

Volume 23, Special Issue**Print ISSN: 1099-9264
Online ISSN: 1939-4675**

FACTORS AFFECTING SUSTAINABLE CONSUMPTION CHOICE IN THE FIELD OF FOOD AND DRINK: THE CASE OF UNIVERSITY STUDENTS IN HANOI

**Pham Tuan Anh, ThuongMai University
Dinh Van Son, ThuongMai University
Nguyen Thi Thu Hong, ThuongMai University
Dinh Tran Ngoc Huy, Banking University HCM city Vietnam
Nguyen Ngoc Khanh Linh, ThuongMai University**

ABSTRACT

The research examines the key factors influencing sustainable consumption choices in food of students in Hanoi area. By analysing data collected from 791 students, the result shows that sustainable consumption choices are positively influenced from three factors include: (i) sustainable purchase choices, (ii) sufficient and frugal consumption and (iii) awareness and action to protect environment. From there, some solutions are proposed to encourage sustainable consumption behaviour for students in particular and for young consumers in general.

Keyword: Sustainable Consumption, Student, Food, Consumption Choice.

INTRODUCTION

The notion Sustainable consumption has been mentioned since 90s of 20th century. In 1992, at the Rio Earth Summit, in the chapter 4 of Agenda 21, an orientation of changing the consumption model to be more sustainable was offered. Accordingly, the proposed activities are the efficient use of energy and natural resources (reducing the use or use the renewable resources to replace); reducing the rubbish to the environment by recycling measures and limiting package the products; helping the individuals and households make the environmentally friendly buying decisions; The Government implements leadership by public procurement; clarifying the cost for production and consumption energy, natural resources.

To the year 1994, the first definition of Sustainable consumption was shown at The Oslo Conference on sustainable production and consumption, referring to the use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations. In 2002, the definition of Sustainable consumption was mentioned again in the Organization for Economic Co-operation and Development (OECD) in which sustainable consumption including changes in consumption behavior, such as using energy sources and family resources effectively,

reduce the waste and make a habit of shopping of households that care about environment. Robins & Roberts (2006) defined Sustainable consumption is a level of consumption that balances time with state costs in money, while responding to present and future life needs. Later, in 2005, The Global Development Research Center (GDRC) summarized and gave the definition of Sustainable consumption: Sustainable consumption is consumption that causes smallest impact on the environment, ensures social justice and economic feasibility in meeting basic needs of people around the globe. The goal of sustainable consumption tends to be everyone, all fields and countries, from individuals to governments and multinational corporations". In Vietnam sustainable production and consumption is one of 17 sustainable development goals proposed by The United Nations in 2015 and emphasized in the Strategic Orientation for Sustainable Development in Vietnam in the period 2011-2020. Accordingly, Sustainable consumption is understood as the use of products and services effectively, meeting the essential needs of life while minimizing the use of natural resources and toxic materials; while limiting the emission of pollutants over the life circle of the product so as not to jeopardize the needs of future generations.

However, for Vietnamese consumers, sustainable consumption is still a relatively new definition, especially for young consumers. A study of Olsson and Gericke (2015) indicated that the phase of adolescence is clearly associated with a rapidly declining interest in environmental and sustainability issues. Besides, Young consumers are considered a key target group by researchers, policy-makers, and educators alike, as it is deemed crucial to intervene in the formation and reutilization of mainstream unsustainable consumption practices and patterns (Fien et al., 2008; Heiss & Marras, 2009).

From that fact, the study explores the factors influencing students' sustainable consumption behavior measurement for the most common consumption category is food. The research topic is a valuable reference for researchers, policy-makers and educators in the intervention of shaping and guiding the implementation of sustainable consumption behavior of the young people in particular and in consumers in general.

LITERATURE REVIEW

To generalize the measurement of sustainable consumption behavior, Geiger et al. (2017) presented the SCB cube model (Sustainable consumption behaviors)-the comprehensive measurement model of consumers' sustainable consumption behavior that consists of 3 dimensions: consumption stages (buying, using, processing), consumption sectors (food, clothing, transportation) and sustainable dimensions (economic, social, environmental). However, this model has just been theoretical.

