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Transforming consumers' intention to purchase green products: Role of social media

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ABSTRACT

This research aims to examine consumers' green product purchasing intentions and observe how social media marketing (SMM) and social media usage (SMU) actively influence consumers' sustainable consumption behavior. We propose a new model for evaluating consumers' green purchase intentions (GPI) through social media (SM) by expanding the Theory of Planned Behavior (TPB) with additional variables, namely green thinking, social media usage, and social media marketing. 785 usable responses were collected using a self-administered questionnaire, and PLS-SEM was applied to perform the analysis. Findings suggest that attitude, subjective norms, perceived behavior control, green thinking, and social media marketing have a strong and positive association with the intention to purchase green products on social media. To the best of the authors' knowledge, this is the first empirical research to explore the moderating-mediating impact of social media usage interaction on the proposed TPB model, bridging research gaps by investigating the effect of consumers' green purchase intentions. Theoretical, managerial, and policy contributions are discussed.

1. Introduction

Rapid economic growth has caused an imbalance in the ecological environment and overconsumption of natural resources. The major environmental concerns include ozone depletion, global warming, water and air pollution (Wang et al., 2019; Afrifa et al., 2020). The Intergovernmental Panel on Climate Change (IPCC) emphasized the necessity for rapid and significant reductions in greenhouse gas emissions (IPCC, 2018; Bauer et al., 2022) to keep global warming to 1.5° Celsius. Past studies evidence that primary causes of the current ecological and environmental challenges have been increased due to population and excessive consumption (Kates, 2000; Chen and Hung, 2016). A recent study by Farrukh et al. (2022) indicates that organizations are responsible for climate change because they keep releasing carbon dioxide and toxic substances into the air and water. Environmental scientists and

activists expect organizations and individuals to adopt green and sustainable consumption practices. Sustainable consumption practices (buying and consuming products in an eco-friendly way) are an essential component of sustainable development (Nekmahmud et al., 2022). Sustainable consumption is one of the Sustainable Development Goals (SDGs), which covers minimizing harmful environmental and health impacts and promoting eco-friendly lifestyles (Ramkissoon et al., 2013; United Nations, 2015). The European Union (EU) proposed a European Green Deal, which aims to make sustainable products the norm in the EU, promote circular business models, and empower consumers for the green transition (EU, 2019). As a result of the new requirements, products have to be more environmentally friendly, durable, reusable, repairable, upgradeable, easier to maintain, refurbish, recycle as well as be energy and resource-efficient (European Commission, 2021).

However, environmental and socioeconomic interdependence are

Abbreviations: SM, Social Media; SMM, Social media marketing; SMU, Social media usage; GPI, Green purchase intention; GT, Green thinking; GPK, Green product knowledge.

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included in the various segments of sustainable development, which are required to conserve resources for future generations and sustainable economic growth (Dangelico and Vocalelli, 2017). Consumers are likely to put extra effort into behaving in an environmentally responsible way when businesses promote green marketing concepts (Kumar and Polonsky, 2017; Hasan et al., 2019). Consumers' choice of goods and services has both direct and indirect negative impacts on the environment (Gruber and Schlegelmilch, 2014; iPuigvert et al., 2020). Thus, it remains crucial for businesses to understand consumers' perceptions and intentions to purchase green products.

Eco-friendliness and environmental concerns have gained substantial attention from marketers, practitioners, and academics. Green products are considered as environmentally-friendly and manufactured from non-toxic, natural, recycled material and eco-packaging (Ottman and Books, 1998; Nekmahmud et al., 2022). For long-term business goals and profit, businesses and marketers use several marketing strategies and policies to encourage consumers to purchase green products. Besides, environmental movements have substantially impacted consumers' behavioral patterns, environmental concerns, and green product purchases (Alwitt and Pitts, 1996; Zahid et al., 2018). Several firms now use various media platforms for advertising their products to capture untapped customers and increasingly invest in green marketing (Sun and Wang, 2020). Multiple media platforms are being used, including print media, television, and internet-based media, e.g., social media. As a combination of the versatility of individual and mass media, social media is vastly used to promote green products compared to other platforms (Shankar et al., 2020; Zafar et al., 2021; Sharma et al., 2022). Social media plays a vital role in effectively influencing the purchase process in several well-established varieties of products such as m-banking, cosmetics, electronic products, textile products, and consumer goods (Masuda et al., 2022; Sharma et al., 2022; Nasir et al., 2021; Sun and Wang, 2020). Nonetheless, using digital marketing strategies (e.g., social media) can also help supermarkets reduce food waste (Gustavo et al., 2021). Moreover, social media plays an appreciable role in transforming consumers' purchase intentions and attitudes toward green products (Huang, 2016). Scholars argue (e.g., Logan et al., 2012) that media proliferation has dramatically affected the way of advertising messages. Advertisers are shifting from television usage and increasingly capitalizing on alternate media, e.g., social networking sites because it is cost-effective and easy to reach their target audience (Shoukat and Ramkissoon, 2022). Tankovska (2021) reports that in 2020 around 3.6 billion global users used social media. It is estimated that by 2025, this figure will rise to 4.41 billion with platforms such as Facebook, Instagram, YouTube, LinkedIn, WhatsApp, WeChat, Snapchat, etc. These social media sites are becoming increasingly popular, especially among the young generation (Luo et al., 2020). Companies promoting their green products on social media can interact more directly with their customers (Pop et al., 2020). Thus, it is essential to analyze the significance of social media usage (SMU) and social media marketing (SMM) to promote green products and evaluate its effect on consumers' green purchase intention (Sun and Wang, 2020).

Most studies have however, focused on the determinants of green purchase intention (GPI) and behavior in developed and developing countries, e.g., USA (Bedard and Tolmie, 2018), UK (De Silva et al., 2021), Italy (Barbarossa and De Pelsmacker, 2016), India (Paul et al., 2016), China (Ali et al., 2020), EU (Liobikiene et al., 2016) and so on. Social media influence on green product purchase behavior in Europe needs to be explored (Nekmahmud et al., 2022). Therefore, the current study analyzes how social media marketing (SMM) and social media usage (SMU) currently affect consumers' purchase intention for green products in Europe.

On the other hand, some studies investigate green purchase behavior by applying several theories, e.g., TPB, TRA, and SOR, with particular products, e.g., organic food, green products, energy-efficient appliance, and green hotels (Chen and Tung, 2014; Paul et al., 2016; Liobikiene et al., 2016; Hsu et al., 2017; Nekmahmud, 2020; Zafar et al., 2021;

Nekmahmud et al., 2022). A deeper understanding of the underlying consumers' purchase intention of green products on social media is required to advance knowledge in this field. Our study aims to fill this research gap. We compare the relationship among the proposed variables and examine the moderating-mediating effects of social media engagement on the TPB framework. Furthermore, we consider educating young consumers to understand green purchase behavior because they represent both present and future consumers.

The novel contributions of this study are two-fold: (1) examining the role of social media (SM) and social media marketing (SMM) in transforming consumers' purchase intention toward green products; (2) contributing to limited studies considering the role of social media in shaping green purchase intention of consumers. We fill this gap with the TPB application and added variables, such as social media usage (SMU), social media marketing (SMM), green product knowledge (GPK), and green thinking (GT). The current study is the first empirical study that comprehensively offers a theoretical framework regarding consumers' green purchase intention (GPI) by social media in Europe.

To fulfill the research objectives, we examine the following research questions; 1) How can SMU play a role in encouraging consumers to buy green products? 2) How does SMM affect consumers' green purchase intention? 3) What are the relationships among proposed variables with green purchase intention in the TPB model? 4) How do SMU, GPK, and SMM moderate-mediate the intention-behavior relationship?

This study provides important theoretical and practical contributions by investigating the role of SMU, SMM, and GT in understanding consumers' green purchase attitudes and intentions. Furthermore, online advertising agencies, companies, and policy planners can use these findings to better understand how consumers perceive green products in the context of social media and social media marketing. The following sections of this study continue with a review of the literature and theoretical justification, description of the methods, results, discussion of findings, implications, limitations, and conclusion.

2. Literature review

2.1. Conceptual orientation: theory of planned behavior

The theory of planned behavior (TPB) was developed to know the consumers' actual behavior and behavioral intentions (Ajzen, 1985). In the last few years, scholars have applied TPB to analyze and evaluate the pro-environmental behavior of consumers (Chao and Lam, 2011; Chen and Tung, 2014; Wang et al., 2020a, 2020b). Some studies are used the TPB model to envisage the green purchase intentions of consumers (Liobikiene et al., 2016; Yadav and Pathak, 2017; Tong et al., 2020; Nekmahmud et al., 2022). Nevertheless, a limited number of studies have incorporated the role of social media to examine consumer's green purchase intention by applying proposed behavioral theories, including stimulus-organism-response (Luo et al., 2020; Zafar et al., 2021), Social Impact Theory (Bedard and Tolmie, 2018), Theory of Reasoned Action (TRA) (Zhao et al., 2019; Zafar et al., 2021), which are focused on how green advertising affects green purchase intention on social media. Those theories failed to predict a range of green intentional behaviors. Only a few studies (Sun and Wang, 2020; Pop et al., 2020) applied TPB to examine the intentions of consumers to purchase green cosmetics on social media. Nevertheless, compared to TRA, TPB better explain the relationship between behavioral intention and actual behavior of green products. Besides, TPB is widely applied to realize consumers' behavioral intention in different situations (Park and Kwon, 2017).

