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The Impacts of the Theory of Planned Behavior, Environmental Concern and Intention to Buy Green Products on Pro-Environmental Behavior (Kermanshah, West of Iran)

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Abstract
Environmental concerns of people in the community have increased due to increasing environmental problems and issues. This in turn leads to changes in consumer behavior and purchasing decisions. Therefore, the aim of this study is to investigate the effects of attitudes, mental norms, and perceived consumer behavioral control using the theory of planned behavior, taking into account the role of environmental concerns and the intention to buy green products. For this purpose, the research data was collected from a sample of 867 people in the cities and villages of Kermanshah City and the data was analyzed by structural equation modeling. The findings revealed that attitudes (36%), mental norms (55%), and perceived behavioral control (50%) all had positive effects on pro-environmental behavior; additionally, environmental concerns (40%), and the intention to buy green products (58%), both had positive effects on pro-environmental behavior.

Keywords: Planned Behavior, Environmental Concerns, Buy Green Products, Kermanshah, West of Iran.

چکیده
نگرانی‌های محیط‌زیستی افراد جامعه با توجه به افزایش مشکلات و مسائل محیط‌زیستی افزایش یافته است. این امر به نوبه‌ی خود تغییر در رفتار مصرف‌کننده و تصمیم‌گیریهای خرید وی را در پی دارد؛ بنابراین هدف پژوهش این است که با استفاده از تئوری رفتار برنامه‌ریزی شده، تأثیرات نگرش، هنجارهای ذهنی، کنترل رفتاری ادراک شده مصرف‌کننده با در نظر گرفتن نقش نگرانی محیط‌زیستی و قصد خرید محصولات سبز را بررسی کند. به‌همین منظور، داده‌های پژوهش از نمونه‌ای مشتمل بر ۸۶۷ نفر در شهر و روستاهای کرمانشاه گردآوری شد و داده‌ها با روش مدل‌سازی معادلات ساختاری تحلیل شد. نتایج پژوهش نشان داد نگرش ۳۶٪، هنجارهای ذهنی ۵۵٪ و کنترل رفتاری ادراک شده ۵۰٪ تأثیر مثبت بر رفتار طرفداری از محیط‌زیست دارند؛ همچنین، نگرانی محیط‌زیستی ۴۰٪ و قصد خرید محصولات سبز ۵۸٪ تأثیر مثبت بر رفتار طرفداری از محیط‌زیست دارد.

واژه‌های کلیدی: رفتار برنامه‌ریزی شده، نگرانی محیط‌زیستی، خرید محصولات سبز، کرمانشاه، غرب ایران.

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Introduction

Environmental problems and their adverse effects on human health in recent years have become an important issue among different people in society (Haytko & Matulich, 2008). This issue has increased the attention and desire of people in society to protect and advocate for the environment, which in return has led to changes in consumer demand and behavior (Chamorro and Bangil, 2006). So, once buying a product, consumers do not only pay attention to its price and quality but also they consider the environmental effects of the consuming products (Joshi and Rahman, 2015). Therefore, today, consumers are more inclined to choose and buy green products to protect the environment (Abbasi, Enayati and Rahbari, 2012).

Today, consumers are concerned about the environment and prefer to buy environmentally friendly products and services, and such environmental concerns have led to eco-friendly consumption known as green consumerism (Suplico, 2009). In recent years, many studies have been done on the behavior and intention of consumers to buy a set of green products in different countries (Han et al., 2010). In these studies, mainly two theories of planned behavior and rational practice have been used to predict the buying behavior of different classes of eco-friendly products (Sun, Live, and Zhao, 2019); hence, these theories show different results in different cultural contexts. Therefore, it is necessary to examine the gap between attitudes and behaviors in these theories using cognitive and psychological factors in different cultural contexts (Wei et al., 2017). Environmental concerns are the basis of environmental research as well as an important issue in the consumer decision-making process (Diamantopoulos et al., 2003). Environmental concern refers to the level of awareness and effort of individuals in the field of environmental problems and shows the behavior of the individual to protect the environment (Albayraket al., 2012). Mental norm is another important variable in the theory of programmed behavior that refers to a person's belief in the thinking and opinion of reference people about whether or not to do a particular behavior (Ajzen, 1991). Perceived behavioral control factor is another variable of the theory of planned behavior that refers to the degree of difficulty or ease which a person experiences in performing a behavior (Ajzen, 1991). This means that if a person has a positive concern about a behavior, but feels it is beyond their ability, he will not do it.