To apply the SCB model in practice, Fischer et al. (2017) conducted research on sustainable consumption behaviors of adolescents in consumption of two items: clothing and food. The author used the model YCSCB (Young consumers' sustainable consumption behavior): A model to evaluate the sustainable consumption behavior of young people (Fischer et al., 2017) to research the target group of adolescents aged 14 to 17 at a high school in Germany. Research results on 155 subjects showed that there are two factors affecting the measurement of sustainable consumption in the area of food: Nutrition choices and Purchase choices. However, the framework YCSCB only selects two areas in consumption: food and clothing to measure the sustainable consumption behavior of young people.

In Vietnam, most research works focus on pre-behavior factors such as the relationship between intention and sustainable consumption behavior of Vietnamese consumers (Hoang Thi

& Bao Thoa, 2017), the consumers' intention of sustainable consumption in Ho Chi Minh City (Nguyen The Khai & Nguyen Thi Lan Anh, 2015), the intention of green consumption of young people (Lan Huong, 2014), not measure specifically the level of sustainable consumption (Table 1).

Observed variables	Author, year
1. I prefer to buy organic food 2. I use fresh, raw ingredients to prepare meals 3. I have a healthy diet 4. I buy eco-labeled food	Geiger & Fischer (2017); Kasser & Brown (2005); Kaiser et al (2007)
1. I use frozen foods to prepare meals 2. I choose to buy products that their shelf life are short to avoid waste 3. I stored the food that was not finished in one meal and continued eating in another one 4. I prepare and cook the meals in an energy-efficient manner 5. I avoid buying food and drinks with non-recyclable covers (plastic, foam boxes, ..) 6. I buy locally grown food to use	Geiger & Fischer (2017)
1. I buy food that has a fair trade mark	Geiger & Fischer (2017); Pepper et al. (2009)
1. I reuse the plastic bags to buy food 2. I sort waste before putting it in the bin 3. I buy seasonal food 4. I recommend to everyone consumption economically and effectively 5. I read books, newspapers and participated in environmental protection activities	Kaiser et al. (2007)
(Source: Research design of the authors)	

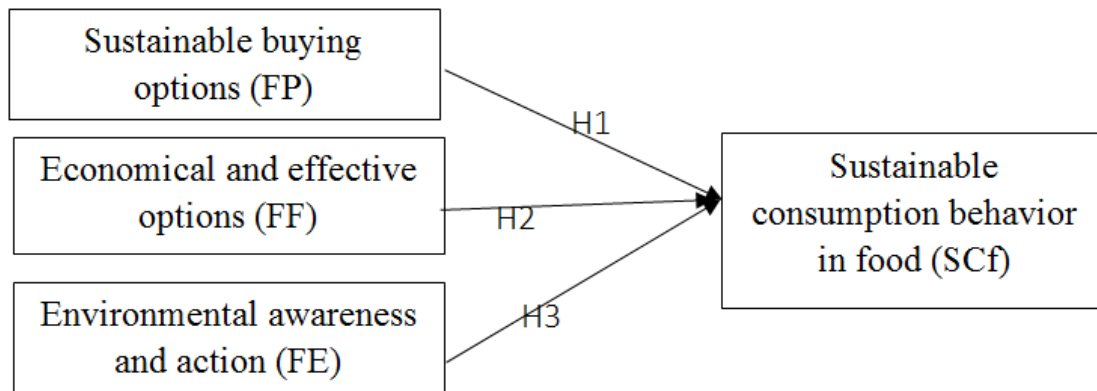
Research Gaps

Currently, research on sustainable consumption in Vietnam is relatively limited, most studies focus mainly on the intention of green consumption and there are no studies on the choice of sustainable consumption behavior, especially in the young people.

This study was conducted to provide a suitable scale for young consumers (students in Hanoi area) and explore the factors affecting their sustainable consumption choices.

