With 75.58 per cent of the total variance explained, the four statements that make up the Attitude Scale are quite significant. This dimension has very strong factor loadings, ranging from 0.704 to 0.938. Participants clearly hold strong views about the value of e-waste recycling to society (Mean = 4.58) and its legitimacy as an appropriate management technique (Mean = 4.55). Three items make up 75.33 per cent of the total variance on the Subjective Norm scale. The factor loadings range from 0.823 to 0.940. The results showed that when people in a participant's social circle recycle, the participant is more likely to recycle themselves (Mean = 4.43). Out of all the variables, 75.09 per cent can be explained by the Behavioural Intention scale. Factor loadings range from 0.805 to 0.937 in this five-statement scale. Notable among the participants' traits are their propensity to favor products with an emphasis on recycling in the future and their readiness to participate in initiatives run by educational institutions or the

government (Mean = 4.40). The scale has strong construct validity for the study model because all items have factor loadings above 0.50, and the explained variance ratios exceed the permissible limits.

Confirmatory Factor Analysis was applied to validate the factor structure identified through exploratory factor analysis and to test the consistency of the relationships among variables with the theoretical model. The analysis results and accepted critical threshold values are presented in Table 3.

Table 3. Fit Indices

Scale	χ^2/df	GFI	CFI	TLI	NFI	RMSEA
Critical Values	≤ 5	$\geq .85$	$\geq .90$	$\geq .90$	$\geq .90$	$\leq .08$
Environmental Awareness	3,532	0,991	0,989	0,968	0,985	0,08
Attitude	2,003	0,997	0,999	0,995	0,998	0,05
Subjective Norm	0,000	1,000	1,000	1,000	1,000	0,000
Behavioral Intention	0,455	0,999	1,000	1,000	0,999	0,000

Upon examining Table 3, it is observed that the goodness-of-fit values for all scales included in the research model fall within the thresholds accepted in the literature. When the results of the Confirmatory Factor Analysis are evaluated as a whole, the fact that the χ^2/df ratios remain below 5, the RMSEA values remain at or below 0.08, and all other fit indices are above the 0.90 (and mostly 0.95) threshold value indicates that the measurement tools used in the study have very high construct validity (Yıldız and Çetindaş, 2018).

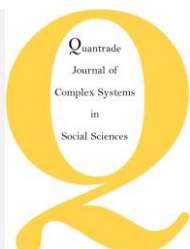
To test the internal consistency and construct reliability of the latent variables included in the research model, Cronbach's Alpha and Composite Reliability (CR) coefficients were calculated. To verify convergent validity, Average Variance Explained (AVE) values were examined. The analysis results are presented collectively in Table 4.

Table 4. Validity and Reliability

Variable	Cronbach's Alpha	Number of Items	AVE	CR
Environmental Awareness	0,777	4	0,49	0,78
Attitude	0,892	4	0,64	0,89
Subjective Norm	0,834	3	0,67	0,85
Behavioral Intention	0,912	5	0,67	0,90

The Cronbach's Alpha coefficients for all variables range from 0.777 to 0.912. These values, which exceed the 0.70 threshold commonly used in the literature, indicate that the scales are highly consistent with each other. The CR values of the scales ranged from 0.78 to 0.90, exceeding the critical threshold of 0.70 and indicating that they are valid constructs (Çiğdem et al., 2023).

The AVE values, which show convergent validity, showed that the dimensions of Attitude (0.64), Subjective Norm (0.67), and Behavioral Intention (0.67) were all above the 0.50 threshold. The AVE value for the Environmental Awareness dimension (0.49) is, however, very close to the 0.50 mark. The literature suggests that a construct's convergent validity remains acceptable even if its AVE is slightly below 0.50 and its Composite Reliability (CR) is above 0.60. In this case, the Environmental Awareness dimension was considered to have convergent validity because its CR value was 0.78. All reliability and validity coefficients indicate that the measurement model is structurally sound and meets the statistical requirements for hypothesis testing.



Pearson's Correlation Analysis was applied to determine the direction and strength of relationships among the variables in the research model. The correlation coefficients (r), means, and standard deviations of the variables obtained from the analysis are presented in Table 5.

