

Developing An Extended Theory Of Planned Behavior Model To Investigate Consumers' Consumption Behavior Toward Organic Food: A Case Study In Thailand

Kamonthip Maichum, Surakiat Parichatnon, Ke-Chung Peng

Abstract: Organic foods are gaining popularity around the world and consumers of organic foods are on the rise. However, information on the consumer behavior towards purchasing organic foods in developing countries, such as Thailand, is lacking. In this study we develop an extended theory of planned behavior (TPB) research model that incorporates organic knowledge to investigate consumers' consumption intention and behavior towards organic food. We derived and examined the model through structural equation modeling (SEM) on a sample of 412 respondents in Thailand, representing 82.40% of the samples that were investigated. Our findings indicated that consumer attitude and perceived behavioral control significantly predicts consumption intention whereas subjective norm does not. Hence, consumption intention has a positive influence on organic food consumption behavior. Furthermore, our results suggest that TPB model mediates the relationship between organic knowledge and consumption behavior.

Keywords: consumption behavior, consumption intention, organic food, organic knowledge, structural equation modeling, theory of planned behavior

1 INTRODUCTION

Global population is currently at risk of exposure to over 15,000 types of chemicals in food, drinking water, and the environment [1]. In particular, such a risk has been associated with food contamination in periods of major disease outbreaks; avian influenza [2], mad cow disease, foot-and-mouth disease [3] and residues of nitrofurans, a banned antibiotic, in shrimp and poultry [4]. Consequently, organic food has become the component of a healthy diet because of its natural qualities. Organic food is derived from a farming system that does not employ chemical fertilizers or pesticides. Organic food is by definition not genetically modified [5]. Moreover, organic food is produced from a process that results in the preservation of the environment. Therefore, the market value of organic food has shown high growth and the market demand for organic food is increasing worldwide. Organic food market has become one of the fastest growing sectors of developed agricultural economies most notably Spain, Italy, France, Germany, United States, United Kingdom, China, and India; demand remains strong throughout the European Union [6]. In 2015, the global organic food market was valued at 89.8 billion USD and is expected to grow in 2022 at a compound annual growth rate (CAGR) of 14.9% [7].

The major factors contributing to this market growth include concerns of increased health, food safety, environmental protection, and animal welfare [8, 9], in addition to the general increased usage of natural and organic products. Thailand is a developing country and one of the largest economies and business centers in Southeast Asia; its substantial economic growth was in part caused by the modernization and industrialization of Thai agricultural food production. Thai government has promoted high-input agricultural systems focusing on exports to increase the country's growth rate. However, the environmental and socio economic effects of the currently adopted agricultural strategy has resulted in a slowdown of the country's agricultural sector. In particular, poor farm management techniques and heavy reliance on synthetic chemicals to protect crops against weeds, pests, and diseases has led to decreased productivity [4]. During the past decade, Thai imports of pesticides have increased substantially, with the total weight more than doubling between 1987 and 1996, that is from 20,357 million tons in 1987 to 45,071 million tons in 1996 [10]. In 2013, the value stood at approximately 172,000 tons (24,000 million Baht) [11], and it is expected that Thailand will import more than 200,000 tons of pesticides annually in the near future. This has led to numerous problems such as an unsustainable economy, environmental issues, and health hazards (e.g., pesticide residues on foods). To reduce the use of pesticides on farms, the Thai government together with certain NGOs, have implemented an initiative on food safety through the Royal Project and the Department of Agriculture. The main focus has been on organic agriculture and is one of the sustainable agricultural approaches that have been promoted and practiced extensively in Thailand. Through this approach, food safety is likely to increase. Increases in food safety can lead to lasting changes in food consumption intention and behavior [12]. Human food choice models reflect the complexity of understanding the behavior of food choice [13]. Food consumption is associated with several types of environmental impacts and a collaborating production–consumption system is needed for sustainable food consumption [14, 15]. Briceno and Stagl [16] reported that sustainable consumption need to be considered as a social activity, enhancing the quality of

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consumers' lives. Several researchers have successfully applied the model devised in [17] which comprises the intention and behavior constructs of the theory of planned behavior (TPB), with special emphasis on organic food choice [18-20]. In-depth studies have been conducted regarding the influence of individual consumer's choice, organic food and behaviors toward the environment [21-23]. Thus, organic foods are presently the most attractive choice among consumers worldwide and are motivating a behavioral change of consumers. Prior studies have used the TPB model to examine the consumption intention and behavioral change toward organic food without factoring in the impact of organic knowledge. According to Laroche et al. [24], Knowledge is an important part of the process of making the decision to purchase. Studies have shown that consumers from developed countries have more knowledge about the environment than those from developing countries [5, 18]. During the past decade, many researchers applying the TPB model have examined the consumption of organic foods and the conditions under which organic food consumers make purchases; however, few studies have focused on organic foods consumption in developing countries, such as Thailand. Therefore, this study investigates the consumers' consumption intention and behavior toward organic food, and examine perspectives on consumer decision making by using an extended framework of the TPB model and organic knowledge among a group of consumers in Thailand.

2 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The TPB, proposed by Ajzen, has evolved since 1985 [25]. TPB is a theory in social psychology based on the theory of reasoned action by Ajzen and Fishbein [26, 27]. This theory explains that human behavior is guided by three dimensions: attitude, subjective norms, and perceived behavior control. These constructs directly affect behavioral intention and behavior. Many researchers have tested and verified the use of TPB model to predict behavioral intentions and behavior in the areas of marketing and consumer behavior [28, 29] such as organic food [5, 18, 30]. Thus, consistent with past studies, this study applied the TPB as its theoretical framework. Moreover, the present study also included new constructs: attitude, subjective norms, perceived behavioral control, organic knowledge, intention, and behavior towards organic food consumption in Thailand. Below the respective predictors are discussed.