Thus, the current study attempts to extend TPB to better understand of consumers' GPI by adding SMU, SMM, and GT as antecedents of GPI. Previous literature testified the impact of only one of the variables among social media and SMM on green purchase intention. Social media itself does not have a significant effect on GPI. However, social media is trusted as an effective online communication platform, as it is used to connect individuals to one or many others (Mo et al., 2018; Luo et al.,

2020). Conversely, social media marketing (SMM) is the ideal alternative for advertisers to integrate relevant marketing messages into conversations happening on social networks (Lee et al., 2018). None of the studies has incorporated both SMU and SMM variables in their proposed model to the best of our knowledge. So, our study attempts to bridge this research gap by examining the impact of these variables on the green purchase intention of consumers. Table 1 presents an overview of the literature on social media and green purchase behavior.

2.2. Research model and hypotheses

2.2.1. Attitude

Attitude (AT) describes the extent to which the purchase behavior of an individual toward products or services is positively or negatively evaluated (Chen and Deng, 2016). Eagly and Chaiken (2007) have described it as a psychological path that affects the disfavor or favor of a person toward a particular product or object. According to previous studies (e.g., Yadav and Pathak, 2016; Yadav and Pathak, 2017), attitude is significantly correlated with GPI. Sreen et al. (2018) researched Indian consumers to examine their GPI and noticed that attitude toward green products posted the highest impact on GPI. Their findings suggest

Table 1
Empirical contributions on purchase intentions toward green products on social media (2010–2022).

Authors (years)	Study focus	Applying theory	Sampling and areas	Methods	Factors with sig. direct and indirect effect	Factors with no sig. effect	Remarks
Gupta and Syed (2022)	• To analyze how social media (SM) activities impact green product marketing	TPAM and U&G theory	536, India	SEM	Word of mouth, interaction, entertainment and customization → green attitude	Trendiness → green attitude	Four major social media marketing activities, e.g., word-of-mouth, interaction, entertainment, and customization, can play a role in shaping attitude
Zafar et al. (2021)	• To explore the relationship between sustainable purchase decisions and personalized advertising	TRA and SOR	713, China	SEM	Buying impulse tendency, personalized advertising, mobile shopping attitude, urge to purchase impulsively, environmental knowledge → sustainable purchase decision	Urge to purchase impulsively → sustainable purchase decision	Digitalization affects the sustainable purchase decision in a positive way
Chi (2021)	• To examine the effect of eco-label, eco-brand, and SM on GPI		350, Vietnam	SEM	Eco-brand, eco-label, motivation, social media → green consumption intention		Correlation of social media with GPI was moderated by environmental concern and mediated by motivation
Luo et al. (2020)	• To examine the fundamental system because of which skepticism of green advertising affects GPI on SM	Stimulus–organism–response (SOR) model	685, China	SEM	Green advertising skepticism, information utility, self-construal → GPI	Green advertising skepticism → perceived information utility	People with a strong interdependent self-construal purchase green products once they trust that green commercials provide valid evidence
Pop et al. (2020)	• To assess SM influence on the egoistic and altruistic motivation of consumers toward green cosmetics	TPB	180, Romania and Hungary	SEM	Attitude, subjective norms, altruism, social media → purchase intention	Egoism → attitude	Social media has multiple effects on forming buying intentions among consumers
Sun and Wang (2020)	• To examine attitudes and intentions of the consumers to buy green products on SM • To investigate interrelationships between variables	TPB	654, China	SEM	Attitude, subjective norms, product knowledge, perceived behavior control, social media marketing, price consciousness → purchase intention	Perceived consumer effectiveness → purchase intention	Social media marketing poses the most significant favorable influence on perceived consumer effectiveness
Zhao et al. (2019)	• To clarify the role of SM on environmentally sustainable apparel purchase intentions	TRA	236, China	SEM and Hierarchical regression	Social media use and perception, attitude, influence of peers → purchase intention	Subjective norm → purchase intention	In moderating relationship between GPI and attitude, social media use and perception play a significant role
Zahid et al. (2018)	• To identify factors influencing GPI and publicity on SM		347, Pakistan	SEM	Green product experience, supporting environmental protection, social appeal, environmental friendliness of companies → GPI	Environmental responsibility → social media publicity, and GPI	High-income group of people portrays more environmentally friendly behavior, and they tend to spread the green message on SM
Bedard and Tolmie (2018)	• To explore the SM and online interpersonal effects on GPI • How culture moderates this relationship among millennials	Social Impact Theory	131, USA	Regression analysis	Social media usage, online interpersonal influence → GPI		Purchase intentions of millennials are associated with their SM activity

that green products are more environmentally friendly than conventional ones and developing favorable attitudes toward them would promote consumer interest and contribute to the nation's sustainable future. Singh et al. (2021) examine the environmental sustainability intentions of family-owned firms and report that their objectives for ecological sustainability are substantially influenced by attitude. This implies that family-owned enterprises are more likely to engage in ecologically-friendly operations if they have a good attitude toward environmental sustainability. Similarly, Murwaningtyas et al. (2020) find that if consumers have a positive attitude toward organic cosmetics, they will show higher purchase intention through social media. The TPB, however, postulates that an individual shows positive behavior if that person possesses a positive attitude toward that behavior (Ajzen, 1991). Thus, we postulate the following hypothesis:

H1. : Attitude has a positive and significant effect on green purchase intention

2.2.2. Green thinking

Green thinking (GT) can be described as the ability to be aware of our connection with the world and manifest our unintentional acts of damaging environment (Ali et al., 2020). According to Jones (2019), green thinkers are believed to show more responsible behavior toward their intentions and decisions regarding environmental issues. Similarly, it is found that thinking positively about green labels tends to create a significant and positive assessment of green products (Hughner et al., 2007). The TPB model generally does not consider the feelings of individuals when making decisions and expressing intentions (Sniehotta, 2009; Sussman and Gifford, 2019). Therefore, an individual's environmental thinking or opinions is reported to positively influence green product buying decision (Wu et al., 2018). Previously, scholars have studied consumers' GT in green advertising (Rademaker and Royne, 2018; Jones, 2019), showing that ecologically conscious consumers accept green promotional messages. It enhances the ability to obtain green marketing information and motivates consumers to purchase green products even if it is expensive (Minbashrazgah et al., 2017). In any scenario, the established attitude can result from careful thinking. For example, customers' attitudes may have been transformed if they were more thoughtful about climate change, quality of life, and environmental protection (Ramkissoon, 2020a). Hence, it can be observed that GT can act as a potential factor in influencing consumer attitudes and GPI. Previous study (Ali et al., 2020) has reported a significant relationship between GT and GPI in general products. As a result, we may establish that customers' GT may be a potential construct for increasing GPI. Therefore, we postulate the following hypotheses:

H2a. : Green thinking has a positive and significant effect on attitude.

H2b. : Green thinking positively and significantly affects green purchase intention.

2.2.3. Green product knowledge

Product knowledge is the accumulation of information saved in the consumer's memory about specific products (Philippe and Ngobo, 1999). Green product knowledge (GPK) encompasses green products' familiarity with the consumer and the features and subjective evaluation of those products (Kang et al., 2013; Sun and Wang, 2020). Literature suggests knowledge and understanding of the product acquired by past experiences can positively influence consumers' behavioral intentions toward product consumption (Nunkoo and Ramkissoon, 2010; Ramkissoon and Uysal, 2011; Kang et al., 2013). Consumers' prior knowledge about a particular product influences their purchasing decisions for such products (Schwarz, 2006; Ritter et al., 2015). Nevertheless, Bettman and Park (1980) suggest that knowledge about the products could help lower uncertainties and risks. If consumers have better knowledge about a specific product, they can understand the product quality to assist in purchasing decisions. Knowledge is considered one of the

essential aspects for successfully implementing the action (Farrukh et al., 2022). Wang et al. (2020a, 2020b) report that product or process knowledge transforms consumers' intentions toward remanufactured products in a circular economy. Green product information, as well as their availability at points of sale, are highlighted as enhancing green consumption. In addition, consumer education might increase green consumption (Ritter et al., 2015). Other studies have reported a direct and positive influence of GPK on the GPI of consumers (McEachern and Warnaby, 2008; Kang et al., 2013). Further, Chen and Deng (2016), in their study on Chinese consumers, have reported a mediating role of GPK between green attitude and GPI; however, its explanatory power decreased in the context of high product knowledge. Additionally, Paço and Lavrador (2017) and Sun and Wang (2020) have found that GPK significantly and positively influences GPI as well as attitude. Hence, based on previous literature, the following hypotheses are formulated:

H3a. : Green Product knowledge has a positive and significant effect on attitude.

