



## The Mechanisms for Influencing Green Purchase Intention by Environmental Concern: The Roles of Self-Green Image Congruence and Green Brand Trust

Fethi Klabi \*

Binzafrah F. †

**Abstract:** *This study is the first to examine a serial mediation model that includes environmental concern, self-green image congruence, green brand trust, and green purchase intention. Based on data from a sample that included 349 Saudi individuals, the analyses supported most mechanisms flowing from environmental concern to self-image congruence and green brand trust in serial. The direct relationship of environmental concern to green purchase intention was also statistically significant. This study provides an interesting perspective on the antecedents of green purchase intention. From a managerial perspective, the results show that cognitive, psychological and motivational mechanisms could enhance green markets in an Arab and Islamic country.*

**Keywords:** *Self-image congruence, Environmental concern, green brand trust, green purchase intention, Saudi Arabia.*

## Introduction

Increasing concern about the harmful effects of industrialization and modern life on the environment has led to the emergence of the concept of environmental sustainability. The rise of environmental sustainability is related to the willingness to protect the environment and pay premium prices for green products (D'Souza, Taghian, & Khosla, 2007). The managerial dimension of environmental sustainability is referred to as green marketing, which is defined as "the holistic management process responsible for identifying, anticipating, and satisfying the needs of customers and society in a profitable and sustainable manner". Green marketing is used to promote less polluting and competitive products and services. It also includes product, pricing and packaging changes (Mehraj & Qureshi, 2016). Companies could benefit from sustainable green marketing practices to project an environmental activist brand image that attracts more and more customers (Hart, 1995).

Green consumers, who are becoming increasingly sophisticated and wiser, are indispensable factors in combating environmental problems. They contribute to sustainability efforts

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\*Marketing and Electronic Commerce Department, College of Business, King Khalid University, Abha, Saudi Arabia. E-mail: fssaleh@kku.edu.sa

†Business Department, College of Business, King Khalid University, Abha, Saudi Arabia.

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by reducing consumption, preferring renewable and clean products over non-green products, recycling, reducing waste and not destroying the environment (Newton, Tsarenko, Ferraro, & Sands, 2015). To predict their behavior, purchase intention could be used. Purchase intentions are a type of decision-making and deliberate planning that explain a consumer's reasons for purchasing a particular product or brand (Ko, Hwang, & Kim, 2013). Green purchase intention is related to various factors such as beliefs, values, knowledge, needs, motivation, demographic characteristics (education, age, gender, income), and attitudes (Bui, 2005). It also influences green purchase behavior.

Several studies proved the influence of environmental concern on green purchase intention (Adnan, Nordin, Amini, & Langove, 2018; Alzahrani, Hall-Phillips, & Zeng, 2019). However, this result was negated by others (M. Chen & Zhang, 2021; Choi & Johnson, 2019). The relationship between environmental concern and pro-environmental behavior is not always empirically demonstrable, leading to a concern or attitude-behavior gap. According to Choi and Johnson (2019), consumers with high environmental concern only have the intention to buy green products when they develop a positive attitude towards them and think that they make a difference on environmental issues.

There is no consensus on the relationship between environmental concern and green purchase intention. Moreover, little has been reported on the indirect relationships linking the two variables (I. Ahmad, Syed, Naseer, Rasool, et al., 2018; Alzahrani et al., 2019; Hartmann & Apaolaza-Ibáñez, 2012). To fill these gaps, this study investigates the mechanism or a multiple serial model to increase green purchase using environmental concern as independent variable and self-green image congruence and green brand trust as mediators in serial. To the best of the authors' knowledge, no research has yet examined this mechanism.

Self-green image congruence is the first mediator of the serial mediation model. It refers to the congruence between a brand's image of pretending to be green and a customer's self-concept (Sirgy, Grzeskowiak, & Su, 2005). The value of self-green image congruence is significantly higher when the image of a green brand coincides with a person who self-identifies as acting to preserve the environment (Confente, Scarpi, & Russo, 2020). People who describe themselves as green should have a high level of concern for the environment. Accordingly, the author hypothesizes that environmental concern is predictive of variance in self-green image congruence.

Green brand trust is integrated as a second mediator in the conceptual framework. Previous research has identified green brand trust as a human psychological state that could explain attitudes, intentions, and behaviors toward green brands (Butt et al., 2017; Khandelwal, Kulshreshtha, & Tripathi, 2019). The authors also hypothesize that green brand trust is a function of environmental concern and self-green image congruence (Wijnands & Gill, 2020; Ziegler & Golbeck, 2007).

The purpose of this research is to provide more insights into the behavior of green consumers. The empirical study investigates the cognitive, psychological and motivational mechanisms that are likely to increase the willingness to buy green in the case of Saudi Arabia. The objectives of this study are: (a) test the relationships among environmental concern, self-green image congruence, and green brand trust, (b) assess the direct and/or indirect effects of these variables on green purchase intention, and (c) identify the mecha-

nisms by which environmental concern influences green purchase intention.

This study provides meaningful implications for theory. First, it contributes to the understanding of green consumption attitudes and intentions. It clarifies whether or not environmental concerns directly influence green purchase intention. The relevance of the gap between attitudes and intentions towards green products is verified here. Second, this research aims to provide new mechanisms to increase green purchase intention. The nature of these mechanisms and the contributions of environmental concern (value-based and motivational), self-green image congruence (cognitive), and green brand trust (psychological) are measured statistically. This study is also of managerial relevance. It aims to contribute to the managerial shift towards successful green marketing. In the new Saudi green market, the findings will help managers to segment customers depending on their beliefs, motivations and psychological states regarding the environment and green brands. The triggers for customers' willingness to buy green products will be elucidated. Understanding the variables that directly or indirectly influence green purchase intention will help green brand managers to choose appropriate messages and techniques to attract more customers.

## Literature Review

### Green marketing and green products in Saudi Arabia

Peattie (1995) defined green marketing as the holistic management process responsible for identifying, anticipating and satisfying the needs of customers and society in a profitable and sustainable manner. Considering the increasing sensitivity of consumers and managers to environmental degradation, green marketing has been used to develop and promote products that are less harmful to the environment. The main objective of green marketing is to influence consumer preferences towards environmentally friendly products and help them adopt a more sustainable behavior pattern.

The Kingdom of Saudi Arabia was among the first countries to recognize the dangers of natural disasters and develop appropriate regulations to combat pollution. The Saudi government is implementing strategies to promote sustainability in construction, agriculture or power generation. Through training programs, the government tries to encourage investors to find innovative methods and provide customers with green products and services of high quality. In this regard, some experiences can be mentioned. For example, Starbucks, KFC, and McDonalds have introduced paper packaging because polystyrene production and ozone layer depletion are dangerous (Alam, Almotairi, & Gaadar, 2012). Recently, the Saudi Standards, Metrology, and Quality Organization (SASO) has allowed the importation of 16 models of electric vehicles and established fast charging stations for EVs. In terms of consumers, Saudis are reported to value natural products such as herbal beauty care. Educated consumers and urban areas have a higher concern about the environment, although the concept of sustainability is still new to the masses (Alam et al., 2012).