2.1 Attitude toward consumption organic food (ATT)

According to Ajzen [17], attitude is defined as the degree to which a person has a favorable or unfavorable evaluation of the behavior in question shown by the consumer. Attitude developed through experience may change when a new experience is obtained [13, 31, 32]. However, it is crucial that consumers understand their attitudes and motivations to overcome perceived purchase obstacles [33]. In particular, previous studies have reported on the relationship between attitude and consumption intention. For example, Kotchen and Reiling [34] reported that attitude is an important predictor of behavioral intention. Yazdanpanah and Forouzani [35] showed that the attitude of Iranian students was the main predictor of their intention to purchase organic foods. Attitude has a clear role in the decision to accept a specific consumption behavior. Therefore, our literature review reveals predictions that the

attitude toward organic food consumption would increase intention to consume organic food. Based on these studies, we derive our first hypothesis:

Hypothesis 1 (H1): *Attitude toward organic food consumption is positively associated with intention to consume organic food*

2.2 Subjective norm (SN)

Subjective norm refers to the belief that a person or group of people has to approve or support specific behavior (Ham et al., 2015). Paul et al. [36] and Park [37] showed that the influence of others, such as relatives, close friends, colleagues, or business partners, can affect the social pressure they feel about a given behavior. De Maya et al. [38] showed that subjective norms are the main factors influencing consumer behavior intentions toward organic food in Europe; people are likely to be affected by others' opinions. Several studies have reported that subjective norm is an important determinant of intention to consume organic food [39, 40]. Therefore, subjective norm is an important factor in encouraging the intention to consume organic food products. Following this discussion, the second hypothesis is drawn:

Hypothesis 2 (H2): *Subjective norm is positively associated with intention to consume organic food*

2.3 Perceived behavioral control (PBC)

Perceived behavioral control relates to an individual's perception of difficulty in performing particular behaviors [17]. Moreover, perceived behavioral control involves reflection on past experiences and anticipation of any obstacles [17] and reflects internal control factors and external perceived difficulty factors [41]. A given behavior possibly occurs when an individual has both the ability and motivation to perform that behavior rather than when the individual has only one or neither factors [42, 43]. Tuu et al. [44] showed that perceived behavioral control had a positive significant effect on consumption intention towards food in Vietnam. Tarkiainen [30] reported that perceived behavioral control has been associated with intention to buy organic foods in Finland. Henceforth, we propose that:

Hypothesis 3 (H3): *Perceived behavioral control is positively associated with intention to consume organic food*

2.4 Organic knowledge (OK)

According to Stutzman and Green [45], knowledge is important in creating the necessary attitude toward consumption behavior. Numerous studies have determined that knowledge is positively linked with attitude [5, 46]. Smith and Paladino [5] proposed that organic knowledge is positively linked with attitude towards organic food which further influences their purchase intention and purchase behavior. Noor et al. [47] suggested that environmental knowledge positively influence attitude on green purchase behavior in developing countries, such as Malaysia. Hence, based on the above discussion, this study hypothesizes that:

Hypothesis 4 (H4): *Organic knowledge is positively associated with attitude towards organic food consumption*

Yang and Kahlor [48] suggested that when people perceive that others expect them to know about problems, they may present themselves as knowledgeable on the issue at hand. Therefore, people who follow the social norms may receive more interest and their knowledge may be developed. As a result, we hypothesize that

Hypothesis 5 (H5): *Organic knowledge is positively associated with subjective norm*

Kim et al. [49] found that the knowledge will increase the belief that one has control of a situation, thereby increasing the perceived behavioral control. Thus, we hypothesize that:

Hypothesis 6 (H6): *Organic knowledge is positively associated with perceived behavioral control*

Knowledge is a crucial element in consumer decisions to purchase or consume products [24] and especially organic products [5, 33]. In addition, Teng [50] and Yeon Kim and Chung [51] proposed that understanding related to organic knowledge is critical in producing an impact on consumption intention toward organic consumers. Researchers have suggested that increased knowledge will enable consumers to have more information and increase the possibility of high purchase intention [52, 53]. On the basis of the above discussion, the following hypotheses is proposed.

Hypothesis 7 (H7): *Organic knowledge is positively associated with intention to consume organic food*

McDougall [54] suggested that knowledge is main variables that influence consumer behavior. Werner and Alvensleben [55] observed that knowledge positively influence the consumers' behavior of buying and food consumption. Previous studies have shown that knowledge has direct effects on behavior [47, 56, 57]. Accordingly, the following hypothesis is suggested:

Hypothesis 8 (H8): *Organic knowledge is positively associated with behavior of organic food consumption*

2.5 Organic food consumption intention (OCI)

According to Patch et al. [58], intention is a conscious plan of action, which specifically requires a behavior and motivation to activate it. Several studies have described the intentions and generally think they are the best predictors of behavior, and fully mediate the impact of attitudes, subjective norms, and perceived behavioral control [31, 59, 60]. Consumption intention is a measure of the willingness to consume the product and it is the probability that a consumer will consume a product. Furthermore, behavioral intention is essential in determining the frequency of behavior. Verbeke and Vackier [61] claimed that intention is critical in determining the frequency of seafood consumption behaviors in Belgium. Moreover, previous studies have supported consumption intentions was positive and significant on the behavior of organic food consumption [30, 62]. In light of the above, we propose that:

Hypothesis 9 (H9): *Intention to consume organic food is positively associated with behavior of organic food consumption*

