

A Study on the Structural Relation of Vietnamese Consumer's Green Purchase Behavior[†]

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<요 약>

This research suggests a structural model of green purchase behavior, focusing on the moderating effect of affordability. Affordability means buying power or ability to buy products. Based on the literature review, a research model of behavior of buying green products was proposed and tested empirically using the field study.

To examine the proposed research model, the reliability and validity verifications on measurement items were carried out and then the structural equation model analysis was applied to test the model. Lastly, to test the moderating effect of affordability, a two-group model(using Amos program) was used subsequently so that it could be determined whether or not there was any significant difference in structural parameters between the high affordability group and the low affordability group.

The empirical results are as follow: Firstly, green purchase attitude is influenced by ecological concern and collectivism, then green purchase attitude has an impact on green purchase intention, and in turn, green purchase intention affects green purchase behavior. Secondly, affordability significantly moderates the relationship between green purchase intention and green purchase behavior. These results are consistent with the past researches and based on them, some managerial implications are given.

Key Words: Green purchase behavior, Green purchase attitude, Affordability, Collectivism

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I. Introduction

Vietnam seems to be among the countries most directly threatened by the consequences of climate change. This makes it imperative to change habits and practices with regard to fishery, farming and environmental protection. According to a 2009 report by UNEP, the United Nations Environment Program, temperatures in Vietnam have risen by 0.05 to 0.20°C per decade over the past 50 years. Globally, using green products is indeed becoming a trend and has been in the developed world.

Accordingly there have been many issues related with the green consumer behaviors inside and outside of Korea. For example, there are studies on the effect of green ad(Cho, 2009; Nagar 2014), determinants of green purchase behavior(Mostafa, 2007; Jung et al., 2012; Ali and Adil, 2014), and features of green consumers(Whitson et al., 2014; Lu et al., 2015). The existing studies have a limitation in aspect of not reflecting country-specific cultural features and psychological factors integrately. This study tries to identify the influence of various cultural and psychological factors on the green purchase behavior of Vietnamese consumers. To reflect the cultural traits of Vietnamese consumer, Collectivism was included in the research model and also ecological knowledge and ecological concern was considered to embrace intellectual and emotional aspects of consumer.

And to predict more precisely the green purchase behavior, the concept of affordability

was included. Actually in the developing countries environmental product use is indeed up, but not nearly as high as awareness is(Ramayah and Chow, 2010). This is very true for Vietnam, where seven out of ten consumers say they prefer environmentally friendly products and are now aware of Green Products, but whether they are willing to spend more money on such products is another story. There must be several reasons(income and expensive) why this niche market is not growing as fast as it has been hoped to be(Francisco and Richard, 2007; Notani, 1997; Kamal and Jauhari, 2007). This means there are some factors that affect consumers' behavior towards buying green products and, one of the main factors is income. Thus, their affordability to pay a premium for green product would be a challenge or a big problem to Vietnamese consumers.

The purposes of this research can be summarized as following: (1) to study the factors that affect green purchase behavior of Vietnamese consumers; and (2) to understand how affordability moderates the relationship between green purchase behavior and its antecedents.

II. Literature review and Hypotheses

1. Definition of green product

Cañlin and Ranchhod(2005) defined a green product as a product that was manufactured using toxic-free ingredients and environmentally-

friendly procedures, and that is certified as such by a recognized organization. Green product attributes may be environmentally sound production processes, responsible product uses, or product elimination, which consumers compare with those possessed by competing conventional products (Baumann and Bragd, 2002).

Therefore it is necessary to support the design function with tools and methodologies that enable an assessment of the environmental consequences (such as emissions, exposure, and effects) in each phase. Environmental requirements in the design process are described as minimizing raw materials and energy consumption, waste generation, health and safety risk and ecological degradation. Product design also constitutes an active interface between the two sides, demand (consumers) and supply (manufacturers), both pressuring and responding to it. This is why environmental issues need to be considered in the design process (Christopher et al., 2008).

2. Green purchase behavior

The earliest publications on green consumer behavior as an issue of importance to marketing planners appeared around 1970 and after a lull in interest, there was a boom in research throughout the 1990s, yielding numerous publications on environmental attitudes and their influences on behavior (Iman and Zainuddin, 2010). Lee (2009) suggested that green purchasing behavior refers to the consumption of products that are beneficial to the environment.

Ajzen (1991) suggested that explaining human

behavior in all its complexity is a difficult task. It can be approached at many levels, from concern with physiological processes at one extreme to concentration on social institutions at the other. Some derive from the social sciences: psychology, sociology, or economics. Others concentrate more on the effects of marketing variables, and stress the effects of external stimuli, such as advertising, physical product differentiation, packaging, promotion, retail availability, point of sale display, direct selling and so on (Christopher et al., 2008).

Past studies have put focus on examining what factors affect environmental behavior in general. These studies suggest that environmental attitude, effect, knowledge and memory could be important determinants of eco-friendly behavior (Richy, 2001). Richy (2001) has evidenced the effects of Chinese adult consumers' man-nature orientation, degree of collectivism, ecological effect and ecological knowledge on their attitudes toward green purchases and purchase intent. A large number of customers show increased environmental awareness and a preference for green firms and their products, revealing their willingness to purchase and pay more for environmentally friendly products or services (Clare et al., 2006).

