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## The Interactive Effect of Level of Education and Environmental Concern toward Organic Food in Vietnam\*

Hung Cuong HOANG<sup>1</sup>, Miloslava CHOVANCOVÁ<sup>2</sup>, Thi Que Huong HOANG<sup>3</sup>

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### Abstract

**Purpose:** As an environmental concern increases, customers pay more attention to purchase organic food. While customers' purchase intention of organic food has been widely studied, there are lacks of researches regarding the moderation effect of environmental concern and the interactive effect of level of education based on the Theory of Planned Behavior (TPB). This study examines the influence of level of education and environmental concern on purchase intention based on the Theory of Planned Behavior and organic food in Vietnam. **Research design, data and methodology:** The methodology of mixed methods of qualitative and quantitative is applied with a survey of 420 customers being conducted to collect data from three biggest cities in Vietnam: Ho Chi Minh, DaNang and Hanoi. SPSS 23 and SMART-PLS 3.2 are used for data analysis. **Results:** The result shows that the customers have more environmental concern which increases their attitude to the intention of purchasing organic food. Moreover, there has not the three-way interactive effect of level of education, environmental concern and attitude on purchase intention toward organic food. **Conclusions:** This enriches the existing literature with the moderation of environmental concern to the relationship between attitude and purchase intention toward organic food in Vietnam based on the Theory of Planned Behavior.

**Keywords:** Environmental Concern, Level of Education, Theory of Planned Behavior, Organic Food, Mixed-methods.

**JEL Classification Code:** M10, M31, Q56.

### 1. Introduction

In recent decades, environmental concern has gradually escalated (Han, Hsu, & Sheu, 2010). The ongoing and

accelerating overuse and destruction of natural resources such as air, forest and water are a serious threat to the environment. In addition, agriculture uses chemical fertilizers, pesticides and new technologies to generate massive amounts of food (Carvalho, 2006). This has long-term negative effects on the environment, such as contamination of water, air pollution and safety (Carvalho, 2006; K. H. Lee, 2014; Matsui & Ikemoto eds., 2015). Especially in developing countries, such as Vietnam, the problem of protecting the environment is becoming more concerning (Pham, Nguyen, Phan, & Nguyen, 2018). Consumer demand for environmentally friendly goods has grown with environmental concern, and consumers are now seeking to buy environmentally friendly products to increase environmental protection and develop sustainable practices (Paul, Modi, & Patel, 2016). This condition has led, over the last 15 years, to an enormous interest in organic agriculture and organic food, in general (Chekima, 2018). Hence, it is very important to study the effect of environmental concern

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1 First and Corresponding Author, PhD candidate, Department of Management and Marketing, Faculty of Management and Economics, Tomas Bata University in Zlín, Czech Republic. Email: [hoanghungcuong9@gmail.com](mailto:hoanghungcuong9@gmail.com)

2 Second Author, Associate Professor, Department of Management and Marketing, Faculty of Management and Economics, Tomas Bata University in Zlín, Czech Republic. Email: [chovancova@utb.cz](mailto:chovancova@utb.cz)

3 Third Author, Lecturer, Faculty of International Economic Relations, University of Economics and Law, Vietnam. Email: [huonghtq@uel.com.vn](mailto:huonghtq@uel.com.vn)

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on purchase intention toward organic food in developing countries, such as Vietnam.

Education plays a key role in providing people with knowledge, promoting social development and supporting sustainable growth (Laurie, Nonoyama-Tarumi, Mckeown, & Hopkins, 2016). According to Uvalic-Trumbic and Daniel (2016), education increases environmental awareness and community concern, and it will play an important role in enhancing understanding of the science behind climate change and other environmental issues. In developing countries such as Vietnam, the education system is improving significantly to catch up with the developing world and to increase the concern of people regarding environmental issues. Education is an important tool for equipping awareness and increasing environmental concern (Uvalic-Trumbic & Daniel, 2016), hence it is essential to investigate the relationship between the level of education and environmental concern based on the Theory of Planned Behavior (TPB) toward organic food in Vietnam.

Researches which are based on the TPB has provided growing empirical evidence environmental concern has a direct effect on many aspects, such as tourism management (Han et al., 2010; Wang, Zhang, Yu, & Hu, 2018) and green products consumption (Paul et al., 2016; Yadav & Pathak, 2016). The direct effect of environmental concern is described in many studies regarding the purchase intention of organic food. For example, Asif, Xuhui, Nasiri, and Ayyub (2018) illustrate factors influencing organic food purchase intention with a comparative analysis. Moreover, many investigations examine the indirect and direct relationships between environmental concern in the context of the TPB toward organic food purchase intention (Chekima, Chekima, & Chekima, 2019; Pham et al., 2018; Yiridoe et al., 2014).

There is some research on the effects of environmental concern as a moderator in the TPB. Diamantopoulos, Schlegelmilch, Sinkovics, and Bohlen (2003) observed that in the decision-making process of consumers, environmental concern is an important factor. Moreover, the number of consumers with environmental concerns increased, which led to an increase in purchase intention of the green products (Aman, Harun, and Hussein, 2012). Additionally, other studies also highlighted environmental concern not only affect behavior, but also influence the attitude toward behavior; the consumers with higher environmental concern tend to have the more positive environmental attitude, which in turn increase their willingness to act (Chen & Peng, 2012; Clark, Kotchen, & Moore, 2003). Besides, education raises environmental concern and helps change behavior by increasing involvement among people (Uvalic-Trumbic & Daniel, 2016). The three-way interactive effect of level of education and environmental concern on organic food purchase intention based on the TPB has not been

investigated. To fill in the gaps, this study attempts to answer the following research questions: How is the TPB applied to organic food? Does environmental concern have moderating effects on organic food purchase intention in Vietnam, based on the TPB? Does the level of education have any interactive effects on organic food purchase intention in Vietnam? And what are the theoretical and practical implications for the purchase intention of organic food in Vietnam?

Based on the gaps in the research, the main research objectives of this paper are: to confirm the direct effect of factors in the TPB on purchase intention toward organic food in Vietnam; to investigate the moderation effects of environmental concern on the TPB toward organic food purchase intention in Vietnam; to investigate the interactive effects of level of education on purchase intention toward organic food in Vietnam; and to point out the theoretical and practical implications in the purchase intention of organic food in Vietnam.

