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From worry to action: the role of climate change worry and TPB variables in green purchase behavior in Turkey

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Abstract: Climate change, natural resource depletion, and ecological destruction cultivate an unsustainable environment for humans. This study aims to develop a predictive model via empirical research to investigate the impact of climate change worry on environmental attitude (EA), subjective norms (SN), and perceived behavioral control (PBC) and to assess the effect of these three variables from the Theory of Planned Behavior (TPB) on green purchase intention (GPI) for green products. The study investigates the behavior of a sample of 334 Generation Z university students at a university in Turkey using the convenience sampling method. This study, based on partial least squares structural equation modeling (PLS-SEM), demonstrates that young consumers' climate change worries increase their EA, SN, and PBC, all of which contribute to a stronger desire to purchase green products. According to the findings, while SN and PBC are found to have a positive effect on GPI, EA is not considered as a significant predictor of GPI. The findings substantiate the applicability of the TPB model specifically in terms of SN and PBC in elucidating intentions to buy green products. Our findings also imply that the impact of novel factors —in this case, climate change worry on GPB should also be considered.

Keywords: climate change worry, green purchase intention (GPI), green purchase behavior (GPB), consumer behavior, theory of planned behavior (TPB)

Introduction

The extensive nature of globalization has resulted in various issues for the planet. Climate change represents the foremost environmental peril facing the globe (Matiiuk et al., 2023). Throughout history, environmental problems have had an impact on people's health, both at the community and at the individual level. Such concerns have resulted in the emergence of the sustainable development concept, which highlights the urge to enhance sustainability and fosters environmental innovation, green consumerism, and GPB (Joshi & Rahman, 2015). In recent consumer studies, green customer behavior has become a new marketing paradigm

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(Habib et al., 2025; Marcon et al., 2022; Sharma, 2021). While some research concentrated on understanding the characteristics of "green consumers" (Jaiswal et al., 2021; Shahsavar et al., 2020), other studies investigated the impact of consumers' environmental knowledge, attitude, concern, and consciousness on GPB (Kim & Lee, 2023; Rusyani et al., 2021). Product price, gender effects, environmentally friendly behavior (Correia et al., 2023), knowledge of green products (Borah et al., 2024), social influence, self-image (Simiyu & Kariuki, 2024), perceived market influence (Joshi et al., 2021), concern about the environment (Alghamdi & Agag, 2024) have also been studied.

One of the most important concerns about the environment is climate change. It has recently been one of the most extensively discussed environmental issues with negative effects on human health and the economy (Skeirytė et al., 2022). Although public knowledge (Kurowski et al., 2022), awareness (Venghaus et al., 2022), environmental concern (Tam & Chan, 2017), and risk perception (Bradley et al., 2020) regarding climate change and environmental behavior have been widely discussed in the literature, studies on climate change worry are rather limited (Vecina et al., 2024; Zameer & Yasmeen, 2022). Worry is also considered a different term from concern or perceived risk since it is more experiential compared to concern. Hence, it is more personal and prone to triggering the individuals' mitigation moves (van der Linden, 2017). It is, therefore, crucial for policymakers and practitioners to reveal the impact of climate change worries on GPB. Turkey is viewed as a concerning country for climate change issues since Turkey's overall greenhouse gas emissions have increased significantly, placing it as the 17th highest emitter in the world over the past decade (World Bank, 2023). It was also stated that climate change poses a greater threat to developing countries than industrialized nations (IPCC, 2023). The number of climate-related disasters in Turkey has increased and Turkey experienced more than 1,500 of these occurrences in 2024 alone, including wildfires and heatwaves, which have gotten worse as a result of climate change (UNDP [United Nations Development Programme], 2024). In parallel with these findings obtained from the literature, this study examined the GPB of young consumers based on TPB.

The main motivation to employ TPB in this research is that TPB suggests a systematic approach to the scholars in terms of revealing, measuring, and conceptualizing the determinants of behavior. Many studies employing TPB jointly illustrate that the theory offers a thorough framework for examining the psychological and social determinants of environmentally conscious purchasing behavior. TPB is one of the widely used models in consumer environmental behavior research (Ajzen, 1985; Sharma et al., 2023) and in this study, environmental attitude (EA), subjective norms (SN) and perceived behavioral control (PC) variables are included in the research model. These variables help to understand the reasons for consumers' environmentally conscious purchasing decisions (Rozenkowska, 2023; Wijekoon & Sabri, 2021). Besides, in this study, the model was extended by adding climate