H3c. : Green product knowledge positively and significantly affects green purchase intention.

2.2.4. Social media marketing

Marketing has substantially transformed as a management activity and academic discipline in the last twenty years. Traditional marketing principles, such as mass marketing approaches, common in the 1960s and 1970s, are becoming less effective today (Constantinides, 2014). Some scholars argue that social media marketing (SMM) is considered the best option for advertisers because consumers select similar lifestyle groups (Lee et al., 2018). Currently, customers have become more sophisticated because of social media, which helped them adopt new strategies for evaluating, searching, selecting, and purchasing products they prefer (Sun and Wang, 2020). It is easy to enter and target consumers and promotes green advertising via networking, user communications, positive eWOM spread, and interpersonal relationships (Hung et al., 2011; Mo et al., 2018). Firms use social media to promote and highlight their green products (Sun and Wang, 2020). Several scholars have testified that social media plays a significant impact in persuading consumers' intentions and attitudes toward green products (Huang, 2016; Zhao et al., 2019). In green advertising, SM is trusted as an effective platform, as it facilitates interpersonal communications and networking that leads to an electronic and indirect form of interaction that advances from word-of-mouth (Mo et al., 2018; Luo et al., 2020). As SM facilitates increased development or process knowledge, consumers intend to transform their purchasing intentions and attitudes toward green products. Sun and Wang (2020) report that social media advertising also helps increase the product knowledge of green products. Likewise, some studies proved the positive influence of SMM on SNs and product knowledge (Mangold and Faulds, 2009; Schuitema and De Groot, 2015; Sun and Wang, 2020). SMM is also shown to have an important and positive influence on customer intentions to engage in pro-environmental behavior (Hynes and Wilson, 2016). Thus, the following hypotheses are formulated:

H4a. : Social media marketing has a positive and significant effect on green product knowledge.

H4b. : Social media marketing has a significant effect on green purchase intention.

H4c. : Social media marketing has a positive and significant effect on subjective norms.

2.2.5. Subjective norm

Subjective norm (SN) explains that behavior is either executed or not executed under the influence of perceived social pressures (Ajzen, 1991). SN is also considered a social pressure exerted on a person to perform a particular action or behavior (Ajzen and Fishbein, 1980;

O'Neal, 2007). McClelland (1987) proposed the theory of needs in which he suggests that there is a propensity of an individual to display behavior which his/her reference group appreciates because it is a nature of a person to seek group association and relationship. Furthermore, firms are more likely to embrace and execute pro-environmental activities if a significant number of individuals support ecologically sustainable practices since they sense social pressure (Singh et al., 2021). Previous studies have reported a significant and positive association between SN and purchasing intention (Dean et al., 2008; Ramkissoon et al., 2013; Al-Swidi et al., 2014). This reveals that social pressure tends to significantly impact consumers' intention or attitude toward certain products. However, the positive association between SN and GPI has been refuted by several studies (e.g., Paul et al., 2016; Chaudhary and Bisai, 2018). This can explain that high social pressure negatively influences an individual toward certain actions or intentions, and they are not likely to buy such products. Furthermore, Sun and Wang (2020) and Pop et al. (2020) find a positive impact of social media on SN and then a significant impact of SN on the GPI of an individual. Hence, we postulate the following hypothesis:

H5. : Subjective norm has a positive and significant effect on green purchase intention.

2.2.6. Perceived behavioral control

Perceived behavioral control (PBC) is the perceived difficulty or ease of performing a particular behavior (Ajzen and Fishbein, 1980; Ajzen, 1991). PBC is a result of control beliefs and perceived power. Control beliefs, including cost, time, availability, and effort, may assist or hinder consumers' purchase intention (Barbarossa and De Pelsmacker, 2016; Yadav and Pathak, 2017). Perceived power refers to an individual's measure of the impact to which specific elements facilitate or obstruct a particular behavior (Ajzen, 1991). Prior studies have shown that perceived inconvenience negatively impacts an individual's purchase intentions for eco-friendly products (McCarty and Shrum, 2001; Barbarossa and De Pelsmacker, 2016). However, an individual considers past experiences and anticipated problems before taking a specific action. Previous research has supported PBC's significant and positive impact on GPI (Chen and Tung, 2014; Paul et al., 2016; Hsu et al., 2017). Due to increased awareness of the consequences of non-eco-friendly products, consumers are adopting more pro-environmental practices. Therefore, we propose the following hypothesis:

H6. : Perceived behavioral control has a positive relationship with green purchase intention.

2.2.7. Social media usage

Pop et al. (2020) state that social media significantly transforms consumers' subjective norms and attitudes. Social media usage (SMU) strongly influences the consumers' perception, attitude, and purchasing decisions at each stage of their purchase decision (Mangold and Faulds, 2009). SMU helps educate young consumers about sustainability and environmental practices (Zhao et al., 2019). A few studies have approved the significant role of SMU in altering or shifting consumers' attitudes toward green products or GPI (e.g., Huang, 2016; Zhang et al., 2018; Sun and Wang, 2020; Zhao et al., 2019). Social media is considered as one of the most effective and powerful tools in respect of consumer marketing, and it has changed the way of interaction or communication between marketers and consumers (Zhao et al., 2019). Some studies have found that the social media activity of consumers poses positive influence on their pro-environmental behavior (Săplăcan and Márton, 2019), green attitude, subjective norms (Pop et al., 2020), perceived behavior control (Sun and Wang, 2020), and green purchase intentions (Li et al., 2012; Bedard and Tolmie, 2018). Hence, the following hypotheses are formulated:

H7a. : Social media usage positively and significantly affects green attitude.

H7c. : Social media usage positively and significantly affects green purchase intention.

H7f. : Social media usage positively and significantly affects subjective norms.

H7g. : Social media usage positively and significantly affects perceived behavioral control.

2.2.8. Moderating variables as SMU and GPK

Consumers with environmental knowledge are more responsible for protecting the natural environment (Cheng and Wu, 2015). Similarly, green product knowledge (GPK) relates to the consumer's familiarity with products as well as knowledge about a specific green product that influences their GPI (Liu et al., 2017). Knowledge helps to understand the proper ways to achieve a goal (Hasan et al., 2019; Farrukh et al., 2022). Thus, in the current study context, GPK may appear to be a significant precondition for establishing attitudes toward environmental concerns and environmentally friendly products (Kaiser et al., 1999). GPK can moderate the relationship between attitude and GPI. Chen and Deng (2016) have reported a moderating influence of GPK between AT and GPI. They assert that there will be a strong effect of AT on GPI if consumers have insufficient product knowledge. Another study has posited that increasing consumer product knowledge would stimulate a positive attitude toward GPI (Synodinos, 1990). Therefore, we propose that GPK could moderate the effect of AT and GPI.

Nevertheless, SMU assists in informing consumers about sustainability and green products. It has a significant role in influencing consumers' perceptions, attitudes, perceived behavioral control, and purchasing intentions at each stage of the purchasing decision (Mangold and Faulds, 2009; Zhao et al., 2019). Thus, it may perform as a moderator construct in the TPB. To our best knowledge, the moderating effect of SMU between AT and GPI, SN and GPI, and PBC and GPI has not been empirically investigated in any previous study. Thus, social media usage is regarded as a significant variable that could influence attitude, SN, and PBC, which will lead to positive GPI. We formulate the following hypotheses:

H3b. : Green product knowledge moderates the relationship between attitude and green purchase intention.

H7b. : Social media usage moderates the relationship between attitude and green purchase intention.

H7d. : Social media usage moderates the relationship between subjective norms and green purchase intention.

H7e. : Social media usage moderates the relationship between perceived behavioral control and green purchase intention.

Fig. 1 presents our hypothesized conceptual model of consumers' GPIs on social media based on the literature and theoretical background mentioned above. In this model, AT, SN, PBC, GT, SMU, and SMM are predictive factors that could directly contribute to purchasing intentions regarding green products. Additionally, it is presumed that SMU could moderate the influence of AT, SNs, and PBC on consumer intention to buy green products through the social media platform. Moreover, GPK could have a moderating relationship between AT and GPI.