The strength of this study and its contribution to theory is to update the moderation effects of environmental concern based on the TPB. Furthermore, examining the interactive effect of the level of education in the context of the TPB will enrich the literature. In practical applications, companies understand the importance of the environmental concern of their customers. By launching many environmental activities, companies that produce organics foods will increase the environmental concern of their customers. This leads to an increase in organic purchasing intention. The environment of the world and the health of human beings would be better if everyone used organic foods, and governments pay more attention to the development of education not only for economic and sustainable development purposes but also as a tool to protect the environment.

In the following section, the theoretical background of TPB and the conceptual framework that supports the research hypotheses are described. In the methodology section, measurement development, data collection and analyses are illustrated. Finally, the study findings, implications, and conclusion are discussed in the results and conclusion sections.

## **2. Background**

### **2.1. Theoretical foundation**

The Theory of Planned Behavior has been commonly used to explain individual behavior, particularly in relation to organic food, and many studies have demonstrated it effectively (Rana & Paul, 2017). TPB is a cognitive model that predicts intention and behavior (Ajzen, 1991). TPB is connected to the beliefs and behavior of individuals and

considers that the intentions and behavior of individuals can take on three factors: attitude, subjective norm and perceived behavioral control (Ajzen, 1991). There are many fields that have successfully applied this model for the explanation, such as health psychology (Walker, Grimshaw, & Armstrong, 2001; Zemore & Ajzen, 2014), environmental behavior (Abrahamse & Steg, 2009; Whitmarsh & O'Neill, 2010), food choice in the diet (Arvola et al., 2008; Kim, Ham, Yang, & Choi, 2013), green consumption (Al, Rosli, Ra, & Mohiuddin, 2018) and tourism and green hotel choices (Han et al., 2010; Wang et al., 2018). In the area of organic food, TPB has been used to illuminate research related to purchase intention and behavior (Carvalho, 2006; Chekima et al., 2019; Lee, Chang, Cheng, & Chen, 2018; Rana & Paul, 2017; Shamsi, Najafabadi, & Hosseini, 2020; Yadav & Pathak, 2016a)

The Theory of Reasoned Action (TRA) is developed to the TPB (Fishbein & Ajzen, 1975). The TRA model is a model of social psychology explaining behavioral intentions as well as actual behavior. This model is based on two predictors, attitude and subjective norm (Fishbein & Ajzen, 1975). In 1985, Ajzen developed the TPB to remedy the limitation between behavioral intentions and actual behavior by providing an additional variable. This variable is perceived behavior control (PBC), which influences directly intentions and behavior (Ajzen, 1985)

In TPB, the first component of the model attempts to detect a person's "personal attitude" to the behavior by identifying their outcome beliefs and evaluations. Outcome beliefs capture what we believe to be the outcome of engaging in a behavior; outcome evaluations estimate how worthwhile we consider that outcome to be (Ajzen, 1991). The second part of the model discovers a person's "subjective norm," which is composed of their normative beliefs and motivation to comply. The third part of the model looks at our personal control beliefs, which are made up of self-efficacy beliefs and perceived external barriers. Self-efficacy beliefs explain how confident we are that we can achieve the change, even in the face of barriers, while the perceived external barriers describe external factors we think might prevent us from achieving our goals (Ajzen, 1991).

## 2.2. Hypotheses

### 2.2.1. Attitude

TPB defines attitude as the "favorable or unfavorable idea towards conducting certain behavior" (Ajzen, 1991). It assumes that the more positive the attitude, the more likely it is that the purchase intention will be illustrated (Boobalan & Nachimuthu, 2020; Judge, Warren-Myers, & Paladino, 2019; Shamsi et al., 2020). Individual attitudes can be linked to evaluation considerations (Arvola et al., 2008). Moreover,

the degree to which a person has a positive or negative opinion of the purchase influences the intention of consumption (Ajzen, 2001). In particular, if a person has a positive attitude toward engaging in the behavior, their actions will be more likely. To put it another way, the consumer's attitude toward organic food is positive and their attitude toward the purchasing of organic foods is more possibility to be positive. With the increased purchasing of organic food as shown in the literature (Chekima et al., 2019; Paul & Rana, 2012; Rana & Paul, 2017; Yadav & Pathak, 2016a), we believe that attitude toward the purchasing of organic food is positive. The effect of personal attitude on the intention to purchase organic food is investigated by the following hypothesis:

**H1:** Attitude toward organic food positively affects purchase intention toward organic food.

### 2.2.2. Subjective Norm

According to the TPB, a subjective norm (SN) is known as "perceived social pressure to perform or not perform the behavior" (Ajzen, 1991). In particular, social perception pressure persuades individuals to decide whether or not they will perform the behavior (Ajzen, 1985; 2015; Arvola et al., 2008). A subjective norm relates to the incentive of a customer to perform a behavior that reflects perceptions of what is important in the customer's life. When consumers believe organic food is bad for certain people, the intention to buy organic food will be lower. When organic foods are considered safer and more environmentally friendly, consumers will be more willing to buy organic foods; this is because they believe that organic food is better than conventional food, based on the attitude of the important people around them. Much research presents the positive effects of subjective norm on purchase intention toward organic food (Chekima, 2018; Chu, 2018; Paul et al., 2016; Yazdanpanah & Forouzani, 2015). Thus, this study tests this understanding with the following hypothesis:

**H2:** Subjective norm positively affects purchase intention toward organic food.

### 2.2.3. Perceived Behavioral Control

The definition of Perceived Behavioral Control is "an individual perceived ease or difficulty of performing the particular behavior" (Ajzen, 1991). PBC is the construct that determines how simple or difficult the behavior is to perform (Ajzen, 1985; 1991; 2002). It is based on perceived barriers and capacity that have affected consumer intentions to purchase (Asif et al., 2018). Specifically, PBC can be seen as the degree of control that affects the individual to perceive behavior performance (Chen & Tung, 2014). Price perceptions and availability are, thus, seen as significant obstacles in the consumption of organic food. Customers

expecting to buy such items could be willing to pay an extraordinary price (Kim & Chung, 2011). The outcome of individual beliefs supports the purchase decision because the individual can control their behavior (Ajzen, 2015). Moreover, the understanding and clarity of purchase intention may be based significantly on the control of customers (Govindasamy, Puduri, & Simon, 2010). The following hypothesis will be tested to investigate the influence of perceived behavioral control on purchase intention of organic food:

**H3:** Perceived behavioral control positively affects purchase intention toward organic food.

#### 2.2.4. Environmental Concern

The argument offered in this article is that the relationship between attitude and purchase intention may depend on a number of limiting conditions that may change the strength of this relationship. The extent or degree of environmental concern may be a constraint that can vary the strength of the relationship. First, according to Hu et al. (2010), environmental concern is identified as “the extent to which people are aware of environmental issues and endorse efforts to resolve them or to show their personal readiness to contribute to their solution” (Paul et al., 2016). Many publications have illustrated the positive effect of environmental concern on purchase intention based on the TPB. For example, one study pointed out the effect of ecological concerns and consumer purchase intention for organic food (Ragavan & Mageh, 2012) and for eco-friendly products and services (Aman et al., 2012; Han, Hsu, & Lee, 2009). Sang and Bekhet (2015) presented that environmental concern has a significant positive impact on consumer intention to buy an electric vehicle (Yadav & Pathak, 2016). Mostafa (2009) identified environmental concern among the major variables that influence consumers’ attitude, as well as their intention to buy green products. Mostafa (2007) also reported environmental concern positively influences consumers’ attitude toward green products and influence their purchase intention.

However, there was an observation of the significant impact of environmental concern on the decision making of the consumer (Diamantopoulos et al., 2003). More studies show that environmental issues do not only affect behavior but also impact behavioral attitude; greater environmental concern customers seem to have a more positive attitude toward the environment which makes them more likely to take actions in terms of environmental protection, such as organic food purchasing (Chen & Peng, 2012; Clark et al., 2003). From the above arguments, the following hypothesis can be stated:

**H4:** There are two-way interactive effects of environmental

concern and attitude on purchase intention toward organic food.

#### 2.2.5. Level of Education

This study investigated the influence of the level of education (from high school to doctor of philosophy) on the purchase intention toward organic food. Education is a conservation and sustainable development tool. The ultimate contribution of education to sustainable development will come through both individual and social change in behavior—enhancing environmental resilience and raising awareness of climate change (Bangay, 2016). The many threats posed by the destruction of the environment and climate change have acquired a special urgency. Through better knowledge, values, beliefs and changing attitudes, education has significant strength to change ecologically damaging lifestyles and behavior. According to Uvalic-Trumbic and Daniel (2016), education tends to improve behavior by involving people in many actions that promote environmental protection. People with more education are not only more concerned about the environment but also more engaged in activism that promotes and supports environmental policy decisions. In addition, higher education contributes to greater environmental concern (Uvalic-Trumbic & Daniel, 2016). Previous studies revealed that the purchase of organic food is affected by the level of education. Consumers with higher education were more interested in purchasing organic food than those with less education (Dettmann & Dimitri, 2010). Most of the studies focused on the importance of demographic factors, but some of the studies have shown contradictory results that indicated that intention to purchase is slightly affected by age and education level (Yin, Wu, Du, & Chen, 2010). From the above arguments, the next hypothesis is:

**H5:** There is a three-way interactive effect of level of education, environmental concern and attitude on purchase intention toward organic food.

Based on the above discussions, the following theoretical model was developed in Figure 1:

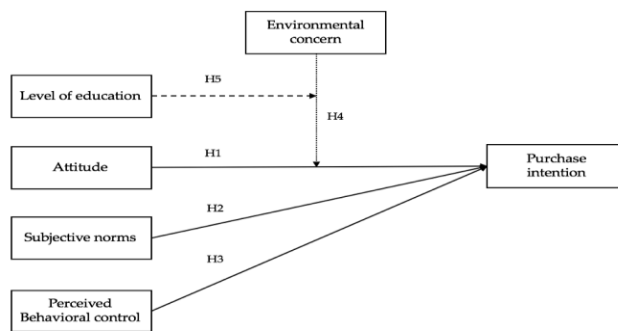


Figure 1: Theoretical model development

### 3. Research Methods

#### 3.1. Survey Design

The Theory The study uses a mixed-methods design. This approach is suggested by Creswell (2014) as the best way to obtain a clear understanding of the research problem.

The mixed-methods design combines qualitative and quantitative data collection and analysis procedures, which are employed either simultaneously or sequentially in a single study (Pham, Tuckova, & Chiappetta Jabbour, 2019). There are three stages for this study, which are illustrated in Table 1.

**Table 1:** Research stages

Stage	Procedure	Objectives
1	To review the existing literature concerning the level of education, environmental concern and purchase intention toward organic food.	To identify current and unresolved issues and to provide inspiration and objectives for the study.
2	Qualitative: Focus group consisting of 10 organic customers in Vietnam.	To explore whether important variables or relationships are missing from the model.
3	Quantitative: Pilot test: N= 70–100 The main survey by paper questionnaire	To assess the statements' accuracy in representing corresponding constructs and to estimate sample size based on effect size To test hypotheses.

**Table 2:** Measurement scale development

Measures	Item description	Sources
Attitude (ATT)	I think that organic food purchasing is interesting.	Ajzen (2002); Arvola et al., (2008)
	I think that organic food purchasing is a good idea.	
	I think that organic food purchasing is important.	
	I think that organic food purchasing is beneficial.	
	I think that organic food purchasing is wise.	
Subjective Norm (SN)	I think that organic food purchasing is favorable.	Ajzen (2002); Arvola et al., (2008)
	My family thinks that I should buy organic food rather than non-organic food.	
	Most people I value would buy organic food rather than non-organic food.	
	People I value (such as my teacher) think you should buy organic food.	
Perceived Behavioral Control (PBC)	My close friends, whose opinions regarding diet are important to me, think that I should buy organic food.	Ajzen (2002); Arvola et al., (2008)
	If I wanted to, I could buy organic food instead of non-organic food.	
	I think it is easy for me to buy organic food	
Environmental Concern (EC)	It is mostly up to me whether or not to buy organic food.	Kilbourne & Pickett (2008); Maichum et al., (2016); Paul et al. (2016)
	I am very concerned about the environment.	
	Humans are severely abusing the environment.	
	I would be willing to reduce my consumption to help protect the environment.	
	Major political change is necessary to protect the natural environment.	
Level of Education (LE)	Major social changes are necessary to protect the natural environment.	Ajzen (2002); Arvola et al., (2008)
	Anti-pollution laws should be enforced more strongly.	
	High School	
	College	
	University	
Purchase Intention (PI)	Master's degree	Ajzen (2002); Arvola et al., (2008)
	Doctor of Philosophy	
	I am willing to consume organic foods if they are available for purchase.	
	I intend to consume organic foods if they are available for purchase.	
	I plan to consume organic foods if they are available for purchase.	
	I will try to consume organic foods if they are available for purchase.	

