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The relationship between Green Social Media Marketing and Intention of Using Energy Saving Services based on the Theory of Planned Behavior and Norm Activation Model

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The relationship between Green Social Media Marketing and Intention of Using Energy Saving Services based on the Theory of Planned Behavior and Norm Activation Model

In recent years, global warming and the consequent shortage in energy resources have urged countries and communities worldwide to take a closer look at their consumption behavior. Social Media has provided a platform to promote pro-environmental behaviors. Such pro-environmental activities and content on Social Media platforms are known as Green Social Media Marketing (GSMM). The influence of Social Media Marketing on Consumer Green Purchase Intention and Behavior has already been a controversial topic among scholars. Also, there are more obstacles slowing down the growth of Energy Service Companies(ESCO) in developing countries. Some of these constraints are due to structural malfunctions of the governments and others are affiliated to cultural norms. This paper tries to pave the way for the development of the ESCOs' by depicting the effectiveness of GSMM and the role of goverments' Public Policy in their markets particularly in developing countries.This study aims to explain the relationship between GSMM, Personal Norms (PN), and Consumer Green Purchase Intention using some behavioral theories such as the theory of planned behavior and the Norm Activation Model. A total of 362 questionnaires were obtained from Instagram users who were exposed to a specific page related to energy efficiency services using a convenience sampling approach. Partial Least Square Structural Equation Modelling (PLS-SEM) was employed for testing the hypotheses. The results confirmed that GSMM significantly influenced PNs. The relationship Between PNs and Green Purchase Intention as well as the mediating role of Public Policies was reported positive and significant.

Keywords: green social Media marketing, green purchase intention, ESCO (Energy Service Companies), personal norms, public policies

Introduction

The earth is warming at an unprecedented rate, which makes it impossible for sceptical people to deny the damage global warming has caused to the environment. Specifically, in developing countries emission of greenhouse gases into the atmosphere has been increasing due to rapid

industrialization and urbanization (Yoro & Daramola, 2020). The initial idea of Energy Service Companies (ESCO) was introduced over 100 years ago in Europe and afterwards it passed to the North America region. ESCOs have been implemented quite successfully in developed countries. However, there is still room for improvement in developing countries (Nurcahyanto et al., 2020a). Human behavior has a significant influence on the environment. Pro-environmental behavior is when the individuals' consumption not only has a less destructive impact on the environment but also preserves or benefits it (Kaur & Chahal, 2018). On the one hand, environmental concerns have altered consumers' behavioral patterns and increased their demand for pro-environmental products. Showing concern for the environment contributes to the company's competitive advantage through boosting brand image (Zameer et al., 2020). A socially responsible brand with environmental considerations could attract new customers and reinforce existing customers' loyalty (Nadanyiova et al., 2020). As a result of this, a new concept emerged in marketing which today is widely known as Green Marketing.

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Despite the existing literature on the impact of social media marketing on purchase intention (Moslehpour et al., 2021; Savitri et al., 2021; Wijayaa et al., 2021), the process by which purchase intention is affected has not been addressed. Reviewing the literature on Sustainable Consumption, Quoquab and Mohammad (2020) addressed a set of behavioural theories such as self-determination theory, theory of reasoned action, social cognitive theory, value-belief-norm theory, norm activation theory and the theory of planned behaviour. The present research applies different behavioral theories including Norm Activation Model (NAM) and Theory of Planned Behavior to fill this

vacuum. Moreover, previous works revealed that, in addition to attitude, green consumer behavior is affected by cultural, personal, political, psychographic, and ethical values (Sharma et al., 2022). Many previous studies have compared the status of ESCOs and Green Marketing in developed and developing countries (Carfora et al., 2018). According to Sarkar and Moin (2018), ESCOs in developing states have not reached their full potential which is mostly regarded as national market failures and public sector being the major energy consumer. According to the World Economic Situation and Prospect (WESP) report in 2021, Iran is ranked as a developing country. Parchami and Naderi (2018) state that in Iran -with a developing economy- ESCOs face many obstacles, specifically in public sector. Lack of clear and stable laws in relation to ESCOs as well as banks reluctance to invest in this sector due to dismal prospects are two major problems impeding market's growth. Additionally, personal and social norms are another factors making the status of ESCOs different in developing and developed counties. For instance, despite government's monetary and regulatory pressures to reduce energy consumption, Egyptians have shown trivial inclination to curtail their consumption, while they reduced their water consumption more willingly in the absence of any significant motivator. Marzouk and Mahrous (2020) attribute this behavior to consumers' subjective norms.