3. Method

3.1. Data collection and sampling

The research was multi-layered and used both qualitative and quantitative evidence to better understand consumer behavior and their perception of purchasing green products on social media. Fig. 2. presents the flowchart of the research method. Data was gathered from consumers living in Hungary (Hungarians & non-Hungarians), Europe. We targeted young respondents who had prior experience buying green

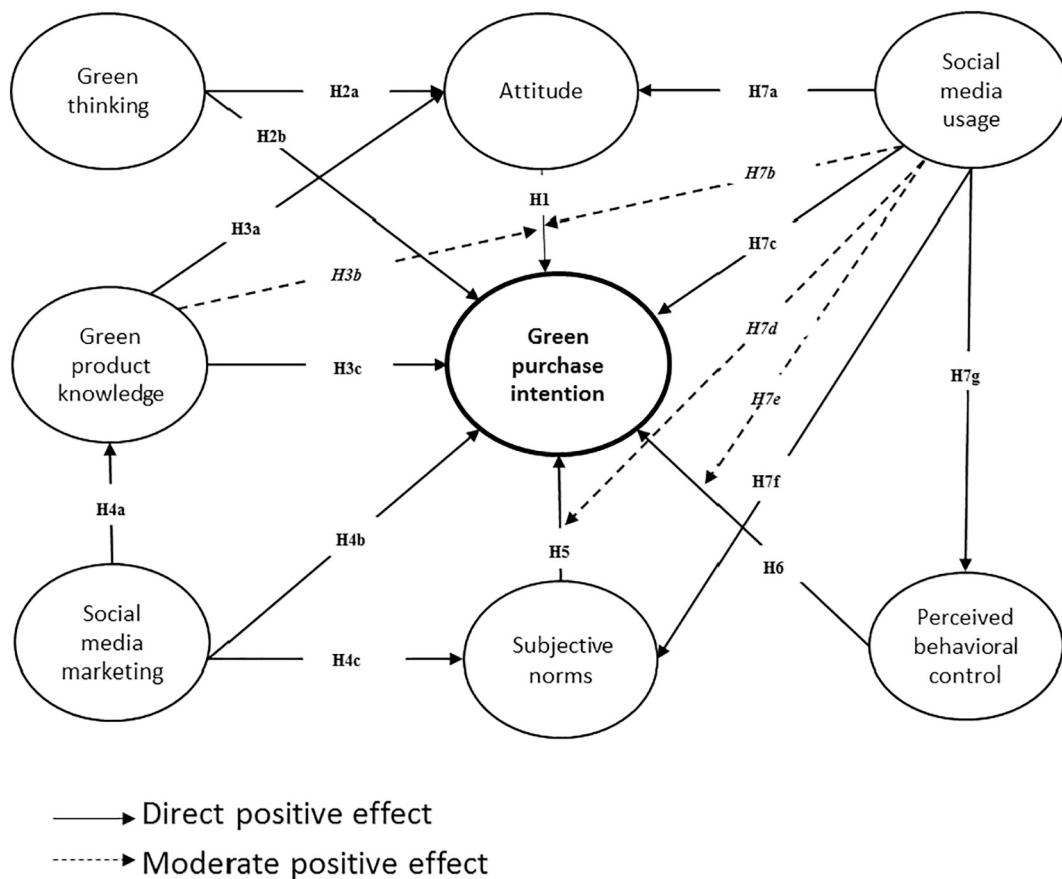


Fig. 1. Proposed a new conceptual model of consumers' GPI on social media.

products, especially organic or local vegetarian food, organic food, reusable, recyclable, and green products. We asked about the survey among the participants. Have they had any previous experience buying green items and being influenced by social media? If they said yes, respondents received access to answer the next questions. Due to COVID-19 place confinement (Ramkissoon, 2020b), we could not administer the survey questionnaire face to face. As a result, in March 2021, a self-administered questionnaire was distributed online over six weeks to students studying at six universities in Hungary using the judgmental sampling approach. Our study used judgmental sampling since it is less time-consuming, saves money, and allows direct access to our target population of interest (Fielding et al., 2012). As the purpose of this study is to understand the GPI of young consumers on social media, thus, university students were approached for data collection. Six universities were chosen to ensure geographic coverage; the selected institutions also had a high number of international students and are located in five major cities: Budapest, Debrecen, Gödöllő, Pécs, and Szeged.

Every institution in Hungary offers a Facebook community for international students as well as Neptun educational email systems (www.neptun.hu). University administrations are responsible for running University social media groups, and students can post questionnaires on those social media groups, e.g., Facebook, and participate in any research. Because of its convenience, we contacted twelve professors and administrative authorities of six Hungarian universities in order to post Google docs form questionnaires to the social media group and send emails individually through the university's educational email system. University social media admins distributed questionnaires to Hungarian and non-Hungarian (international) students via the Neptun system and posted questionnaires on university social media groups, e.g., Facebook, without considering their sex, behavior, and territorial status. In this study, the non-Hungarian students (respondents) belong to several

nationalities, e.g., 7 countries from Asia, 6 countries from the Middle East, and 14 other countries from Europe. According to Ali et al. (2021), the most successful data collection method is online, which found to be 54 % average response. We collected 950 responses, excluded missing information, and analyzed 785 valid questionnaires in order to avoid biased results. According to previous research by Hair et al. (2010, 2014), this sample size is appropriate for our study, as the data set should be at least ten times the parameter/items (Kline, 1998; Hair et al., 2014). Since this analysis included 34 items, a sample size of 340 was needed as a minimum. 785 valid responses were gathered for data processing, representing a 75 % response rate from this distribution. An overview of the respondent's socio-demographic data is shown in Table 2.

3.2. Measurement of constructs

The questionnaire was in English, and two sections as follows: (1) socio-demographic questions (2) 34 items related to latent variables such as AT, SN, PBC, GT, GPK, SMU, SMM, and GPI. All of the items were evaluated using a 5-point Likert scale (From 5 = strongly agree to 1 = strongly disagree). Four measurement items for constructs (e.g., AT, PBC, GPI) and three measurement items for (e.g., SN) were adopted from earlier literature (Ding et al., 2017; Wang et al., 2018; Sun and Wang, 2020). Four corresponding items for GT were adopted from the studies (Mostafa, 2007; Lee, 2008; Ali et al., 2020). Seven items for implementing SMM were adapted from literature (e.g., Logan et al., 2012; Ding et al., 2017; Wang et al., 2018; Sun and Wang, 2020). Four assessment substances of GPK were adopted from the study of Sun and Wang (2020) and Kang et al. (2013). Finally, four items of SMU were adapted from literature (Gunawan and Huarng, 2015; Pop et al., 2020) (see Appendix A for all details of items and constructs). Selected eight

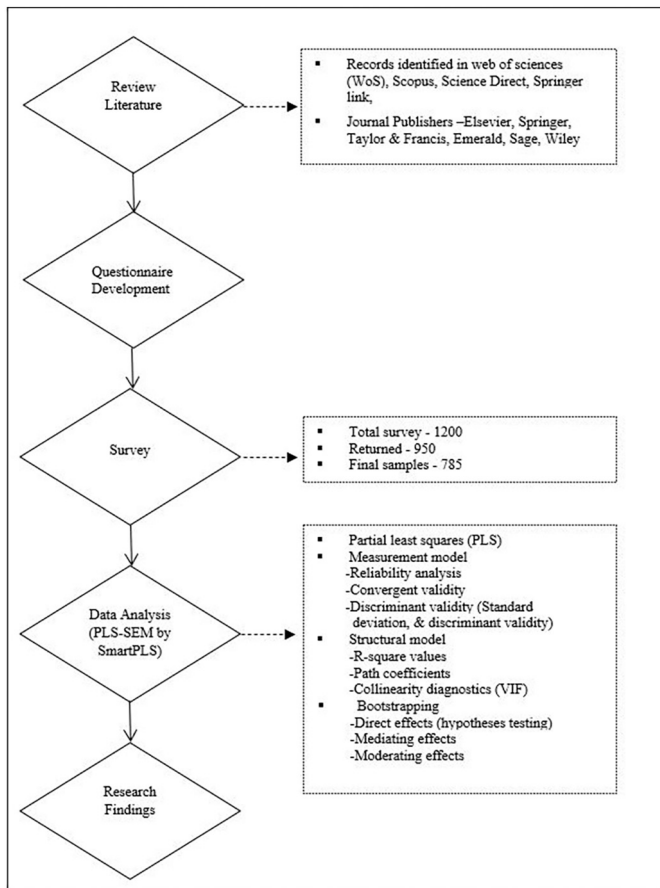


Fig. 2. The flow chart of research methodology (Nekmahmud and Fekete-Farkas, 2020) (Source: Authors’ explanation).

Table 2 Respondents’ socio-demographic data.

Characteristics	Frequency	Percent
Gender		
Male	465	59.8
Female	310	39
Others (transgender & gay)	10	1.2
Age (years)		
18–22	140	17.84
23–27	150	19.11
28–32	275	34.6
33–37	170	21.4
38–42	50	6.38
Education		
Undergraduate	210	27.05
Postgraduate	350	44.0
PhD	210	27.05
Others	15	1.9
Hungarian University of Agriculture and Life Sciences	257	32.73
Budapest University of Technology and Economics	123	15.68
Corvinus University of Budapest	83	10.57
University of Debrecen	135	17.19
University of Pecs	105	13.37
University of Szeged	82	10.46
Total (respondents)	785	100

variables with 34 items were measured on an ordinal scale that was used to represent non-mathematical ideas such as frequency, purchase behavior, intention, satisfaction, enjoyment, etc. (Forrest and Andersen, 1986). Thus, it used an ordinal scale to determine consumer buying intention. Before finalizing the questionnaire and having an appropriate conceptual framework, it was pretested by 35 people using social media

platform’s online survey, e.g., pretesting the content and readability on Facebook. We omitted a few items after pretesting because it was unclear, contradictory, or unsuitable.