Roberts (1996) indicated that consumer attitudes are significant predictors of ecologically conscious consumer behaviors. His findings revealed that environmentally conscious people are likely to engage in eco-friendly consumer behaviors, and individuals who believe their specific ecological activities can cause positive change are more likely to display green consumer behaviors.

3. Ecological Knowledge

According to Malony et al.(1975), the term ecological knowledge refers to the amount of knowledge an individual has about environmental issues. And there are many research issues to support the relationship between ecological knowledge and green purchase behavior (Dispoto, 1977; Ricky and Lau, 2000) also confirmed the importance of ecological knowledge in determining Chinese consumers' green purchase intention as well as their actual green purchase.

Adamantios et al.(2003) stated that along with attitudinal and behavioral components, knowledge items that capture individuals' level of factual information about specific or general aspects of environmental, ecological, or energy-saving phenomena should be contained within any operationalization of environmental consciousness. If a consumer has knowledge about the environment and pollution promulgation, the causes and impact on the environment, then their awareness levels would increase and thus would potentially promote a favorable attitude towards green products(Clare D'Souza and Lamb, 2006).

Hypothesis 1: Ecological knowledge will positively affect green purchase attitude.

4. Collectivism

In general, people from individualistic cultures tend to be independent and self-oriented whereas those from collectivistic cultures are more interdependent and group-oriented.

Individualism is characterized by independence, self-reliance, freedom of choice, and a high level of competition, while collectivism emphasizes interdependence, in-group harmony, family security, group-oriented goals, social hierarchies, cooperation, and a low level of competition(Hofstede, 1980; Triandis 1989). The continuum from collectivism to individualism describes how people relate to others in the environment. Any action of an individual within a group affects the group and may cause public criticism(Emre and Hewett 2010). Eastern Asian cultures tend to be high in collectivism, and China, in particular, is based on a collectivist political system(Tyson and Mallery, 2000).

According to Oyserman et al.(2002), the primary feature of collectivism is that groups bind individuals. Thus, collectivists are more likely to emphasize relationships instead of their individual needs, and therefore we expect collectivist consumers to place a greater value on relationships than on other issues. Collectivism has also been suggested to be predominantly important for relational behaviors among individuals. In particular, Tyson and Mallery(2000) find that members of collectivist cultures are more likely to reciprocate with cooperative behaviors in general. According to the reciprocity literature, consumers anticipate the guilt they would have if they do not follow norms of reciprocity. Evidence exists that collectivism can enhance relational behaviors in general. Collectivists are more receptive to and motivated by social bonding, with a focus on personal factors such as trust,

than they are by structural bonding or monetary rewards(Williams and Beckmann, 1998).

Theoretically, values can motivate and influence behavior(Carman 1977; Williams 1979). Hoyer and MacInnis(2004) suggested that consumers' values need to be considered as antecedent of purchasing decisions. Individualistic or collectivistic orientations have been found to influence a variety of social behaviors. Likewise, person-level tendencies of individualism or collectivism appeared to influence their motivation to engage in environmentally conscious behaviors(Kim and Choi 2005). Ricky(2001) also found collectivism exert significant bearing on Chinese consumers' attitudes toward green purchases, which in turn, affect their green purchase intention, and ultimately, their green purchase behavior.

Hypothesis 2: Collectivism will positively affect green purchase attitude.

5. Ecological Concern

Yeung(2005) stated that environmental concern refers to an affective attribute that can represent a person's worries, compassion, likes and dislikes about the environment. People nowadays do worry and concern about environment problems. Environmental concerns have attained substantial momentum and are continuing to alter consumers' basic habits. Environmental concern denotes an individual's general orientation toward the environment (Kim and Choi, 2005). Several studies have

shown that green consumers are willing to change their consumption behavior to preserve the environment(Clare et al., 2006). Later studies investigated the effects of environmental concern on behavioral intentions and behavior. For instance, Bang et al.(2000) found in their study that consumers who were more concerned about the environment expressed more willingness to pay more for renewable energy than those who were less concerned about the environment(Lee, 2009).

Some researchers pointed out that only a small portion of environmentally conscious customers actually purchases eco-friendly products in the marketplace because of high monetary and non-monetary costs and inconvenience(Roberts, 1996). However, numerous findings indicated that more environmental concern tends to result in more environmentally friendly buying behaviors(e.g., Stavros, 1999; Michel et al., 2001; Kamal and Jauhari, 2007). In exploring consumer attitudes and behaviors toward green practices in the lodging industry, Kamal and Jauhari(2007) verified that customers with ecological concerns prefer to make eco-friendly purchases. These research findings emphasized the significant role of attitude in the decision-making process.

Hypothesis 3: Ecological concern will positively affect green purchase attitude

6. Green purchase attitude

A recent research done by the Athens Laboratory of Research in Marketing in

collaboration with the Center of Sustainability about the green marketing found more than 92% of consumers has a positive attitude towards the companies that are sensitive on environmental matters(Richy, 2001). Researchers agree that eco-friendly attitudes contain several dimensions, such as (1) perceived severity of environmental problems, (2) inconvenience of being environmentally friendly, (3) importance of being environmentally friendly, and (4) perceived level of corporate responsibility to be eco-friendly, with the last indicating individuals' beliefs that business firms should be concerned about our environment and, thus, try to be ecologically responsible(Michel et al., 2001; Roberts, 1996).