The questionnaire was developed based on measurement scales from previous research, and there are two parts consisting of demographic and construct variables. The demographic profile includes basic information which are education, age, gender, marital status, personal income, family size and employment status. The second element is the scale of measurement of environmental concern, attitude, perceived behavioral control, subjective norm and purchase intention toward organic food. The construct of the level of education was developed from the Ministry of Education and Training in Vietnam, and there are four items for this construct in the study. The attitude construct was adopted from the research of Ajzen (2002) and Arvola et al. (2008), and there are six items in this attitude construct. Moreover, four items measuring subjective norm and two items measuring perceived behavioral control were also adopted from Ajzen (2002) and Arvola et al. (2008). Environmental concern consists of six items and was adopted from Kilbourne and Pickett (2008), Maichum et al. (2016), and Paul et al. (2016). Purchase intention toward organic food was adopted from Ajzen (2002) and Arvola et al. (2008), and four items are used to measure the construct. The 5-point Likert scale is used as response options for all of the above items, is from “1” as strongly disagree to “5” as strongly agree. The level of education was captured using a 4-item scale: college, university, master’s degree, and Doctor of Philosophy. Table 2 describes the measurement scales of constructs developed from the literature.

### 3.2. Data Collection

The data were collected from the three largest cities in Vietnam: Ho Chi Minh City, Da Nang City and Hanoi City. This research utilized the three largest cities not only because of the size of the population but also due to their organic markets. It is convenient for citizens in these cities to purchase green products, in general, and organic food, in particular. Furthermore, the awareness of using organic food and the trend of purchasing it are much higher than in rural areas and small cities. For the focus group stage, primary data collection used semi-structured interviews with a sample size of 10. Respondents were adult customers (over 18 years) who have purchased organic food or who have no experience with it; we limited the study to adults with higher education degrees because highly educated customers have a better understanding of the topic and are better able to discuss and provide accurate information as opposed to less well-educated people (Han et al., 2010; Han & Kim, 2010). Hence, the data were collected from consumers who have a high level of education above a high school qualification.

For the pilot study, the questionnaire was sent to potential respondents and included the study description. Respondents completed the questionnaire by clicking the link. The sample size for the pilot test was 100 respondents.

The reliability and validity of the measurements in the pilot test are acceptable. In the full study, the data collection used provided a URL and included a face-to-face interview. The full study included a sample size based on the effect size of the pilot study. The sample size was sufficient for this research and was calculated based upon the recommendation of Hair, Black, Babin, and Anderson (2013). They suggested 15–20 observations per variable examined. This investigation includes six constructs (6 items for attitude, 4 items for subjective norm, 3 items for PBC, 6 environmental concern items, 5 education items and 4 purchase intention items for a total of 28 items), resulting in an optimal sample size of 420 respondents.

The descriptive statistical analysis of the sample is illustrated. In particular, 54.8% of respondents are female, and 45.2% are male. In terms of age distribution, the highest proportions are 42.65% and 31.9%, which included 20–35-year-olds and 36–50-year-olds, respectively. The primary marital statuses are married (53.3%) and single (40%). Respondents with a family size of 4–5 people accounted for the highest percentage (49.5%), followed by those with a family size of 2–3 people (36.4%). For employment status, the two most common positions are a full-time job and a part-time job, 67.1% and 12.4%, respectively. Regarding education, the largest proportion of respondents are college graduates (43.6%), followed by respondents with post-graduate degrees (24%) and high school graduates (13.6%). The monthly income of respondents ranges primarily from 15 million VND to 25 million VND and from 25 million VND to 35 million VND, with 34.5% and 22.1%, respectively (1 USD = 23,545 VND as of 14 April 2020).

### 3.2. Statistical Analysis

With respect to the data analysis, the accuracy and quality of the measurement device were evaluated first for the validity and reliability of the data gathered. Regression subsequently followed to analyze the effect on TPB of environmental concern and level of education. The PROCESS model has been used mainly to explain interactive factors and has been developed and implemented for SPSS programs (Hayes & Rockwood, 2017). This approach enables the calculation of regression equations due to their simplicity and ease of use (Hayes & Rockwood, 2017). In addition, SMART-PLS version 3.2 is used in the study of the variable relationships, as well as to measure reliability and validity.

## 4. Results

### 4.1. Reliability and discriminant validity

In terms of the factor loading, a value of factor loading above 0.50 is valid (Hair, Hult, Ringle, & Sarstedt, 2017).

According to the measurement model shown in Table 4, the factor loading of all items ranged from 0.71 to 0.86. This means that all factor loadings exceed the recommended value of 0.6. Moreover, for all constructs, the average variance extracted (AVE) was from 0.58 to 0.69, which exceeded the value of 0.5 recommended by Fornell and Larcker (1981). For the result of the composite reliability, the value was from 0.86 to 0.89, which is greater 0.6. The value of Cronbach’s alpha was from 0.77 to 0.85, which

met the requirement of bigger than 0.6 for internal consistency. Therefore, there is sufficient convergence reliability for all scales.

According to, Table 5 shows discriminant validity which can be assured by the AVE square root value that exceeds the correlations among the constructs in the model (Fornell and Larcker, 1981). All constructs of this study met the requirement of discriminant validity as follows.