Globally, scholars have been studying the predictors of Sustainable Consumption Behavior (SCB) to provide guidance for policy makers and guarantee a more sustainable future (Marzouk & Mahrous, 2020). Despite the Iranian government's greater attention to ESCOs and their impact on energy intensity reduction, the policy of the facilitating regulations has been neglected. Additionally, high energy losses have undermined the efforts of the Iranian government to facilitate the investments on renewable energy sources (Solaymani, 2021). The trend remains almost similar worldwide. For instance, Marzouk and Mahrous (2020) suggest that there is currently a drive toward sustainable consumption which works in two directions: resource conservation and purchase of sustainable products with less negative environmental impacts. The expansion of the ESCOs market

substantially contributes to energy consumption reduction and helps foster a culture of energy conservation in the society (Jafari, 2018). Therefore, the present research aims to study the impact of marketing (specifically social media marketing) practices on introducing ESCOs to the Iranian public.

Literature Review

Energy Service Companies

The energy service company (ESCO) industry offers energy savings and other advantages through inclusive building retrofits, efficient equipment installation, and other energy services (Carvallo et al., 2019). ESCOs provide diverse facilities to consumers such as the energy supply and management, financing, consultancy and technical engineering support, providing equipment, installation, and set-up and maintenance comprising enhancement, examining, measurement, and corroboration for energy savings. ESCOs are normally carried out with energy efficiency project design and development, providing energy savings assurance and guaranteeing economical and optimal performance functioning (Nurcahyanto et al., 2020).

Internationally, ESCO operations typically involve three contract types: shared savings, guaranteed savings, and fee for service contracts. The two types of shared savings and guaranteed savings which are known as energy performance contracting (EPC), are the chief business models that characterize ESCOs in implementing energy efficiency compared with other service companies. Shared savings contracts obligate an ESCO to provide technical assistance and support to energy efficiency project design and application, in addition to holding it liable for upfront project financial support. Therefore, it admits both the implementation and the financial risk of the project. However, the guaranteed saving contract commits the facility owner, rather than the ESCO, to finance the energy efficiency project. Through such contracts, the ESCO allocates a pre-determined percentage of the energy savings

to the facility owner. The fee for service contracts comprises of the ESCO providing specified energy efficiency services for a contracted payment. The facility owner is committed to finance the energy efficiency project and obtains all the cost savings. The ESCO is not bound to an indicated level of energy savings, nor does it receive a segment of the savings from the energy efficiency project. Thus, this contract type is not based on performance (Zhu, 2020).

Jafari (2018) performed a study to develop strategies for ESCOs in Iran, employing SWOT[1] and internal and external matrixes. This study yielded the following as the most significant weaknesses of ESCOs in Iran:

- The challenge of cooperation with experienced foreign companies
- ESCOs' incapability to introduce their services to the public
- Lack of experience in ESCOs
- Lack of technology in ESCOs

Such results indicate failure in the introduction and marketing of these companies in Iran.

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According to the theories mentioned, we present the conceptual framework of our study as

[1] Strength/Weakness-Opportunity/Threat

following:

Place Figure 1 here.

Figure 1. Conceptual framework of the study

Research Method

Data collection

As a questionnaire-based study, the present research included a questionnaire which was distributed among the students of Kharazmi University of Tehran. The questionnaire was designed to include an introduction to provide a proper understanding of the concept and verify the respondents' consent to their data being used in the research. In this section, the ESCOs and their available services in the country were introduced. To assure that the respondents had familiarity with the content, a conditional question was presented inquiring if they had been following and reading the contents of our Instagram page, "Energy Darmany", which discussed the ESCOs profoundly. A "yes" response would lead the students to the two central parts of the survey. The first section inquired the sample's demographic characteristics including age, gender, monthly income, and education. The proceeding section was dedicated to the subject of the study. The validity of the responses was screened with regarded to omit responses with missing values or with zero standard deviation.