## Green brand trust

In the age of marketing, trust is considered a cornerstone of relationships between sellers and buyers. It is a powerful element for firms to build long relationships with their customers. Many studies confirm the influence of trust on product purchase intention and its role in increasing firm profitability and market share (Chaudhuri & Holbrook, 2001). Trust is defined as "the intention to accept vulnerability based on positive expectations of the behaviors or intentions of another" (Rousseau, Sitkin, Burt, & Camerer, 1998). Trust implies dependence on another party due to an expectation of their integrity, benevolence, and capabilities.

Green brand trust is "the willingness to depend on a product or service based on the belief or expectation resulting from its credibility, benevolence and ability about environmental performance" (M. Chen & Zhang, 2021). Green brand trust is an important driver of green product adoption because of the high level of risk and doubt among consumers regarding the environmental performance claimed by companies. Consumers who trust claims about what green products bring in terms of health, reliability, and ability to meet environmental standards are believed to express positive attitudes and behaviors toward these products (Butt et al., 2017; M. Chen & Zhang, 2021).

In general, consumers think that green products are less effective than conventional products even though they are more expensive (Rettie, Burchell, & Riley, 2012). Due to perceived misleading green claims, consumers are believed to be skeptical of green advertising. Regardless of their concern for the environment, Jordanian consumers do not sufficiently translate these attitudes into actual purchases due to the lack of credibility of green brand claims. Skepticism towards green advertising was also shown to negatively affects trust in green brands, which in turn affects attitudes towards green products (Wei, Chiang, Kou, & Lee, 2017). Therefore, to gain consumer trust and succeed in green markets, companies need to be trustworthy providers of green benefits.

## Self-image congruence applied to green products

The self-image congruence theory states that consumers value and use products that are congruent with their self-concept (Sirgy et al., 2005). Depending on the part of the self-concept that is activated by consumption, four motives related to self-congruence are distinguished: Self-consistency, self-esteem, social consistency, and social approval. When consumers prefer items that are congruent with their self-identity or actual self-concept, it is referred to as the self-consistency motive (Aguirre-Rodriguez, Bosnjak, & Sirgy, 2012; J. Kim, Schmöcker, Bergstad, Fujii, & Gärling, 2014). The self-consistency motif suggests that individuals choose brands whose images reinforce the way they see themselves. The variable in our study that reflects such a motive is ASGIC (Actual Self-Green Image Congruence). Self-consistency motive may also be at a social level, when individuals purchase products that reflect the way they believe significant others view them (the actual-social self). This motive is referred to as social consistency and is driven by a willingness to conform to social norms. In this study, we use Actual Social self-Green image Congruence (ASoGIC) for this type of motive.

Individuals may also prefer products or brands for aspiration reasons. The self-enhancement motive is driven by the desire to gain or maintain self-esteem. It is believed to be a tendency to promote an ideal self-image by guiding people to display their positive attributes. Therefore, they may develop positive attitudes towards products with a perceived ideal status. At this level, Ideal Self-Green Image Congruence (ISGIC) is measured in this study. The social approval motive is related to the willingness to do things that are congruent with a socially ideal image of the self (Sirgy et al., 2005). Accordingly, individuals adopt certain brands in order to receive approval from significant others. The variable called ISoGIC (Ideal Social self- Green Image Congruence) is measured in terms of social approval motive.

## **Environmental Concern**

Recently, people have shown an increasing tendency to conserve the environment. A movement called "*going green*" has emerged as consumers have become aware of the serious damage that products cause to the environment (Y.-S. Chen & Chang, 2013). Environmental concern is defined as "the degree to which people are aware of problems regarding the environment and support the efforts to solve them or indicate the willingness to contribute personally to their solution" (Dunlap, Jones, et al., 2002). Environmental concern refers to a set of cognitive and affective attitudes toward the environment. To measure it, some authors used climate change problem awareness and personal norms related to feelings of moral obligation to protect nature. Environmental concern is also attributed to the new environmental paradigm (NEP) represented by phenomena such as people's pro-environmental orientation and willingness to pay more to protect the environment (Dunlap et al., 2002).

Environmental concern reflects different value orientations. Schultz (2001) defined a structure of three values related to environmental concerns. These values refer to the relative importance a person places on self (egoistic value), other people (socioaltruistic value), and components of the environment such as plants or oceans (biospheric value). Concern for the environment has also been associated with anthropocentric altruism, when people are concerned about the environment because they perceive environmental degradation as a threat to human health and life. Here, people's welfare rather than the environment is the focus of concern. Another dimension of environmental concern is egocentrism, which is composed of an egoistic perception of one's relationship with the environment, termed "egobiocentric" and a strictly "biospheric" dimension in which the environment is valued intrinsically. According to Mainardes, de Araujo, Lasso, and Andrade (2017), environmental concern in emerging countries is associated with egoism rather than altruism.

## **Green purchase intention**

Green purchase intention has been defined as "the probability or the willingness of an individual to give preference to eco- friendly products over conventional products in their purchase considerations" (Rashid, Jusoff, & Kassim, 2009). Green purchase intention is related to the possibility of buying environmentally friendly products. It could be assessed

by three actions, namely 'considering buying green products, switching to other brands for environmental reasons, and switching to a green version of a product'. Some authors linked green purchase intention to environmental attitudes, subjective norms, and perceived behavioral control derived from the Theory of Planned Behavior (TPB), while others linked it to advertising attitudes (Nabilla et al., 2019). Environmental knowledge, environmental attitude, government initiatives and peer pressure are also defined as predictors of green purchase intention.

Green purchase intention is a function of environmental knowledge, perceived behavioral control, perceived environmental responsibility, and perceived green value. The direct effects of perceived behavioral control and physical health concern on green furniture purchase intention were confirmed, while the effects of subjective norms and environmental awareness were not. The associations between green purchase intention and attitude, subjective norm, perceived behavioral control, pro-environmental self-identity, perceived sense of responsibility, and ethical obligations were also confirmed. An increase in environmental knowledge leads to a positive attitude toward green products and a higher subjective norm, thus increasing green purchase intention (Yoon & Joung, 2019). Kabadayı, Dursun, Alan, and Tuğer (2015) demonstrated for young Turkish consumers that green purchase intention depends on consumers' guilt or feeling of being responsible for not protecting the environment and consumers' perceived effectiveness, i.e., whether they believe their actions have a significant impact on the country's environmental problems.