**Table 4:** Reliability measurement

Variable	Measurement Item	Loading	Cronbach’s alpha	Composite Reliability	Average Variance Extracted (AVE)
Attitude (ATT)	ATT1	0.71	0.85	0.89	0.58
	ATT2	0.77			
	ATT3	0.76			
	ATT4	0.74			
	ATT5	0.79			
	ATT6	0.78			
Subjective Norm (SN)	SN1	0.84	0.79	0.87	0.62
	SN2	0.77			
	SN3	0.74			
	SN4	0.79			
Perceived Behavioral Control (PBC)	PBC1	0.86	0.77	0.87	0.69
	PBC2	0.81			
	PBC3	0.81			
Environment Concern (EC)	EC1	0.74	0.85	0.89	0.58
	EC2	0.71			
	EC3	0.79			
	EC4	0.79			
	EC5	0.76			
	EC6	0.77			
Purchase Intention (PI)	PI1	0.84	0.78	0.86	0.61
	PI2	0.78			
	PI3	0.74			
	PI4	0.76			

**Table 5:** Measurement of discriminant validity

Variable	ATT	PBC	PI	SN
Attitude (ATT)	0.76			
Perceived Behavioral Control (PBC)	0.64	0.83		
Purchase Intention (PI)	0.69	0.56	0.78	
Subjective Norm (SN)	0.76	0.60	0.65	0.78

### 4.2. Hypotheses Testing

In this study, Smart PLS 3.0 was applied to calculate the action paths between variables in order to analyze the research hypotheses (see Table 6). The results illustrate that there are positive impacts of attitude, perceived behavioral control and subjective norm on purchase intention toward organic food. With p-values < .05, the analysis supports the TPB, which illustrates the hypothesized relationships between attitude, subjective norm and perceived behavior control and purchase intention, supporting H1, H2 and H3.

**Table 6:** Hypotheses testing

H	Relationship	Coefficient	Standard error	t-value	p-value	Supported
H1	ATT→ PI	0.41	0.08	5.42	0.000*	Yes
H2	SN→ PI	0.26	0.08	2.38	0.017*	Yes
H3	PBC→ PI	0.14	0.06	3.10	0.002*	Yes

Note: N=420; \*p<0.05.

### 4.3. Moderating Effect

Using PROCESS version 3.4 by Hayes in SPSS 23, the moderation effect of environmental concern was analyzed. The model is significant, and the model summary shows that the value of  $F(3, 416) = 124.58$ ,  $p < 0.001$  and  $R^2 = .47$ . The two-way interactive effects of environmental concern and attitude on purchase intention toward organic food is significant, with  $b = -0.10$  ( $p = 0.039$ ) and  $\Delta R^2 = .01$ . Thus, H4 is supported. The different conditions presented to the different effects. The conditional effects of the focal predictor at moderator values of low, average and high are presented as follows. Environmental concern is at a low level (2.45) with  $b = 0.68$  ( $p < 0.01$ ), average level (3.22) with  $b = 0.61$  and high level (4.00) with  $b = 0.53$  ( $p < 0.01$ ). The highest slope is at the low level of environmental concern ( $b = 0.68$ ), which shows the strongest positive relationship between attitude and purchase intention toward organic food.

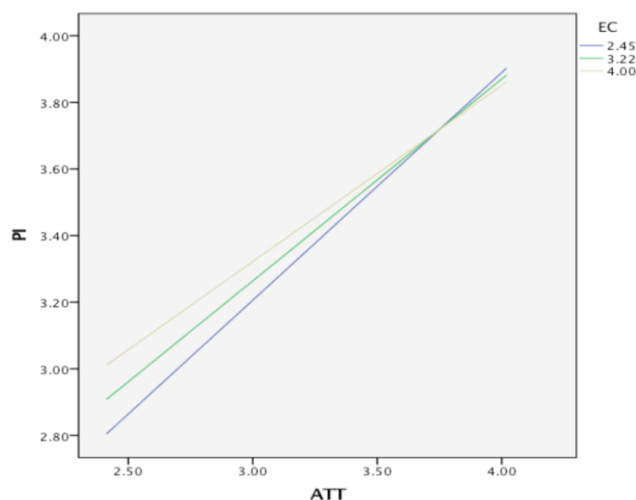


Figure 2: The two-way interactive effects

### 4.4. Three-way interactive effects

First, the level of education was divided into three categories: high school graduates were coded as 0, college graduates were group 1, and the others were group 2. The three categories were divided based on the qualification

from the lowest to the highest level. The PROCESS model 4 was run in SPSS 23, along with the three-way interactive effects of level of education, environmental concern and attitude on purchase intention. The three-way interactive effects were not significant ( $p > .05$ ). Therefore, hypothesis H5 is not supported.

## 5. Discussion and conclusions

This research applies TPB to investigate the moderation effects of environmental concern and the level of education on purchase intention toward organic food in Vietnam. The study confirmed the positive effects of attitude, subjective norm and perceived behavior control in the TPB.

For the results for H1, the study verified that attitude toward organic food purchasing is positively related to the intention to purchase organic food. Many scholars presented the same results for many nations in the world, including European Union countries (Koklic, Golob, Podnar, & Zabkar, 2019), India and the United States (Boobalan & Nachimuthu, 2020), Taiwan (Chen, 2007) and Vietnam (Pham et al., 2018). For the perspectives in Vietnam, particularly in the three largest cities where the data were collected, urban residents find it easier to pay attention to their standards of living, such as health and diet. Thus, organic food is one of the essential choices that bring them healthy meals daily. Additionally, in such a big city, residents find it easier to learn about the benefits of using organic food. Hence, a more positive attitude toward organic food leads to more purchases, as shown in this study.

H2 showed the positive effects of subjective norm on purchase intention toward organic food in Vietnam. This finding is consistent with many investigations of Chen (2007), Boobalan and Nachimuthu (2020), Yadav and Pathak (2016a) and Maichum et al. (2016). The explanation for this finding is primarily due to economic and cultural conditions. Cities such as Ho Chi Minh, Ha Noi and Da Nang are the central cities that have higher levels of economic development and social and cultural diversity. With such conditions, urban residents are more aware of health and environmental protection when they choose which foods to consume. These factors contribute significantly to their behavioral norm, which leads to an increase in intention to purchase organic food.

Regarding hypothesis H3, the study's result presented



that there was a significant positive correlation between perceived behavioral control and purchase intention toward organic food. This result was verified in many previous studies related to organic food based on the TPB (Chekima, 2018; Sultan et al., 2020). Important barriers to organic food consumption are the price and the availability of organic food. However, customers expecting to buy such items could be willing to pay an extraordinary price (Kim & Chung, 2011). The income of urban residents in large cities is significantly higher compared to people living in rural areas, thus, the cost of organic food is attainable for city-dwellers.