Behavioral intention models, such as the theory of planned behavior, posit that attitude toward the behavior, subjective norm, and perceived control are the primary antecedents of intention and mediate the effect of belief concepts(Ajzen, 1991). Attitude represents a person's global positive or negative evaluation toward doing the behavior; while subjective norm assesses the person's global perceived social pressure from important others to engage in the behavior.

Roberts(1996) related the perceived importance of the environment to the degree to which individuals express their consciousness of environmental issues. Such environmental awareness instills in the public a positive attitude toward eco-friendly activities, and encourages people to more frequently engage in ecological behaviors in their everyday lives. These individuals have strong environmentally

friendly attitudes, look for opportunities to behave in an environmentally friendly ways, and often express environmental concerns (Stavros, 1999).

In conceptualizing the perceived importance of the environment as the primary indicator of attitudes toward environmentally compatible behaviors, Michel et al.(2001) determined the levels of these attitudes by whether individuals considered eco-friendly behaviors to be essential to themselves or the entire society. This attitude mainly involves the perceived importance or inconvenience of environmental consciousness, the severity of environmental problems, and the level of responsibility of corporations. In other words, individuals' attitude can be established by the level of their awareness of these dimensions of attitude for themselves and for society as a whole.

Hypothesis 4: Green purchase attitude will positively affect green purchase intention.

7. Green purchase intention

Ajzen(1991) stated that as in the original theory of reasoned action, a central factor in the theory of planned behavior is the individual's intention to perform a given behavior. Intentions are assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior. As a general rule, the stronger the intention to engage in a behavior,

the more likely should be its performance. It should be clear, however, that a behavioral intention can find expression in behavior only if the behavior in question is under volitional control, i.e., if the person can decide at will to perform or not perform the behavior.

Hypothesis 5: Green purchase intention will positively affect green purchase behavior.

8. Affordability

Income is an important variable in economics and is examined extensively, both as an exogenous and an endogenous variable (Notani, 1995). Changes in income are postulated to affect consumer spending and saving, which prompt changes in interest rates and other economic policies. Some support for the importance of financial resources vis-a-vis purchase intent measures in predicting purchase.

While the role of perceptions of affordability in individual product choice has received little attention in consumer research, there is some evidence for the importance of consumers' evaluation of their financial situation in predicting consumer expenditure. Researchers found that consumer expenditure, saving and credit are affected by the consumers' evaluation of their household financial situation; in many cases these subjective evaluations perform better than a measure of real disposable income (e.g., Notani, 1995; Guttentag and Redstone, 1994).

Affordability perceptions are a psychological

manifestation of an economic variable (Notani, 1995). Measuring whether a person feels psychologically capable of spending circumvents the problems inherent in objective measures of income mentioned above. While affordability concerns should be important in determining purchase, they may not be important for some types of purchases. For inexpensive, repeat purchase products like paper towels, candy, and the like, affordability concerns are not important in determining purchase since it is easy to bear the cost of such products. Simply intending to buy them should be sufficient to lead to their purchase. Thus, it would appear that the role of affordability concerns in predicting purchase is more important for products that are perceived more as expensive by consumers.

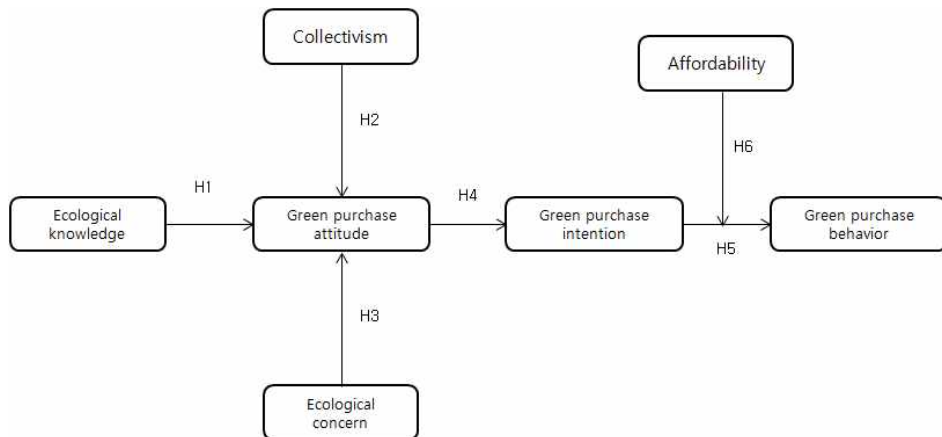
Further, solely having the ability to purchase an item does not lead to purchase (Guttentag and Redstone, 1994). For purchase to take place, a person has to intend to buy the product and have the ability to buy it. Similarly, purchase intentions should be stronger if, in addition to liking the product, a person believed that he/she could afford to buy the product. On the other hand, if a person liked the product, but could not afford to buy it, he/she would not have strong intentions to buy it. However, purchase intentions (compared to actual purchase) are a purely internal, psychological phenomenon. Simply possessing the ability to afford a product should motivate one to buy it, regardless of whether the product is perceived as expensive or inexpensive by the consumer.