Research Models

The model of studying factors affecting students' sustainable consumption behaviors was built based on reference to models of Sustainable consumption behaviors - SCB (Geiger et al. 2017) and Young Consumers' Sustainable consumption behaviors - YCSCB (Fisher et al. 2017), and based on qualitative research and preliminary research for the study object is the students, the authors propose a research model (Figure 1 (Source: Research design of the authors)):



**FIGURE 1
RESEARCH MODEL**

With the above research model, the research hypotheses include:

H1: The sustainable purchasing options in food (FP) have a positive effect on measuring sustainable consumption behavior in food (SCf).

H2: Economical and effective options (FF) have a positive effect on measuring sustainable consumption behavior in food (SCf)

H3: Environmental awareness and action (FE) have a positive effect on measuring sustainable consumption behavior in food (SCf)

The scales are encoded in the Table 2 below:

TABLE 2 ENCODING SCALES		
Factor group	Variable	Detailed explanation
Sustainable buying options	FP1	I prefer to buy food that have clear origin, certified clean / organic
	FP2	I process dishes from fresh, raw food
	FP3	I have a healthy diet (restricting alcoholic beverages)
	FP4	I use food grown in my hometown
	FP5	I buy the products that are near the expiry date because of the discount
Economical and effective options	FF1	I prefer to cook by myself
	FF2	I buy enough food for the meals to avoid waste
	FF3	I handle food before cooking (thawing)
	FF4	I waited for the food to cool and put it in the refrigerator
	FF5	I stored the food that was not finished in one meal and continued eating in another one
Environmental awareness and action	FE1	I cook in an energy-efficient way (gas, water, electricity)
	FE2	I avoid eating convenience food because of plastic waste
	FE3	I use containers instead of plastic wraps/ bags
	FE4	I sort the inorganic or organic waste before throwing into the trash
Sustainable consumption behavior in food	SCf1	I buy the food that is hygienic and nutritious
	SCf2	I consume food sparingly and effectively
	SCf3	I consciously eat and drink to protect the environment
	SCf4	I care and follow the trend of sustainable consumption for eating purpose

(Source: Research design of the authors)

RESEARCH METHODS

The research team uses two main research methods, which are qualitative research and quantitative research:

Qualitative research is conducted to determine which practical behavior young consumers (students) are interested in purchasing, using and disposing of consumer goods in food and then, building the most appropriate scale for the research object is students in Hanoi area

Quantitative research to test the hypothesis model proposed by the author, from preliminary to formal studies, through convenient non-random sampling methods. Primary data was collected through a semi-structured questionnaire, in which the observed variables were assessed on a 5-point Likert scale and the performance level increased from 1 to 5. The data collected from the end of November 2018 to the end of January 2019, the number of votes issued 1050, the number of votes collected 831, the number of valid votes for analysis is 791.

The collected data will be processed by the following techniques: Descriptive analysis, Cronbach's Alpha test, Exploratory factor analysis (EFA), Confirmatory factor analysis (CFA), correlation analysis, Structural Equation Model (SEM) analysis and Bootstrap estimation method, One-way ANOVA.

RESEARCH RESULTS AND DISCUSSION

Descriptive Statistics

	Number of observations	The average value (Mean)	Standard error (S.E. Mean)	Median	Mode	Standard deviation
FP1	791	3.53	0.046	4	5	1.297
FP2	791	3.65	0.042	4	5	1.191
FP3	791	3.60	0.042	4	5	1.178
FP4	791	3.41	0.040	3	3	1.130
FF1	791	3.72	0.041	4	5	1.153
FF2	791	3.84	0.040	4	5	1.135
FF3	791	3.84	0.039	4	5	1.096
FF4	791	3.82	0.040	4	5	1.128
FF5	791	3.61	0.041	4	3	1.158
FE1	791	2.70	0.051	3	1	1.436
FE2	791	2.56	0.048	3	1	1.352
FE3	791	2.76	0.044	3	3	1.241

FE4	791	2.99	0.049	3	3	1.377
SCf1	791	3.16	0.043	3	3	1.217
SCf2	791	3.70	0.037	4	4	1.051
SCf3	791	3.42	0.050	4	5	1.403
SCf4	791	3.19	0.040	3	3	1.116
(Source: Survey data processing results of the authors)						

The study shows (Table 3) that the average value of the observed variables of spending for food is in the 2.5-<4 range, the level of sustainable spending in students' food is only occasional. However, it is clear that the standard deviation of all observed variables is greater than 1, FE1 and SCf3 are up to more than 1.4, this shows that the trend of consumer choice has a large difference among students in each selected behavior.