change worry to understand its impact on the original variables of the TPB model as well as their impact on GPI. Turkey, facing severe impacts of climate change, is a country with around 12.87 million people between the ages of 15 and 24, making up 15.1% of the country's total population as of the end of 2023 (TSI [Turkish Statistical Institute], 2024). Organisation for Economic Co-operation and Development (OECD) (2023) has reported that Turkey, as a developing country, is experiencing a substantial youth surge with a population percentage of 15.3%, which is close to the global average (15.4%). Since younger generations are more likely to assume responsibility, use environmentally friendly alternatives, and consider their carbon footprint prior to purchase (Skeirytė et al., 2022), this study is aimed to reveal the impact of climate change worry, which is studied in a limited scope in the related literature, on EA, SN, and PBC, as well as the impact of these constructs on behavioral intention through the sample of young consumers in Turkey. Young consumers are viewed as a significant force in the development of an ecologically conscious population (do Paco et al., 2013), as they represent a significant market opportunity for environmentally responsible products (Lee, 2008) and contributing to the adoption and dissemination of green products (Gidaković et al, 2024). United Nations (2021, p.3) define young adults as *"engaged citizens, positive agents of change, bold innovators and committed partners"*. They also actively exert a significant effect on the environment (Bandura & Cherry, 2020) in addition to being well-educated, open-minded and informed about green purchasing (Kuźniar et al., 2021). Today's university students comprising Generation Z exhibit significant apprehension regarding environmental matters (Gentina, 2020). Gomes et al. (2023) define Generation Z as those born between 1997 and 2012, also referred to as the post-millennial generation, and considerable gaps persist in the literature concerning Generation Z's distinct preferences and motives for sustainable consumption (Lopes et al., 2024). Although there have been many studies on pro- environmental behavior in the literature, the case of developing countries, like Turkey, has been investigated less than that of developed ones (Emekci, 2019; Yarimoglu & Binboga, 2019). Hence, this study focuses on understanding the GPB of Generation Z university students in a selected faculty in Turkey. Regarding the location of green product research, the number of studies conducted in developing nations has increased over the past decade (Ayar & Gurbuz, 2021; Shalender & Sharma, 2021). Our study seeks to address such gaps mentioned above through the following research objectives: (1) to examine the impact of climate change worry of young consumers on EA, SN and PBC; (2) to investigate whether these three constructs of TPB have a significant impact on their GPI. To the best of the authors' knowledge, no specific research has been conducted in terms of the relationship between climate change worry and TPB in Turkey. The study begins with a theoretical background and the development of hypotheses. The research model is then evaluated, and the findings are reported and discussed. Finally, suggestions for further research, limitations and implications are presented.

1. Theoretical background and hypotheses development

This study proposes a theoretical research model (Figure 1) based on the TPB (Ajzen, 1991), a popular theory for explaining consumer purchasing intention and behavior (Chen & Tung, 2014; Paul et al., 2016). In consumer behavior studies, the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) is widely applied as the first attempt to propose that consumer behavior is determined by intentions, attitudes, and subjective standards. Consequently, TPB (Ajzen & Fishbein, 1980) was employed as the extended model of TRA; it consists of PBC in addition to measures of EA and SN. According to the TPB model, human conduct is influenced by three types of considerations: behavioral beliefs, normative beliefs, and control beliefs, which then lead to specific results such as attitude (EA) toward the behavior, SN, and PBC, respectively. The interplay of attitude (EA) towards the behavior, SN, and PBC collectively culminates in the establishment of behavioral intention which leads to purchase behavior.

Attitude is one of the fundamental concepts in the discipline of psychology, referring to an individual's positive or negative beliefs that reinforce their behavior (Ajzen & Fishbein, 1980). An individual is more likely to perform a particular behavior when their attitude towards it is favorable (Ajzen, 1991). Another factor influencing a behavior is SN and it refers to the influence of important people around the individual - family, friends, colleagues or community members - on his/her behavior (Ajzen, 1991; Ajzen & Fishbein, 2005). Moreover, PBC shows how the individual perceives his/her control over his/her behavior and helps to predict behavior, especially in uncontrollable situations. The TPB was developed by Fishbein and Ajzen (1975) and Ajzen and Fishbein (1980) and has been used in many studies on environmental behavior to explain the GPB (Joshi et al., 2021; Kumar, 2021).

According to TPB, attitude, SN and PBC are the three main factors that affect consumer behavior related to green products. However, as argued by Ajzen (1991), these three factors may not always fully explain behavior. Therefore, other variables can be added to the model. Recent research also shows that attitude alone is not sufficient to understand intention and behavior (Maran et al., 2023). In addition to the three dimensions in TPB, we considered climate change worry, which is one of several potential psychological responses to climate change (Stewart, 2021), would have an impact on EA, SN and PBC.

1.1. Climate change worry

Climate change worry is considered one of the critical factors in GPB. Although it is declared that factors related to environmental knowledge and economic issues have gained importance in the literature on GPB literature, in practice, perceptual and emotional factors are considered to have a greater impact on behavioral change (Sheikh et al., 2023). Climate change worry consists of verbal-

linguistic thoughts (rather than images) about the potential climate system changes and their potential consequences (Stewart, 2021). According to Bouman et al. (2020), climate change worry can play a significant role in directing people to support policies regarding climate change and engage in personal actions to mitigate climate change. Hence, climate change worry can be accepted as an indicator when the objective is to disclose the connection between environmental emotions and attitudes, behavior, and policy support (Gregersen et al., 2020). This is also supported by the recent literature that environmental action predictors, such as prior pro-environmental behavior or pro-environmental values were linked to habitual concern about global warming (Qin et al., 2024; Verplanken et al., 2020). In summary, climate change concern manifests as an adaptive and constructive emotion that stimulates pro-environmental behaviors. The relationship between fear, concern, anxiety regarding climate change and EA has been studied in the previous studies (Atta et al., 2024; Wong-Parodi & Rubin, 2022). However, many scholars argued that climate change worry is a component that needs to be studied separately since it differs in content and meaning from concepts such as climate anxiety, consciousness, and environmental concern (Bouman et al., 2020; Stewart, 2021; Verplanken et al., 2020). While previous studies found the relationship between the climate change worry and pro-environmental behavior significant (Kleres & Wettergren, 2017; Verplanken et al., 2020), it was observed that very limited research investigated whether climate change worry had any impact on EA (Bouman et al., 2020; Jylhä et al., 2023). In addition, Bouman et al. (2020) argued that the relationship between worry and specific climate mitigation attitudes is less examined by pointing out the gap between worry regarding abstract and global climate change and concrete, personal climate mitigation efforts. Based on the aforementioned discussion and Jylhä et al.'s (2023) conclusion highlighting the fact that a heightened worry on climate change correlates with increased attitude towards environment, the following hypothesis is proposed:

H1. Climate change worry positively affects environmental attitude.