Notani(1995) also found that perceptions of affordability significantly influenced purchase over and above intention alone. Further, purchase intention and affordability perceptions interacted to explain purchase. That is, purchase was better predicted when individuals simultaneously possess both the motivation to buy(in the form of intention) and the ability to do so (in the form of affordability perceptions). However, as was expected, this was true only for the scenario perceived as more expensive by the respondents. This finding is consistent with the Theory of Planned Behavior(Ajzen, 1991) which postulates that for behaviors over which individuals feel they have limited control, a measure of perceived behavioral control would be of considerable value in

predicting behavior. When individuals perceive barriers to performing a behavior due to lack of skill, opportunities, or resources, a measure of perceived behavioral control should be used in addition to a measure of behavioral intention. When an individual perceives that he/she has control over the behavior, the concept of perceived behavioral control is irrelevant for predicting behavior; a measure of intention alone should suffice.

Hypothesis 6: As consumers perceive high affordability, the relation between green purchase intention and green purchase behavior will be stronger.

Thus, the proposed model of this article is demonstrated in the <Figure 1>.



<Figure 1> Research Model

III. Methodology

1. Data collection

To verify the proposed model, a survey approach was adopted. 263 questionnaires were

collected. Except 21 with recording error, omission, or insincere reply, 242 were used in analysis. <Table 1> shows that around 50.8 percent of 242 respondents were male and 66.1 percent were not married. With the percentage of 82.2%, almost of their age are ranged from

18 to 30 years old. It is easy to understand that 50.4% of the respondents were employed for wages and 46.3 were student because the survey was sent to some companies and universities in Vietnam.

There is one problem that 56.6 percent of the respondents were Master. It is not popular with the characteristic of Vietnamese population. However, people with higher education, in general, have deeper understanding about the topic under investigation and are more willing to cooperate with the research than those who have less education(Chan and Yam, 1995). As the research problem of this article is related to affordability, income becomes the main demographic characteristic. Income is generally

thought to be positively related to environmental sensitivity. The most common justification for this belief is that individuals can, at higher income levels, bear the marginal increase in costs associated with supporting green causes and favoring green product offerings. That's why income variable was divided into six levels. Around 24% of the respondents earn less than \$150 per month, 36.8% of them earns from \$150 to \$400 and 26.9% of them earns from \$400 to \$700. This number represents the common characteristic of Vietnamese income level. <Table 1> contains full information about demographic variables in this article.

<Table 1> Sample profile

Variables	Items	Frequency	Percent
Gender	Male	123	50.8
	Female	119	49.2
Age	18-30	199	82.2
	30-45	43	17.8
	Over 45	0	0
Employment status	Unemployed	7	2.9
	Employed for wages	122	50.4
	Self-employed	1	.4
	Student	112	46.3
	Retired	0	0
Income	Under \$150	58	24.0
	\$150~\$400	89	36.8
	\$400~\$700	65	26.9
	\$700~\$1000	12	5.0
	\$1000~\$2000	10	4.1
	Over \$2000	8	3.3
Marital status	Married with children	50	20.7

	Married without children	30	12.4
	Not married	160	66.1
	Divorced	2	.8
Education level	Under bachelor	10	4.1
	Bachelor	63	26.0
	Master	137	56.6
	PhD	32	13.2
Sample size		242	100

2. Definition and measurement items of the constructs

The following section describes how the variables under investigation were operationalized in the survey.

2.1 Definition and measurements of ecological knowledge

Environmental knowledge can be defined as “a general knowledge of facts, concepts, and relationships concerning the natural environment and its major ecosystems”. In this study, the measurement items of ecological knowledge were obtained from the research of Mostafa (2007). There are initially five items with 5-likert scale. However, after running factor analysis, one item was deleted and only four items left. These four items are: (1) I know more about recycling than the average person, (2) I know how to select products and packages that reduce the amount of waste ending up in landfills, (3) I understand the environmental phrases and symbols on product package, (4) I am very knowledgeable about environmental issues.

2.2 Definition and measurements of collectivism

People high in collectivism prefer to do things with others and believe that cooperation is the best way to achieve goals. For them, personal matters tend to involve friends or the members of a particular group. They also believe that the group is entitled to know and regulate what the individual does and thinks in private matters. In sum, any action of an individual within a group affects the group and may cause public criticism (Tyson and Mallery, 1999).

In this study, the measurement items of collectivism were obtained from the research of Richey (2001). There are initially five items with 5-likert scale. However, after running factor analysis, one item was deleted and only four items left. These four items are: (1) To me, pleasure is spending time with others, (2) I feel good when I cooperate with others, (3) It is my duty to take care of my family, even when I have to sacrifice what I want, (4) It is important to me that I respect the decisions made by my groups.

2.3 Definition and measurements of ecological concern

Environmental concern refers to an affective attribute that can represent a person's worries, compassion, likes and dislikes about the environment (Yeung, 2005). In this study, measurement items to test ecological concern were taken from the research of (Yeung, 2005). Initially, they had twelve items for this variable, however, we only chose only four items that were suitable with our research, and after factor analysis, one was deleted and three items left are: (1) When humans interfere with nature, it often produces disastrous consequences, (2) Humans must live in harmony with nature in order to survive, (3) Mankind is severely abusing the environment.