The survey result shows that the average score for the Sustainable buying options and Economical and effective options factors of students in turn have average of 3.55 and 3.766; meanwhile, the average score for the Environmental awareness and action factor is relatively low at 2.75 (SD=1.3515), this factor has the lowest average score among the three factors, the reason is that students are not much aware of the environmental issues when consuming for food.

Preliminary Assessment of Scales and Discovery Factor Analysis

Factors	Acronyms	Number of variables	Cronbach's Alpha
Sustainable buying options (after removing FP5)	FP	4	0.644
Economical and effective options	FF	5	0.776
Environmental awareness and action	FE	4	0.723
Sustainable consumption behavior in food	SCf	4	0.644
(Source: Data processing results of the authors)			

In particular, the FP5 variable (Table 4) with a total correlation coefficient less than 0.3 should be excluded, after removing FP5, the Cronbach's Alpha coefficient is 0.644. From the results, it is shown that the observed variables are set up to measure the internal consistency factors for each group =-[p\li,8[p-10kp0lkum\“4] (Table 5).

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.799
Bartlett's Test of Sphericity	Approx. Chi-Square	1556.85
	Df	136
	Sig.	0
(Source: Data processing results of the authors)		

Results of exploratory factor analysis by Principal Component Analysis and Varimax factors show that KMO coefficient is greater than 0.5, p-value is less than 0.05, explanation variance is greater than 50% (53.235%) and all load factors coefficient are greater than 0.3. This shows that the scale of the factors in the food category are necessary and the scale of each factor is unidirectional (Table 6).

Observed variables	Ingredients			
	1	2	3	4
FF2	0.797			
FF3	0.703			
FF4	0.702			
FF5	0.689			
FF1	0.637			
FE2		0.83		
FE1		0.776		
FE3		0.679		
FE4		0.612		
SCf2			0.701	
SCf4			0.695	
SCf1			0.69	
SCf3			0.601	
FP3				0.721
FP1				0.712
FP2			0.349	0.689
FP4				0.522
(Source: Data processing results of the authors)				

Confirmatory Factor Analysis (CFA)

After the first CFA analysis, the standardized weight of the observed variable SCf4 is $0.340 < 0.5$ and FP4 is $0.482 < 0.5$. Thus, removing these two variables from the model and running again. Conducting a second CFA analysis, the following results were obtained: The standardized coefficients of the observed variables are greater than 0.5 and all the estimated coefficients were statistically significant ($p=0.000$).

The results of CFA analysis after adjusting the possible relationships between observed variables in the model through the indicator of MI coefficient show that Chi-square / $df=2.483 < 3$, CFI=0.960, GFI=0.965, AGFI=0.949, are both greater than 0.9. P-value= $0.000 < 0.05$, RMSEA = 0.043 is less than 0.08. Thus, it is possible to conclude the model is consistent with the survey data (Hair et al., 2006; Byrne, 2001; Vakata et al. 2006).

The results of the composite reliability analysis and the extracted variance calculated based on the standardized coefficient of CFA show that the factors are unidirectional scale and the components of the multidirectional scale are qualified of composite reliability (≥ 0.6). Only the extracted variance of FE is 57.2%; the others one are less than 50%. However, the composite reliability of this variable is greater than 0.6 that is still accepted because the convergent value of the scale is still guaranteed (Fornell & Larcker, 1981) (Table 7).