In addition to EA, SN are considered another construct in the model of the study as they represent the social pressure to be involved in a particular behavior (Ajzen & Fishbein, 2005). Previous research has found a significant relationship between environmental concern and SN (Asha & Rathiha, 2017; Paul et al., 2016). Paul et al. (2016) dictated that an individual worried about environmental circumstances can readily influence their family members or social circles. This signifies SN influenced by increasing environmental concerns. According to Moser (2016), the abstract nature and magnitude of climate change can obscure individuals understanding of their potential contributions and the efficacy of their actions which may lead individuals to doubt their personal responsibility to act (Brügger et al., 2015). Consequently, climate change worry is expected to trigger the increased

involvement of family members, friends, social circles in taking actions accordingly. Therefore, the following hypothesis is proposed:

H2. Climate change worry positively affects subjective norms.

When consumers believe they greater control over themselves or more resoruces and opportunities, they will have greater PBC, and their intentions regarding GPB will increase (Sun & Wang, 2020). The research by Bouman et al. (2020) indicated that people with climate change worry are more willing to be involved in climate-related actions when they feel such a need. This suggests that PBC, manifested as personal responsibility, is essential in converting climate concern into proactive actions. In addition, Martin et al. (2024) dictated that climate change worry is negatively correlated with happiness and life satisfaction, but belief in one's own ability to prevent climate change has a positive correlation with these well-being markers. This may also prove that increasing personal responsibility may alleviate the negative impacts of climate change worry on mental health, thereby improving PBC. Therefore, we posit that climate change worry shapes the way in which young consumers evaluate the extent to which they have control over the products they buy. Hence, the third hypothesis is suggested as follows.

H3. Climate change worry positively affects perceived behavioral control.

Environmental Attitude and Green Purchase Intention

Attitudes are critical dimensions that disclose consumers' psychological considerations of products. (Xu et al., 2022). TPB offers a significant paradigm for comprehending customers' intentions regarding pro-environmental purchasing behavior. Attitude, as a fundamental element of the TPB model, exerts a direct and substantial influence on consumers' intentions about green consumption (Liang et al., 2024; Wang et al., 2021). According to the TPB, purchase intention serves as a valid determinant of purchasing behavior; an individual's attitude and beliefs subsequently shape this purchasing intention. The balance between behavior and attitude towards a behavior is established by intention (Leclercq-Machado et al., 2022). Many studies on GPB concluded that customers are more inclined to favor green products when they exhibit a positive attitude towards environmental preservation (Cheung & To, 2019; Liu et al., 2023). In accordance with this, some scholars have agreed that consumers with a heightened interest in environmental issues exhibit a stronger willingness to engage in environmentally protective actions (Hamzah & Tanvir, 2021; Laureti & Benedetti, 2018). An individual's EA is their concern regarding the probable causal effects of environmental deterioration on their behavioral commitment. Hence, we agreed that environmental attitudes are

important since they lead to positive GPI, which form our actions. Accordingly, the following hypothesis is proposed:

H4. Environmental attitude positively affects green purchase intentions.

1.2. Subjective norm

A SN denotes the perceived public pressure to engage in or abstain from specific behaviors (Ajzen, 1991), representing an individual's perspective that profoundly influences their decisions and actions (Lavuri et al., 2021). SNs are formed by family members, peer groups, friends, and colleagues, influencing individuals' and consumers' preferences and attitudes toward environmentally friendly purchases. When customers view that people within a certain group are more prone to be involved in pro-environmental behavior, they subconsciously raise an interest in such products, thereby triggering a desire to buy through the influence of collective behavior (Xu et al., 2022). There are many studies in the literature (Aydın et al., 2024; Rusyani et al., 2021) which concluded that social pressure motivates consumers to purchase environmentally friendly products, particularly through the influence of behavioral intention. On the other hand, some studies showed that SN can be considered as one of the factors that indirectly impede a favorable customer attitude towards green products (Ogiemwonyi et al., 2023; Patwary et al., 2022; Testa et al., 2018). Moreover, Sun et al. (2019) argued that SN's impact on green consumption has not yet been verified. In addition, most research in this domain concentrates on developed nations, resulting in a scarcity of studies examining the GPI within the setting of developing countries (Al-Swidi & Mohammed, 2021). Consequently, this study has also focused on the relationship between SN and GPI in a developing country setting:

H5. Subjective norms positively affect green purchase intentions.