Furthermore, Saut and Saing (2021), Zhang et al. (2019), Bhutto et al. (2019), Chen and Tong (2014), and Paul et al. (2016) have stated that environmental concerns affect positive norms and increased control of the situation; thus, people who are concerned about the environment influence the behavior of others through the pressures of family and friends. Therefore, consumer mental norms are affected by increasing environmental concerns.

The environmental concerns and awareness of society has increased due to the increase in environmental problems and issues in developing countries such as Iran. Using the theory of planned behavior, this study attempts to answer the question of what effect cognitive and psychological factors such as environmental concerns and the intention to buy green have on pro-environmental behavior. According to the review of the results of previous researches, the conceptual model of the research and its related hypotheses were presented in Figure 1:

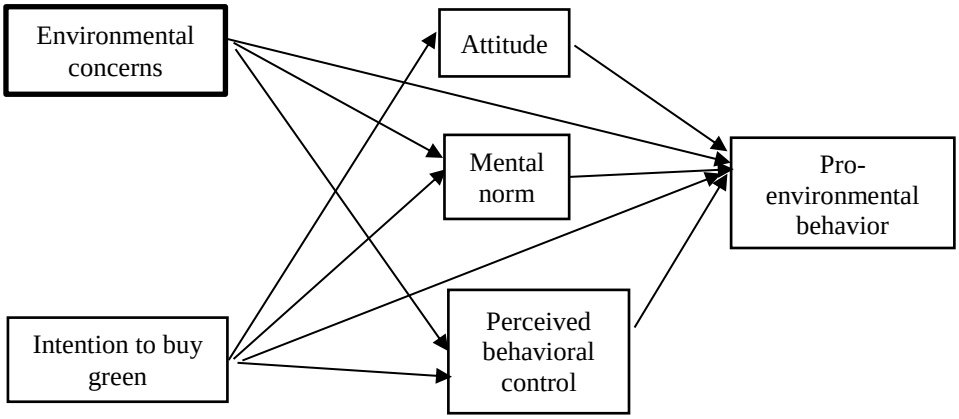

Fig 1. Conceptual model of research (Ajzen, 1991)

Method and Materials

Based on the purpose, this paper could be categorized as an applied research; moreover it is also a correlational research based on the method used. On the other hand, according to the data collection method (questionnaire), this research is a field study and its method is descriptive-survey.

The statistical population of this research included all the people aged 20-65 years old who lived in the urban and rural areas of Kermanshah city – located in the west of Iran - in 2018 and 2019. Sampling was performed in two stages as follows; first, to evaluate the validity and reliability of the questionnaires, a multi-stage cluster sampling method was used. The sample size of 880 people was determined and selected by multi-stage cluster sampling from multiple urban and rural areas of Kermanshah City, for 176 items used in this study. Two neighborhoods from each district and 15 households from each neighborhood were selected by simple random sampling. In rural areas, 10 villages were selected out of the total 86 villages in Kermanshah according to the 2016 census, and 10 households from each village were selected by a multi-stage cluster sampling method. It should be noted that 6 questionnaires were incompletely filled out and 7 questionnaires were discarded due to incomplete data. Finally, 867 questionnaires were analyzed in the hypothesis testing stage. Sample size determination formula in structural equation modeling methodology: $Q< n <15Q5$.

Research Tools

- Perceived Behavioral Control Scale: To measure the perceived control variable, Al-Swidi et al. (2014) questionnaire was used which consists of 4 items. The scale was based on a 5-point Likert scale of 1 to 5, where 1 was strongly disagree and 5 was strongly agree. The Cronbach's alpha of the mentioned questionnaire - in a study which was previously done by Seif et al. (2016) - was 0.72.
- Desire to Buy Green Scale: Kim, Njite and Hancer (2013) questionnaire was used to measure "the willingness to buy" variable which consists of 6 items. The scale was also based on a 5-point Likert scale of 1 to 5, where 1 was strongly disagree and 5 was strongly agree. The Cronbach's alpha of this questionnaire - in a former study done by Seif et al. (2016) - was 0.73.
- Environmental Attitudes Scale: Ten questions designed by Dunlap and York (2008) were used to measure "environmental attitudes". To measure this variable, respondents were asked to express their attitudes and beliefs towards those 10 items. The assessment spectrum was ranked in order of priority to the categories "I strongly agree", "I agree", "I have no idea", "I disagree", "I strongly disagree". In the study done by Naderloo and Shams (2017), Cronbach's alpha for the environmental attitude was 0.78.
- Pro-Environmental Behavior Scale: Readiness and tendency for taking practical action to improve environmental issues (Ajzen, 1991) refers to biological performance. The Pro-environmental