The power analysis approach was employed to determine the minimum sample size. According to Chin and Newsted (1999), to calculate the minimum sample volume for a pls model, a statistical power analysis based on the segment of the model with the most complex multiple regression is required. To locate the most complex multiple regression segment,

we need to decide in advance which of the following possibilities is larger: either the block that contains the most formative indicators or the dependent Latent Variable (LV) with the most LVs impacting it. All of the indicators of the present model are reflective, so the model's most complex regression was determined by PN variable which receives the largest number of structural paths; PN and its four antecedent constructs form the largest regression of the model with five variables.

Place Table 1 here

Table 1. Sample size requirements for a Power of .80 (Alpha = .05)

Also, Chin and Newsted (1999) stated that "for a more accurate assessment, one needs to specify the effect size for each regression analysis and look up the power tables provided by Cohen (1988) or Green's (1991) approximation to these tables." According to their guideline and using Green's (1991) approximation (Table 1), to get a power of 0.80 and an alpha level of 0.05 and considering medium effect size, a minimum sample of 91 cases was required for our model. Moreover, according to Kline (1998), if the ratio of the sample size to the number of items is 5:1, the results of PLS method will be statistically suspicious; It will be realistic if the ratio is 10:1, and will be expected and reliable if the ratio is 20:1. There were 33 valid indicators in the present study, so in order to obtain more realistic results, we tried to gather more than ten times of 33 samples instead of the minimum 91 cases.

The validity of the responses was screened regarding omitting responses with missing values or zero standard deviation. Eventually, 362 questionnaires were validated for testing the model.

Descriptive analysis

The descriptive analysis contains information about the respondents' gender, age, and educational background. Table 2 shows that most respondents, i.e., (181) 50% people fall within the 20–24 age group. While 53 individuals (15%) and 87 people (24%) fall within the 25–29 and 30-34 age groups, respectively with only 11% of people 35 or older. Additionally, 43% of respondents were female, while 57% of respondents were male. Since the questionnaires were disseminated among university students, all respondents were students. The majority including 232 (64%) of them were bachelor's students, while the remaining 130 (36%) were graduate students with a larger proportion being in the master's level.

Place Table 2 here

Table 2. Sample Demographics

The questionnaire contained questions extracted from different sources which were modified and localized considering the subject of the present paper. **Error! Reference source not found.** displays the scale and sources of each item of the questionnaire.

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Conceptual Model Evaluation

The structural equation model was used to test the hypotheses. According to (Chin, 1998), the bootstrapping method with 5000 subsamples was applied to each set of independent LVs in the hypotheses. Table 4 illustrates the causal relationship between variables by path coefficients.

The coefficient of determination (R^2) of the endogenous constructs is the primary criterion to assess a PLS model. The R^2 value is an indicator of the predictive power indicating what extent of the variance in the relevant construct is described by its antecedent variables in the model (Urbach & Ahlemann, 2010). Consistent with Cohen (1992), R2values of 0.60, 0.33, and 0.19, respectively, are assumed to be substantial, moderate, and weak. Additionally, the Q2 test is employed to evaluate the endogenous components' predictive relevance. In our study, cross-validated redundancy techniques in SmartPLS 3 were used to get predictive relevance (Q2). A Q2 value greater than 0 denotes the model's predictive relevance, while a Q2 value less than 0 denotes the model's lack of predictive relevance (Chin, 1998). The R^2 and Q2 values in Table 5 show that the model's endogenous constructs had acceptable predictive relevance and proper predictive power.

According to the results, the path coefficients in the model validated all relations except H6. The variables of Awareness of Consequences, Environmental Responsibility and Perceived Consumer Effectiveness had a significant impact (P-value < 0.01 or P-value < 0.05) on the formation of PNs, while no significant relationship was observed between the variables of Environmental Concern and PNs. The third hypothesis (H3) postulates that PP significantly affects how PN and GPI are related to one another. PP therefore moderates the already favourable association between PN and GPI. Furthermore, hypothesis eight (H8) postulates that PP significantly affects how PN and GPI are related to one another, i.e., PP moderates the already existing relationship between PN and GPI.

The findings, moreover, confirmed the significant impact of GSMM on consumers' Awareness and Concern. The moderating role of PP on the relationship between PNs and consumers' GPI was confirmed as well (as also depicted in figure 5).