1.3. Perceived Behavioral Control

PBC shows a person's evaluation of the ease or difficulty related with the execution of an action, as well as an awareness of potential impediments (Wang et al., 2016). A greater PBC correlates with a heightened belief in the execution of a specific behavior, hence facilitating its occurrence (Mirani et al., 2021, Patwary et al., 2022). Therefore, customers are prone to have purchasing intentions when they think that they have greater control over the situation (Joshi et al., 2021). In the realm of consumption of environmentally friendly products, when consumers regard themselves as sufficiently capable of purchasing a specific product and encounter minimal perceived barriers in the acquisition process, their PBC intensifies, resulting in a heightened intention to purchase green products (Wang et al., 2018; Xiong et

al., 2020). Indeed, previous studies have demonstrated that PBC positively affects the propensity to purchase green products (Lavuri, 2022; Saleki et al., 2020; Stranieri et al., 2023). Carrion et al. (2023) also demonstrated that PBC is an important variable determining GPI. Accordingly, the following hypothesis is proposed:

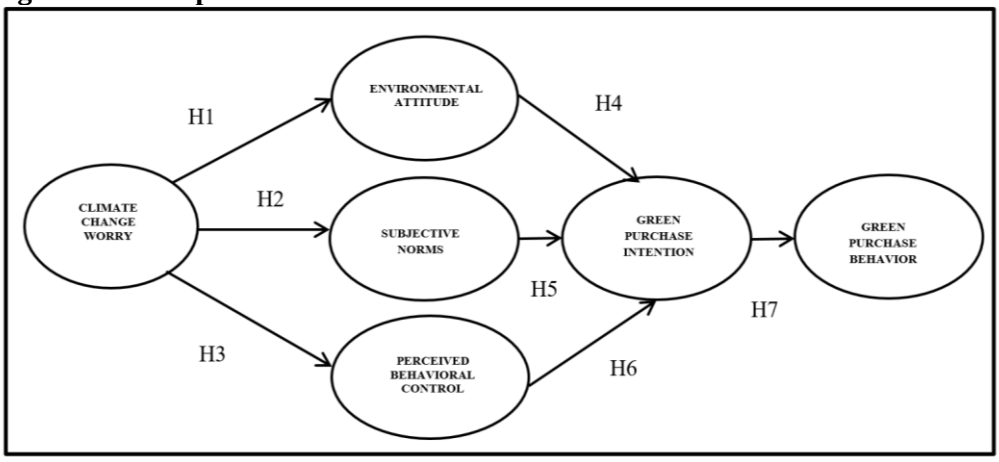
H6. Green purchase intentions are positively impacted by perceived behavioral control.

1.4. Green purchase intention and green purchase behavior

Purchase intention has widely been considered as critical for understanding, interpreting, and influencing customer behavior (Kim & Lee, 2023). The GPIs of consumers show their intentions to buy sustainable products or services (Zhuang et al., 2021). Customers concerned about sustainability are more prone to show intents to be involved in GPB since they think it would be beneficial for the environment. (Shehawy & Khan, 2024). Many studies across many disciplines have highlighted that intention has a direct positive impact on behavior (Wang et al., 2021). Although there are many studies highlighting the positive impact of behavioral intentions on GPB, recent research has concentrated on highlighting the gap between self-reported intentions and actual GPB (Tawde et al., 2023; Testa et al., 2018; Wang et al., 2021; Witek & Kuźniar, 2023). Based on the discussion above, the following hypothesis is proposed:

H7. Green purchase intention positively affects green purchasing behavior.

Figure 1. Conceptual framework



Source: authors' representation

2. Methodology

2.1. Sample and data collection

A survey was applied to undergraduate students at a university in Turkey. This study, like a number of others (Gidaković et al, 2024; Heo & Muralidharan, 2019), investigated the preferences and behaviors of youthful consumers regarding environmentally friendly products and services. In consumer research, students are regarded as proxies for customers (Allen et al., 2018). Tri (2020) argued that university students are important for understanding GPB since they can affect other people's decisions to buy with more creativity. Therefore, they have an important impact on shaping future consumer behaviors and attitudes.

To avoid ambiguity, the questionnaire consists of pre-tested and revised questions. Due to insufficient data, 22 responses out of 355 were disregarded. 333 valid responses were evaluated, surpassing the minimum threshold of 200 (Hair et al., 1998). PLS-SEM analysis necessitates 200 observations to produce valid results (Chin, 1998; Henseler et al., 2016).

Table 1. Demographic findings

Gender	**Frequency (n)**	**Percentage (%)**
Female	92	27.6
Male	241	72.4
Age	**Frequency (n)**	**Percentage (%)**
18 and below	11	3.3
18–20	80	24.0
21–23	204	61.3
24–26	34	11.4
27 and above	4	1.2
Department	**Frequency (n)**	**Percentage (%)**
Maritime Business	200	60.1
Maritime Transportation Engineering	133	39.9
Class	**Frequency (n)**	**Percentage (%)**
1	80	24.0
2	89	26.7
3	63	18.9
4	101	30.4
Total	**333**	**100**

Source: authors' calculations

Convenience sampling was employed. The strategy selects accessible and available study participants from the population of interest rather than randomly picking them. The generalizability or representativeness of the research may be restricted by convenience sampling, but previous research has shown that young

people or student samples are reliable for such studies (Cheah & Phau, 2011; DelVecchio, 2000). As presented in Table 1, 27.6% of female respondents participated. 3.3% are under 18, 24% are 18–20, 61.3% are 21–23, and 11.4% are 24–26. 24% of participants are in first grade, 26.7% in second, 18.9% in third, and 30.4% in fourth.

2.2. Measures

Two sections comprised the questionnaire. The first section examined the demographic characteristics of respondents. The second section contained queries regarding the variables in the research model (see Annex 1). The majority of the constructs were adapted from previous research with modifications to ensure their validity. Specifically, the climate change worry scale was comprised of ten items adapted from Stewart (2021). The four-item environmental attitude construct was adapted from Leonidou et al. (2010). While SN (three items) and PBC (three items) were adapted from Liao and Yang (2022), the GPI and GPB scale were taken from Kanchanapibul et al. (2014), and each construct included five items. All scale items were measured using a five-point Likert scale with options from 1 "strongly disagree" to 5 "strongly agree."