Behavior Questionnaire was adapted from the Kaiser et al. (1999) questionnaire. The questionnaire includes questions about how people perform behaviors such as recycling, energy saving, and information and also how people engage in environmental activities, with priority given to categories that are rated very low, low, medium, high, and very high, respectively. Respondents were asked to answer the questions according to their performance. The validity of the questions was confirmed through formal validity, so the research questions were presented to a number of environmental experts and based on their views, the questions in the questionnaire were finalized. The reliability of the questions was evaluated using Cronbach's alpha coefficient which was calculated for the "environmental attitude" variable (0.85) and for the "environmental behavior" variable (0.78) and the values confirmed the reliability of the assessment tool (Shobeiri, 2016).

- Environmental Concern Questionnaire: This questionnaire has 9 questions and its purpose is to assess the level of environmental concern in individuals. The scoring of the questionnaire is in the format of a 4-point Likert scale (I am not worried at all = 1, I am a little worried = 2, I am very worried = 3, I am worried so much = 4). To compute the total score, we calculated the total score for each question together. This score will potentially range from 9 to 36. Achieving a high score on this scale means a higher environmental concern in the respondents. In Salehi, Ghadami and Hemmati (2012) research, the face validity of this scale has been confirmed by the relevant academic experts. Also, the reliability of this questionnaire was evaluated using Cronbach's alpha, which was 0.89.
- Environmental Norms Questionnaire: Social norms refer to the characteristics that a person behaves according to the shared expectations. Normative behavior in this study was assumed to be the behavior that the individual has adjusted according to the others' behavior. Salehi and Imam Qoli (2012) environmental norms questionnaire was used to examine the norms. Items two and three dealt with social norms and items one and four dealt with individual norms. For this purpose, a five-part Likert spectrum has been used. The range of responses ranged from very positive to very negative. The Cronbach's alpha for this scale was 0.55.

The inclusion criteria consisted: volunteering for the study, age range of 20-45 years old, urban or rural resident of Kermanshah City, having a minimum literacy degree, and on the other hand, the exclusion criteria consisted: physical disability to answer the questionnaires, incomplete filling of the questionnaire, and to be employed in environmental organizations.

Descriptive statistics (i.e. calculation of mean, standard deviation and zero-order Pearson correlations) were used to analyze the research data. The proposed model was then subjected to more complex analyses to determine its suitability using structural equation modeling (SEM) and the statistical method of maximum likelihood estimation. Finally, confirmatory factor analysis (CFA) was performed to determine the validity of some scales. Also, to investigate the indirect relationships of paths, the macro bootstrap method proposed by Preacher and Hayes (2008) and Baron and Kenny's method (1986) have been used. All analyses were carried out with the help of Social Science Statistical Software (SPSS) version 23 and Analysis of Moment Structures (AMOS) version 23.

To determine the adequacy of the fitting of the proposed model with the data, a combination of fitting indices were used as follows: chi-square value ($\chi 2$), chi-square standardized measure (chi-square ratio to degrees of freedom), Goodness-of-Fit index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Normalized Fit Index (NFI), Comparative Fit Index (CFI), Incremental Fit Index (IFI), Tucker-Lewis Index (TLI), and Root of the Mean Square of the Error Approximation (RMSEA).

Results

According to the sample's demographic data, approximately 35.8% (310 respondents) were male and 64.2% (557 respondents) were female. 53.6% (465 respondents) were single, 42.6% (369 respondents) were married, and 3.8% (33 respondents) did not have a spouse.

Testing the Conceptual Model and Research Hypotheses

To test the conceptual model and research hypotheses, the structural equation modeling method and the path analysis method in AMOS software have been used. The final model of the research after testing the model and establishing the proposed relationships was presented in Figure 2.