Regarding H4, the two-way interactive effects of environmental concern and attitude on purchase intention toward organic food are significant. At low and average levels of environmental concern, the positive relationship between attitude and purchase intention is stronger than at a high level of environmental concern. The customers with low and average concern for the environment present a stronger relationship between their attitude and purchase intention toward organic food. In other words, customers who have low- and average-level environmental concern have greater intentions to purchase organic foods.

The results for the last hypothesis, H5, show no significant three-way interactive effects between the level of education, environmental concern and attitude on purchase intention toward organic food.

Based on the four research questions, the study findings are summarized and discussed. For the first research question, predicting organic food purchase intention in Vietnam with the applying of extended TPB showed higher utility than of TRA. Regarding the second research question, the study illustrates the moderating effect of environmental concern in the relationship between attitude and purchase intentions toward organic food. The third research question is answered with H5 unsupported.

The study's main contribution is that the interactive effect of environmental concern and attitude is significant and positive on purchase intention. The consumer with a positive attitude and higher environmental concern may take many activities to limit their impacts on the environment. And organic food purchasing is one of the actions that customers can do. In practice, companies understand the importance of the environmental concern of their customers. Companies that invest in larger marketing campaigns addressing the environmental concern can increase the purchase intention of customers. This can lead to an increase in revenue, as well as environmental protection. This study suggests the important role of the level of education in environmental concern toward organic food purchase intention. The efficiency of environmental concern, as well as environmental protection, will be greater if education focuses on environmental subjects.

## 5.1 Limitations and Future Research

The study's limitations can be divided into two views. Firstly, this investigation examined organic food only within a specific geographic region, and this research model can be tested on other green products among other global settings. This study's model can be tested in many aspects such as green products in future research. Second, more relevant variables such as environmental knowledge and/or environmental awareness can be other constructs that add to the model to investigate and test the sufficiency of this model is related to predicting organic food purchase intention from geographic or other perspectives to delineate more specific environmental concern.

## References

- Abrahamse, W., & Steg, L. (2009). How do socio-demographic and psychological factors relate to households' direct and indirect energy use and savings? *Journal of Economic Psychology*, 30(5), 711–720. <https://doi.org/10.1016/j.joep.2009.05.006>
- Ajzen, I. (1985). *From intentions to actions: A theory of planned behavior. action control- from cognition to behavior*. Springer Berlin Heidelberg. [https://doi.org/10.1007/978-3-642-69746-3\\_2](https://doi.org/10.1007/978-3-642-69746-3_2)
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology*, 52, 27–58.
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology*, 32(4), 665–683. <https://doi.org/10.1111/j.1559-1816.2002.tb00236.x>
- Ajzen, I. (2015). The theory of planned behaviour is alive and well, and not ready to retire: a commentary on Sniechotta, Priesseau, and Araújo-Soares. *Health Psychology Review*, 9(2), 131–137. <https://doi.org/10.1080/17437199.2014.883474>
- Al, A., Rosli, M., Ra, M., & Mohiuddin, M. (2018). Intention and behavior towards green consumption among low-income households. *Journal of Environmental Management*, 227(1), 73–86. <https://doi.org/10.1016/j.jenvman.2018.08.061>
- Aman, A. H., Harun, A., & Hussein, Z. (2012). The influence of environmental knowledge and concern on green purchase intention the role of attitude as a mediating variable. *British Journal of Arts and Social Sciences*, 7(2), 145–167.
- Arvola, A., Vassallo, M., Dean, M., Lampila, P., Saba, A., Lähteenmäki, L., & Shepherd, R. (2008). Predicting intentions to purchase organic food: The role of affective and moral attitudes in the Theory of Planned Behaviour. *Appetite*, 50(2–3), 443–454. <https://doi.org/10.1016/j.appet.2007.09.010>
- Asif, M., Xuhui, W., Nasiri, A., & Ayyub, S. (2018). Determinant factors influencing organic food purchase intention and the moderating role of awareness: A comparative analysis. *Food Quality and Preference*, 63(1), 144–150.