2.3. Data analysis and results

In this study, Partial Least Squares (PLS) based Structural Equation Modeling (SEM) was used (Chin et al., 2003). This method is covariance-based and does not require multiple normal distributions and has high estimation and application power for complex multivariate models (Hair et al., 2014).

2.4. The measurement model

In the study, reliability and validity analyses were conducted for the model. Accordingly, internal consistency reliability was measured by Cronbach's Alpha (α), Composite Reliability (CR), and rho_A values (Hair et al., 2014; Henseler et al., 2016; Nunnally & Bernstein, 1994). For internal consistency reliability, 0.7 is generally accepted as the minimum value (Hair et al., 2018; Ringle et al., 2012). As seen in Table 2, Cronbach's Alpha values ranged between 0.785 and 0.885, CR values ranged between 0.791 and 0.886, and rho_A values ranged between 0.779 and 0.891. This reveals that all constructs are reliable.

For convergent validity, standardized factor loadings and average variance extracted (AVE) values were examined (Anderson & Gerbing, 1988). Factor loadings were above the threshold value of 0.7 (Hair et al., 2018) and ranged from 0.652 to 0.875 as seen in Table 2. It has been suggested that items with loadings between 0.40 and 0.70 may be removed only if their exclusion improves AVE or CR

values. In line with this guideline, CCW3, CCW6, CCW7, CCW9, and CCW10 from the Climate Change Worry construct and EA3 from the Environmental Attitude construct were removed. However, CCW8, EA2, and INT2 were retained despite loadings below 0.708, as the revised AVE and CR values remained above the thresholds. Furthermore, AVE values ranged from 0.560 to 0.690, which exceed the minimum threshold of 0.50 recommended by Fornell and Larcker (1981). These findings confirm that convergent validity was satisfactorily established for all constructs.

In the evaluation of discriminant validity, HTMT (Heterotrait-Monotrait Ratio) coefficients were assessed. The relevant values are presented in Table 3. HTMT coefficients represent the ratio of the average correlations between items of different constructs to the geometric mean of the correlations between items of the same construct. It has been suggested that the HTMT value should be below 0.90 when the constructs are theoretically similar, and below 0.85 when the constructs are theoretically distinct (Henseler et al., 2015). As shown in Table 3, the HTMT coefficients meet the threshold value of <0.90, indicating that discriminant validity among the constructs has been achieved. Therefore, we continue with the structural model evaluation to test the hypotheses.

Table 2. Results of the measurement model

Variable	Item		Factor Loading	AVE	CR	Cronbach's	rho_A
Climate Change Worry	**CCW1**	I worry about climate change more than other people	**0.700**	0.610	**0.886**	0.885	**.891**
	CCW2	Thoughts about climate change cause me to have worries about what the future may hold	**0.828**				
	CCW4	I tend to worry when I hear about climate change, even when the effects of climate change may be some time away	**0.820**				
	CCW5	I worry that outbreaks of severe weather may be the result of a changing climate	**0.846**				
	CCW8	I notice that I have been worrying about climate change	**0.698**				
Environmental ...	**EA1**	I am concerned about the environment.	**0.773**	0.560	**0.791**	0.785	**0.779**
	EA2	I would be willing to reduce my consumption to help protect the environment	**0.652**				
	EA4	I have asked my family to recycle some of the things we use.	**0.810**				
Subjecti ve ...	**SN1**	My friends and family would like me to protect the environment	**0.795**	0.646	**0.845**	0.842	**0.849**
	SN2	Most people who are important to me want me to be environmentally friendly	**0.865**				

	SN3	Most people whom I respect and admire engage in environmentally friendly behaviors	**0.747**				
Perceived Behavioral Control	**PBC1**	I can mostly decide whether or not to behave pro-environmentally	**0.875**	0.690	**0.869**	0.868	**0.872**
	PBC2	I think that I am capable of adopting eco-friendly behaviors	**0.834**				
	PBC3	I have the knowledge and skills to behave pro-environmentally. (dropped)	**0.779**				
Green Purchase Intention	**INT1**	I avoid buying products which are potentially harmful to the environment	**0.735**	0.603	**0.883**	0.883	**0.886**
	INT2	I have changed my principal products for ecological reasons	**0.698**				
	INT3	When I have to choose between two similar products, I choose the one that is less harmful to the environment	**0.833**				
	INT4	I make a special effort to buy paper and plastic products that are made from recycled materials	**0.785**				
	INT5	I will not consider environmental issues when making a purchase	**0.823**				
Green Purchase Behavior	**PURCH1**	I feel that I have played a great part in helping the environment when I use green products	**0.721**	0.595	**0.880**	0.880	**0.882**
	PURCH2	I feel more comfortable when I use green products rather than normal ones	**0.782**				
	PURCH3	There is not much I can do about the environment, and my experience of green products does not change my belief	**0.736**				
	PURCH4	I aim to buy green products again after my first purchase	**0.816**				
	PURCH5	I would recommend green products to my friends and family	**0.802**				

Source: authors' calculations

Table 3. Discriminant validity for the measurement model (Heterotrait-Monotrait Ratio)