2.4 Definition and measurements of green purchase attitude

The theory of planned behavior postulates three conceptually independent determinants of intention and the first is the attitude toward the behavior which refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question. Attitude represents a person's global positive or negative evaluation toward doing the behavior (Ajzen, 1991).

In this study, measurement items to test green purchase attitude were taken from the research of Shirley and Todd (1995). Initially, they had four items for this variable, however, we only chose only three items that were suitable with our research: (1) Buying green products is a good idea, (2) Buying green

products is a wise idea, (3) Buying green products is an idea I like.

2.5 Definition and measurements of green purchase intention

In theory of planned behavior, intentions are assumed to be indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior. Fishbein and Ajzen (1975) have defined intention as a "person's location on a subjective probability dimension involving a relation between himself and some action".

In this study, measurement items to test green purchase intention were taken from the research of Ahmad et al. (2010): (1) I would definitely intend to buy those products that are environmental friendly, (2) I would absolutely consider buying those products that are environmental friendly, (3) I definitely expect to buy those products that are environmental friendly, (4) I would absolutely plan to buy the environmental friendly products.

2.6 Definition and measurements of green purchase behavior

Lee (2009) suggested that green purchasing behavior refers to the consumption of products that are: benevolent/beneficial to the environment; recyclable/conservable; or sensitive/responsive to ecological concerns.

In this study, measurement items to test green purchase behavior were taken from the research of Shirley and Todd (1995) that was also used in Lee's research. Initially, they had seven items for this variable, however, we

only chose only five items that were suitable with our research: (1) I often buy organic products, (2) I often buy products that are labeled as environmentally safe, (3) I often buy products that contain no or fewer chemical ingredients, (4) When I consider buying a product, I will look for a certified environmentally-safe or organic stamp, (5) I often buy products that use recycled/recyclable packaging.

2.7 Definition and measurements of affordability

Notani(1995) defined affordability as the perceptions of whether one perceives that he/she can afford the product or not. He also examined how it influences purchase intention and purchase behavior. There are 3 items to test the effect of affordability in my research model, they are: (1) I think I am rich enough to buy all kinds of product, (2) I feel free to shop, (3) I can buy anything that I want.

3. Reliability and validity of measurement items

The reliability of scales was measured by using the Cronbach- α value analysis. Cronbach- α value of the constructs are ranged from .650 to .852. While all the figures were higher than .60, the lowest acceptable limit for Cronbach- α suggested by Hair et al(1998), they indicate adequate internal consistency associated with most of the measures.

Second, we used exploratory factor analysis which provides a useful first step for confirmatory factor analysis. As shown in <table 2>, seven factors were retained with eigenvalues greater than 1, and all factor loadings are higher than .60 with no cross-construct loadings with the cumulative of variance is accounted for 64.7%. These numbers show the acceptable adequacy(Hair et al., 1998).

<Table 2> Exploratory factor analysis

	Factor							Eigenvalue
	GPB	EK	AF	GPA	GPI	CO	EC	
EK1	0.07	0.832	0.044	0.072	0.075	0.04	-0.018	3.043
EK2	0.289	0.660	0.043	0.039	0.199	0.046	0.118	
EK3	0.209	0.754	0.089	0.068	0.09	0.026	-0.028	
EK4	0.261	0.641	0.049	0.002	-0.018	0.152	0.234	
CO1	0.094	0.027	0.09	0.426	0.046	0.636	0.06	1.153
CO2	0.13	0.094	0.023	0.301	0.154	0.699	-0.047	
CO3	0.195	0.03	0.033	-0.094	0.047	0.680	0.117	
CO4	0.07	0.114	-0.009	0.028	0.155	0.637	0.308	
EC1	-0.04	0.163	0.019	0.116	0.002	0.127	0.758	1.029
EC2	0.113	-0.003	-0.056	0.207	0.163	0.168	0.662	
EC3	0.107	0.018	-0.011	0.169	0.093	0.027	0.717	
GPA1	0.073	0.058	-0.132	0.751	0.138	0.171	0.322	1.511

GPA2	0.148	0.043	-0.012	0.802	0.174	0.092	0.306	1.289
GPA3	0.397	0.171	0.114	0.636	0.271	0.117	0.109	
GPI1	0.255	0.035	-0.052	0.404	0.565	0.096	0.033	
GPI2	-0.037	0.094	-0.096	0.203	0.753	0.107	-0.077	
GPI3	0.149	0.082	0.037	0.073	0.769	0.044	0.202	
GPI4	0.267	0.161	0.013	0.015	0.668	0.185	0.215	7.026
GPB1	0.605	0.291	0.098	0.157	0.187	0.12	-0.026	
GPB2	0.752	0.168	0.163	0.175	0.149	0.134	0.067	
GPB3	0.757	0.109	0.223	-0.021	0.009	-0.008	0.101	
GPB4	0.766	0.174	0.085	0.169	0.119	0.174	0.008	
GPB5	0.687	0.24	0.125	0.103	0.128	0.213	0.114	1.781
AF1	0.131	0.045	0.845	-0.014	-0.042	-0.066	0.034	
AF2	0.202	0.101	0.848	0.05	-0.01	0.17	0.016	
AF3	0.189	0.064	0.859	-0.076	-0.018	0.023	-0.106	
% of variance	27.024	11.705	6.849	5.81	4.956	4.436	3.959	
Cumulative %	27.024	38.728	45.577	51.387	56.343	60.779	64.738	

note) GPB: Green purchase behavior, EK: Ecological knowledge, AF: Affordability, GPA: Green purchase attitude, GPI: Green purchase intention, CO:Collectivism, EC: Ecological concern