Table 5. Correlation Analysis

	Mean	Std. Dev.	Environmental Awareness	Attitude	Subjective Norm	Behavioral Intention
Environmental Awareness	4,1092	,49290	1			
Attitude	4,4407	,59210	,615**	1		
Subjective Norm	4,1263	,76770	,411**	,699**	1	
Behavioral Intention	4,1813	,67741	,558**	,752**	,786**	1

Upon examining the data in Table 5, it is observed that all variables are positively correlated with one another at the $p < 0.01$ significance level. It was determined that the strongest relationship with the dependent variable, Behavioral Intention, exists between Subjective Norm ($r = 0.786$; $p < 0.01$) and Attitude ($r = 0.752$; $p < 0.01$). These findings indicate that the expectations of the social environment and the individual's positive judgments regarding e-waste recycling have a strong interactive effect on intention (). The relationship between the Environmental Awareness variable added to the model and the other constructs was also significant. Environmental awareness was found to exhibit a moderate positive relationship with attitude ($r = 0.615$; $p < 0.01$) and a moderate positive relationship with behavioral intention ($r = 0.558$; $p < 0.01$). Although the relationship between Subjective Norm and Environmental Awareness ($r = 0.411$; $p < 0.01$) is lower compared to the others, it remains statistically significant. Overall, the results confirm that as individuals' knowledge and sensitivity toward environmental issues increase, their attitudes toward e-waste recycling and their intentions in this regard also strengthen simultaneously. Additionally, the fact that all correlation coefficients are below 0.80 provides preliminary evidence against multicollinearity among the variables.

A structural equation modeling analysis was conducted to test the research hypotheses. The model is presented in Figure 2.