## Research Hypotheses

Previous studies confirmed the effects of eco-responsibility and emotionality on the congruence of one's ecotourism (Malone, McCabe, & Smith, 2014; Nowaczek & Smale, 2010). When individuals are highly affected by environmental issues, they self-identify as environmentally friendly and are more likely to perceive high congruence with green brand images (Khare, 2015). Thus, self-green image congruence (SGIC) might be associated with sustained concern for the environment. If so, the authors expect the following:

*H1: Environmental concern (EC) will have a positive effect on self-green image congruence (SGIC).*

Individuals with high environmental concern have been shown to be more likely to trust the ability of green organizations to fulfill their personal values and meet their environmental needs (Butt et al., 2017). Consumers with high environmental values tend to believe green initiatives of organizations and trust in their ability to address environmental issues. The more people know about environmental issues, the more they trust green brands. Yadav, Balaji, and Jebarajakirthy (2019) reported a positive effect of biospheric value related to environmental concern, on trust in green brands for green hotels. They found that biospheric value is strongly associated with environmental concern. The same conclusion was reported by Jian, Yu, Yang, and Zeng (2020) as it was shown that trust in green hotel brands is influenced by environmental concern.

*H2: Environmental concern (EC) will positively influence green brand trust (GBT).*

Almost all previous studies have shown that consumers who have high concern for the environment are likely to exhibit positive attitudes and behaviors towards green products (Hartmann & Apaolaza-Ibañez, 2012; Testa, Iraldo, Vaccari, & Ferrari, 2015). J. Kim et al. (2014) found that high levels of environmental concern induce the acceptance of government environmental taxes. According to Verma, Chandra, and Kumar (2019), environmental concern predicted intention to visit green hotels in India. This relationship was also mediated by attitudes towards green hotels. Environmental concern exerted an influence on the purchase intention of green vehicles in Malaysia (Adnan et al., 2018). This same was also supported for Saudi Arabia (Alzahrani et al., 2019) and for China (Wang, Li, & Zhao, 2017).

*H3: Environmental concern (EC) will positively influence green purchase intention (GPI).*

The literature argues that perceptions of certain brand personality traits are key to increasing consumer trust or preference towards these brands (Aaker, 1997). Brand personality has an expressive and symbolic function that reflects emotions and feelings evoked by brands. It exerts a positive effect on brand trust through self-image congruence, as consumers tend to trust brands with personality traits that match how they actually see themselves (Amjad, Amjad, Jamil, & Yousaf, 2018).

In this context, self-image congruence is more important for brand evaluation than the brand personality itself (Bocian, Baryla, Kulesza, Schnall, & Wojciszke, 2018). Higher levels of self-image congruence lead to higher trust toward a hotel's brand. In the case of electronic communities, people are more likely to trust recommendations from others who are very similar to them (Ziegler & Golbeck, 2007). Also, Wijnands and Gill (2020) found that actual and ideal self-image congruence exert a significant effect on brand trust. The same was evidenced by Badrinarayanan, Becerra, and Madhavaram (2014). In view of this, the following hypotheses were proposed:

*H4: Self-green image congruence (SGIC) will have a positive effect on green brand trust (GBT).*

Due to the growing interest in environmental issues, the concept of green self-identity has been proposed. Green self-identity could be defined as the degree to which a person sees him or herself as acting in an environmentally friendly way (Van der Werff, Steg, & Keizer, 2014). The more individuals embody values and identities related to the environment, the more they engage in clean environment and environmentally friendly behaviors such as recycling. To satisfy their self-expressive motives and show their pro-environmental attitudes, consumers are more likely to have positive attitudes toward and use green products.

When those who self-identify as "green" perceive the values embodied in green prod-



ucts as congruent with their environmental desires, expectations, and beliefs, they exhibit positive attitudes and behaviors toward these products (Abbas & Bashir, 2020; Confente et al., 2020). As expected in their hypotheses, Nguyen and Nguyen (2020) found that the more Millennials self-congruently identify with green products, the more they show higher intention to make green purchases. Moreover, the more individuals perceive hybrid cars as expressing what they are or what they stand for, the more they intend to purchase this category of cars. These results are identical for both American and Korean samples.

Self-green image congruence (SGIC) is the correspondence between consumers' self-concept (identity) and the perception of a brand as "green" oriented. The following hypothesis was then proposed:

*H5: Self-green image congruence (SGIC) has a positive effect on green purchase intention (GPI).*

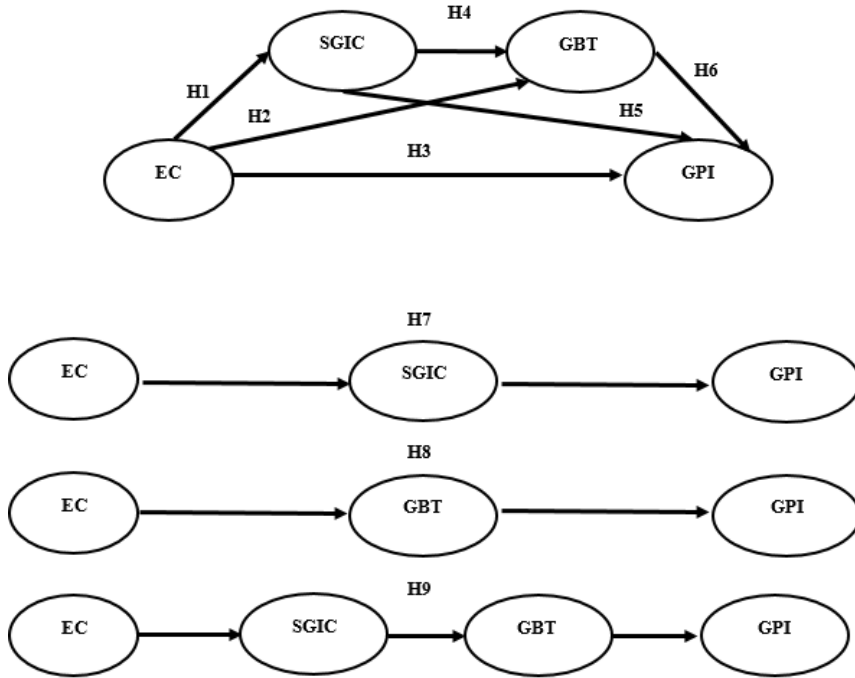
Trust in the green attributes of products induces lower perceived risks, removes barriers to purchasing these products, and increases consumers' brand loyalty, equity or attachment (W. Ahmad & Zhang, 2020; Choi & Johnson, 2019; Yadav et al., 2019). Hameed, Waris, et al. (2018) argued that eco-labels that provide information about green products increase consumers' green brand trust and concern about environmental issues, which in turn leads to environmentally conscious behavior. For their part, Yang and Zhao (2019) concluded for the case of Taiwan that the influence of green brand trust on green brand loyalty was evidenced. As part of green brand equity, green brand trust has been shown to be a predictor of consumer attitude. It could explain 47% of the variance in green repurchase intention in the case of a bottled water brand that launched a lightweight bottle in Hong Kong. Based on the above, the following hypothesis is proposed:

*H6: Green brand trust (GBT) will have a positive effect on green purchase intention (GPI).*

Previously, the direct and indirect effects of EC on GPI through brand attitude was confirmed (Hartmann & Apaolaza-Ibañez, 2012). I. Ahmad et al. (2018) established a mechanism to measure green purchase intention. Their results showed that environmental concern mediates the relationship between environmental beliefs and green purchase intention. For the case of hybrid cars (HEVs) in Saudi Arabia, another mechanism linking EC and GPI using Theory of Reasoned Action (TRA) was established. Their results showed that variables such as attitude towards HEVs adoption and subjective norms interfere between EC and GPI. Meta-analytic structural modeling by Zaremohzzabieh, Ismail, Ahrari, and Samah (2021) on 94 samples revealed the significance of an indirect effect leading from EC to GPI.