IV. Research results

1. Confirmatory factor analysis

After exploratory factor analysis, confirmatory factor analysis was conducted with Amos program. <Table 3> shows the results of CFA. The used AMOS 5 program showed the high significant results. The measurement model statistics are reported in <Table 3>. Based on Hair et al.(1998), we can understand the indices in table 3 as follow: Chi-square = 442.201 at 278 degree of freedom is significant at $p = .000$. Goodness of fit index GFI = .882 and adjusted goodness of fit index AGFI =

.852 are nearly .9 that is typically considered good. Root means square residual RMR = .043 which is around .4 is also a good index. Root means square error of approximation RMSEA = .05 is considered good as it is between .03 and .08.

Moreover, normed fit index NFI= .832 is also good index as it ranges from 0 to 1 and it is nearly 1 which is a perfect NFI index. Comparative fit index CFI = .929 which is greater than .90 is associated with a model that fits well. Tucker Lewis index TLI = .917 almost similar to CFI and nearly 1 which is considered a good index. All of these results indicate a good fit of the model to the data.

<Table 3> Confirmatory factor analysis

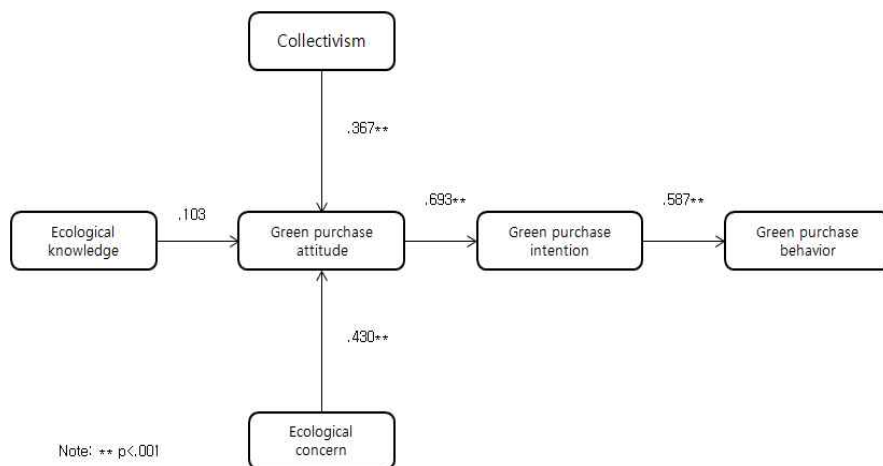
Constructs	Items	Standardized regression weight	SE	CR	Goodness of fit indices
Ecological knowledge	EK1	0.632	0.053		Chi-square=442.201 DF=278, Chi-square/df=1.59 P-value = .000 GFI = .882 AGFI = .852 RMR = .043 NFI = .832 IFI = .930 TLI = .917 CFI = .929 RMSEA = .050
	EK2	0.694	0.062	8.156	
	EK3	0.704	0.06	8.228	
	EK4	0.689	0.057	8.120	
Collectivism	CO1	0.563	0.047		
	CO2	0.456	0.058	5.379	
	CO3	0.694	0.042	6.984	
	CO4	0.677	0.046	6.913	
Ecological concern	EC1	0.642	0.048		
	EC2	0.668	0.041	6.967	
	EC3	0.581	0.061	6.507	
Green purchase attitude	GPA1	0.803	0.041		
	GPA2	0.881	0.046	13.753	
	GPA3	0.699	0.051	11.116	
Green purchase intention	GPI1	0.664	0.045		
	GPI2	0.581	0.044	7.330	
	GPI3	0.665	0.049	8.129	
	GPI4	0.689	0.051	8.326	
Green purchase behavior	GPB1	0.681	0.052		
	GPB2	0.794	0.054	10.726	
	GPB3	0.639	0.052	8.890	
	GPB4	0.785	0.056	10.636	
	GPB5	0.76	0.056	10.355	
Affordability	AF1	0.84	0.064		
	AF2	0.842	0.067	13.087	
	AF3	0.734	0.069	11.772	

2. Hypotheses testing

2.1 Analysis results of hypotheses

The next phase of the analysis, the relationships between the constructs in the structural model were assessed<Figure 2>. Reference from Hair et al.(1998) is still used to examine the model and hypotheses. The

goodness of fit indices suggest a good fit of the model to the data(Chi-square = 384.659, df = 219, Chi-square/df = 1.756, P value = .000, GFI = .885, AGFI = .855, RMR = .058, NFI = .824, IFI = .916, TLI = .901, CFI = .914, RMSEA = .056). The statistical significance of all the structural parameter estimates was examined to determine the hypothesized paths.