3 RESEARCH METHODOLOGY

3.1 Sample and data collection

This study used a questionnaire survey method to collect data. Individual respondents over the age of 18 years old who consume organic food in Thailand were considered to be the target population. Chan [63] and Maichum et al. [43] reported that the environmentally friendly context under investigation is very difficult to understand by minors due to the conceptual complexity that have led to the decision. Therefore, the ideal sample for this study consists of adults (age 18 years or over) and quota sampling technique was used to select respondents that resided in Thailand. Prior to formal data collection, two pilot tests were conducted. The first pilot sampled 50 consumers who consume organic food for testing the validity and reliability of the questionnaires. The comments and suggestions from these respondents were used to improve the questionnaire in terms of simplicity and ease of understanding. Considering the first revision, a second pilot test of 50 consumers was performed to re-evaluate the reliability. Finally, the questionnaire for data collection was completed. The data were collected through face to face interviews from the consumers. We choose face to face interview survey as our instrument, because this technique is highly accurate [64] and it reduces the non-response rate [65]. A total of 500 questionnaires were distributed among consumers who consume organic food in Thailand from January to April 2016, and 412 usable responses were obtained yielding a response rate of 82.40%. The answering time for the questionnaire was approximately 10–15 minutes. All questionnaires were returned to researchers directly after completion. The survey was conducted at organic markets, organic shops, and convenience and department stores in Thailand. As shown in Table 1, a majority of the respondents were females (62.62%), aged 25–34 years (31.31%), married (57.28%), bachelor's degree (40.78%), with a family size of 4–5 persons (33.98%), full-time job (24.52%), and a monthly income ranged 20,001–30,000 THB per person (1 USD = 36.0904 THB as of 1st January, 2016).

Table 1. Socio-demographic characteristics of the sample; sample size (N) = 412

Items	Classification	Frequency	Percentage
Gender	Male	154	37.38
	Female	258	62.62
Age	18–24 years	63	15.29
	25–34 years	129	31.31
	35–44 years	82	19.90
	45–54 years	72	17.48
	55–64 years	54	13.11
Marital Status	65 years or older	12	2.91
	Single	152	36.89
	Married	236	57.28
Education	Divorced/Widowed	24	5.83
	Less than high school	27	6.55
	High school	61	14.81
	Some college	80	19.42
	Bachelor's degree	166	40.78
Family size	Master's degree	63	15.29
	Doctoral degree	13	3.15
	1 person	63	15.29
Employment status	2–3 persons	94	22.82
	4–5 persons	140	33.98
	More than 5 persons	115	27.91
	Student	62	15.05
Personal income-monthly (THB)	Housewife	86	21.36
	Unemployed	74	17.96
	Business	56	13.59
	Full-time job	101	24.52
	Part-time job	31	7.52
Personal income-monthly (THB)	Less than 5,000 THB	11	2.67
	5,001–10,000 THB	55	13.35
	10,001–20,000 THB	109	26.46
	20,001–30,000 THB	147	35.68
	30,001–40,000 THB	42	10.19
	40,001–50,000 THB	38	9.22
More than 50,001 THB	10	2.43	

3.2 Measures

This study the measurement variables considered for each construct were selected or modified from previous studies. This study has six constructs. First, attitude towards organic food consumption was measured by three different items, as proposed by Taylor and Todd [66]; Chan [63]; Mostafa [67] and Paul et al. [36]. Second, subjective norm was measured on three items based on Liobikienė et al. [60], Dean et al. [39] and Chen and Peng [68]. Third, the validated four items were used to measure perceived behavioral control taken from these studies [39, 68]. Fourth, organic knowledge was measured on three items and extracted from previous studies [52, 53, 60, 69]. Fifth, intention to consume organic food was measured through five items taken from Paul et al. [36], Mostafa [67], Chang and Chen [70] and Taylor and Todd [66]. Finally, behavior of organic food consumption was measured by four items based on Zhu et al. [14], Young et al. [71], Seyfang [72] and Tanner and Wölfing Kast [73]. These items were rated using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Table 2 reported the descriptive statistics of the questionnaire items.

Table 2. Descriptive statistics of the questionnaire items

Constructs / Questionnaire Items	Mean	Standard Deviation
Attitude toward consumption organic food (ATT)	4.099	0.754
ATT1: I think that the consumption of organic food is healthy	3.966	0.688
ATT2: I think that the consumption of organic food is favorable	4.253	0.761
ATT3: I think that the consumption of organic food is safe	4.079	0.748
Subjective norm (SN)	3.383	0.931
SN1: My family think that I should consume organic food rather than normal food	3.252	0.913
SN2: My close friends think that I should consume organic food rather than normal food	3.411	0.964
SN3: Most people who are important to me think I should consume organic food rather than normal food	3.486	0.973
Perceived behavioral control (PBC)	3.976	0.867
PBC1: I am confident that I can consumption organic food rather than normal food when I want	3.239	0.914
PBC2: I see myself as capable of consumption organic food in future	4.533	0.768
PBC3: I have resources, time and willingness to consumption of organic food	4.367	0.735
PBC4: There are likely to be plenty of opportunities for me to consumption of organic food	3.766	0.832
Organic knowledge (OK)	4.215	0.798
OK1: I prefer to check the eco-labels and certifications on organic food before consumption	4.312	0.734
OK2: I want to have a deeper insight of the inputs, processes and impacts of products before consumption	4.479	0.870
OK3: I would prefer to gain substantial information on organic food before consumption	3.853	0.832
Organic food consumption intention (OCI)	4.296	0.803
OCI1: I plan to consume more on organic food rather than normal food	3.998	0.887
OCI2: I will consume organic food to guarantee my health	4.163	0.824
OCI3: I would like to consume more for organic food for high quality life	4.474	0.795
OCI4: I would like to consume organic food to avoid illness since unhealthy food may hurt my health	4.631	0.793
OCI5: I would like to consume organic food to reduce environmental damage	4.212	0.796
Organic food consumption behavior (OCB)	4.461	0.808
OCB1: I consume organic food even with higher prices	4.460	0.807
OCB2: I always consume organic food	4.713	0.863
OCB3: I always try to consume food with eco labeling marks	3.981	0.983
OCB4: I recommend organic food that I consumed to my relatives and friends	4.689	0.805

3.3 Tools for analysis

Statistical package for social sciences (SPSS 23.0) and analysis of moment structures (AMOS 19.0) software were used in this study. First, Cronbach's alpha was used for examining the reliability of the measures. The reliability assessment was conducted to reduce measurement error [74]. Second, confirmatory factor analysis (CFA) was used to assess the adequacy of the measurement model for confirming reliability, convergent validity, and discriminate validity [43]. Finally, structural equation modeling (SEM) was used for evaluating our hypotheses and for examining relationships among observed and latent variables.