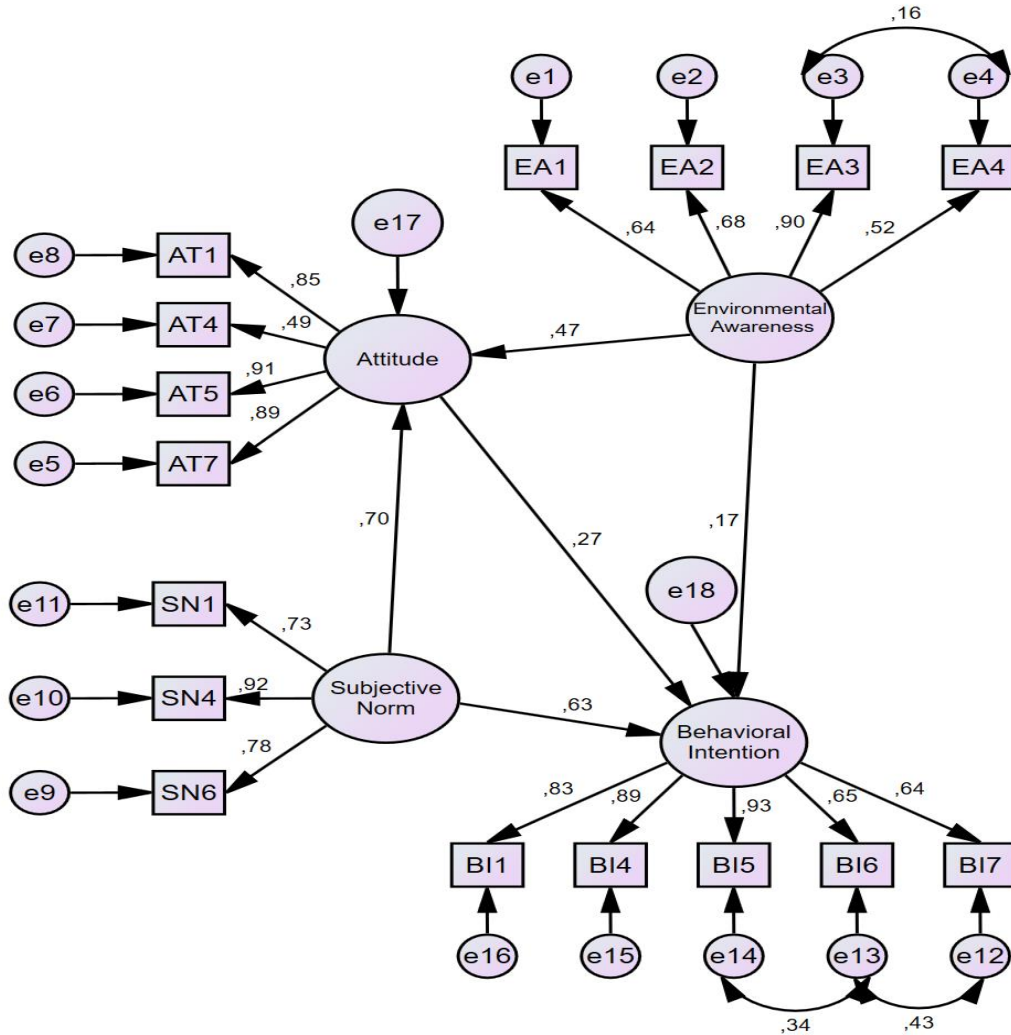


Figure 2. Structural Equation Model

The model fit indices for the structural equation model are presented in Table 6.

Table 6. Model Fit Values

Model	χ^2/df	GFI	CFI	TLI	NFI	RMSEA
Critical Values	≤ 5	$\geq .85$	$\geq .90$	$\geq .90$	$\geq .90$	$\leq .08$
Model	2,032	0,942	0,977	0,957	0,967	0,072

It was determined that the structural equation model also provided good fit indices.

Following the validation of the measurement model, Structural Equation Modeling (SEM) was applied to test the direct relationships and hypotheses among the variables. The results of the analysis are presented in Table 7.

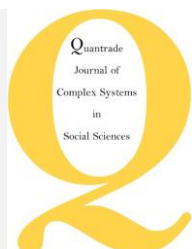


Table 7. Analysis Findings

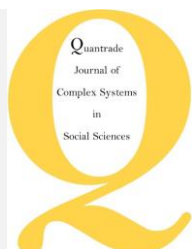
Analysis Path			β	S.E.	C.R.	P
Attitude	<---	Environmental Awareness	0,465	0,074	8,714	***
Attitude	<---	Subjective Norm	0,699	0,045	13,062	***
Behavioral Intention	<---	Environmental Awareness	0,172	0,051	2,97	0,003
Behavioral Intention	<---	Attitude	0,269	0,053	3,223	0,001
Behavioral Intention	<---	Subjective Norm	0,632	0,044	7,773	***

Upon examining the analysis results, it was found that all tested paths were statistically significant. The variable with the strongest effect on attitude was Subjective Norm ($\beta = 0.699$; $p < 0.001$). Similarly, the Environmental Awareness variable also has a positive and significant effect on Attitude ($\beta = 0.465$; $p < 0.001$). These findings reveal that individuals' cognitive awareness of e-waste recycling and the expectations stemming from their social environment are key determinants in developing a positive attitude toward recycling. When evaluating the effects on Behavioral Intention, the study's final dependent variable, it was determined that the Subjective Norm variable has the highest explanatory power with a coefficient of $\beta = 0.632$ ($p < 0.001$). This is followed, in order, by Attitude ($\beta = 0.269$; $p = 0.001$) and Environmental Awareness ($\beta = 0.172$; $p = 0.003$). The results confirm the success of PDT's core components in explaining e-waste recycling intention and demonstrate that the environmental awareness variable included in the model makes a significant contribution to the intention formation process. The fact that all critical ratio (C.R.) values are above the 1.96 threshold indicates that the established structural model has been empirically validated and that the proposed hypotheses have been accepted.

As a result of the analysis, all study hypotheses were supported.

5. Conclusion

This study examined, within the PDT framework, the factors shaping individuals' disposal intentions in the face of the rapidly growing e-waste problem, incorporating the environmental awareness variable. The findings reveal that all hypotheses in the model are supported and that there are significant relationships among the variables. The most striking finding of the study is the dominant influence of subjective norm on both attitude and behavioral intention. It appears that participants highly value the expectations of their close social circles (family, friends, neighbors) regarding e-waste recycling. This result aligns with similar studies in the e-waste literature (Wang et al., 2018; Bhutto et al., 2023) and confirms the central role of the social approval mechanism in an individual's environmental actions. It was determined that the environmental awareness variable included in the model serves as a critical precursor in developing a positive attitude toward e-waste recycling. When individuals become aware of the toxic risks posed by e-waste and its potential for urban mining, they perceive the recycling action as a more "correct" and "beneficial" practice. This finding supports literature findings indicating that increased knowledge stabilizes attitudes and triggers the formation of intentions (Sehar et al., 2025; Lansang and Dimaculangan, 2025). An examination of participants' current behaviors revealed that a large majority (79.3%) still keep e-waste at home, while the rate of using professional recycling channels is quite low (2.8%). This situation indicates the presence of an "intention-behavior gap" at the point of taking action, despite high levels of intention, and points to the existence of infrastructural or psychological barriers (Echegaray and Hansstein, 2017).