Factors	Acronyms	Number of observed variables	Composite reliability	Extracted variance (%)
Sustainable buying options	FP	3	0.699	40.4%
Economical and effective options	FF	5	0.744	36.9%
Environmental awareness and action	FE	4	0.842	57.2%
Sustainable consumption behavior in food	SCf	3	0.610	34.3%

(Source: Calculated from data processing results of the authors)

Correlation Analysis

The results show that the coefficients in the correlation coefficient matrix of the observed variables in the four factors are both positive and relatively uniform, the average correlation coefficient of the factor Sustainable buying options (FP). Is 0.402, of Economical and effective options (FF) is 0.357, Environmental awareness and action (FE) has an average correlation coefficient of 0.590 and the factor Sustainable consumption behavior in food (SCf) is 0.343.

The correlation coefficient matrix between the dependent variable SCf and the independent variables has the coefficient in the range of 0.19 to 0.34, the independent variables FE and FP have a negative correlation but relatively small is 0.034. On the other hand, two independent variables FF and FP have a positive correlation that is greater than 0 (Table 8).

		FP	FF	FE	SCf
Correlation	FP	1			
	FF	0.339	1		
	FE	-0.034	0.055	1	
	SCf	0.191	0.266	0.338	1

(Source: Research data processing results)

Structural Equation Model (SEM) Analysis

The results of analysis by linear structure model after adjusting some possible relationships between the errors of observed variables in the factors showed that: Chi-square/df=2.483<3, CFI=0.960, GFI=0.965, AGFI=0.949 are both greater than 0.9. P-value=0.000 <0.05, RMSEA = 0.043 <0.08. This shows that the theoretical model is compatible with the survey data.

All 3 independent variables FE, FF, FP are statistically significant with p-value <0.05, so all 3 independent variables influence the measurement of sustainable consumption behavior in food of students and their influence is proportional (Table 9).

			Non-standardized weights	Standardized regression weights	S.E.	C.R.	P
SCf	<---	FE	0.271	0.465	0.033	8.138	***
SCf	<---	FF	0.204	0.267	0.047	4.321	***
SCf	<---	FP	0.148	0.208	0.045	3.297	***

(Source: Data processing results of the authors)

Environmental awareness and action (FE) is the strongest impact on measuring sustainable consumption behaviors of students in food (SCf). Hypotheses H1, H2, H3 are accepted. The regression equation is rewritten as follows: $SCf = 0.465FE + 0.267FF + 0.208FP$.

To test the stability of the estimated model, the author used Bootstrap test with the refunded sample of 1500 to compare with the estimated results from the samples obtained. The results show that the difference between the sample estimation and the Bootstrap estimation is very small, the absolute values of the critical values (CR) are less than 2, it shows that the sample estimation can be generalized. Thus, the estimated model can be considered lasting and reliable (Table 10).

Relationship			Estimates	SE	SE-SE	Mean	Bias	SE-Bias	CR
SCf	<---	FE	0.464	0.050	0.001	0.466	0.000	0.001	0.000
SCf	<---	FF	0.267	0.068	0.001	0.264	-0.003	0.002	-1.5
SCf	<---	FP	0.208	0.074	0.001	0.210	0.002	0.002	-1

(Source: Data processing results of the authors)

In which: Mean is the average estimation result of the regression coefficient by Bootstrap, SE-Bias is the standard error for the bias, CR is the critical value.

The results show that accepting hypotheses H1, H2, H3. The regression coefficients β are positive, reflecting the positive impact of the independent variables on the dependent variables, meaning that when these factors increase, the level of sustainable consumption also increases. The first factor includes sustainable buying choices that imply consumer choice is to choose to buy foods that ensure food hygiene and nutrition. The second factor includes the economical choice behavior and sustainable efficiency in consumption for food, which both bring about personal finance and contribute to the efficient use of finite resources. The third factor is the awareness and environmental protection action that the indicators reflect the ecological and social purchasing such as clean / organic food, produced product areas. This result is quite similar to that of Geiger et al. (2017) in a study of adolescents aged 14-17 in Germany.