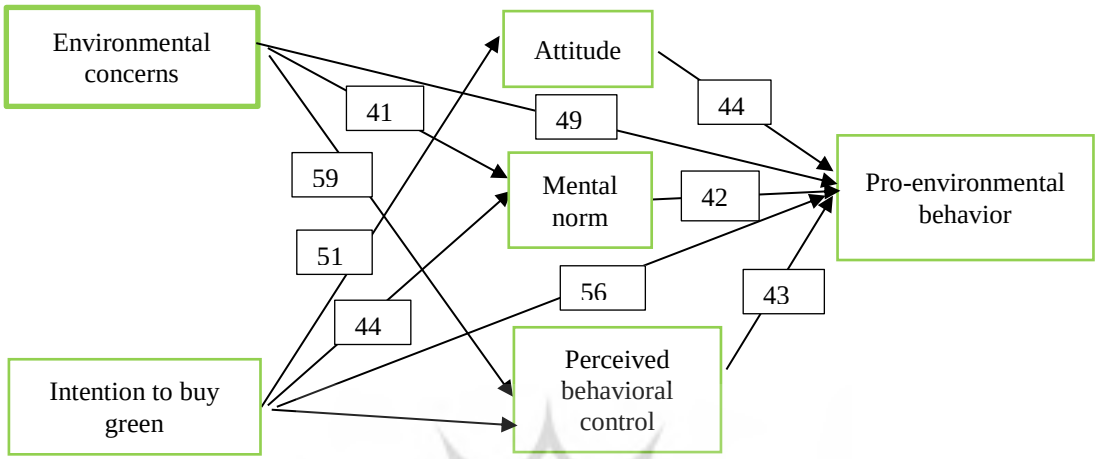

Fig 2. Conceptual model of the research with standard regression coefficients (Ajzen, 1991)

Table 1. Correlation results among the research variables, the mean and the standard deviation

Variables	Environmental concerns	Intention to buy green	Attitude	Mental norms	Perceived behavioral control	Pro-environmental behavior
Environmental concerns						
Intention to buy green	**0.510					
Attitude	**0.455	**0.592				
Mental norms	**0.550	**0.483	**0.455			
Perceived behavioral control	**0.465	**0.541	**0.550	**0.510		
Pro-environmental behavior	**0.620	**0.613	**0.486	**0.410	**0.468	
mean	24.28	20.17	21.76	9.45	11.32	87.18
Standard deviation	6.64	4.57	4.66	2.79	2.53	16.59

** Significance level at 0.01

Table 2. Parameters measuring direct effects in the proposed model

Path	Standard estimate	Non-Standard estimate	standard error	Critical ratio (T)	Significance level (P)
Environmental concern to attitude	0.443	0.363	0.041	8.762	0.001≤
Environmental concern to the mental norm	0.559	0.428	0.062	6.950	0.001≤
Environmental concern to perceived behavioral control	0.510	0.403	0.056	7.251	0.001≤

Intention to buy into attitude	0.494	0.398	0.062	6.369	0.001≤
Intention to buy into the mental norm	0.523	0.145	0.070	5.892	0.001≤
Intention to buy into perceived behavioral control	0.514	0.410	0.042	9.771	0.001≤
Environmental concerns to pro-environmental behavior	0.512	0.405	0.049	8.313	0.001≤
Intention to buy into pro-environmental behavior	0.610	0.580	0.055	10.629	0.001≤

In the table above, the standard and non-standard coefficients calculated for the effect of each variable in the following equations were reported in terms of the value of t. When $p \geq 0.05$ and $t < 2$, the effect is not significant because "t" is less than the criterion. When $p < 0.05$ and $t \geq 2 > 3$, the effect is significant with more than 95% confidence. Also, when $p < 0.05$ and t3≤, the effect is significant with more than 95% confidence. Therefore, based on this table, it can be concluded that $p < 0.05$ and t3≤, therefore, it was concluded that all straight paths were significant.

Table 3. Goodness indices of the proposed research model

	Title of index	Values	Results
Chi square on the degree of freedom	$\frac{x^2}{df}$	2.631	Approve of Model
Significance level	$p \leq 0/001$	0.000	Approve of Model
Root of the Mean Square of the Error Approximation	RMSEA	0.025	Approve of Model
Root of the mean of remaining squares	RMR	0.621	Approve of Model
Goodness-of-Fit Index	GFI	0.900	Approve of Model
Adjusted Goodness-of-Fit Index	AGFI	0.811	Approve of Model
Normalized Fit Index (Better-Found)	NFI	0.902	Approve of Model
Comparative Fit Index	CFI	0.846	Approve of Model
Incremental Fit Index	IFI	0.933	Approve of Model
Tucker-Lewis Index	TLI	0.859	Approve of Model

According to the obtained results, it can be acknowledged that all the fitting indices of the above model were in an acceptable range and therefore the fitting of the collected data with the model was desirable. Therefore, the suitability of the proposed model was approved.