Because the subjective norm has such a big effect, recycling campaigns should stress "social participation" and "shared responsibility." Local governments can encourage people to recycle by giving rewards to neighborhoods or groups that do it. Schools and the government should set up more programs to teach people about e-waste and how to get rid of it properly. After all, the first step to changing people's minds and making them more determined is to raise awareness. To stop people from keeping e-waste at home, there should be more recycling points and more reverse logistics services like "door-to-door collection." Since participants are motivated by financial incentives or extra chances, models such as discount coupons or tax breaks for e-waste drop-offs could be implemented.

The research data were gathered through convenience sampling, predominantly comprising male, highly educated participants. Subsequent research may perform comparative analyses on more equitable demographic distributions or diverse cultural frameworks. This study assessed the "intention" variable through participants' self-reports. Experimental studies that examine actual behaviors may elucidate the relationship between intention and behavior more effectively. While this study focused on the environmental awareness variable, subsequent research might integrate additional psychological variables, such as "perceived consumer efficacy," "moral norms," or "habit," into the framework.

Ethical Considerations of the Study

It is declared that the study was designed to realistically and ethically meet the needs, and that integrity was maintaining in obtaining data, concluding the study, and publishing the results. Ethical committee approval was not required for this research. No research requiring ethics committee approval was conducted in this study.

Informed Consent

There was no need to obtain informed consent from individuals, as the study did not involve any procedure or interventions on human participants.

Author Contributions

Idea/Concept: B.Y.,A.Ö.; Design: B.Y.,A.Ö.; Supervision/Consultancy: B.Y.,A.Ö.; Resources: B.Y.,A.Ö.; Data Collection and/or Processing: B.Y.,A.Ö.; Analysis and/or Interpretation: B.Y.,A.Ö.; Literature Review: B.Y.,A.Ö.; Writing: B.Y.,A.Ö.; Critical Review: B.Y.,A.Ö.

Conflict of Interest Statement

The author declares no conflict of interest.

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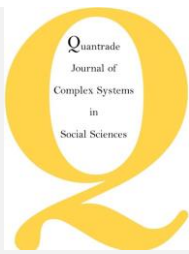
The study did not receive any financial support from individuals or institutions.

Declarations

This study has not been presented at any congress.

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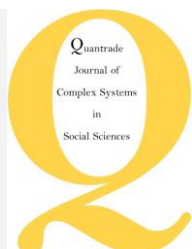
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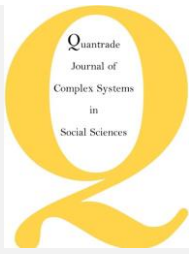
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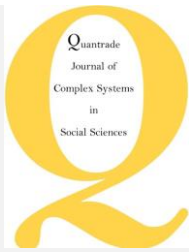
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Appendix 1: Scale Items

Environmental Awareness
CF1: I frequently engage with environmental issues
CF2: I believe that daily habits can affect the environment.
CF3: I think everyone should contribute to environmental protection
CF4: E-waste contains toxic and hazardous substances that are harmful to human health and negatively impact the environment.
Attitude
T1: E-waste recycling is a proper management practice.
T4: E-waste recycling has a positive impact on the health of citizens and future generations.
T5: E-waste recycling contributes to society.
T7: E-waste recycling is the primary way to conserve natural resources.
Subjective Norm
SN1: The people who are important to me (family, friends, neighbors) are knowledgeable about e-waste recycling.
SN4: The people who matter to me (family, friends, neighbors) think I should recycle my e-waste
SN6: If my neighbors and friends participate in e-waste recycling, I will participate as well.
Behavioral Intention
DN1: I am more inclined to purchase electronic products that promise recycling in the future.
DN4: I am willing to participate in e-waste recycling programs if funding or additional opportunities are available.
DN5: I am willing to participate in environmental programs related to e-waste organized by universities, educational institutions, the government, etc.
DN6: I am willing to share my e-waste recycling experiences with my friends.
DN7: It is very likely that I will engage in e-waste recycling within the next two years.