<Figure 2> Structural equation model results

<Table 4> lists the structural parameter estimates and the hypothesis testing results. The result shows that collectivism and ecological concern have significantly positive effect on green purchase attitude with the corresponding estimate of .367, $t = 3.720$ (collectivism) and .430, $t = 4.269$ (ecological concern) at p value = .000 < .001. Thus, hypotheses H2 and H3 are supported. While H1 which demonstrates the impact of ecological knowledge on green purchase attitude is not supported as $t = 1.431$ is not significant at $p < .05$. This results seems to

mean that just knowing ecological issues can't affect green purchase attitude and this findings point to the superiority of catching emotional than cognitive appeals to influence the green purchase attitude.

<Table 4> also shows the significance of hypotheses H4 and H5. H4 demonstrates the influence of green purchase attitude on green purchase intention with coefficient = .693 is significant at $p = .000$. H5 indicates the effect of green purchase intention on green purchase behavior with coefficient = .587, is significant at $p = .000$

<Table 4> Hypotheses testing

	Research hypotheses	Standardized path coefficient	Standard error	t-value	P-value	
H1	Ecological knowledge → green purchase attitude	0.103	0.07	1.431	0.153	Not accepted
H2	Collectivism → green purchase attitude	0.367	0.122	3.72	***	Accepted
H3	Ecological concern → green purchase attitude	0.43	0.104	4.269	***	Accepted
H4	Green purchase attitude → green purchase intention	0.693	0.085	7.688	***	Accepted
H5	Green purchase intention → green purchase behavior	0.587	0.108	6.278	***	Accepted

2.2 Moderating effect testing

Final step is to test the moderating effect of Affordability on the relationship between green purchase intention and green purchase behavior. To examine this moderating effect, the sample was split into 2 groups according to the mean score of the affordability. The data above the mean were defined as high affordability, and the data below the mean as low affordability.

A two-group AMOS model was used subsequently so that it could be determined whether or not there was any significant difference in structural parameters between the high affordability group and the low affordability group. First analysis, the parameter

from green purchase intention to green purchase behavior was constraint to be equal. Second, the parameter was kept free(not constraint). Differences in the chi-square values between the two models determine whether the affordability had a moderating effect on the relationship between green purchase intention and green purchase behavior.

The results of the test are summarized in <Table 5>. Based on <Table 5>, we can see that the difference in the chi-square value is 9.118($D = 742.321 - 733.203$), and the difference of degree of freedom $df = 1$. This Chi-square difference is greater than chi-square statistic at 1 degree of freedom(chi-square statistic = 3.84).

<Table 5> Moderating effect testing

	Unrestricted model	Restricted model
Chi-square	733.203	742.321
Degree of freedom	448	449
Coefficient(high group)	0.727	0.656
Coefficient(low group)	0.453	0.576

Thus, affordability significantly moderates the relationship between green purchase intention and green purchase behavior and hypothesis H6 is supported. Moreover, according to <Table 5>, in both models, coefficients of high groups are greater than that of low groups. This result also supports hypothesis H6.

V. Discussion and conclusion

1. Conclusion

Firstly, theoretically consistent with Ajzen's

theory of planned behavior, the relationships among attitude, intention and behavior towards purchasing green product of Vietnamese consumers are examined and supported. It means that green purchase intention is positively influenced by green purchase attitude, and in turns, green purchase intention positively affects green purchase behavior.

Secondly, green purchase attitude is, psychologically, proved to be determined by collectivism and ecological concern. The result shows that collectivism and ecological concern have significantly positive effect on green

purchase attitude. Consumers who are collectivistic and who concern much about environment than the others are more willing to buy green products.

Thirdly, affordability is found to moderate the relationship between green purchase intention and green purchase behavior. This result is consistent with the findings of Notani(1995) that purchase intention and affordability perceptions interacted to explain purchase behavior. That is, purchase was better predicted when individuals simultaneously possess both the motivation to buy(in the form of intention) and the ability to do so(in the form of affordability perceptions). However, as was expected, this was true only for the scenario perceived as more expensive by the respondents. Theory of Planned Behavior (Ajzen, 1985) also postulated that for behaviors over which individuals feel they have limited control, a measure of perceived behavioral control would be of considerable value in predicting behavior.

2. Implication

2.1 Theoretical implication

Firstly, the general pattern of the article confirms the existence of a value-attitude-behavior hierarchy in the green purchase context. Grunert and Kristensen(1991) and Homer and Kahle(1988) found a similar pattern in the organic food context. Florian et al.(1999) applied a value-attitude-behavior approach to environmentalism within a European context. Their model operates with such variables as

knowledge(factual and normative), attitudes towards the environment and toward ecological behavior, a sense of responsibility, and behavior intention. Based on earlier work by Williams(1979), this study concludes that even if they are implicit and not consciously reflected upon, values affect attitudes and, mediated by the attitudes, affect behavior.

Secondly, the results also provide substantial empirical support to some of the important premises of such classic behavioral theories as the theory of reasoned action and the theory of planned behavior. In these theories, intention (volition) mediates the relation between motivation(attitude) and behavior. Lee(1991) claims that while most of the major consumer behavior theories have been developed and tested in the West, relatively little attention has been devoted to investigating the validity of these theories in other cultural settings. However, this cross-cultural testing is essential as most behavioral theories are rooted in psychology which, in turn, is heavily bound by cultural values(Ricky and Lau, 1998).