	Green Purchase Intention	**Subjective Norms**	**Perceived Behavioral Control**	**Environmental Attitude**	**Green Purchase Behavior**	**Climate Change Worry**
Green Purchase Intention						
Subjective Norms	0.675					
Perceived Behavioral Control	0.706	0.667				
Environmental Attitude	0.705	0.740	0.790			
Green Purchase Behavior	0.835	0.574	0.757	0.777		
Climate Change Worry	0.491	0.500	0.560	0.728	0.595	

Source: authors' calculations

2.5. The structural model

After the construct measurements were confirmed, by utilizing the PLS algorithm, collinearity among the constructs (VIF), path coefficients, and coefficients of determination (R2) were calculated. Then, Stone-Geisser's predictive relevance (Q2) was assessed using the blindfolding method. To determine the significance of PLS path coefficients, t-statistics were generated from 5000 bootstrap samples. To evaluate multicollinearity among the predictor variables, we computed the Variance Inflation Factor (VIF) values. As seen in Table 4, the VIF values are below the threshold value of 5. This suggests that there is no multicollinearity between the variables (Hair et al., 2014; Henseler et al., 2015).

As seen in Table 4, the VIF values are below the threshold value of 5. This suggests that there is no multicollinearity between the variables (Hair et al., 2014; Henseler et al., 2015). When the overall goodness-of-fit indices of the model are examined, the Standardized Root Mean Square Residual (SRMR) value was determined to be 0.036. According to Hu and Bentler (1999), the threshold value for this index is 0.08, while Schumacker and Lomax (2004-1996) revealed that SRMR values between 0.05 and 0.08 indicate a good fit, and values below 0.05 indicate an excellent perfect fit. Therefore, the SRMR value of the research model indicates a perfect fit. Furthermore, the Normed Fit Index (NFI) of the model was calculated at 0.903, exceeding the accepted threshold value of 0.90. These findings suggest that the measurement model performs adequately as per the basic fit criteria.

As shown in Table 5, climate change worry has a significant impact on environmental attitude ($\beta=0.726$, $p<0.001$), SN ($\beta=0.500$, $p<0.001$) and PBC ($\beta=0.562$, $p<0.001$). As a result, hypotheses H1, H2, and H3 were supported. However, H4, which states that environmental attitude affects behavioral intention, is not confirmed ($\beta=0.228$ $p>0.05$). Additionally, SN ($\beta=0.279$, $p<0.01$) and PBC ($\beta=0.339$, $p<0.001$) have a positive influence on behavioral intention, supporting H5 and H6. H7 is also confirmed ($\beta=0.836$, $p<0.001$), demonstrating the strong impact of behavioral intention on green purchasing behavior.

The R2 value represents how much of the change in the dependent variable can be explained by variations in the independent variables. For a meaningful interpretation, the dependent variable's R2 value should be at least ten percent (Chin, 1998), and the values in this particular model indicate a positive effect and meet the requirement for a meaningful interpretation. Climate change worry explains 53% of environmental attitude, 25% of SN, and 32% of PBC. In addition, environmental attitude, SN, and PBC together explain 59% of the variability in behavioral intention, and behavioral intention is responsible for explaining 70% of the GPB. Besides, a Q^2 value greater than 0 indicates that the model has predictive power (Hair et al., 2014). The results in Table 4 show that all endogenous variables meet this criterion and the model is valid in terms of prediction.

Table 4. Research model coefficients (total effect)

Constructs	VIF	R^2	Q2
Climate Change Worry → Environmental Attitude	1.000	0.527	0.259
Climate Change Worry → Subjective Norms	1.000	0.250	0.141
Climate Change Worry → Perceived Behavioral Control	1.000	0.316	0.190
Environmental Attitude → Green Purchase Intention	3.369		
Subjective Norms → Green Purchase Intention	2.257	0.586	0.323
Perceived Behavioral Control → Green Purchase Intention	2.753		
Green Purchase Intention → Green Purchase Behavior	1.000	0.699	0.365

Source: authors' calculations

Table 5. Structural model result

Hypothesis	*β*	*SE*	*t-Statistic*	*p-Value*	*Hypothesis supported*
H1. *Climate Change Worry → Environmental Attitude*	0.726	0.046	15.905	0.000	Accept
H2. *Climate Change Worry → Subjective Norms*	0.500	0.066	7.585	0.000	Accept
H3. *Climate Change Worry → Perceived Behavioral Control*	0.562	0.062	9.082	0.000	Accept
H4. *Environmental Attitude → Green Purchase Intention*	0.228	0.128	1.773	0.077	Reject
H5. *Subjective Norms → Green Purchase Intention*	0.279	0.098	2.836	0.005	Accept
H6. *Perceived Behavioral Control → Green Purchase Intention*	0.339	0.104	3.267	0.001	Accept
H7. *Green Purchase Intention → Green Purchase Behavior*	0.836	0.035	24.167	0.000	Accept

Source: authors' calculation

3. Discussion

The study provides important insights into the determinants of GPB of Generation Z Turkish consumers. The results show once again that TPB is a good predictor of GBP, and the traditional structure of this model is extended by adding climate change concern to the research model.