- <https://doi.org/10.1016/j.foodqual.2017.08.006>
- Bangay, C. (2016). Protecting the future: The role of school education in sustainable development – an Indian case study. *International Journal of Development Education and Global Learning*, 8(1), 5–19. <https://doi.org/10.18546/ijdegl.8.1.02>
- Boobalan, K., & Nachimuthu, G. S. (2020). Organic consumerism: A comparison between India and the USA. *Journal of Retailing and Consumer Services*, 53(9), 101988. <https://doi.org/10.1016/j.jretconser.2019.101988>
- Carvalho, F. P. (2006). Agriculture, pesticides, food security and food safety. *Environmental Science and Policy*, 9(7-8), 685–692. <https://doi.org/10.1016/j.envsci.2006.08.002>
- Chekima, B. (2018). The dilemma of purchase intention. *International Journal of Sustainable Economies Management*, 7(2), 1–13. <https://doi.org/10.4018/ijsem.2018040101>
- Chekima, B., Chekima, K., & Chekima, K. (2019). Understanding factors underlying actual consumption of organic food: The moderating effect of future orientation. *Food Quality and Preference*, 74, 49–58. <https://doi.org/10.1016/j.foodqual.2018.12.010>
- Chen, A., & Peng, N. (2012). Green hotel knowledge and tourists' staying behavior. *Annals of Tourism Research*, 39(4), 2211–2216. <https://doi.org/10.1016/j.annals.2012.07.003>
- Chen, M. F. (2007). Consumer attitudes and purchase intentions in relation to organic foods in Taiwan: Moderating effects of food-related personality traits. *Food Quality and Preference*, 18(7), 1008–1021. <https://doi.org/10.1016/j.foodqual.2007.04.004>
- Chen, M. F., & Tung, P. J. (2014). Developing an extended Theory of planned behavior model to predict consumers' intention to visit green hotels. *International Journal of Hospitality Management*, 36, 221–230. <https://doi.org/10.1016/j.ijhm.2013.09.006>
- Chu, K. M. (2018). Mediating influences of attitude on internal and external factors influencing consumers' intention to purchase organic foods in China. *Sustainability (Switzerland)*, 10(12), 1–15. <https://doi.org/10.3390/su10124690>
- Clark, C. F., Kotchen, M. J., & Moore, M. R. (2003). Internal and external influences on pro-environmental behavior: Participation in a green electricity program. *Journal of Environmental Psychology*, 23(3), 237–246. [https://doi.org/10.1016/S0272-4944\(02\)00105-6](https://doi.org/10.1016/S0272-4944(02)00105-6)
- Creswell, J. W. (2014). *Research design: qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks: SAGE Publications.
- Dettmann, R. L., & Dimitri, C. (2010). Who's buying organic vegetables? Demographic characteristics of U.S. consumers. *Journal of Food Products Marketing*, 16(1), 79–91. <https://doi.org/10.1080/10454440903415709>
- Diamantopoulos, A., Schlegelmilch, B. B., Sinkovics, R. R., & Bohlen, G. M. (2003). Can socio-demographics still play a role in profiling green consumers? A review of the evidence and an empirical investigation. *Journal of Business Research*, 56(6), 465–480. [https://doi.org/10.1016/S0148-2963\(01\)00241-7](https://doi.org/10.1016/S0148-2963(01)00241-7)
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behaviour: An introduction to theory and research*. Massachusetts, USA: Addison-Wesley Publishing Company.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39. <https://doi.org/10.2307/3151312>
- Govindasamy, R., Puduri, V., & Simon, J. E. (2010). Hispanic consumers perceptions towards organically grown ethnic produce: A logistic analysis. *Afr. J. Agric. Res*, 5, 3464–3469.
- Hair, J., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). *Multivariate data analysis* (7th ed.). London: Pearson Education Limited.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2nd ed.). Thousand Oaks, CA, USA: SAGE Publications.
- Han, H., Hsu, L. T. (Jane), & Lee, J. S. (2009). Empirical investigation of the roles of attitudes toward green behaviors, overall image, gender, and age in hotel customers' eco-friendly decision-making process. *International Journal of Hospitality Management*, 28(4), 519–528. <https://doi.org/10.1016/j.ijhm.2009.02.004>
- Han, H., Hsu, L. T. (Jane), & Sheu, C. (2010). Application of the Theory of Planned Behavior to green hotel choice: Testing the effect of environmental friendly activities. *Tourism Management*, 31(3), 325–334. <https://doi.org/10.1016/j.tourman.2009.03.013>
- Han, H., & Kim, Y. (2010). An investigation of green hotel customers' decision formation: Developing an extended model of the theory of planned behavior. *International Journal of Hospitality Management*, 29(4), 659–668. <https://doi.org/10.1016/j.ijhm.2010.01.001>
- Hartmann, P., & Apaolaza-Ibanez, V. (2012). Consumer attitude and purchase intention toward green energy brands: The roles of psychological benefits and environmental concern. *Journal of Business Research*, 65(9), 1254–1263. <https://doi.org/10.1016/j.jbusres.2011.11.001>
- Hedlund, T. (2011). The impact of values, environmental concern, and willingness to accept economic sacrifices to protect the environment on tourists' intentions to buy ecologically sustainable tourism alternatives. *Tourism and Hospitality Research*, 11(4), 278–288. <https://doi.org/10.1177/1467358411423330>
- Hu, H. H., Parsa, H. G., & Self, J. (2010). The dynamics of green restaurant patronage. *Cornell Hospitality Quarterly*, 51(3), 344–362. <https://doi.org/10.1177/1938965510370564>
- Judge, M., Warren-Myers, G., & Paladino, A. (2019). Using the theory of planned behaviour to predict intentions to purchase sustainable housing. *Journal of Cleaner Production*, 215, 259–267. <https://doi.org/10.1016/j.jclepro.2019.01.029>
- Kalafatis, S. P., Pollard, M., East, R., & Tsogas, M. H. (1999). Green marketing and Ajzen's theory of planned behaviour: A cross-market examination. *Journal of Consumer Marketing*, 16(5), 441–460. <https://doi.org/10.1108/07363769910289550>
- Kang, H., Hahn, M., Fortin, R., D., Hyun, J., Y., & Eom, Y. (2006). Effects of perceived behavioral control on the consumer usage intention of e-coupons. *Psychology*, 23, 841–864. <https://doi.org/10.1002/mar>
- Kilbourne, W., & Pickett, G. (2008). How materialism affects environmental beliefs, concern, and environmentally responsible behavior. *Journal of Business Research*, 61(9), 885–893. <https://doi.org/10.1016/j.jbusres.2007.09.016>