3.3. Model specification and data analysis

A two-step structural modeling technique (Anderson and Gerbing, 1988) and PLS-SEM (partial least square- structural equation model) approach (Lohmöller, 1989) was applied in the research for assessing the underlying theoretical model and testing hypotheses. The experiment was carried out with the help of the software Smart-PLS 3.2.3 (Ringle et al., 2015). A fully-fledged SEM method (Henseler et al., 2016) is a recent concept in the PLS-SEM that could be extended to reflective and formative model simulations to facilitate the measurement of a more multiplex model (Sarstedt et al., 2016), and theoretical model structures with high complexity (Jöreskog and Wold, 1982). PLS-SEM is particularly helpful if the study aims to predict a structural model which describes the target construct (Rigdon, 2012; Richter et al., 2016). Since our research goals are to forecast consumers’ GPI, thus, PLS-SEM is well suited to demonstrate how fundamental factors predict purchase intention on social media (Coelho and Henseler, 2012). For testing hypotheses, 5000 sub-samples were bootstrapped, with a bias-corrected and accelerated (Bca) bootstrap confidence interval and two-tailed significance checks at a 95 % confidence level (Aguirre-Urreta and Rönkkö, 2018).

Table 4 presents the results of the correlation matrix between the key constructs, and the research results have no Common Method Bias (CMB). The correlation between constructs is <0.9; hence, no concern was noted about CMB (Rasoolimanesh et al., 2017).

4. Results

4.1. Measurement model evaluation

At this point, the inconsistency and validity of latent constructs were examined, including internal consistency, calculation of convergent construction validity, and discriminant validity.

Cronbach’s coefficient alpha was applied to verify the dataset’s reliability, and t composite reliability was used to test the internal consistency of the constructs. All constructs with Cronbach’s alpha values are larger than 0.700 and no problems with reliability (Anderson et al., 2010). Table 3 shows that the value of Cronbach’s alpha for each construct crosses the threshold value 0.700. Composite reliability (CR) ranges from 0.880 to 0.959, which are greater than the 0.70 threshold value (Hair et al., 2014), indicating strong reliability between processes. Consequently, the survey instrument is valid in all areas of research design and is consistently free from random errors. Composite reliability, standardized factor loading, and average variance extracted were applied to calculate convergent validity. Table 3 shows the results, AVE values exceed the ideal value of 0.50 (Hair et al., 2014). The loading of each item exceeds the optimum value of 0.70 (Hair et al., 2021), and composite reliability exceeds 0.70, suggesting that the construction has strong convergent validity.

Fornell and Larcker (1981) recommended that a reliable construct must have a minimum cut-off value of 0.50. Following this recommendation, two items were omitted as they did not meet the loading level requirements of <0.50, namely an item of green product knowledge (GPK3: “I often learn about green products through articles or news” with 0.652 loadings), green purchase intention (GPI3: “I intend to pay more for green products” with loading 0.565).

The variance inflation factor (VIF) values for each item range from 1.459 to 4.713, lower the threshold value of 5.0, which means that the structural model has no multicollinearity and no negative effect between items or predictors (Ringle et al., 2015; Hair et al., 2017). As a result, each construct is statistically distinctive and explains how discriminant validity is satisfactory.

Table 3
The evaluation of the measurement model (reliability, validity, and VIF).

Constructs	Items	Loading	Cranach's Alpha	rho_A	Composite reliability (CR)	(AVE) ^b	VIF
Attitude	AT1	0.927	0.944	0.945	0.959	0.855	4.274
	AT2	0.936					4.713
	AT3	0.908					3.692
	AT4	0.928					4.383
Green Thinking	GT1	0.800	0.896	0.903	0.928	0.763	1.957
	GT2	0.910					3.210
	GT3	0.903					3.396
	GT4	0.876					2.747
Green Product Knowledge	GPK1	0.771	0.795	0.810	0.880	0.710	1.459
	GPK2	0.888					2.013
	GPK4	0.864					1.895
Social Media Marketing	SMM1	0.707	0.901	0.904	0.922	0.630	2.435
	SMM2	0.770					2.760
	SMM3	0.715					1.825
	SMM4	0.811					2.114
	SMM5	0.871					2.201
	SMM6	0.843					2.185
	SMM7	0.825					1.862
Subjective Norms	SN1	0.903	0.912	0.913	0.945	0.850	2.679
	SN2	0.926					3.312
	SN3	0.938					3.735
Perceived Behavioral Control	PBC1	0.847	0.849	0.853	0.898	0.687	2.126
	PBC2	0.822					1.819
	PBC3	0.811					1.968
	PBC4	0.835					2.012
Social Media Usage	SMU1	0.852	0.867	0.873	0.91	0.716	2.435
	SMU2	0.877					2.760
	SMU3	0.795					1.825
	SMU4	0.858					2.114
Green Purchase Intention	GPI1	0.928	0.878	0.884	0.925	0.805	3.587
	GPI2	0.925					3.514
	GPI4	0.836					1.811

All the diagonal values reach the row and column values, suggesting that discriminant validity is sufficient. Additionally, all the HTMT ratios are below 0.85, except GPI with AT (0.891), GT with AT (0.867), and GT with GPI (0.884), while GPI and AT still lower the threshold value of < 0.90 (Henseler et al., 2015) (see Table 4). The measurement model achieves discriminant validity.

Table 4
The findings of discriminant validity, Fornell-Lacker, and HTMT criterion.

	AT	GPI	GPK	GT	PBC	SMU	SMM	SN
Fornell-Larcker Criterion (FLC)								
AT	0.925							
GPI	0.815	0.897						
GPK	0.636	0.635	0.842					
GT	0.801	0.785	0.702	0.873				
PBC	0.638	0.742	0.596	0.676	0.829			
SMU	0.454	0.484	0.540	0.552	0.594	0.846		
SMM	0.678	0.677	0.601	0.694	0.671	0.711	0.794	
SN	0.672	0.688	0.611	0.658	0.607	0.549	0.567	0.922
Heterotrait Monotrait Ratio (HTMT)								
AT								
GPI	0.891							
GPK	0.727	0.757						
GT	0.867	0.884	0.829					
PBC	0.702	0.853	0.723	0.769				
SMU	0.497	0.553	0.647	0.628	0.689			
SMM	0.733	0.757	0.706	0.773	0.762	0.807		
SN	0.723	0.770	0.719	0.730	0.684	0.614	0.655	

Note: AT: Attitude; GT: Green thinking; GPK: Green product knowledge; SMM: Social media marketing; SMU: Social media usage; SN: Subjective norms; PBC: Perceived behavioral control; GPI: Green purchase intention.

4.2. Structural path model to examine hypothesized relationships

The structural model is the second step in the PLS process and is applied to assess the testing hypotheses. Table 5 presents the outcomes of path relationships. We measured the R^2 to evaluate the sample consistency of the model. The model clarifies 65 % for AT, 36 % for SN, 35 % for PBC, 36 % for GPK and 78 % for GPI (R^2 Adjusted: 0.65 for AT, 0.36 for SN, 0.35 for PBC, 0.36 for GPK and 0.78 for GPI) (see Fig. 3).

According to Rasoolimanesh et al. (2016), R^2 values exceeding 20 % are considered significant for consumer behavior studies. Since one of our main aims is to determine the moderating impact of GPK and SMU, R^2 is favored over Q^2 as a consistency criterion for “explanatory modeling efforts” (Shmueli et al., 2016, p. 4555). Moreover, the blindfolding approach is used by PLS to test predictive ability. For the interdisciplinary endogenous constructs, cross-validation data redundancy values of 0.55 for AT, 0.31 for SN, 0.24 for PBC, 0.26 for GPK, and 0.62 for GPI,

Table 5The effects of the structural model (p values) and Coefficient of determination (R^2).