**Figure 1**  
Conceptual framework



In this sense, the present study proposed serial mediation processes emanating from EC to explain GPI. Two types of effects were examined: the direct effect of EC on GPI and indirect effects through SGIC and GBT. The following three hypotheses were proposed:

*H7: EC will have an influence on GPI and this influence will be mediated by SGIC.*

*H8: EC will have an influence on GPI and this influence will be mediated by GBT.*

*H9: EC will have an influence on GPI and this influence will be serially mediated by SGIC and GBT.*

## Data and Methodology

### Data collection and sample

To test the above hypotheses, the authors conducted a survey in the first three months of 2020. The Google Forms platform was used to obtain a convenience sample of 349

individuals. Compared to traditional paper-based methods, online surveys offer many advantages such as cost savings and speed of survey. Moreover, since Saudi Arabia is very large, it was difficult to reach respondents from different parts of the country. Whatsapp for mobile phones helped to share the electronic questionnaire in several groups. Respondents were asked to complete the electronic questionnaire in their native language (Arabic). To ensure wide distribution, respondents were also asked to share the questionnaire in the groups they are members of. The items of the questionnaire were translated from English to Arabic by two experts using the "translation and back translation" to ensure accurate translation. After opening the electronic questionnaire, subjects were shown a brief presentation of green products. Green products were defined as durable and non-toxic products with low environmental impact. Some green products were given as examples namely organic food, hybrid cars, green fuel, organic coffee cups, and recycled plastic.

The sample is almost evenly split between male (47.2%) and female (52.8%) respondents. The average age was "25 to 35". The monthly personal income of the respondents was "less than 10,000 SAR" which is approximately \$2660. 21% of the respondents have a college degree or are currently studying at a university.

## Measures

The items used in the questionnaire were adapted from previous studies. The green image of a brand can be reflected in a number of factors, such as typical usage, advertising, personnel, or products and services (Grzeskowiak & Sirgy, 2007; Sirgy et al., 2005). To measure self-congruence with the global image of a green brand (SGIC), subjects were asked to imagine the different factors (typical user, personal products, advertising) associated with the image of a green brand and to express their agreement or disagreement with the following statements: "This green brand agrees with how I really see myself" (actual-self green image congruence, ASGIC); "This green brand agrees with how I would like to be" (ideal-self green image congruence, ISGIC); "This green brand matches how I think others see me" (actual-social green image congruence, ASoGIC); "This green brand matches how I would like others to see me" (ideal-social green image congruence, ISoGIC). SGIC was then represented by four items (ASGIC, ISGIC, ASoGIC, ISoGIC).

The six-item of the measurement Scale of EC was adapted from Onurlubaş (2018). The green purchase intention (GPI) measurement scale was previously used by (Doszhanov & Ahmad, 2015). Originally, this variable was represented by four items. The five expressions expressing GBT were also adopted from Doszhanov and Ahmad (2015) study. All items were rated on a 5-point Likert scale with 1: strongly disagree and 5: strongly agree.

## Data Analysis and hypothesis testing

### Exploratory Factor Analysis

For all items of the questionnaire, the values of kurtosis and skewness are close to zero, which means that the data are considered normally distributed. According to the results of factor analysis with varimax rotation on SPSS, a four-factor solution that explained

73.971% of the total information was extracted. The index of Kaiser-Meyer-Olkin (KMO) was 0.901 and Bartlett's test for sphericity was significant at  $p = 0.000$  (Table I). Again, the extracted solution explained. Therefore, factor analysis with data for each variable was appropriate. Some items were eliminated due to their weak communality values (EC3, EC5 and GPI4). Item EC6 was removed because it was not significantly correlated with the corresponding factor (EC). The item (ISoGIC) was also excluded because it was not related to SGIC. The values of Cronbach Alpha index for ASGIC (3 items), GPI (3 items) and GBT (5 items) were above 0.7, suggesting the reliability of the variables (Peterson, 1994). The alpha Cronbach statistic of EC increased to 0.680 when item EC4 was removed from the measurement scale. Accordingly, the authors calculated the composite variables for SGIC, EC, GPI and GBT.

**Table 1**  
Results of Factor Analyses

Items	SGIC	EC	GPI	GBT	% variance explained	KMO	Cronbach's Alpha
ASGIC	0.830				38.104		0.897
ISGIC	0.816						
ASoGIC	0.811						
EC1		0.635			15.638		0.680
EC2		0.640					
GPI1			0.783		11.735	0.901	0.761
GPI2			0.845				
GPI3			0.663				
GBT1				0.798	8.495		0.909
GBT2				0.763			
GBT3				0.835			
GBT4				0.847			
GBT5				0.840			

## Convergent and discriminant validity

To establish convergent validity, the authors measured the Average Variance Extracted (AVE) and Composite Reliability (CR) of EC, SGIC, GBT and GPI. Convergent validity is assumed when AVE and CR exceed the standard cutoffs of 0.5 and 0.7, respectively (Fornell and Larcker, 1981; Henseler et al., 2009). According to the results, the values of AVE are 0.609 (EC), 0.811 (SGIC), 0.703 (GBT) and 0.609 (GPI), while those of CR are 0.757 (EC), 0.928 (SGIC), 0.922 (GBT) and 0.824 (GPI). Thus, the convergent validity of EC, SGIC, GPI and GBT is demonstrated. The discriminant validity of EC, SGIC, GPI and GBT is demonstrated as the bolded values in Table 2 (AVE square root values) are superior to the correlations between the constructs (Hair Jr, Hult, Ringle, & Sarstedt, 2021). To further support our conclusion on discriminant validity, the heterotrait-monotrait ratio of correlations (HTMT) was applied. Using the means of Monte Carlo simulation study, the HTMT criterion showed higher performances compared to those of the Fornell-Larcker criterion or the assessment of (partial) cross-loadings (Henseler, Ringle, & Sarstedt, 2015). According to Kline (2015), a value of the HTMT above 0.85 indicates a lack of discriminant validity of the measurement scale. Others set a threshold value of 0.90 (Gold, Malhotra, & Segars, 2001). The results in Table 2 showed that discriminant validity was confirmed

for EC, SGIC, GPI and GBT as the HTMT values were all below 0.90.