H1 was supported. In other words, it is revealed that young individuals who are concerned about environmental issues exhibit more positive attitudes towards the environment, and these findings are in line with previous studies in the literature (Atta et al., 2024; Chen & Tung, 2014; Wang, 2022). However, positive attitudes may not always result in consumer behavior. This issue should also be taken into consideration. The findings of the study also support hypothesis H2. This result is like the findings of Bouman et al. (2020) and Abonyi and McDermott (2024). Consistent with prior research (Innocenti et al., 2023; Qin et al., 2024; Sun & Wang, 2020), H3 is accepted due to the influence of climate change worry on PBC. This reinforces the idea that

worries can empower individuals if they are convinced that they have the ability to act. However, it also prompts the question of whether this perceived control reflects actual capability or merely intention. However, H4, which states that EA affects GPI, is not supported. This contradicts several prior studies (Chen & Tung, 2014; Susanty et al., 2021; Wang, 2022), prompting a deeper examination: it suggests that although consumers may express favorable environmental attitudes, these attitudes could be superficial or symbolic, devoid of the motivational potency necessary to affect actual intentions. The recent literature also confirms that attitude–behavior gaps are increasingly observed (Aydın et al., 2024; Wang et al., 2021; Xu et al., 2022).

Hypotheses 5 and 6 are supported. According to the findings, SN and PBC have a positive effect on GPI, which is consistent with previous research (Joshi et al., 2021; Yadav & Pathak, 2016). H5 is accepted, i.e. that SN influences the GPI by university students. Susanty et al. (2021) addressed SN as a driving factor for GPI with attitude and PBC. Recent research on young consumers collectively supports the view that SN are a critical factor impacting GPI (Gupta, 2021; Han et al., 2024). These results indicate that young consumers are influenced by their social contacts in developing sustainable consumption behaviors. Previous studies, as in this study, have also shown that an individual's belief in their own capacity to perform a specific action (PBC) significantly influences purchase intention (Joshi et al., 2021; Paul et al., 2016). Furthermore, in line with previous studies (Susanty et al., 2021), when the effects of PBC and SN on GPI were compared, it was found that PBC had a greater effect. Hypothesis H7 is also supported in the study. It reveals that young consumers' intentions to purchase green products lead to purchasing behavior, and this finding is consistent with previous studies in the literature (Sharma et al., 2020; Zhuang et al., 2021; Wu et al., 2024).

4. Theoretical implications

This study examined the impact of Gen Z consumers' concern about climate change on their GPB, based on the TPB. The findings indicate that young people's concern about climate change significantly and positively impacts EA, SN, and PBC, and that these factors, in turn, support green product purchase intentions and ultimately purchasing behavior. In terms of these three concepts, PBC has a higher impact on the GPI, while EA has a more limited impact. This situation calls into question the determining power of environmental attitude in purchasing behavior. Apart from these, it is also important to investigate the factors that will affect this behavior.

Moreover, the recognition that concern about climate change can function as a psychological stimulus in individuals offers a different perspective to climate communication strategies. Especially in young individuals, such emotional awareness can increase peer influence, encourage participation in community-based initiatives and trigger social transformation by paving the way for collective action. Leveraging this emotional connection, education-based interventions and awareness

campaigns can be developed to translate individual concerns into concrete environmental actions, thereby supporting behavioral change at the societal level.

Focusing on consumer behavior, this study makes several theoretical contributions. First, it is shown that integrating a psychological variable such as climate change concern with existing theoretical models, namely TPB, can strengthen the prediction of GPI and behavioral tendencies. Such a theoretical extension allows marketing experts and policy makers to more comprehensively analyze the factors that lead individuals to green product choices. Second, the study highlights the determinant role of PBC in GPI. This finding suggests that strategies to promote sustainable consumption behaviors should focus on increasing consumers' perception of control in their decision processes. Overall, this research both points to the importance of incorporating climate change concern into the TPB framework and, by acknowledging the influence of PBC, provides a theoretical basis for the development of effective interventions and strategies to encourage individuals to make sustainable choices. Tanzi (2022) argues that economic paradigms should be rethought due to climate change, and policymaking should shift from short-term gains to long-term global cooperation by anticipating future uncertainties (Nuţă, 2022).

From the social implications' perspective, this study highlights the fact that young consumers' GPB is influenced by climate change worry rather than broader EAs. The study supports that, in the case of Generation Z in Turkey, EA alone may not be sufficient to drive consumers to be involved in GPB, which is contrary to much of the current literature. In the case of social development, the findings highlight the importance of motivating and empowering young consumers through structural support rather than focusing only on traditional climate change-related campaigns. As one of the findings of the study, PBC is considered a critical factor of intention and, therefore, educational institutions, policymakers, and institutions working on climate-change issues need to concentrate more on decreasing barriers related to cost, increasing availability of green products as well as on enhancing consumers' interest towards sustainable actions.

5. Managerial implications

This study's findings have significant managerial implications for companies seeking to promote sustainable consumption behavior among youthful consumers in emerging economies like Turkey. Accordingly, climate change concerns are of considerable importance in terms of the purchasing behavior of Generation Z consumers today. For this reason, in marketing communication activities related to products, the interactions of products with the environment can be emphasized and the environmental benefits of products, if any, can be highlighted. Within this scope, businesses can make improvements in their products to address the concerns of young people about climate change by improving the environmentally friendly

aspects of their products. They can also utilize social media campaigns to increase the acceptance and attractiveness of products. At this point, the use of famous people in advertisements or user references can also make significant contributions to the success of the process.