HN	Hypothesized paths	Std β	M	SD	t value (bootstrap)	p values	2.5 %	97.5 %	Results
H1	AT \rightarrow GPI	0.382	0.381	0.037	10.220	0.000	0.309	0.456	Supported
H2a	GT \rightarrow AT	0.704	0.702	0.033	21.437	0.000	0.637	0.765	Supported
H2b	GT \rightarrow GPI	0.195	0.194	0.032	6.041	0.000	0.131	0.257	Supported
H3a	GPK \rightarrow AT	0.150	0.150	0.031	4.877	0.000	0.090	0.211	Supported
H3c	GPK \rightarrow GPI	0.022	0.024	0.026	0.825	0.409	-0.028	0.076	Not Supported
H4a	SMM \rightarrow GPK	0.601	0.602	0.030	19.927	0.000	0.535	0.653	Supported
H4b	SMM \rightarrow GPI	0.083	0.082	0.037	2.254	0.024	0.009	0.152	Supported
H4c	SMM \rightarrow SN	0.429	0.428	0.053	8.080	0.000	0.325	0.529	Supported
H5	SN \rightarrow GPI	0.128	0.129	0.025	5.069	0.000	0.080	0.178	Supported
H6	PBC \rightarrow GPI	0.283	0.283	0.030	9.429	0.000	0.223	0.342	Supported
H7a	SMU \rightarrow AT	-0.016	-0.015	0.024	0.646	0.518	-0.060	0.035	Not Supported
H7c	SMU \rightarrow GPI	-0.136	-0.135	0.032	4.250	0.000	-0.197	-0.073	Supported
H7f	SMU \rightarrow SN	0.300	0.301	0.045	6.681	0.000	0.214	0.389	Supported
H7g	SMU \rightarrow PBC	0.594	0.594	0.028	21.034	0.000	0.536	0.648	Supported
		R^2	R^2 Adjusted	SSO	SSE	$Q^2 (=1-SSE/SSO)$			
	AT	0.652	0.651	3140.000	1401.054	0.554			
	SN	0.368	0.366	2355.000	1623.245	0.311			
	PBC	0.353	0.353	3140.000	2387.752	0.240			
	GPK	0.369	0.368	2355.000	1742.829	0.260			
	GPI	0.786	0.782	2355.000	877.078	0.628			

Note: For two-tailed experiments, statistical significance is described as $p < 0.05$ (for t -value > 1.960).

Note: AT: Attitude; GT: Green thinking; GPK: Green product knowledge; SMM: Social media marketing; SMU: Social media usage; SN: Subjective norms; PBC: Perceived behavioral control; GPI: Green purchase intention.

Table 6

Results of the mediating investigation.

Indirect effects	Std β	T statistic	p -Value	Results Support	Total effect	Std β	T statistic	p -Value	Results Support
SMM \rightarrow GPK \rightarrow AT	0.056	4.442	0.000	Yes	SMM \rightarrow GPI	0.190	5.976	0.000	Yes
SMM \rightarrow GPK \rightarrow GPI	0.003	0.317	0.751	No	SMU \rightarrow GPI	0.084	2.469	0.014	Yes
SMM \rightarrow SN \rightarrow GPI	0.044	3.631	0.000	Yes					
SMM \rightarrow GPK \rightarrow AT \rightarrow GPI	0.022	4.039	0.000	Yes					
SMU \rightarrow AT \rightarrow GPI	-0.006	0.636	0.525	No					
SMU \rightarrow SN \rightarrow GPI	0.037	4.423	0.000	Yes					
SMU \rightarrow PBC \rightarrow GPI	0.175	8.948	0.000	Yes					

Table 7

Results of the moderation investigation.

HN		Std β	M	SD	t value (bootstrap)	p values	f^2	Results
H3b	Mod_AT_GPK_GPI \rightarrow GPI	0.040	0.042	0.019	2.079	0.038	0.005	Supported
H7b	Mod_AT_SMU_GPI \rightarrow GPI	-0.133	-0.133	0.032	4.134	0.000	0.027	Supported
H7d	Mod_SN_SMU_GPI \rightarrow GPI	0.038	0.036	0.036	1.068	0.286	0.002	Not Supported
H7e	Mod_PBC_SMU_GPI \rightarrow GPI	0.057	0.056	0.039	1.466	0.143	0.004	Not Supported

the model (Stone-Geiger test, Q^2) was determined to have methodological validity (Stone-Geiger test, Q^2) (Chin, 1998). These are categorized as medium to wide in scale and demonstrate (pseudo) out-of-sample predictive accuracy (Hair et al., 2019).

The findings reveal that twelve out of fourteen proposed hypotheses are accepted. "The path coefficient will be significant if the value is not zero without the confidence interval" (Hair et al., 2017, p. 156). The effects of the path coefficients and t values are shown in Table 5 and Fig. 3, whereby AT, GT, SMM, SN, PBC, and SMU seem to have a positive relationship with GPI, that are convenient in prospect (bootstrap t -value = AT-10.220, GT-6.041, SMM-2.254, SN-5.069, PBC-9.429, and SMU-4.250, $p < 0.001$). Consequently, H1, H2b, H4b, H5, H6, and H7c hypotheses are accepted. However, GPK is showing insignificant relationship with GPI, as p -values exceed ideal value of 0.05 (bootstrap t -value = GPK-0.825). So, it is validated that H3c is not supported. The path results show that GT, and GPK, have significant positive influences on AT (bootstrap t -value = GT-21.437, GPK-4.877, $p < 0.001$); as a result, H2a, and H3a are supported. Nevertheless, SMU has no significant influence on AT because p -value 0.518 is higher than 0.05

(bootstrap t -value = 0.646, $p > 0.05$). Thus, H7a is unsupported. Further, SMM has a significant influence on GPK (SMM-19.927, $p < 0.001$); therefore, H4b is supported. The path results estimate that SMU and SMM significantly influence SN, and p -value is less than the optimal 0.05 value (bootstrap t -value = SMM-8.080, SMU-6.681, $p < 0.05$), hence H4c and H7f are supported, signifying positive correlation among SMU, SMM, and SN. Finally, SMU has a strong relationship with the PBC (bootstrap t -value = SMU-21.034, $p < 0.001$), and H7g is supported in the model.

4.3. Testing for mediation: indirect and total effects

PLS bootstrap resampling was used to assess the mediating functions of consumer GPI through SMU and SMM in the model, as mentioned in Table 6. The result shows that in the context of SMM, the mediating roles of SN and GPK-AT have a full-mediation (complete) effect between SMM and GPI ($\beta = 0.044$, $p < 0.001$) and ($\beta = 0.022$, $p < 0.001$) respectively, but GPK insignificantly works as a mediating role between SMM and GPI ($\beta = 0.003$, $p > 0.05$). Nevertheless, the results present that SN and PBC

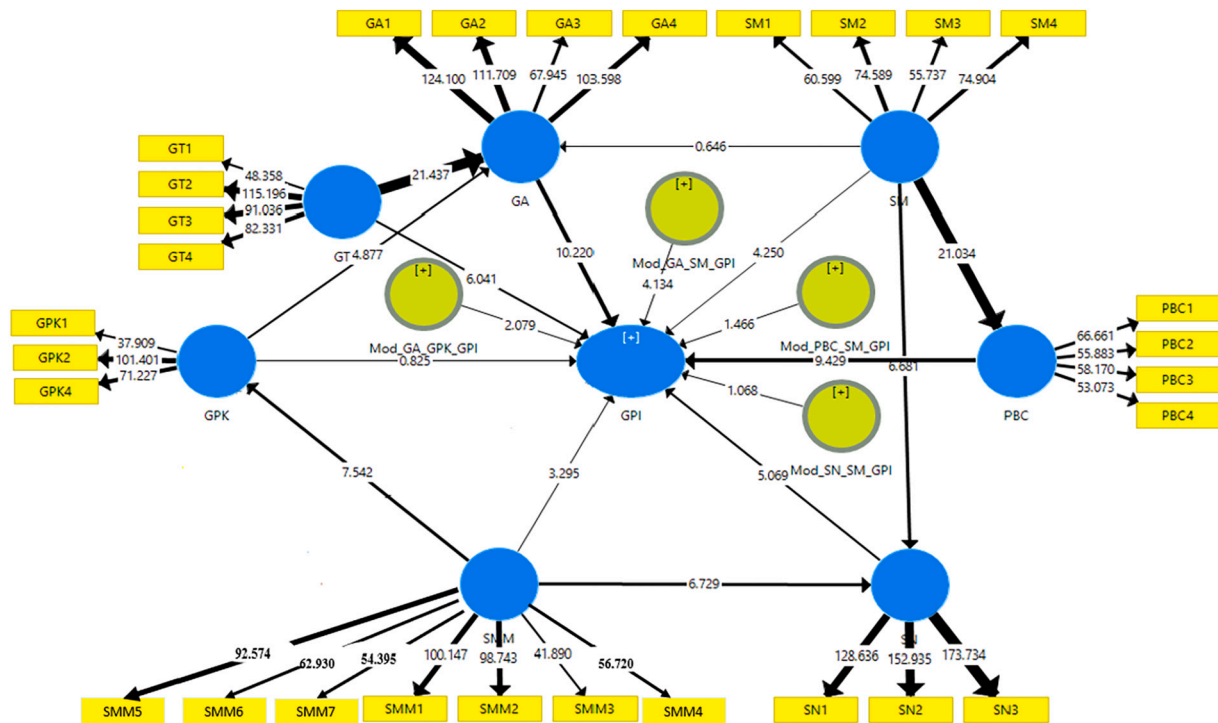


Fig. 3. The results of the structural model, path coefficients, and R-square values.

work as a mediating role because social media usage (SMU) has a significant indirect impact on purchase behavior intention ($\beta = 0.037, p < 0.001$) as well as ($\beta = 0.175, p < 0.001$) respectively. Moreover, SMU has an insignificantly negatively indirect effect on purchase behavior intention ($\beta = -0.006, p > 0.001$) through attitude.