**Table 2**

Discriminant validity using Fornell-Larcker criterion (upper right)  
the HTMT criterion (lower-left)

	<b>EC</b> <b>(2 items)</b>	<b>SGIC</b> <b>(3 items)</b>	<b>GBT</b> <b>(5 items)</b>	<b>GPI</b> <b>(3 items)</b>
EC (2 items)	0.780	0.410	0.350	0.580
SGIC (3 items)	0.368	0.900	0.820	0.600
GBT (5 items)	0.310	0.874	0.838	0.650
GPI (3 items)	0.515	0.559	0.620	0.780

Numbers in bold denote the square root of the AVE for each latent variable. Below the diagonal, the HTMT values and above it, the correlations between the latent variables in italic.

## Results of the one- sample t-test

To find out the average positioning of the respondents on environmental issues and green products, the authors used the one-sample t-test in SPSS. One-sample t-test allows the comparison of the mean of a sample with an a priori value. Since the corresponding items were scored on a 5-point Likert scale, this a priori value is equal to 3. A t-value is determined for each variable and compared to a critical t-value for the corresponding degree of freedom (number of cases minus 1) and a desired significance level. The mean value of EC is 4.09 with a t-value of 25.028 ( $p=0.000$ ) and 95% confidence interval of the mean difference ranging from 1.01 to 1.17. Thus, EC is significantly higher than 3 and the null hypothesis is rejected accordingly. This result is consistent with the observations of Chen (2001) and Milfont and Schultz (2016) on the increase in environmental awareness among the majority of the world's population due to global environmental degradation and the global expansion of environmental organizations. Otherwise, these results contradict those of [Franzen and Vogl \(2013\)](#) who found that environmental concern declined in most countries over the last two decades due to public fatigue, climate change exaggerations, economic uncertainty and political controversies. The results for GBT and GPI showed that the mean scores were significantly above 3 ( $mGBT= 3.98$ ,  $t=22.429$ ,  $p=0.000$  and  $mGPI=4.35$ ,  $t=38.760$ ,  $p=0.000$ ). The high level of green brand trust contradicts the skepticism that consumers might feel about companies' green claims, or what is referred to as greenwashing. For the GPI, the claim that consumers are increasingly adopting green products has been confirmed.

## Structural Model and path analysis on Lisrel

To test H1, H2, H3, H4, H5 and H6, Structural Equation Modeling (SEM) was applied on Lisrel. The structural model, which included EC, GPI, SGIC, and GPI, showed a satisfactory fit to data ([Kline, 2015](#)). In fact, the root mean square of approximation (RMSEA) is 0.059, and the value of  $\chi^2/\text{degree of freedom}$  is 2.19 (less than 3). The values of NFI (Normed Fit Index), GFI (Goodness of Fit) and CFI (Comparative Fit Index) were

also higher than 0.90. Table 3 shows some goodness-of-fit indices of the proposed structural model.

**Table 3**

Goodness of fit indices for the research framework

Goodness of fit indices	$\chi^2(\text{d.f})$	$\chi^2/\text{d.f}$	NFI	CFI	GFI	RMR	RMSEA
	94.23	2.19	0.99	0.99	0.96	0.063	0.059
<b>90 Percent Confidence Interval for RMSEA</b>							
(0.042, 0.075)							

As hypothesized in H1, EC likely influences SGIC. The results in Table 4 show that EC has a significant effect on SGIC ( $\beta = 0.41$ ,  $t = 6.76$ ,  $p < 0.01$ ). This result complements the findings of [Malone et al. \(2014\)](#); [Nowaczek and Smale \(2010\)](#), who showed that eco-responsibility has an impact on self-image congruence. H1 is thus confirmed.

The direct effect of EC on GBT was statistically significant at  $p = 0.01$  ( $\beta = 0.88$ ,  $t = 14.52$ ,  $p < 0.01$ ). These results support the findings of [Butt et al. \(2017\)](#); [Jian et al. \(2020\)](#). Accordingly, H2 is supported. When SGIC was introduced in the structural model, the effect of EC on GBT decreased to  $-0.04$  ( $t = -0.95$ ,  $p > 0.05$ ). According to the results, EC exerts a significant effect on GPI ( $\beta = 0.42$ ,  $t = 6.45$ ,  $p < 0.01$ ). Thus, H3 is accepted. This result combines those of [Alzahrani et al. \(2019\)](#) for the Saudi case. The effect of SGIC on GBT is also significant at  $p = 0.01$  ( $\beta = 0.94$ ,  $t = 18.26$ ), confirming H4. This result supports the findings of [Wijnands and Gill \(2020\)](#).

SGIC had a significant effect on GPI at  $p = 0.01$  when GBT was not included in the equation ( $\beta = 0.70$ ,  $t = 10.37$ ,  $p < 0.01$ ). Thus, H5 is confirmed. This result supports the literature on the predictive power of self-image congruence on green consumer attitudes and behaviors ([Nguyen & Nguyen, 2020](#)). The path between GBT and GPI has a significant coefficient at  $p = 0.01$  ( $\beta = 0.76$ ,  $t = 3.52$ ). This result is consistent with the results of [Hameed et al. \(2018\)](#); [Yang and Zhao \(2019\)](#); [Khandelwal et al. \(2019\)](#), so H6 is confirmed.