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Table 4. Structural model results

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Table 5. Results of R2 and Q2 for endogenous constructs

Discussion and Implication

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Limitations and Future Studies

In present study we face some limitations regarding our sample. Since ESCOs are newcomers in Iran's energy market, their share of the market is not considerable and thus it has not been convenient for us to reach actual customers. Therefore, we examined potential customers of energy saving services, through studying their GPI. With this in mind, we suggest researchers

to study the purchase behavior of actual consumers of these services in future works. On the other hand, the source of our data is self-reported consumption behavior of the respondents who may have fallen into social-desirability trap to show they adhere to the social norms and that they are "greener consumers" (Mostafa, 2007). Hence, to evaluate consumers' consumption behavior, it would be better to collect real data from real customers (Allen et al., 2015).

In addition, to investigate the role of GSMM, we limited our sample to Instagram users, since it is one of the most popular social media platforms amongst Iranians. Users use different platforms for different purposes and therefore they adapt different behavioral patterns (Alhabash & Ma, 2017). Hence, a more comprehensive study may encompass a thorough social media campaign launched on a set of platforms.

We must admit that since the literature regarding Green Purchase Intention is highly rich, we neither aimed to, nor were we able to address all the antecedents of the variable. However, it should not be inferred as an attempt to downplay the significance of other moderators and drivers. Social Norms, for instance, are another antecedent of pro-environmental behaviours along with PNs (S. H. Kim & Seock, 2019). In this paper, we investigated the impact of GSMM on PNs and GPI, nonetheless further study is required to determine how SNs affect the relationship between GSMM and consumers' GPI. It is noteworthy to add that we had to ignore some underlying variables including the replacement rate between conventional and energy-efficient products and services.

Acknowledgement

We send our gratitude to all our followers on "Energy Darmany" Instagram page, with special regards for those who responded to the questionnaire.

Disclosure statement

No potential conflict of interest was reported by the authors.

Appendix 1:

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Table 6. Cross Loadings

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Figures:

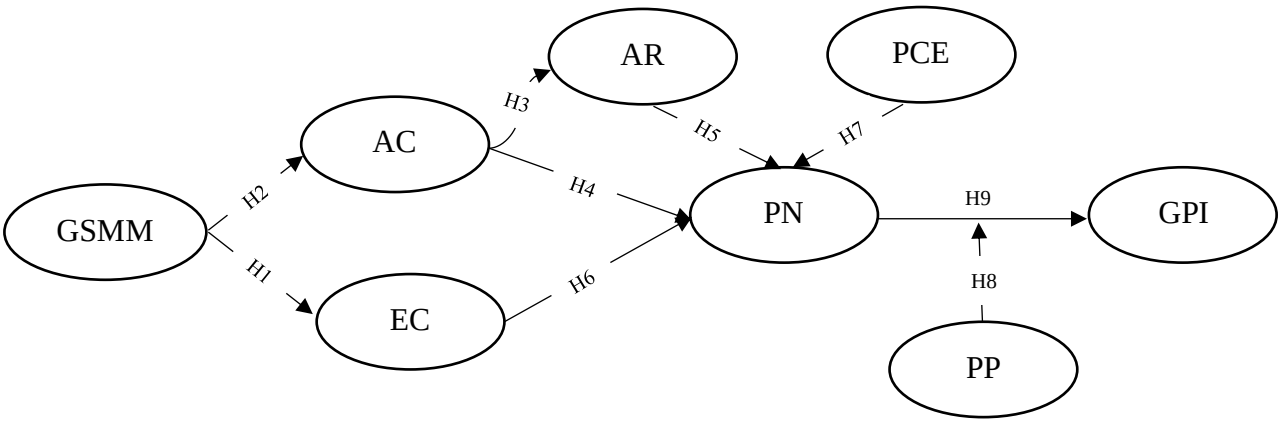

Figure 1. Conceptual framework of the study. Notes: GSMM: Green Social Media Marketing, AC: Awareness of Consequences, EC: Environmental Concern, AR: Ascription of Responsibility, PN: Personal Norm, PCE: Perceived Consumer Effectiveness, PP: Public Policies, GPI: Green Purchase Intention

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Tables:

Table 1. Sample size requirements for a Power of .80 (Alpha = .05)

Number of predictors	Sample size based on power analysis		
	Effect size		
	Small	Medium	Large
1	390	53	24
2	481	66	30
3	547	76	35
4	599	84	39
5	645	91	42
6	686	97	46
7	726	102	48
8	757	108	51
9	788	113	54
10	844	117	56
15	952	138	67
20	1066	156	77
30	1247	187	94
40	1407	213	110

Source: Green (1991)

Table 2. Sample Demographics

Demographic Variables	**Categories**	**Frequency**	**Percentage**
Age	20-24	181	50%
	25-29	87	24%
	30-34	53	15%
	35 and above	41	11%
Gender	Female	156	43%
	Male	206	57%
Education	Bachelor's Student	232	64%
	Master’s Student	128	35%
	PhD Student	2	< 1%

Source: Authors

Table 3. Questionnaire design

Constructs	Items	Source
Green Social Media Marketing	It is easy to use social media sites to get information on climate changes.	Note: Most of the sources of the questionnaire have been deleted in this special release.
	I pay attention to contents (videos/posts/blogs) of environmental issues matters on social media.	
	I share videos and posts regarding environmental issues.	
Awareness of Consequences	Using ESCOs' services can lower energy usage.	
	Adoption of ESCOs' services can lessen the damage to the environment.	
	Energy consumption leads to exhaustion of energy sources.	
	Energy consumption results in local ecological harm.	
	I am aware of the effect of energy consumption on global warming.	
	Generally, energy consumption can cause some negative results.	
Environmental Concern	I pay great attention to environmental protection and energy conservation.	
	I feel I have a mission to save energy and protect the environment.	
	I believe using ESCOs' services can influence the environment pollution.	
	I am really worried about the environment (air, water, and the land use).	
	I am really concerned about water and air pollution in my city.	
Environmental Responsibility	I believe everyone is somewhat responsible for energy shortage and air pollution.	
	As I do not partake in e-waste recycling and affect the living environment, I am responsible for this.	
	Considering the negative outcomes of not participating in e-waste recycling, I can accept costlier energy-efficient products.	
	Considering the negative effects of not participating in e-waste recycling, I am willing to accept the transportation expenses of the waste to the recycling network.	
Perceived Consumer Effectiveness	Everyone can positively affect the society through buying ESCOs' services.	(Y. Kim & Choi, 2005)
	I can help resolve the issue of air pollution through my personal consumption behavior.	
	I can promote environmental protection through buying ESCOs' services.	

	There is a lot more that we can do about the environment.	(Kautish et al., 2019)
	When I buy products, I try to think about how my use of them will affect the environment and other consumers.	
Personal Norm	I am the kind of person who wants to use ESCOs' services because of severe air pollution.	
	I think I have a moral obligation to buy ESCOs' services.	
	I feel guilty if I do not buy ESCOs' services.	
	I would feel proud if I purchase ESCOs' services.	
Public Policies	I have heard about the guidelines of subsidies to the purchase of ESCOs' services.	
	Policy advocacy of energy-saving behavior will encourage me to buy ESCOs' services.	
Green Purchase Intention	I plan to try ESCOs' services.	
	I am interested in purchasing ESCOs' services.	(Zerbini et al., 2019)
	Possibly I will purchase ESCOs' services.	
	I will suggest ESCOs' services to others .	

Table 4. Structural model results

Hypotheses	Path	Path coefficient	Standard Deviation	T-value	Result	P-value
H1	GSMM → EC	0.572	0.029	19.456	Supported	0.000
H2	GSMM → AC	0.608	0.033	18.236	Supported	0.000
H3	AC → AR	0.463	0.047	9.891	Supported	0.000
H4	AC → PN	0.271	0.049	4.692	Supported	0.000
H5	AR → PN	0.337	0.071	4.720	Supported	0.000
H6	EC → PN	0.009	0.055	0.173	Not Supported	0.862
H7	PCE → PN	0.291	0.075	3.870	Supported	0.001
H8	PN*PP → GPI	0.157	0.064	2.377	Supported	0.017
H9	PN → GPI	0.475	0.067	7.074	Supported	0.000