The results show that SMU and SMM have 8.4 % and 19 % total effect on GPI, where the t-value is 0.084 and 0.190, respectively, and the p-value is lower than 0.5, which is accepted.

4.4. Testing for moderation effects

A moderating effect of GPK and SMU is shown in Table 7 for the interaction between AT & GPI, SN & GPI, and PBC & GPI. Cohen (1988) defines f^2 as the proportion of the endogenous construct represented by the moderator construct; f^2 effect size of 0.02 suggests a small effect, 0.15 a medium effect, and 0.35 a large effect. GPK moderates the significant positive relationship between AT & GPI ($\beta_1 = 2.079, p < 0.05$). Thus, H3b is accepted, and the moderating impact of GPK is interpreted as being low. Likewise, moderating variable SMU significantly moderates the association between AT & GPI ($\beta_1 = 4.134, p < 0.001$), which supports the hypothesis H7b and β_1 value indicates the strong predicting effect of SMU between AT & GPI. Nevertheless, SN & GPI ($\beta_1 = 1.068, p > 0.05$), and PBC & GPI ($\beta_2 = 1.466, p > 0.05$) have insignificant interactions with the moderate variable of SMU, implying that when SMU is high, the interaction between SN & GPI, PBC & GPI, is considerably better than when it is low. The results do not support hypotheses H7d and H7e that SM moderates the intention-behavior relationship.

4.5. Slope graph of moderating effects

Fig. 4 illustrates the moderating role of GPK and SMU. The moderator's high (+1 SD exceeding the mean), normal, and low (-1 SD lower the mean) effects are shown by orange, red, and blue lines, respectively. The findings show (Fig. 4a) that low GPK (-1 SD) consequences in lower AT & GPI than a strong GPK (+1 SD), which has a stronger impact on both AT & GPI. Similarly, as seen in Fig. 4b, a low SMU (-1 SD) affects lower AT & GPI instead of SD), which has r effects on both AT and

GPI. Therefore, SMU has significant positive moderate effects on AT & GPI. Nevertheless, Fig. 4c-d also confirms that SMU has no moderating effects on SN-GPI and PBC-GPI relationships.

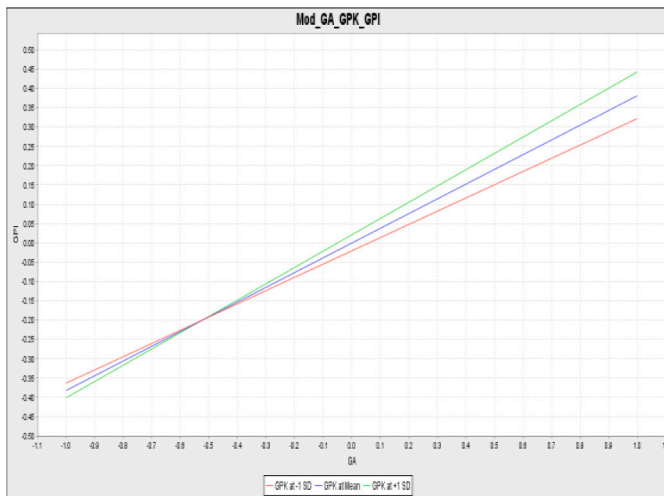
5. Discussion

Our primary aim of this research is to assess consumers' green product purchasing intentions and observe how SMM and SMU actively influence consumers' purchase of green products. We develop a theoretical framework for evaluating consumers' green purchase intentions through social media by expanding the TPB with additional variables (green thinking, green product knowledge, social media usage, and social media marketing). We examined the moderating impact of GPK and SMU on the interrelation between AT & GPI, SN & GPI, and PBC & GPI. Our study confirmed that an extended TPB is an effective model for explaining consumers' GPI. Also, it validated the claim that consumers are more eager to purchase green products if green thinking, social media use, and social media marketing positively influence them.

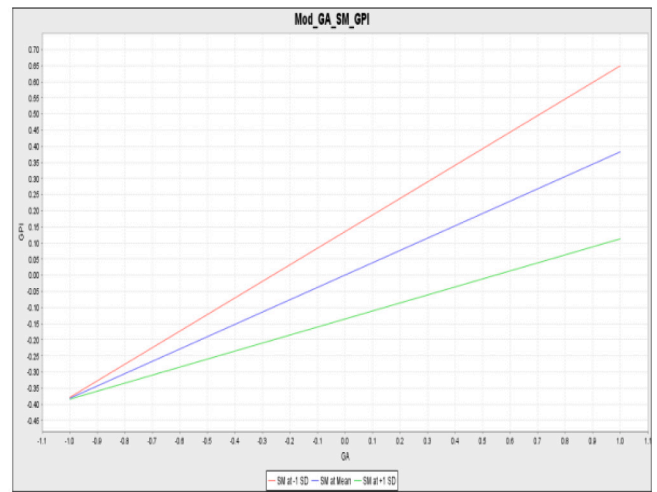
The PLS-SEM results exhibit that attitude has a significant positive relationship with consumers' GPI. Our results correlate with previous studies (e.g., Sreen et al., 2018; Zhao et al., 2019; Pop et al., 2020). Results suggest that if consumers have a favorable view of green products and believe that green products are good for health and the environment, they would be interested in purchasing such products. Moreover, a positive attitude toward health, environment, and climate can make consumers more likely to buy green products.

Green thinking has positive and significant impacts on AT and GPI, which is a remarkable contribution to the extended TPB model. Ali et al. (2020) reveal that GT increases GPI if consumers are more aware of the environment, which positively impacts their attitude. Consequently, it increases the purchase of green products. Green thinkers take a more responsible stance on environmental issues, prioritizing green products when purchasing. For example, consumers who think positively about green labels tend to evaluate green products favorably (Hughner et al., 2007).

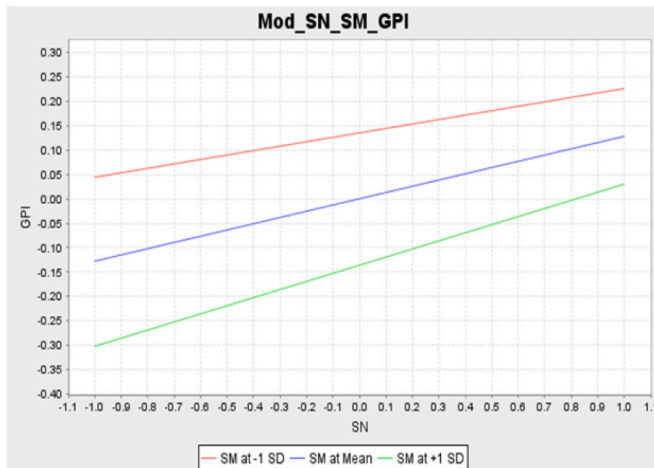
Our study finds a new result about green product knowledge (GPK) variable in the TPB model. It shows a significant positive relationship



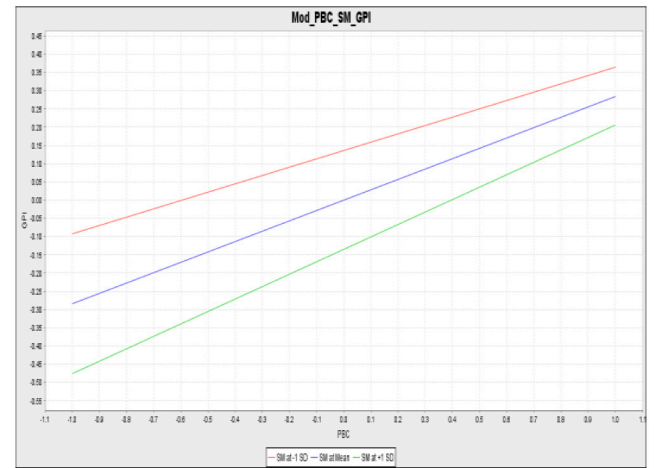
a. GPK's moderating effect on the GA and GPI



b. SMU's moderating effect on the AT and GPI



c. SMU's moderating effect on the SN and GPI



d. SMU's moderating effect on the PBC and GPI

Fig. 4. Moderating effects.

between GPK and AT toward green products but a significant negative relationship between GPK and GPI on social media. However, Wang et al. (2013) argue that product knowledge does not impact consumers' purchase intentions in China. A phenomenon exists that despite knowing green products and their attributes, consumers do not necessarily buy green products. GPK leads consumers to form cognitive judgments and evaluate green products based on green trust. Similarly, product knowledge is only relevant for female categories, mid and upper families, and Gen Y when purchasing green products and does not apply to all groups of citizens (Sun and Wang, 2020). Our findings show that GPK moderates and significantly positive interaction with AT & GPI. GPK works as a moderate predictor of attitude and GPI when green products are more familiar to consumers and are available in stores.