**Table 4**

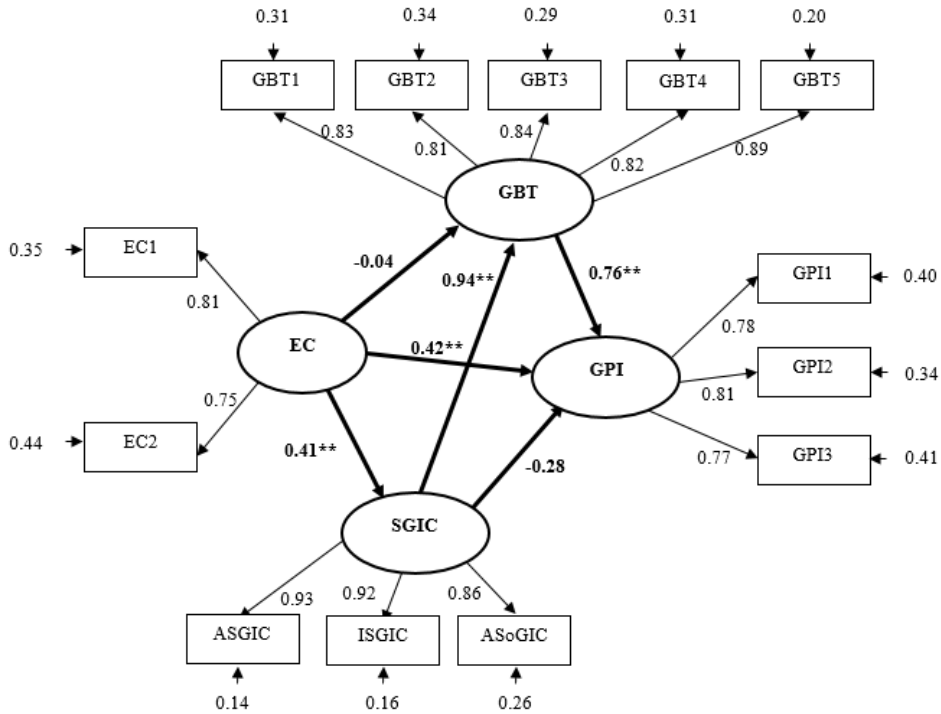
Estimates of path coefficients

Paths		Standardized coefficients	t	Results
from	to			
EC	SGIC	0.41**	6.76	H1 confirmed
EC	GBT	0.88**	14.52	H2 confirmed
	(without SGIC)			
	GBT	-0.04	-0.95	
	(with SGIC)			
EC	GPI	0.42**	6.45	H3 confirmed
SGIC	GBT	0.94**	18.26	H4 confirmed
SGIC	GPI	0.70**	10.37	H5 confirmed
	(without GBT)			
	GPI	-0.28	-1.30	
	(with GBT)			
GBT	GPI	0.76**	3.52	H6 confirmed

As mentioned earlier, the path coefficient of EC -GBT became insignificant when SGIC was introduced and we know that the effects of EC -SGIC and SGIC-GBT are significant. Again, the effect of SGIC on GPI decreased from 0.70 to  $-0.28$  when GBT was introduced

into the equation, and the path coefficients of SGIC-GBT and GBT-GPI are significant.

**Figure 2**  
The results of SEM on Lisrel



Following the recommendations of [Baron and Kenny \(1986\)](#), we can conclude that SGIC mediates the relationship between EC and GBT and that GBT mediates the effect of SGIC on GPI. In the following parts of this study, a detailed analysis of the serial mediations is performed using the PROCESS method on SPSS. The structural model proposed in this study is shown in Figure 2.

## Serial mediation analysis

To test research hypotheses H7, H8, and H9, the authors conducted a serial multiple mediation analysis using the SPSS macro PROCESS (Hayes, 2017). Model 6 with 5000 bootstrap samples and 95% confidence intervals for indirect effects was used. According to [Hayes \(2012\)](#), “The serial multiple mediator model assumes a causal chain linking the mediators, with a specified direction of causal flow”. EC was set as the independent variable (X). Each of the four components of SGIC (ASGIC, ISGIC, ASoGIC, and ISoGIC) was treated as the first mediator. Thus, we can evaluate the role of each of these components in the mechanisms of GPI improvement. GBT is the second mediator (M2) and GPI is

the dependent variable (Y). For example, when ASGIC was introduced to represent SGIC, ASGIC was estimated by EC as follows:

GPI was estimated from both ASGIC and EC as:

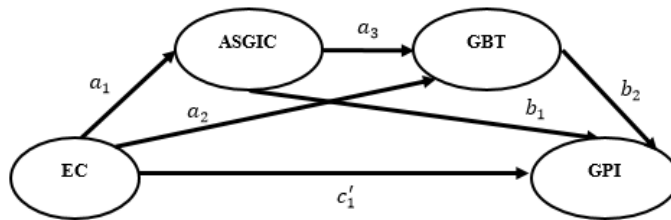
In equation (2),  $c'_1$  reflects the direct effect of EC on GPI. The indirect effect of EC on GPI via ASGIC is  $a_1 b_1$ , which is the product of the effect of EC on ASGIC ( $a_1$ ) and the effect of ASGIC on GPI ( $b_1$ ) under the control of EC.

The second mediator in the causal chain is GBT. This variable was estimated from EC and ASGIC as:

When EC, ASGIC and GBT were included in the multiple mediator model, GPI was represented as follows:

**Figure 3**

Direct and indirect effects of the serial mediation (using ASGIC as an example)



The results of the analyses are shown in Table 5.

**Table 5**  
Results of serial mediation analysis using Process on SPSS

Serial Models	Equations	Effects	BootSE	BootLLCI	BootULCI	Results	
						Supported	Not Supported
EC >>ASGIC >>GPI		0.02	0.015	-0.008	0.054		✓
EC >>GBT >>GPI		0.025	0.015	-0.002	0.058		✓
EC >>ASGIC >>GBT >>GPI		0.051	0.017	0.023	0.09	✓	
Total of Indirect effects		0.096	0.026	0.049	0.151	✓	
Direct effect (p)		0.205 (0.000)	***	0.277	0.315	✓	
Total effect (p)		0.301 (0.000)	***	0.222	0.379	✓	
EC >>ISGIC >>GPI		0.006	0.013	-0.018	0.032		✓
EC >>GBT >>GPI		0.037	0.018	0.007	0.076	✓	
EC >>ISGIC >>GBT >>GPI		0.048	0.017	0.02	0.087	✓	
Total of Indirect effects		0.091	0.025	0.046	0.144	✓	
Direct effect (p)		0.209 (0.000)	***	0.138	0.281	✓	
Total effect (p)		0.301 (0.000)	***	0.222	0.379	✓	
EC >>ASoGIC >>GPI		0.031	0.019	-0.003	0.07		✓
EC >>GBT >>GPI		0.01	0.013	-0.015	0.038		✓
EC >>ASoGIC >>GBT >>GPI		0.066	0.017	0.037	0.105	✓	
Total of Indirect effects		0.106	0.028	0.057	0.168	✓	
Direct effect (p)		0.194 (0.000)	***	0.121	0.268	✓	
Total effect (p)		0.301 (0.000)	***	0.222	0.379	✓	
EC >>ISoGIC >>GPI		0.001	0.003	-0.004	0.007		✓
EC >>GBT >>GPI		0.085	0.023	0.044	0.134	✓	
EC >>ISoGIC >>GBT >>GPI		0.003	0.007	-0.011	0.018		✓
Total of Indirect effects		0.088	0.025	0.043	0.142	✓	
Direct effect (p)		0.213 (0.000)	***	0.141	0.284	✓	
Total effect (p)		0.301 (0.000)	***	0.222	0.379	✓	

H7 assumed that SGIC mediates the relationship between EC and GPI. According to



the results, this indirect effect was not significant for ASGIC, ISGIC, ASoGIC, and ISoGIC. For example, the indirect effect of EC on GPI bypassing ISGIC has a coefficient  $a_1 b_1$  equal to 0.006 with a 95% bootstrap confidence interval of -0.018 to 0.032. This interval includes the value 0, so the value of  $p$  should be greater than 0.05 and the corresponding indirect effect could not be confirmed. H7 is thus rejected.