4 EMPIRICAL RESULTS

4.1 The Results of the Measurement Model

The measurement model was assessed through CFA by testing reliability and convergent validity of all constructs. The results in Table 3 show Cronbach's α values ranged from 0.804 to 0.892, thus demonstrating a high level of reliability. All of the constructs had a Cronbach's α coefficients greater than 0.700, a threshold established by Nunnally and Bernstein [75] for high reliability. Further, the range of factor loadings were between 0.721 and 0.913 which were greater than 0.700 [76], thus providing evidence of convergent validity. Convergent validity of the CFA results should be supported by the item and construct reliabilities and the average variance extracted (AVE) [77]. Alamsyah and Angliawati [78] proposed that estimates of the composite reliability (CR) and AVE, which measures the amount of variance explained by the given construct, should be higher than 0.700 and 0.500, respectively. The study showed that the CR and AVE values ranged from 0.791 to 0.901 and 0.556 to 0.760, respectively, surpassing the respective recommended levels of 0.700 and 0.500. All the results indicated that the measurement model had acceptable convergent and discriminant validities, thus, the hypothesized measurement model was reliable and valid for all constructs.

Table 3. Validity of the measurement model

Construct	Question item	Cronbach's α	Standardized factor loading	Composite reliability	Average variance extracted
Attitude toward consumption organic food (ATT)	ATT1	0.872	0.851*	0.861	0.751
	ATT2	0.880**	0.880**		
	ATT3	0.873**	0.873**		
Subjective norm (SN)	SN1	0.804	0.721*	0.791	0.556
	SN2	0.798**	0.798**		
	SN3	0.810**	0.810**		
Perceived behavioral control (PBC)	PBC1	0.886	0.736*	0.900	0.757
	PBC2	0.832**	0.832**		
	PBC3	0.797**	0.797**		
	PBC4	0.894**	0.894**		
Organic knowledge (OK)	OK1	0.870	0.871*	0.857	0.667
	OK2	0.863**	0.863**		
	OK3	0.880**	0.880**		
Organic food consumption intention (OCI)	OCI1	0.865	0.822*	0.844	0.645
	OCI2	0.725**	0.725**		
	OCI3	0.796**	0.796**		
	OCI4	0.819**	0.819**		
	OCI5	0.822**	0.822**		
Organic food consumption behavior (OCB)	OCB1	0.892	0.724*	0.901	0.760
	OCB2	0.913**	0.913**		
	OCB3	0.819**	0.819**		
	OCB4	0.792**	0.792**		

Note: *** $p < 0.001$, *Values were not calculated because loading was set to 1.000 to fix construct variance.

The acceptable values for assessing the measurement model fit are: (1) the ratio of the chi-square value to degree of freedom (χ^2/df) should be less than 5.000; (2) goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), relative fit index (RFI), normalized fit index (NFI) should be more than 0.900 [79]; (3) comparative fit index (CFI) should be greater than 0.950; (4) root mean square error of approximation (RMSEA) should be less than 0.080; and, (5) root mean square residual (RMR) should be less than 0.050 [80]. The CFA results showed that the measurement model fit indices were as follows: $\chi^2 = 270.171$ ($p < 0.001$), $df = 72$, $\chi^2/df = 3.915$, and according to the standard described by Marsh and Hocevar [81], we achieved a ratio of chi-square to the df ranging between 2 and 5. Other fit index values for GFI, AGFI, RFI, NFI, CFI, RMSEA, and RMR were 0.929, 0.911, 0.964, 0.958, 0.971, 0.065, and 0.039, respectively. The indicator values exceeded acceptable levels. Therefore, this analysis confirmed that the measurement model of this study was both valid and reliable.

4.2 The Results of the Structural Model

Structural equation analysis was conducted using a maximum likelihood parameter that evaluated the hypothesized conceptual model of this study (Figure 1). The overall model achieved significant and satisfactory goodness-of-fit indices because all suggested values were met: $\chi^2 = 315.503$ ($p < 0.001$), $df = 72$, $\chi^2/df = 4.382$, GFI = 0.932, AGFI = 0.924, RFI = 0.971, NFI = 0.969, CFI = 0.956, RMSEA = 0.062, and RMR = 0.026 respectively. These results indicate that the model fit the data very well. Table 4 summarizes the results of testing

the nine hypotheses. The impact of attitude (H1: $\beta_1 = 0.461$, $t = 7.750$, $p < 0.001$) had significant positive effects on organic food consumption intention, thus supporting H1. Subjective norm showed no significant influences on organic food consumption intention (H2: $\beta_2 = 0.122$, $t = 1.371$), and the H2 was not supported. The positive relationship between perceived behavioral control and organic food consumption intention (H3: $\beta_3 = 0.431$, $t = 6.674$, $p < 0.001$) indicated that H3 was supported. Organic knowledge had a significant positive influence on attitude (H4: $\beta_4 = 0.245$, $t = 5.231$, $p < 0.001$), perceived behavioral control (H6: $\beta_6 = 0.307$, $t = 5.034$, $p < 0.01$), organic food consumption intention (H7: $\beta_7 = 0.226$, $t = 4.155$, $p < 0.05$), and organic food consumption behavior (H8: $\beta_8 = 0.342$, $t = 6.051$, $p < 0.01$), but not on subjective norm (H5: $\beta_5 = 0.103$, $t = 1.170$). Thus, H4, H6, H7, and H8 were supported, while H5 was not supported. Finally, organic food consumption intention showed significant positive influences on organic food consumption behavior (H9: $\beta_9 = 0.541$, $t = 8.324$, $p < 0.001$), supporting H9. Furthermore, Table 4 also presented on measured effects of all relationships in this study. Lai and Chen [82] reported that the total effect was estimated as the sum of direct and indirect effects. First, the significant effect of attitude was found to be the largest (0.461), followed by perceived behavioral control (0.431), and insignificant direct effect on subjective norm (0.122) on organic food consumption intention. Second, the direct effect of organic knowledge was greater on perceived behavioral control (0.307) followed by attitude (0.245), and insignificant direct effect on subjective norm (0.103).