As a result of our study, another significant question arises about the relationship between social media marketing (SMM) and GPI. Results show that SMM positively affects GPK, SN, and GPI. Our results are consistent with previous research (e.g., Sun and Wang, 2020) that SMM tools have a positive impact on SN (Sun and Wang, 2020), and product knowledge (Schuitema and De Groot, 2015; Sun and Wang, 2020). This is a novel result of SMM having a significant favorable impact on GPI. It

suggests that consumers learn about green products and services from social media and get informed about how they could support people's health and environment. SMM influences consumers to purchase green products. At the same time, they share the post of SMM about environmentally friendly products with their friends and family.

Findings show that subjective norm (SN) is favorably associated with GPI aligning with previous studies (Zhao et al., 2019; Sun and Wang, 2020; Pop et al., 2020). This suggests people are willing to buy green products if they perceive their "significant others" want them to adopt healthier consumption behaviors. Consumers consider approval from their "significant others" to be important in buying green products. If their friends-family or peer group give a positive opinion about the advantages of green products, they will be more likely to purchase them. Few studies contradict our results where SN and PI have a negative association (e.g., Khare, 2015; Paul et al., 2016; Chaudhary and Bisai, 2018).

Likewise, our results reveal that perceived behavioral control (PBC) substantially influences purchasing green products via social media, which aligns with previous studies (Paul et al., 2016; Hsu et al., 2017; Sun and Wang, 2020). Similarly, social media usage (SMU) strongly

correlates significantly with GPI. Findings suggest that consumers have enough time, resources, and confidence in social media to buy green products and know where to purchase eco-friendly products.

Finally, the main contribution of this study is that SMU is found to be a solid and positive relationship for SN, PBC, and GPI as well as indirectly through the TPB variables. The results show a positive and strong correlation between social media use and GPI levels. Prior studies confirmed that SMU helps increase GPI in the USA (Li et al., 2012; Bedard and Tolmie, 2018). Consumers can become more aware of environmental and health issues through social media usage, advertising, marketing, and reviewing social media posted comments that influence consumers to buy eco-friendly products. The likelihood that consumers will purchase green products is higher if they frequently use social media for searching product buying-related activities and engage in online interpersonal dialogue regarding green consumption. SMU makes it easier for consumers to access information about green products' benefits and find out where they can buy them.

On the other hand, SN are positively impacted by SMU. It is consistent with the previous study by Pop et al. (2020), which examined the influence of social media on organic cosmetic purchase intentions. They recommend that social media engagement can influence a consumer's cosmetic purchase decision, as consumers perceive social media information as trustworthy and reliable (Dewnarain et al., 2019). Celebrities, reference groups, friends, or family on social media positively influence consumers' buying intention of organic products. Moreover, a study of Hong Kong adolescents finds social influence to be the most substantial influence on green purchasing behavior (Lee, 2008). However, our findings show that SMU has a negative effect on green attitudes. Thus, our findings do not align with Pop et al. (2020) findings that SM significantly influenced consumers' attitudes toward green cosmetics. Our results also reveal that SMU moderates the association between AT & GPI.

6. Implications

6.1. Theoretical implication

Consumers' green purchase intentions are found to be positively influenced by social media. Hence, our model makes an important theoretical contribution to existing literature with social media as an important construct incorporated in the TPB. According to Mason (2014), social media frames cannot be ignored as it has become an important component. Social media has become increasingly popular and is mostly used on online platforms. Therefore, our proposed conceptual model incorporates constructs of social media usage, social media marketing, green thinking, and green product knowledge with the TPB theory that investigates social media's influence on consumer green purchasing decisions. The model contributes valuable theoretical insights into an era of changing environmental, social, and technological aspects. Our results suggest that incorporated theories have the potential to evaluate and explain green purchase intention on social media. This study would have a more splendid view of green purchase intention, green advertising, and social media usage, as well as a framework for future studies. However, it is urgently necessary to identify ways to reduce food waste in retail stores in the context of perishable products (Trento et al., 2021). Thus, social media marketing (SMM) offers useful insights into how coordinated actions in the 4Ps of green marketing can reduce food waste and raise the circular economy system by preventing financial losses for the organization (Gustavo et al., 2021). Our model can contribute valuable theoretical insights into perishable products and food waste management.

6.2. Managerial implication

Our findings offer a better understanding to marketing managers regarding consumers' perception and sustainable consumption behavior

of green products in the context of social media and social media marketing. It's apparent from the result that social media marketing has played a significant role in spreading knowledge about green products to consumers. Hence, marketers and managers could provide a specific platform for the consumers to help them build their trust in the advertising. Previous studies reported skepticism toward advertising green products on social media (Luo et al., 2020; Do Paço and Reis, 2012) and indicated that misleading or exaggerated green advertising leads to this skepticism which is widely found among green consumers. Therefore, marketers and managers need to reduce green advertising skepticism at the managerial level by providing authentic information and building trust among consumers (Nunkoo and Ramkissoon, 2012; Ramkissoon, 2020a). They should be exact and open about their products' information and communication platform on social media and ready to take feedback and facilitate accessible communication with consumers. Consumers may be more prepared to trust green products if they get proper answers to their doubts regarding their usage. Since social media users are more likely to make green purchase intentions, companies should invest more resources in improving social media engagement and awareness. To reach young consumers and increase channel dynamism, firms should allocate extra funding for developing social media strategies, offer special promotions through social media, or invest in influencer campaigns. Digital marketing strategies, e.g., social media, can be applied for short shelf life (SSL) products to reduce food waste (Gustavo et al., 2021; de Souza et al., 2021). Similarly, marketers should take appropriate green marketing actions to reduce the food waste of SSL products.

6.3. Implications for policy

Policymakers can build on our findings to facilitate green product knowledge, reduce green product skepticism, and build consumer awareness of the consequences of their purchasing and consumption behavior. Policies need to be designed to show the benefits of switching from non-green to green products emphasizing both individual and environmental benefits. More supportive measures or regulatory policies for the firms and organizations can be offered to enhance interaction with consumers with proofs of green claims presented by firms concerned. These may reduce the negative perception of green advertising or products and help strengthen consumers' purchase intentions.

7. Conclusion, limitation, and avenues for future research

In recent years, there has been tremendous growth and development in social media marketing. This study contributes to the area of environmental marketing and consumer behavior literature by investigating the intersection of green consumption behavior on social media and social media marketing. The most notable contribution of the research is to better understand consumers' purchasing intentions for green products by exploring the role of a complex set of constructs, namely social media usage, green thinking, social media marketing, as well as three TPB constructs (AT, SN, and PBC). This is the first empirical investigation that exhibits the role of social media usage on GPI, AT, PBC, and SN. Our research contributes theoretically and practically to developing sustainable consumption of green products for society in Europe. The study contributes to the literature by proposing a conceptual framework and providing novel results. For example, social media usage positively correlates with SN and PBC but has an insignificant association with attitude. Additionally, SMU came out to be the strong moderating variable in the relationship between AT and GPI.

However, according to de Souza et al. (2021), the use of digital technologies such as Big Data, ML (machine learning), and AI (artificial intelligence), or their integration, can assist supermarkets in developing marketing plans and help them become less reliant on customers and suppliers while also minimizing food waste issues. Additionally, supermarkets can prevent wastage by using social media and social media

marketing to immediately inform customers about perishable goods and price changes. A sequence of actions related to the green marketing mix (product, price, place, and promotion) can boost products' sales with perishable or SSL and support reducing food waste (Gustavo et al., 2021). Likewise, the use of social media and digitalized green marketing strategies can support the growth of the circular economy, mitigate the effects of climate change, increase sales of perishable green products and minimize food waste.

Thus, we suggest SMU plays a crucial role in shaping consumers' purchasing intentions for green products and services, which could result in sustainable consumption. Our study offers opportunities for practitioners and scholars to explore the rapidly expanding fields of green marketing, social media marketing, and sustainable consumption.

Our study has limitations in terms of product categories, and it concentrated on generic green products. Future research could use our proposed conceptual framework to categorize products and assess consumers' green purchasing intentions for particular green products and services, e.g., organic food, recycling products, energy-saving home appliances, and green household products.

Further researchers can incorporate other constructs, e.g., trust in social media, brand image, and social media skepticism. Future studies may also examine the role of social media influencers and celebrities in influencing the attitude of consumers toward green products. Centered on social media users, the sample in this analysis was of a limited scale. As a result, a greater sample size should be considered in further study. This research model can be replicated in a cross-culture and cross-country context for more conclusive findings.

Declaration of competing interest

The authors declare no conflict of interest.

Data availability

The raw data set (CSV) has been uploaded as a supplemental file for readers to download and explore.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.techfore.2022.122067>.

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