When ASGIC was introduced, the indirect effect of EC on GPI by GBT was not significant ( $a_2 b_2 = 0.025$  with a 95% bootstrap confidence interval of -0.002 to 0.058). The indirect effect of EC on GPI passing through GBT was also not significant in the case of ASoGIC ( $a_2 b_2 = 0.010$  with a 95% bootstrap confidence interval of -0.015 to 0.038). However, the indirect effects of EC on GPI through GBT were significant at  $p=0.05$  in the case of ISGIC and ISoGIC. When a brand reflects an ideal self or social image (ISGIC or ISoGIC), greater concern for the environment leads to higher trust toward that brand and, consequently, greater willingness to purchase that brand. According to these results, the authors partially accept H8.

The total indirect effects of EC on GPI by SGIC and GBT in serial ( $a_1 a_3 b_2$ ) were significant for ASGIC, ISGIC, and ASoGIC with a 95% bootstrap confidence interval that did not contain the value 0. The serial mediation model running over ISoGIC was not supported ( $a_1 a_3 b_2 = 0.003$  with a 95% bootstrap confidence interval of -0.011 to 0.018). H9 is thus partially accepted.

Overall, the indirect effects of EC on GPI by SGIC and GBT in serial ( $a_1 b_1 + a_2 b_2 + a_1 a_3 b_2$ ) are equal to 0.096, 0.091, 0.106 and 0.088 for ASGIC, ISGIC, ASoGIC and ISoGIC, respectively. All 95% bootstrap confidence intervals did not contain the value 0. Accordingly, the serial mediation models linking EC to GPI were all significant. The direct effect of EC on GPI ( $c'_1$ ) was also confirmed at  $p < 0.01$ , resulting in an overall effect ( $c_1$ ) equal to 0.301 ( $p=0.000$ ) with 95% bootstrap confidence intervals ranging from 0.222 to 0.379. Overall, the direct and indirect (through SGIC and GBT) pathways flowing from EC to GPI explained 14.2% of the GPI variance. The results support the general idea of this research that EC, SGIC and GBT contribute to GPI improvement in different ways.

## Discussion

Green purchase intention is part of a prevailing paradigm that has established a causal chain in which attitudes lead to intentions and intentions lead to behaviors. Previous research focused on green purchase intention as a key element of green consumer behavior, fully reflecting individuals' environmental commitment (Y.-S. Chen & Chang, 2013). However, some studies reported the insignificance of the effect of attitudes towards environmental issues on the willingness to purchase green products (M. Chen & Zhang, 2021; Choi & Johnson, 2019). Again, green attitudes and behaviors are not uniform across cultures and markets (S. Kim & Shin, 2017).

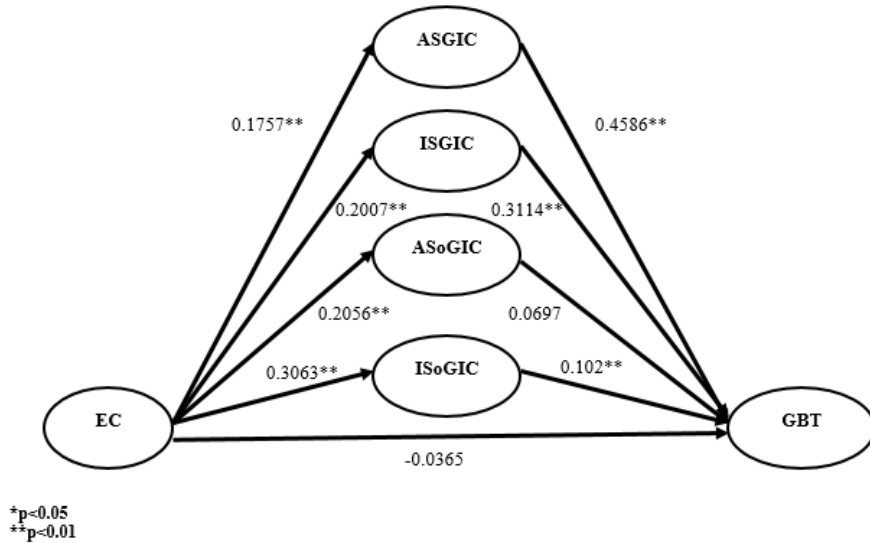
In this regard, the present study examined the antecedents of willingness to purchase environmentally friendly products in an Arab and Islamic country, namely Saudi Arabia. The conceptual framework tested the direct and indirect effects of EC (Environmental Concern) on GPI (Green Purchase Intention). New pathways involving SGIC and GBT as

possible mediators in the relationship between EC and GPI were also assessed. The main contribution of this research is to define new mechanisms for influencing green product purchase intention through EC, SGIC and GBT. As expected, EC exerted a direct influence on GPI (Table 4). This result supports the findings of Alzahrani et al. (2019). Awareness of problems associated with resource degradation and pollution is likely to translate into a willingness to purchase environmentally friendly products.

The empirical results showed that EC exerts an influence on three out of four components of SGIC (Table 5). Accordingly, consumers perceive green brands as self-congruent when they are concerned about environmental issues. Self-image congruence ratings are related to the environmental commitment that brands display and communicate to their audiences. The social psychological underpinnings of EC, including values such as benevolence and general beliefs about nature such as materialism, science, or postmodernism (Olofsson & Öhman, 2006), are likely to transfer into a cognitive state of self-congruence with green brands.

**Figure 4**

The direct and indirect effects of EC on GBT by ASGIC, ISGIC, ASoGIC and ISoGIC (Model 4 on PROCESS)



The total indirect effect of EC on GBT is equal to 0.1884 (0.1757\*0.4586+0.2007\*0.3114+0.2056\*0.0697+0.3063\*0.102)

Previous research has shown that environmental commitment has an impact on trust in green brands (Jian et al., 2020). The results of this study confirm such a statement regarding the significance of the path coefficient between EC and GBT in Table 4 and this relationship was mediated by SGIC.

The serial model that included EC as the independent variable, the four variables of SGIC (ASGIC, ISGIC, ASoGIC and ISoGIC) as mediators, and GBT as the dependent variable was tested (model 4 with PROCESS), the results negated the significance of the

direct effect of EC on GBT ( $\beta=-0.0365$ ,  $p=0.0722$ ). The effect of EC on GBT is mainly indirect via SGIC ( $\beta=0.1884$ ), as shown in Figure 4. Individuals who care about the environment do not trust green brands directly. To ensure GBT, concern for the environment transforms into self-image congruence, leading to higher trust toward brands portrayed as advocates of the environment (H4, predicting the significance of the effect of SGIC on GBT, was confirmed). Trust in such brands may not only depend on individuals' environmental orientations, but green brands should take steps to build this trust.

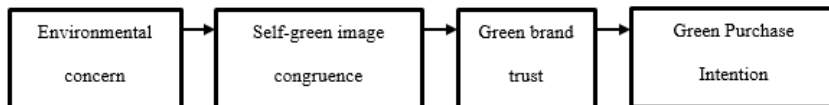
The results provide empirical support for the argument that GBT affects GPI as shown in Table 4. This result complements the findings of previous research that found positive relationships between trust and consumers' attitudes and behaviors toward green brands (Yang & Zhao, 2019). It is quite predictable that GBT predicts GPI as long as trust removes barriers to purchase.