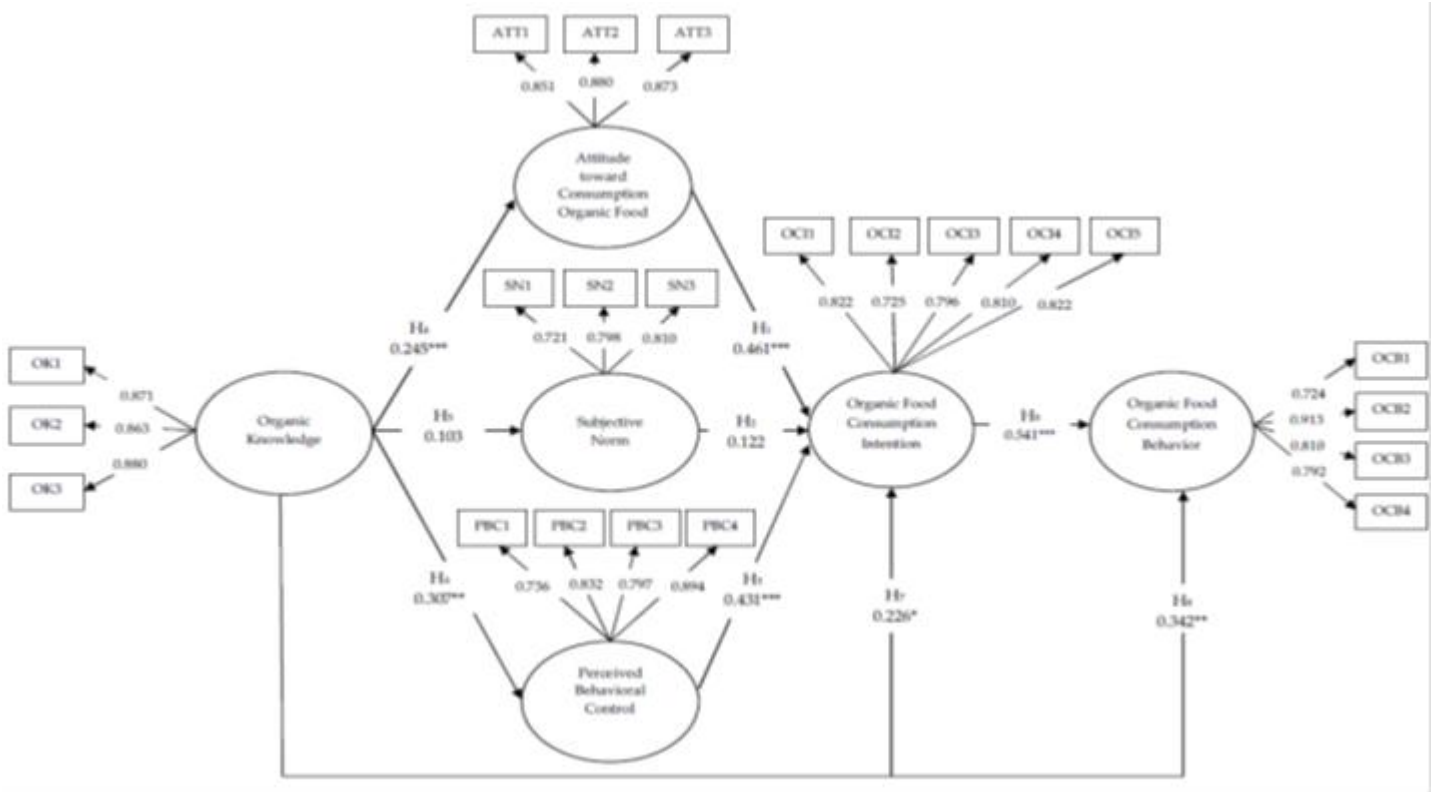


Figure 1. The results of the research model (* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$)

Organic knowledge had a direct effect (0.342) as well as an indirect effect (0.262) mediated by attitude, subjective norm, perceived behavioral control, and consumption intention on

organic food consumption behavior in Thailand. Thus, the finding was the direct effect of organic knowledge on consumption behavior than indirect effect for organic food in

Thailand. Moreover, organic knowledge had a direct effect (0.226) and indirect effect (0.258) mediated by attitude, subjective norm, and perceived behavioral control on organic food consumption intention. The study also depicted that the organic knowledge had indirect effect on organic food consumption intention than direct effect. Finally, consumption intention had a direct effect on consumption behavior (0.541) towards organic food in Thailand.

Table 4. SEM results of extended TPB model

Hypothesis	Path	Standardized path coefficient	t-value	Direct effect	Indirect effect	Total effect	Results
H1	ATT → OCI	0.461***	7.750	0.461	-	0.461	Supported
H2	SN → OCI	0.122>	1.371	0.122	-	0.122	Not supported
H3	PBC → OCI	0.431***	6.674	0.431	-	0.431	Supported
H4	OK → ATT	0.249**	5.231	0.245	-	0.245	Supported
H5	OK → SN	0.103>	1.170	0.103	-	0.103	Not supported
H6	OK → PBC	0.307**	5.054	0.307	-	0.307	Supported
H7	OK → OCI	0.226*	4.155	0.226	0.258	0.484	Supported
H8	OK → OCB	0.342**	6.051	0.342	0.262	0.604	Supported
H9	OCI → OCB	0.541***	8.324	0.541	-	0.541	Supported