Thirdly, the analysis result of the moderating effect of Affordability shows the consistence with the Theory of Planned Behavior(Ajzen, 1985) which postulates that for behaviors over which individuals feel they have limited control, a measure of perceived behavioral control would be of considerable value in predicting behavior. When individuals perceive barriers to performing a behavior due to lack of skill, opportunities, or resources, a measure of perceived behavioral control should be used in addition to a measure of behavioral

intention. When an individual perceives that he/she has control over the behavior, the concept of perceived behavioral control is irrelevant for predicting behavior; a measure of intention alone should suffice. These conditions are also reasonable and suitable in case of green products which are more expensive than the conventional products.

2.2 Managerial implication

Firstly, this article contributes some managerial implications consistent with the relationship among collectivism, ecological concern and green purchase attitude. Company should cooperate with social organization or group to implement activities or actions about environment. Consumers who are collectivistic or concern about environment will be more likely to join. Profits from this technique are, first, to remind consumers who are collectivistic or concern about environment, and second, to educate or introduce the other consumers about purchasing green products. Other ways to market “Green” is by providing communication about what the company is doing to support environmental programs, such as waste management, alternative fuel exploration and many other great causes.

Secondly, related to the theoretical implication of the relationship among green purchase attitude, green purchase intention and green purchase behavior, if a consumer likes buying green products or they feel that it is a wise idea or a good idea, they would intend to or plan to buy green products. Then, their intention to purchase green products will be

transformed to their behavior such as buying organic food, or product with label that is certified environmental safe or product that uses recycled/recyclable package, or product that contains no or fewer chemical ingredients. These results give out some managerial implications for marketing managers and directors. For example, the green products should be clarified and easy to be recognized by consumers with some techniques such as packaging or displaying in stores or advertisement. Thus, package of green products should be contained with full information to explain how they are environmentally friendly. As Vietnamese consumers are becoming more brand savvy and much more aspirational, green products and services need to communicate their premiumness, not only as a product function, but as a global value system in terms of environmental sustainability.

Thirdly, the main contribution of this study is about affordability. In a low-income country like Vietnam, affordability becomes more important when consumers consider buying products that are more expensive than other products. Thus, some special promotion events should be implemented to educate or explain to consumers that what they benefit from the product is much more than the amount of premium they pay for the product. In some cases, consumers do not know that they can save money if they use green product in a long term. Marketers need to make consumers aware of how the product and service actually help the environment in both the short and long term sustainability of a clean Vietnam.

3. Limitations and future research

The first limitation of this study is about sample profile. It does not represent the population of Vietnamese consumers because 56.6% of 224 respondents got Master degree. D'Souza(2004) stated that one reason as to why green products may have a low impact and not be the best seller in the market is due to the lack of emphasis on targeting the right segments. While marketers may have seen themselves as experts in identifying the green markets, ensuring that the offerings made by the green products met those needs of the consumers; the general public perception about green products is much less flattering.

The second limitation is expressed in a question: Do the results generated in this study apply to all types of green products? There are various types of green products in different industries, different types of customers(e.g. commercial client), and different areas in the country. The third limitation is not to address and compare with recent trendy issues(ethical consumerism, fair trade, ethical company) related green consumer behavior. Thus, there are several suggestions for the future research: (1) we need to get a sample profile that presents the population of Vietnamese consumers, the survey should be taken with each family; (2) the research should be conducted with a specific type of industry or customer. (3) we need to compare the concept, determinants and effect between the green purchase behavior and ethical consumerism. (4) finally, to predict more

precisely the green purchase behavior, we need to measure consumer's actual purchase behavior.

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Abstract

그린구매행동의 구조적 관계에 관한 연구†

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본 연구는 베트남 소비자의 그린구매행동에 관한 구조적 모형과 구매능력이 가지는 조절효과를 중점적으로 살펴본 연구이다. 베트남의 중산층 인구는 2012년 12백만 명에서 2020년에는 33백만 명으로 증가할 것으로 예상되고 이에 따른 소비패턴 변화가 예상되고 있으며, 최근 산업화와 내구재 소비증가로 인해 환경문제에 대한 관심이 증가하고 있다(Koning et al., 2016). 이에 따라 그린 제품구매 관련 문헌고찰을 통해 베트남 소비자들의 그린 구매행동 관련 가설 및 모형을 제시하고 실증 자료를 통해 가설을 검증하였다.

연구모형을 검증하기 전에 측정문항의 신뢰성과 타당성분석을 실시하였으며 연구변수간 선·후행 관계검증을 위해 구조방정식 모형분석을 실시하였고 구매능력의 조절효과검증은 개별모수 차이검증을 통해 실시되었다.

실증분석결과는 다음과 같다. 먼저 생태적 관심과 집단주의는 그린구매행동에 관한 태도에 긍정적인 영향을 미치는 것으로 나타났으나 생태적 지식은 유의한 영향을 미치지 않았다. 둘째, 그린구매행동에 대한 태도는 그린구매행동의도에, 그린구매행동의도는 그린구매행동에 유의한 영향을 미치는 것으로 나타나 계층적 효과모형과 일관된 결과를 보여주었다. 셋째, 구매능력은 구매의도와 실제 구매행동 간의 관계를 조절하는 것으로 나타났다. 이러한 연구결과에 기반하여 이론적, 실무적 시사점을 제시하였다.

핵심주제어: 그린구매행동, 그린구매태도, 지각된 구매력, 집단주의

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