Moreover, to improve young people's sense of behavioral control, environmentally friendly options for products can be created and effective and accurate information can be provided to them. Especially at this point, it is of great importance that green products are accessible and affordable. Furthermore, environmentally friendly packaging and labeling methods can be used on products, these issues can be emphasized in product advertising messages, and reward and incentive systems can be implemented to increase product usage. Although the level of influence of EA was found to be low in this study, emotional interaction with young consumers can be created by sharing stories and videos about brands' environmental awareness to increase the impact of this factor. As found in the study, SN influences purchase behavior, and in this context, in order to further increase this effect, environmentally friendly products can be advertised on platforms such as Instagram, TikTok and YouTube and a wide range of young customers can be reached. This can increase existing and potential customers' interest in green practices and products. In addition, workshops for young people can increase their sense of responsibility on these issues and encourage more individuals to engage in environmentally friendly behaviors through peer influence (Mei et al., 2012). In sum, efforts such as these can lead to increased environmental awareness and greener product preferences among young consumers (Uddin & Khan, 2018). Thus, it will be possible both to protect today's world and to leave a more livable world for future generations.

Conclusion

This study examines the factors influencing the GPB of young consumers in Turkey, a developing country, using the TPB as the theoretical framework. According to the findings, PBC has a greater impact on the GPI than SN, while EA has a lesser impact on the GPI. This finding contradicts studies suggesting that SN is the primary factor influencing attitude and intention (Chen & Tung, 2014; Susanty et al., 2021; Wang, 2022) and parallels studies emphasizing the primary influence of perceived control on consumer behavior (Joshi et al., 2021; Paul et al., 2016).

The study has made a significant contribution to the existing literature in this field by expanding the traditional approach of TPB by incorporating a psychological factor, climate change anxiety, into the research model. The role of youth in climate-conscious consumption is viewed not only behaviorally but also within a socio-environmental framework, where affective engagement and perceived responsibility play critical roles, in accordance with Karakaş (2022). This implies that the motivation of pro-environmental behavior, particularly among younger generations, may be significantly enhanced by addressing climate change concerns (Innocenti et al., 2023;

Qin et al., 2024). From a practical perspective, the results underscore the necessity for policymakers, instructors, and companies to prioritize the development of young consumers' sense of agency and control, in addition to awareness campaigns. Creating social environments that provide information about the impacts of environmentally friendly products and facilitate access to these products can support efforts in this direction (Han et al., 2024; Sun & Wang, 2020). Also, by leveraging peer and community influence, the impact of SN can bring about radical and sustainable changes in the consumption habits of this customer group (Gidaković et al., 2024; Gupta, 2021).

This study provides valuable academic and practical information on the status of sustainable consumption behaviors of Generation Z in Turkey. It has developed a new perspective on the impact of climate change concerns, a popular topic today, on the purchasing behavior of young consumers.

Limitations and future research directions

This study has several limitations. The study sampled only university students in Turkey. Furthermore, the PLS-SEM analysis method, which does not require a normal distribution, was used in the study. Therefore, it may not be possible to generalize the study results to different groups. Future research with a broader sample of participants from different age groups and regions could allow the findings to be applied to a broader population. The study only examined the TPB model and climate change anxiety. It is also important to investigate how socioeconomic status influences the relationship between climate change anxiety and GPB. Therefore, future studies could consider demographic and socioeconomic factors. Furthermore, it would be beneficial to include psychological factors such as emotional attachments, moral values, and personal norms in the model. Finally, longitudinal studies can help us better understand the persistence of young people's environmentally friendly habits and the factors that influence these behaviors.

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Annex 1. Scale items used in the survey

Variable		Item
Climate Change Worry	CCW1	I worry about climate change more than other people
	CCW2	Thoughts about climate change cause me to have worries about what the future may hold.
	CCW3	I tend to seek out information about climate change in the media (e.g., TV, newspapers, internet).
	CCW4	I tend to worry when I hear about climate change, even when the effects of climate change may be some time away.
	CCW5	I worry that outbreaks of severe weather may be the result of a changing climate.
	CCW6	I worry about climate change so much that I feel paralyzed in being able to do anything about it.
	CCW7	I worry that I might not be able to cope with climate change.
	CCW8	I notice that I have been worrying about climate change
	CCW9	Once I begin to worry about climate change, I find it difficult to stop.
	CCW10	I worry about how climate change may affect the people I care about
Environmental Attitude	AT1	I am concerned about the environment.
	AT2	I would be willing to reduce my consumption to help protect the environment. .
	AT3	I would donate part of my own money to help protect wild animals.
	AT4	I have asked my family to recycle some of the things we use.
Subjective Norms	SN1	My friends and family would like me to protect the environment
	SN2	Most people who are important to me want me to be environmentally friendly
	SN3	Most people whom I respect and admire engage in environmentally friendly behaviors
Perceived Behavioral Control	PBC1	I can mostly decide whether or not to behave pro-environmentally
	PBC2	I think that I am capable of adopting eco-friendly behaviors
	PBC3	I have the knowledge and skills to behave pro-environmentally. (dropped)
Green Purchase Intention	INT1	I avoid buying products which are potentially harmful to the environment
	INT2	I have changed my principal products for ecological reasons
	INT3	When I have to choose between two similar products, I choose the one that is less harmful to the environment
	INT4	I make a special effort to buy paper and plastic products that are made from recycled materials
	INT5	I will not consider environmental issues when making a purchase
Green Purchase Behavior	PURCH1	I feel that I have played a great part in helping the environment when I use green products
	PURCH2	I feel more comfortable when I use green products rather than normal ones
	PURCH3	There is not much I can do about the environment, and my experience of green products does not change my belief
	PURCH4	I aim to buy green products again after my first purchase
	PURCH5	I would recommend green products to my friends and family

Source: authors' representation

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