CONCLUSIONS AND RECOMMENDATIONS

The results of the study identified three factors that have a positive influence on the sustainable consumption choices of students in universities in Hanoi area: (1) Sustainable buying options, (2) Economical and effective options, (3) Environmental awareness and action. Based on this, the authors propose a number of solutions for promoting sustainable consumption for the eating and drinking purpose of young people, especially for students including:

Firstly, for students, it is necessary to continue promoting the behavior of choosing to buy sustainable foods to protect the health of themselves and their relatives by buying food at reliable places to be able to authenticate food products and find information of marks of interest. Each student should consider in consumption and use to avoid waste and excess. It is necessary to know how to economically use non-renewable resources such as gas and water. At the same time, the need to limit the use of plastic bags and plastic products to minimize the amount of waste released into the environment, using reusable products such as cloth bags or biological bags to replace. In addition to raising your awareness of sustainable consumption, you can participate in volunteer programs for the environment. Students can begin to change their behavior with smart and conscious behavior choices from the product purchasing process to the economical use process, enhancing the exchange activities, exchanging used products, recycling activities and reusing products; switch from using plastic items that are difficult to decompose to using alternative products (biodegradable bags, straws made from reeds, bamboo).

Secondly, for sellers and suppliers, it is necessary to provide accurate information, quality assurance, clear origin, transparency in the importation and storage process for consumers. Suppliers can also convey sustainable consumption behavior to consumers through activities and programs that bring environmental protection factors, promote the production and sales of eco-friendly products. For example, the use of wooden spoons and lunch boxes made of bagasse instead of disposable and plastic containers; implementing the "exchange for new" program may reduce the amount of waste released into the environment, the old products will be recycled and continue to be used. At the same time, suppliers can also influence consumers' awareness by putting environmental protection labels on their products.

Thirdly, for the state and authorities, it is necessary to strictly control goods import activities, intensify the inspection of food products at wholesale markets, strictly handle acts of law violations that were performed by the organizations and individuals that have acts of producing and trading in products lead to harm to consumers' health, emissions of toxic substances that destroy the environment, affecting life of the people. At the same time, the

government and relevant agencies should continue to enhance education, raise awareness of environmental protection for people by many forms of propaganda; especially students should be added to the main program of basic knowledge about environmental protection and sustainable consumption. The government should implement high taxation on plastic bags to make a habit of reusing plastic bags and using other types of bags (cloth bags, bio-bags) when shopping. Specifically, in official letter No. 6545 / BTC-CST, the Ministry of Finance proposed that subjects of environmental protection tax collection are bags and packages with the shape of bags (with the mouth and the bottom of the bag, with the bag side can contain products in it) made from single plastic film HDPE, LDPE, LLDPE; that can be considered an initiative that need replicating. In addition, the government should have incentive policies for manufacturers who consciously protect consumers' health, limit energy consumption, limit emissions and protect the environment, create favorable conditions for enterprises for startups to invest in sustainable production and consumption technologies.

REFERENCES

- Fischer, D., Bohme, T., & Geige, S.M. (2017). Measuring young consumer's sustainable consumption behavior: Development and validation YCSCB scale. *Young Consumer*, 18(3), 312-326.
- Geiger, S., Fischer, D., & Schrader, U. (2017). Measuring what matters in sustainable consumption: an integrative framework for the selection of relevant behaviors. *Sustainable Development*, 26(1), 18-33.
- Hoang. T.B.T (2016). Green consumption trends in the world and implications for Vietnam. *Science Review of Hanoi National University: Economics and Business*, 32(1), 66-72.
- Kasser, B. (2005). Ecologically responsible behavior. *International Journal of Consumer Studies*, 29(2), 114-126.
- Kaiser, O.B. (2007). Behaviour-based environmental attitude: Development of an instrument for adolescents. *Journal of Environmental Psychology*, 27, 242-251.
- Nguyen, T.K., & Nguyen, T.L.A. (2015). Research on consumers' green consumption intent in Ho Chi Minh City. *Science Review of Ho Chi Minh City Open University*, 2(47), 42-53.
- Pepper, M.J.T., & Uzzell, D. (2009). An examination of the values that motivate socially conscious and frugal consumer behaviors. *International Journal of Consumer Studies*, 33(2), 126-136.