5 CONCLUSION

This study investigated consumers' consumption intention and behavior toward organic food and examined perspectives on consumer decision making by using an extended framework of the TPB model in a quota sample of 412 consumers in Thailand. The study employed an expanded theoretical framework of the TPB that included new variables. Hence, we combined organic knowledge into a TPB model to increase the efficiency of decision making for consumer toward organic food consumption behavior. The results revealed that attitude and perceived behavioral control had significant positive influence on organic food consumption intention. On the other hand, this study suggests that subjective norm does not influence organic food consumption intention among the studied group in Thailand. Subjective norm has been identified as a weakest link in intention models by previous research, who had applied TPB frameworks in general [30, 36]. In addition, the overall results confirmed that the organic food consumption intention has a strongest direct influence on organic food consumption behavior according to the TPB model. Our results clearly showed that TPB model and its measures were suitable for this group which is supported by the findings of Emanuel et al. [83]; Paul et al. [36] and Yadav and Pathak [18]. For TPB model, attitude toward consumption organic food, subjective norm, perceived behavioral control and organic food consumption intention had high significant effect on organic food consumption behavior with consumption intention having a strongest influence, followed by attitude, perceived behavioral control and lastly subjective norm. Furthermore, this study main contribution is that organic knowledge was found to be significant and positive for attitude, perceived behavioral control, organic food consumption intention, and organic food consumption behavior and more importantly direct effect through organic food consumption behavior variable than indirect effect. In another aspect, organic knowledge failed to provide any positive thrust concerning a reason of subjective norm, just as Saleki et al. [56]. Consumers feel that approval of knowledge is not that

important a factor for subjective norm of organic food in Thailand. Organic knowledge as a mediator to consumption behavior, therefore, Thai consumers who are knowledgeable about the organic food or environmental issues and have positive knowledge make good adjustments towards organic food consumption behavior. Government, private sector, entrepreneur, and marketers should be a priority and there should be ways to increase knowledge of the benefits of organic food for Thai consumers. This may help increase the Thai consumers' consumption behavior and also impact positively the environment.

6 LIMITATIONS AND FUTURE DIRECTIONS

First, Thailand is economically viable to be competitive and contribute to the livelihoods of farmers. Therefore, to enhance the sustainability of the public and private sectors, the producers and consumers of organic food should be educated. Second, the longitudinal approach is suggested as part of the research methods for further research to ascertain the change of attitude and consumption behavior. Such an approach would be very useful in observing the reactions of consumers who intend to consume more organic food. Finally, the survey will be expanded to include samples in other countries in future studies to further validate our findings.

REFERENCES

- [1] Leishmaniasis W.E.C.o.t.C.o.t., Meeting W.E.C.o.t.C.o.t.L. & Organization W.H. Control of the Leishmaniasis: Report of a WHO Expert Committee. World Health Organization, 1990.
- [2] Tiensin T., Chaitaweessup P., Songserm T., Chaising A., Hoonsuwan W., Buranathai C., et al. Highly pathogenic avian influenza H5N1. Emerging infectious diseases. (2005) 11, 1664-72.
- [3] Miles S. & Frewer L.J. Investigating specific concerns about different food hazards. Food quality and preference. (2001) 12, 47-61.
- [4] Roitner-Schobesberger B., Darnhofer I., Somsook S. & Vogl C.R. Consumer perceptions of organic foods in Bangkok, Thailand. Food policy. (2008) 33, 112-21.
- [5] Smith S. & Paladino A. Eating clean and green? Investigating consumer motivations towards the purchase of organic food. Australasian Marketing Journal (AMJ). (2010) 18, 93-104.
- [6] Paull J. & Hennig B. Atlas of Organics: Four maps of the world of organic agriculture. Journal of Organics. (2016) 3, 25-32.
- [7] Willer H. & Lernoud J. The world of organic agriculture 2015: Summary. The world of organic agriculture: Statistics and emerging trends. (2015), 24-30.
- [8] Brčić-Stipčević V., Petljak K. & Guszak I. Organic Food Consumers Purchase Patterns—Insights from Croatian Market. Mediterranean Journal of Social Sciences. (2013) 4, 472.