- Kim, E., Ham, S., Yang, I. S., & Choi, J. G. (2013). The roles of attitude, subjective norm, and perceived behavioral control in the formation of consumers' behavioral intentions to read menu labels in the restaurant industry. *International Journal of Hospitality Management*, 35, 203–213. <https://doi.org/10.1016/j.ijhm.2013.06.008>
- Kim, H. Y., & Chung, J. E. (2011). Consumer purchase intention for organic personal care products. *Journal of Consumer Marketing*, 28(1), 40–47. <https://doi.org/10.1108/07363761111101930>
- Koklic, M. K., Golob, U., Podnar, K., & Zabkar, V. (2019). The interplay of past consumption, attitudes and personal norms in organic food buying. *Appetite*, 137, 27–34. <https://doi.org/10.1016/j.appet.2019.02.010>
- Laurie, R., Nonoyama-Tarumi, Y., Mckeown, R., & Hopkins, C. (2016). Contributions of education for sustainable development (esd) to quality education: a synthesis of research. *Journal of Education for Sustainable Development*, 10(2), 226–242. <https://doi.org/10.1177/0973408216661442>
- Lee, H. C., Chang, C. T., Cheng, Z. H., & Chen, Y. T. (2018). Will an organic label always increase food consumption? It depends on food type and consumer differences in health locus of control. *Food Quality and Preference*, 63(August), 88–96. <https://doi.org/10.1016/j.foodqual.2017.08.002>
- Lee, K. H. (2014). Globalization, green management and climate change in the Asia-Pacific economy. *Journal of Asia-Pacific Business*, 15(2), 101–104. <https://doi.org/10.1080/10599231.2014.904180>
- Leelapattana, W., Hsu, S. Y., Thongma, W., Chen, C., & Chiang, F. M. (2019). Understanding the impact of environmental education on tourists' future visit intentions to leisure farms in mountain regions. *Sustainability (Switzerland)*, 11(6), 1567. <https://doi.org/10.3390/su11061567>
- Maichum, K., Parichatnon, S., & Peng, K. C. (2016). Application of the extended theory of planned behavior model to investigate purchase intention of green products among Thai consumers. *Sustainability (Switzerland)*, 8(10), 1–20. <https://doi.org/10.3390/su8101077>
- Matsui, N., & Ikemoto eds., Y. (2015). *Solidarity economy and social business: New models for a new society*. Tokyo: Springer. <https://doi.org/https://doi.org/10.1007/978-4-431-55471-4>
- Mostafa, M. M. (2007). A hierarchical analysis of the green consciousness of the Egyptian consumer. *Psychology & Marketing*, 24(05), 445–473. <https://doi.org/10.1002/mar>
- Mostafa, M. M. (2009). Shades of green: A psychographic segmentation of the green consumer in Kuwait using self-organizing maps. *Expert Systems with Applications*, 36(8), 11030–11038. <https://doi.org/10.1016/j.eswa.2009.02.088>
- Paul, J., Modi, A., & Patel, J. (2016). Predicting green product consumption using theory of planned behavior and reasoned action. *Journal of Retailing and Consumer Services*, 29, 123–134. <https://doi.org/10.1016/j.jretconser.2015.11.006>
- Paul, J., & Rana, J. (2012). Consumer behavior and purchase intention for organic food. *Journal of Consumer Marketing*, 29(6), 412–422. <https://doi.org/10.1108/07363761211259223>
- Pham, N. T., Tučková, Z., & Chiappetta Jabbour, C. J. (2019). Greening the hospitality industry: How do green human resource management practices influence organizational citizenship behavior in hotels? A mixed-methods study. *Tourism Management*, 72(8), 386–399. <https://doi.org/10.1016/j.tourman.2018.12.008>
- Pham, T. H., Nguyen, T. N., Phan, T. T. H., & Nguyen, N. T. (2018). Evaluating the purchase behaviour of organic food by young consumers in an emerging market economy. *Journal of Strategic Marketing*, 4488, 1–17. <https://doi.org/10.1080/0965254X.2018.1447984>
- Pomsanam, P., Napompech, K., & Suwanmaneepong, S. (2014). An exploratory study on the organic food purchase intention among Thai-Cambodian cross-border consumers. *Asian Journal of Applied Sciences*, 7(5). <https://doi.org/10.3923/ajaps.2014.294.305>
- Ragavan, & Mageh. (2012). A Study on consumers' purchase intentions towards organic products. *Paripex - Indian Journal Of Research*, 2(1), 111–114. <https://doi.org/10.15373/22501991/jan2013/41>
- Rana, J., & Paul, J. (2017). Consumer behavior and purchase intention for organic food: A review and research agenda. *Journal of Retailing and Consumer Services*, 38(June), 157–165. <https://doi.org/10.1016/j.jretconser.2017.06.004>
- Ranjbar Shamsi, H., Omidi Najafabadi, M., & Hosseini, S. J. F. (2020). Designing a three-phase pattern of organic product consumption behaviour. *Food Quality and Preference*, 79(7), 7–11. <https://doi.org/10.1016/j.foodqual.2019.103743>
- Sang, Y. N., & Bekhet, H. A. (2015). Modelling electric vehicle usage intentions: An empirical study in Malaysia. *Journal of Cleaner Production*, 92, 75–83. <https://doi.org/10.1016/j.jclepro.2014.12.045>
- Sultan, P., Tarafder, T., Pearson, D., & Henryks, J. (2020). Intention-behaviour gap and perceived behavioural control-behaviour gap in theory of planned behaviour: moderating roles of communication, satisfaction and trust in organic food consumption. *Food Quality and Preference*, 81. <https://doi.org/10.1016/j.foodqual.2019.103838>
- Uvalic-Trumbic, S., & Daniel, J. (2016). Sustainable development begins with education. *Journal of Learning for Development*, 3(3), 3–8.
- Walker, A. E., Grimshaw, J. M., & Armstrong, E. M. (2001). Salient beliefs and intentions to prescribe antibiotics for patients with a sore throat. *British Journal of Health Psychology*, 6(4), 347–360. <https://doi.org/10.1348/135910701169250>
- Wang, C., Zhang, J., Yu, P., & Hu, H. (2018). The theory of planned behavior as a model for understanding tourists' responsible environmental behaviors: The moderating role of environmental interpretations. *Journal of Cleaner Production*, 194, 425–434. <https://doi.org/10.1016/J.JCLEPRO.2018.05.171>
- Wang, X., Pacho, F., Liu, J., & Kajungiro, R. (2019). Factors influencing organic food purchase intention in Tanzania and Kenya and the moderating role of knowledge. *Sustainability*, 11(1). <https://doi.org/10.3390/su11010209>
- Whitmarsh, L., & O'Neill, S. (2010). Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours. *Journal of Environmental Psychology*, 30(3), 305–314. <https://doi.org/10.1016/j.jenvp.2010.01.003>
- Yadav, R., & Pathak, G. S. (2016). Intention to purchase organic

- food among young consumers: Evidences from a developing nation. *Appetite*, 96, 122–128. <https://doi.org/10.1016/j.appet.2015.09.017>
- Yadav, R., & Pathak, G. S. (2016). Young consumers' intention towards buying green products in a developing nation: Extending the theory of planned behavior. *Journal of Cleaner Production*, 135, 732–739. <https://doi.org/10.1016/j.jclepro.2016.06.120>
- Yazdanpanah, M., & Forouzani, M. (2015). Application of the theory of planned behaviour to predict Iranian students' intention to purchase organic food. *Journal of Cleaner Production*, 107, 342–352. <https://doi.org/10.1016/j.jclepro.2015.02.071>
- Yin, S., Wu, L., Du, L., & Chen, M. (2010). Consumers' purchase intention of organic food in China. *Journal of the Science of Food and Agriculture*, 90(8), 1361–1367. <https://doi.org/10.1002/jsfa.3936>
- Yiridoe, E. K., Tsakiridou, E., Boutsouki, C., Zotos, Y., Mattas, K., Shaharudin, M. R., Sharma, G. (2014). Attitudes and behaviour towards organic products: an exploratory study. *International Journal of Business Excellence*, 10(2), 320–343. <https://doi.org/10.3126/aej.v10i0.2126>
- Zemore, S. E., & Ajzen, I. (2014). Predicting substance abuse treatment completion using a new scale based on the theory of planned behavior. *Journal of Substance Abuse Treatment*, 46(2), 174–182. <https://doi.org/10.1016/j.jsat.2013.06.011>