Source: Authors, Notes: GSMM: Green Social Media Marketing, AC: Awareness of Consequences, EC: Environmental Concern, AR: Ascription of Responsibility, PN: Personal Norm, PCE: Perceived Consumer Effectiveness, PP: Public Policies, GPI: Green Purchase Intention

Table 5. Results of R2 and Q2 for endogenous constructs

Constructs	R^2	Q^2
AC	0.370	0.180
EC	0.328	0.164
ER	0.214	0.116
PN	0.547	0.342
GPI	0.474	0.309

Source: Authors, Notes: AC: Awareness of Consequences, EC: Environmental Concern, ER: Environmental Responsibility, PN: Personal Norm, GPI: Green Purchase Intention

Table 6. Cross Loadings

Construct	GSMM	AC	EC	ER	PCE	PN	PP	GPI
GSSM1	**0.769**	0.446	0.357	0.232	0.300	0.252	0.411	0.346
GSMM2	**0.854**	0.612	0.443	0.254	0.256	0.318	0.370	0.484
GSMM3	**0.798**	0.403	0.575	0.402	0.454	0.439	0.425	0.450
AC1	0.401	**0.641**	0.242	0.186	0.123	0.297	0.238	0.363
AC2	0.406	**0.811**	0.465	0.290	0.320	0.440	0.181	0.541
AC3	0.452	**0.757**	0.413	0.310	0.443	0.370	0.251	0.346
AC4	0.381	**0.813**	0.433	0.438	0.437	0.458	0.316	0.423
AC5	0.578	**0.636**	0.446	0.434	0.536	0.459	0.548	0.451
AC6	0.421	**0.753**	0.498	0.312	0.291	0.329	0.159	0.507
EC1	0.488	0.375	**0.721**	0.371	0.396	0.399	0.412	0.440
EC2	0.394	0.425	**0.812**	0.495	0.654	0.509	0.306	0.346
EC3	0.501	0.715	**0.748**	0.395	0.493	0.426	0.362	0.614
EC4	0.244	0.331	**0.766**	0.342	0.396	0.285	0.235	0.459
EC5	0.450	0.211	**0.708**	0.315	0.438	0.207	0.304	0.264
ER1	0.138	0.332	0.321	**0.620**	0.482	0.323	0.200	0.292
ER2	0.312	0.328	0.450	**0.823**	0.659	0.506	0.331	0.404
ER3	0.247	0.358	0.374	**0.901**	0.612	0.663	0.252	0.549
ER4	0.407	0.400	0.445	**0.666**	0.459	0.464	0.216	0.572
PCE1	0.287	0.261	0.471	0.514	**0.636**	0.473	0.350	0.457
PCE2	0.097	0.229	0.342	0.488	**0.814**	0.381	0.263	0.377
PCE3	0.422	0.603	0.646	0.581	**0.781**	0.578	0.511	0.674
PCE4	0.304	0.423	0.579	0.413	**0.631**	0.259	0.201	0.398
PCE5	0.348	0.330	0.358	0.604	**0.780**	0.585	0.280	0.468
PN1	0.356	0.453	0.431	0.562	0.571	**0.838**	0.431	0.588
PN2	0.327	0.406	0.386	0.530	0.607	**0.844**	0.352	0.600
PN3	0.345	0.405	0.363	0.523	0.441	**0.820**	0.390	0.512
PN4	0.346	0.515	0.478	0.548	0.530	**0.767**	0.538	0.416
PP1	0.443	0.387	0.374	0.382	0.441	0.552	**0.875**	0.465
PP2	0.425	0.327	0.405	0.196	0.371	0.369	**0.881**	0.475
GPI1	0.416	0.456	0.453	0.517	0.632	0.554	0.437	**0.820**
GPI2	0.360	0.527	0.463	0.468	0.460	0.493	0.474	**0.817**
GPI3	0.554	0.518	0.500	0.430	0.473	0.430	0.413	**0.818**
GPI4	0.468	0.506	0.506	0.602	0.645	0.659	0.460	**0.880**

Source: Authors, Notes: GSMM: Green Social Media Marketing, AC: Awareness of Consequences, EC: Environmental Concern, ER: Environmental Responsibility, PN: Personal Norm, PCE: Perceived Consumer Effectiveness, PP: Public Policies, GPI: Green Purchase Intention