- [9] Gil J.M., Gracia A. & Sanchez M. Market segmentation and willingness to pay for organic products in Spain. *The International Food and Agribusiness Management Review*. (2000) 3, 207-26.
- [10] Li A., Tanabe S., Jiang G., Giesy J.P. & Lam P.S. Persistent organic pollutants in Asia: sources, distributions, transport and fate. Elsevier, 2011.
- [11] Tawatsin A. Pesticides used in Thailand and toxic effects to human health. *Medical Research Archives*. (2015).
- [12] Buzby J.C. Effects of food-safety perceptions on food demand and global trade. *Changing structure of global food consumption and trade*. (2001), 55-66.
- [13] Chen M.-F. Consumer attitudes and purchase intentions in relation to organic foods in Taiwan: Moderating effects of food-related personality traits. *Food Quality and Preference*. (2007) 18, 1008-21.
- [14] Zhu Q., Li Y., Geng Y. & Qi Y. Green food consumption intention, behaviors and influencing factors among Chinese consumers. *Food Quality and Preference*. (2013) 28, 279-86.
- [15] Partidário P.J., Lambert J. & Evans S. Building more sustainable solutions in production–consumption systems: the case of food for people with reduced access. *Journal of cleaner production*. (2007) 15, 513-24.
- [16] Briceno T. & Stagl S. The role of social processes for sustainable consumption. *Journal of Cleaner Production*. (2006) 14, 1541-51.
- [17] Ajzen I. The theory of planned behavior. *Organizational behavior and human decision processes*. (1991) 50, 179-211.
- [18] Yadav R. & Pathak G.S. Intention to purchase organic food among young consumers: Evidences from a developing nation. *Appetite*. (2016) 96, 122-8.
- [19] Basha M.B., Mason C., Shamsudin M.F., Hussain H.I. & Salem M.A. Consumers Attitude Towards Organic Food. *Procedia Economics and Finance*. (2015) 31, 444-52.
- [20] Yazdanpanah M. & Forouzani M. Application of the Theory of Planned Behaviour to predict Iranian students' intention to purchase organic food. *Journal of Cleaner Production*. (2015) 107, 342-52.
- [21] Petrescu D.C. & Petrescu-Mag R.M. Organic Food Perception: Fad, or Healthy and Environmentally Friendly? A Case on Romanian Consumers. *Sustainability*. (2015) 7, 12017-31.
- [22] Qendro A.-E. Albanian and UK Consumers' Perceptions of Farmers' Markets and Supermarkets as Outlets for Organic Food: An Exploratory Study. *Sustainability*. (2015) 7, 6626-51.
- [23] Vittersø G. & Tangeland T. The role of consumers in transitions towards sustainable food consumption. The case of organic food in Norway. *Journal of Cleaner Production*. (2015) 92, 91-9.
- [24] Laroche M., Bergeron J. & Barbaro-Forleo G. Targeting consumers who are willing to pay more for environmentally friendly products. *Journal of consumer marketing*. (2001) 18, 503-20.
- [25] Ajzen I. From intentions to actions: A theory of planned behavior. Springer, 1985.
- [26] Ajzen I. & Fishbein M. Understanding attitudes and predicting social behaviour. (1980).
- [27] Fishbein M. & Ajzen I. Belief, attitudes, intention, and behavior. An introduction to theory and research Massachusetts: Addison-Wesley. (1975).
- [28] Choo H., Chung J.-E. & Thorndike Pysarchik D. Antecedents to new food product purchasing behavior among innovator groups in India. *European Journal of Marketing*. (2004) 38, 608-25.
- [29] Lam T. & Hsu C.H. Theory of planned behavior: Potential travelers from China. *Journal of Hospitality & Tourism Research*. (2004) 28, 463-82.
- [30] Tarkiainen A. & Sundqvist S. Subjective norms, attitudes and intentions of Finnish consumers in buying organic food. *British Food Journal*. (2005) 107, 808-22.
- [31] Ajzen I. Perceived behavioral control, self-efficacy, locus of control, and the theory of. *International Journal of Entrepreneurship Behaviour and Research*. (2002) 4, 28-50.
- [32] Armstrong M. Armstrong's handbook of performance management: an evidence-based guide to delivering high performance. Kogan Page Publishers, 2009.
- [33] Hill H. & Lynchehaun F. Organic milk: attitudes and consumption patterns. *British Food Journal*. (2002) 104, 526-42.
- [34] Kotchen M.J. & Reiling S.D. Environmental attitudes, motivations, and contingent valuation of nonuse values: a case study involving endangered species. *Ecological Economics*. (2000) 32, 93-107.
- [35] Yazdanpanah M. & Forouzani M. Application of the Theory of Planned Behaviour to predict Iranian

- students' intention to purchase organic food. *Journal of Cleaner Production*. (2015).
- [36] Paul J., Modi A. & Patel J. Predicting green product consumption using theory of planned behavior and reasoned action. *Journal of Retailing and Consumer Services*. (2016) 29, 123-34.
- [37] Park H.S. Relationships among attitudes and subjective norms: Testing the theory of reasoned action across cultures. *Communication Studies*. (2000) 51, 162-75.
- [38] De Maya S.R., López-López I. & Munuera J.L. Organic food consumption in Europe: International segmentation based on value system differences. *Ecological Economics*. (2011) 70, 1767-75.
- [39] Dean M., Raats M.M. & Shepherd R. The Role of Self-Identity, Past Behavior, and Their Interaction in Predicting Intention to Purchase Fresh and Processed Organic Food1. *Journal of Applied Social Psychology*. (2012) 42, 669-88.
- [40] Ha H.-Y. & Janda S. Predicting consumer intentions to purchase energy-efficient products. *Journal of Consumer Marketing*. (2012) 29, 461-9.
- [41] Vermeir I. & Verbeke W. Sustainable food consumption among young adults in Belgium: Theory of planned behaviour and the role of confidence and values. *Ecological economics*. (2008) 64, 542-53.
- [42] Zhou Y., Thøgersen J., Ruan Y. & Huang G. The moderating role of human values in planned behavior: the case of Chinese consumers' intention to buy organic food. *Journal of Consumer Marketing*. (2013) 30, 335-44.
- [43] Maichum K., Parichatnon S. & Peng K.-C. Application of the Extended Theory of Planned Behavior Model to Investigate Purchase Intention of Green Products among Thai Consumers. *Sustainability*. (2016) 8, 1077.
- [44] Tuu H.H., Olsen S.O., Thao D.T. & Anh N.T.K. The role of norms in explaining attitudes, intention and consumption of a common food (fish) in Vietnam. *Appetite*. (2008) 51, 546-51.
- [45] [45] Stutzman T.M. & Green S.B. Factors affecting energy consumption: Two field tests of the Fishbein-Ajzen model. *The Journal of Social Psychology*. (1982) 117, 183-201.
- [46] Kaise F., Wolfing S. & Fuhrer U. Environmental attitude and ecological behavior. *Journal of Environmental Psychology*. (1999) 19, 1-19.
- [47] Noor N., Muhammad A., Kassim A., Jamil C., Mat N., Mat N., et al. Creating Green Consumers: How Environmental Knowledge and Environmental Attitude Lead To Green Purchase Behaviour? *International Journal of Arts and Sciences*. (2012) 5, 55-71.
- [48] Yang Z.J. & Kahlor L. What, me worry? The role of affect in information seeking and avoidance. *Science Communication*. (2013) 35, 189–212.
- [49] Kim Y., Yun S. & Lee J. Can companies induce sustainable consumption? The impact of knowledge and social embeddedness on airline sustainability programs in the US. *Sustainability*. (2014) 6, 3338-56.
- [50] Teng Y.-M. Applying the extended theory of planned behavior to predict the intention of visiting a green hotel. *African Journal of Business Management*. (2011) 5, 7579.
- [51] Yeon Kim H. & Chung J.-E. Consumer purchase intention for organic personal care products. *Journal of consumer Marketing*. (2011) 28, 40-7.
- [52] Lee N., Choi Y.J., Youn C. & Lee Y. Does green fashion retailing make consumers more eco-friendly? The influence of green fashion products and campaigns on green consciousness and behavior. *Clothing and Textiles Research Journal*. (2012) 30, 67-82.
- [53] Mahesh N. & Ganapathi R. Influence of Consumer's Socio-Economic Characteristics and Attitude on Purchase Intention of Green Products. *International Journal of Business and Management*. (2012) 4, 33-7.
- [54] McDougall G.H. The green movement in Canada: Implications for marketing strategy. *Journal of International Consumer Marketing*. (1993) 5, 69-87.
- [55] Werner J. & Alvensleben R. Consumer attitudes towards organic food in Germany (FR). VIII Symposium on Horticultural Economics 155. 1984, pp. 221-8.
- [56] Saleki Z.S., Seyedeh M.S. & Rahimi M.R. Organic food purchasing behaviour in Iran. *International Journal of Business and Social Science*. (2012) 3, 278-85.
- [57] Rokicka E. & Stomczyńska J. Attitudes toward natural environment: A study of local community dwellers. *International Journal of Sociology*. (2002), 78-90.
- [58] Patch C.S., Tapsell L.C. & Williams P.G. Attitudes and intentions toward purchasing novel foods enriched with omega-3 fatty acids. *Journal of Nutrition Education and Behavior*. (2005) 37, 235-41.
- [59] Gracia A. & de Magistris T. Organic food product purchase behaviour: a pilot study for urban