There is an extensive review of the role of self-image congruence on consumer behavior in the literature (M. Chen & Zhang, 2021). However, little has been done in relation to green consumer behavior. To the best of the authors' knowledge, only two studies have validated the relationship between self-image congruence and willingness to adopt green products (Nguyen & Nguyen, 2020). The relationship between SGIC and GPI was estimated as mediated by GBT. Self-image congruence is probably one the appropriate instrument to increase green purchase intention through trust toward green brands. This result compounds the findings of previous research on the predictive power of self-image congruence on consumer attitudes and behavior.

The indirect effect flowing from EC to GPI through GBT was confirmed only when ISGIC and ISoGIC were taken into account (Table 5). However, the indirect effect flowing serially through SGIC and GBT was estimated to be the one with the highest power to influence GPI. High concern for the environment leads to increased self-congruence with the image of green brands, which increases trust in the green brand, leading to higher intention to make a green purchase (Figure 5). It is not only prices and quality that reflect consumers' choice of green products. It is an ethical and self-expressive act that reflects increased awareness of environmental degradation and a green identity. While these results contribute to further understanding of the mechanism predicting green purchase intention, the direct effect of EC on GPI remains dominant, representing approximately 68% of the relationship between the two variables (this percentage is calculated by dividing the average of the direct effects of EC on GPI for each component of SGIC (0.205, 0.209, 0.194, 0.213), which equals 0.205, by the total effect of EC on GPI, which is 0.301).

**Figure 5**

The strongest mechanism to predict green purchase intention



It should be noted that the indirect path from EC to GPI via SGIC and GBT was not

supported when green brands reflect an ideal consumer social image. This result supports the findings of Wang et al. (2017), who showed that actual self-image congruence exerts the highest effect on emotional brand loyalty compared to ideal and social image congruence.

## Managerial implications

To make green marketing a profitable management process, consumer behavior and specifically green purchase intention should be measured. Emphasizing the mechanism to increase green purchase intention would help practitioners capture greater market share and increase profitability. The purpose of this research was to provide a better understanding of how to influence consumer behavior toward green products. The direct and indirect links between green purchase intention and environmental concern were the cornerstone of this research.

The results of the rigorous analyzes showed that EC directly influences GPI. Therefore, it is the responsibility of authorities and companies to highlight environmental issues and raise environmental awareness in society. Authorities could launch awareness campaigns through TV, the internet, social media or other channels. Protecting the environment should also be an important part of school programs. Since KSA is strongly linked to religion, the consequences of overexploitation of natural resources and environmental degradation for present and future generations should be addressed in Islamic sermons and lessons. Companies could use advertisements, viral videos on Youtube, Facebook, Twitter and other social media networks, electronic communities and others to promote environmental awareness and encourage people to participate in creating a cleaner and safer environment. Companies should present themselves as advocators of nature and portray their green products as a way to achieve a sustainable lifestyle. Considering the empirical results, this could increase people's willingness to buy green products.

The effect of EC on GPI is also indirect. The main contribution of this study was to identify a mechanism that predicts a significant proportion of GPI. The serial mediation model, starting from EC through SGIC and GBT to GPI, was most able to explain the variance of GPI. When consumers show high environmental awareness, they identify with green brands, tend to trust them, and intend to buy them. Through advertising, packaging and social media, companies should reflect a sustainable and green image of their brands. A sustainability strategy should be followed: Change production processes, provide safe products and services, provide sustainable and recycled packaging, and develop green selling points. As part of the global image of green brands, employees should also lead by example and show sustainable behavior. Being a green brand allows customers to express themselves in their community and make them feel like they are contributing to the preservation of the environment. Looking at the results, it seems that social consistency motives play a major role in enhancing the direct effect of EC on GPI. In this regard, promotional messages could create a social frame (with family, friends or colleagues) when people use green products.

Trust in green brands was estimated to be influenced by the congruence of one's green image. People tend to trust brands that reflect an image of themselves. The results showed that actual self-green image congruence exerts the highest effect on GBT. Ac-

cordingly, brands should convey the benefits of self-congruence through their marketing communications. They should focus on an authentic green brand image. An authentic image reflects the actual rather than an ideal image of a consumer's self-image. In the Saudi context, brands could promote a responsible and sustainable Saudi lifestyle that fits into a conservative culture. For example, the use of Saudi characters wearing the national costume in advertising can make brands more self-congruent and thus more trustworthy.

When green brands are communicated, they should convey trustworthy messages to the audience. Trust in green brands has been identified as part of the global mechanism to increase green purchase intention. The more consumers trust a green brand, the more purchase intentions they have. Green brand trust means that consumers have confidence in companies' commitment to protect the environment and provide high-performance products and services. To gain consumer trust, companies should provide consumers with details about their green practices and the benefits of their green products. In this regard, they can also use eco-labels, awards and third-party endorsement.

The present research showed that emotional and ethical strategies can be effective in increasing consumers' purchase intention for green products. Environmental concern was evaluated as a significant predictor of green purchase intention through a mechanism involving self-green image congruence and green brand trust in serial. For an effective green marketing strategy, environmental concern could be used to segment markets. People with higher levels of environmental concern, are more likely to identify with green goods and services, trust green brands, and make green purchases. In this regard, green brands operating in KSA could create profitable niche markets where consumers are willing to pay premium prices for green goods and services. Knowing that environmental protection has become a growing concern in Islamic and developing societies ([Hasnain, Raza, & Qureshi, 2020](#)), the task of authorities and corporations would be easier than one might think.

## **Limitations and recommendations for future research**

The first limitation of this research relates to the use of previous measurement scales to assess the variables of the theoretical framework. Reduction, convergence and discriminant analyzes confirmed the appropriateness of these scales. However, it was preferable to conduct a qualitative study prior to the quantitative study. This qualitative study would produce measurement scales more related to the psychological, ethical, and cultural characteristics of Saudis. The second limitation relates to not using specific brands or industries to measure trust in green brands, congruence of one's green image, and green purchase intention. Subjects could have divergent assessments depending on the performance and trustworthiness of green brands. For example, subjects could have positive attitudes and beliefs towards an organic food brand such as "Macro Green" although they evaluate "Toyota Prius" negatively. Therefore, their responses to the questionnaire would be highly biased. As an indication, the variables influencing purchase intention for green products differ by product.

Accordingly, further research could validate the theoretical framework for a specific industry or brand, such as hybrid cars. It would be interesting to know how to most

effectively attract Saudis to green cars given their preference for SUVs and gas-guzzling pick-ups. The link between Islamic values and green consumption would be considered in this context. Cross-industry or cross-country analyzes could also be considered. Incorporating moderator variables into the model, such as demographic characteristics (gender, age) or subjective norms, will also contribute to further understanding of green purchasing behavior among consumers in emerging or developed countries. The moderating role of marketing strategies and practices (advertising, promotion, pricing) could also be explored.

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