Table 4. Bootstrap results related to the indirect effects in the research mediation model

Path	Data	Boot	Bias	Standard Error	Low Limit	High Limit
The effect of environmental concern through attitudes on pro-environmental behaviors	0.049	0.041	0.001	0.009	0.046	0.051
The effect of environmental concern through mental norm on pro-environmental behavior	0.032	0.031	0.003	0.011	0.021	0.037
The effect of environmental concern through perceived behavioral control on pro-environmental behaviors	0.012	0.010	0.005	0.003	0.009	0.015
The effect of buying intention through attitude on pro-environmental behaviors	0.026	0.024	0.004	0.006	0.023	0.029

The effect of buying intention through mental norm on pro-environmental behavior	0.039	0.035	0.007	0.013	0.033	0.041
The effect of buying intention through perceived control behavior on pro-environmental behaviors	0.027	0.024	0.002	0.010	0.022	0.028

The results of Table 4 show that the upper and lower limits of the above indirect effects were not zero, and this indicates the significance of these indirect paths.

After confirming the research hypotheses, the direct and indirect effects of each variable on the dependent variable of pro-environmental behavior can be investigated. The values related to the effect of research variables on the dependent variable were presented in Table 5.

Table 5. Values related to the effect of research variables on the dependent variable

Research variables	Direct effects	Indirect effects	Total effects	Impact rating
Environmental concerns	0.040	0.041	0.081	**2**
Intention to buy green	0.058	0.051	0.109	**1**
Attitude	0.039	0.023	0.062	**4**
Mental norms	0.042	0.033	0.075	**3**
Perceived behavioral control	0.040	0.021	0.061	**5**

Discussion

In this study, the factors affecting pro-environmental behavior have been investigated using the theory of planned behavior by considering the role of environmental concern variables and the intention to buy green products. According to the results, it can be said that the variable of “pro-environmental behavior” was predicted by the factors such as the "attitude", "mental norm", "perceived behavioral control", "environmental concern" and the "intention to buy green products".

In reviewing the research hypotheses, it can be said that the hypothesis of a positive effect of environmental concern on behavioral attitude was confirmed based on the research results. This finding was consistent with the findings of the researches done by Ibrahim et al. (2021), Zhang et al. (2019), Bhutto et al. (2019), Modi and Patel (2016), Albayrak et al. (2012), Sang and Bekhet (2015) and Hartmann and Apaolaza-Ibanez (2012). This finding shows that a large level of environmental concern leads to a positive attitude towards action to protect the environment.

The next hypothesis - the effect of environmental concern variable on oral norm - was also confirmed. This finding was consistent with the findings of the researches done by Paul et al. (2016), Albuquerque et al. (2012) and Chen and Tung (2012). It can be said that more people were aware of the environment and thus their environmental concerns increased, which in return can change a person's mental belief in the environment and make people have a greater moral commitment to protect the environment. The hypothesis of the effect of biological anxiety on perceived behavioral control was also confirmed. This finding was consistent with the findings of the researches previously done by Paul et al. (2016), Albuquerque et al. (2012) and Chen and Tung (2012). This was due to the fact that as individuals become more worried about the environmental issues, they potentially become more responsible too.

Furthermore, the results of this study was also consistent with the study of Nawah and Froutan Kia (2011) that stated there was a positive and significant relationship between the following variables two by two :

The behavioral beliefs and the environmental behaviors, the normative beliefs and the

environmental behavior, the environmental attitudes and the environmental behavior, the individual norms and the environmental behavior, and finally the intention to perform behavior and the environmental behavior. Moreover, human attitude to the environment and its importance in predicting environmental behaviors has long been considered by researchers. In recent models for measuring attitudes, it is assumed that knowledge of specific realities affects the attitudes towards them. For example, Ajzen (1991) states that if people are not convinced that certain factors play a role in the destruction of the environment, they will not have a negative attitude towards it and human knowledge of the environment will affect the way he views the environment. The type of attitude towards the environment can include the unrepeatable teachings of environmental resources or it can be assumed that environmental resources are recreated and replaced after each use and even destruction. This can be attitudes with specific or generalist preferences.

Conclusion

The Perceived Behavior Control Factor is another variable in the theory of planned behavior that refers to the degree of difficulty or ease which a person experiences in performing a behavior; so those who have a greater degree of control over their behavior, have a stronger intention to perform certain behaviors (Ajzen, 1991). This means that if a person has a positive attitude towards a behavior, but feels it is beyond her ability, he will not do that action (Sanaei, et al., 2013). Regarding the relationship between perceived behavior control and the desire to buy green, it can be argued that according to the theory of planned behavior, people's motivation based on their understanding of the results of a behavior was affected and they could produce green products based on their personal and psychological motivations.

Research Limitations

This study, like other research within this domain, had some limitations in the way it was carried out. Because middle-aged and older people were unwilling to answer the questionnaire, the majority of respondents were young and educated, implying that their responses to questions were shaped by favorable social factors and a prejudice against pretending to be pro-environmental.

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Disclosure of conflicts

JK, FD, have no conflicts.

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