- consumers in the South of Italy. *Spanish Journal of Agricultural Research*. (2013) 5, 439-51.
- [60] Liobikienė G., Mandravickaitė J. & Bernatoniene J. Theory of planned behavior approach to understand the green purchasing behavior in the EU: A cross-cultural study. *Ecological Economics*. (2016) 125, 38-46.
- [61] Verbeke W. & Vackier I. Individual determinants of fish consumption: application of the theory of planned behaviour. *Appetite*. (2005) 44, 67-82.
- [62] Saba A. & Messina F. Attitudes towards organic foods and risk/benefit perception associated with pesticides. *Food quality and preference*. (2003) 14, 637-45.
- [63] Chan R.Y. Determinants of Chinese consumers' green purchase behavior. *Psychology & Marketing*. (2001) 18, 389-413.
- [64] Sekran U. *Research methods for business*. John Wiley & Sons Inc. New York. 2000.
- [65] Kinneer T. & Taylor J. *Marketing Research: An Applied Research*. McGraw Hill, USA. 1996.
- [66] Taylor S. & Todd P. Assessing IT usage: The role of prior experience. *MIS quarterly*. (1995), 561-70.
- [67] Mostafa M.M. Shades of green: A psychographic segmentation of the green consumer in Kuwait using self-organizing maps. *Expert Systems with Applications*. (2009) 36, 11030-8.
- [68] Chen A. & Peng N. Green hotel knowledge and tourists' staying behavior. *Annals of Tourism Research*. (2012) 39, 2211-6.
- [69] Biswas A. & Roy M. Green products: an exploratory study on the consumer behaviour in emerging economies of the East. *Journal of Cleaner Production*. (2015) 87, 463-8.
- [70] Chang H.H. & Chen S.W. The impact of online store environment cues on purchase intention: Trust and perceived risk as a mediator. *Online information review*. (2008) 32, 818-41.
- [71] Young W., Hwang K., McDonald S. & Oates C.J. Sustainable consumption: green consumer behaviour when purchasing products. *Sustainable development*. (2010) 18, 20-31.
- [72] Seyfang G. Ecological citizenship and sustainable consumption: Examining local organic food networks. *Journal of rural studies*. (2006) 22, 383-95.
- [73] Tanner C. & Wölfling Kast S. Promoting sustainable consumption: Determinants of green purchases by Swiss consumers. *Psychology & Marketing*. (2003) 20, 883-902.
- [74] Hair Jr J., Babin B., Money A. & Samouel P. *Essentials of Business Research Methods: Johns Wiley & Sons. Inc, United States of America*. (2003).
- [75] Nunnally J.C. & Bernstein I. *Elements of statistical description and estimation. Psychometric Theory 3 Edition* (Edited by: Nunnally JC, Bernstein IH). (1994).
- [76] Hair J.F., Black W.C., Babin B.J., Anderson R.E. & Tatham R.L. *Multivariate data analysis*. Pearson Prentice Hall Upper Saddle River, NJ, 2006.
- [77] Hair J., Anderson R., Tatham R. & Black W. *Conjoint analysis. Multivariate data analysis*. (1998), 387-441.
- [78] Alamsyah D.P. & Angliawati R.Y. *Buying Behavior Of Organic Vegetables Product: The Effects Of Perceptions Of Quality And Risk*. *International Journal of Scientific and Technology Research*. (2015) 4, 28-35.
- [79] Steiger J.H. Understanding the limitations of global fit assessment in structural equation modeling. *Personality and Individual differences*. (2007) 42, 893-8.
- [80] Tabachnick B.G., Fidell L.S. & Osterlind S.J. *Using multivariate statistics*. (2001).
- [81] Marsh H.W. & Hocevar D. Application of confirmatory factor analysis to the study of self-concept: First-and higher order factor models and their invariance across groups. *Psychological bulletin*. (1985) 97, 562.
- [82] Lai W.-T. & Chen C.-F. Behavioral intentions of public transit passengers—The roles of service quality, perceived value, satisfaction and involvement. *Transport Policy*. (2011) 18, 318-25.
- [83] Emanuel A.S., McCully S.N., Gallagher K.M. & Updegraff J.A. Theory of Planned Behavior explains gender difference in fruit and vegetable consumption. *Appetite*. (2012) 59, 693-7.