

國立交通大學交通運輸研究所

碩士學位論文

綠色行銷下消費者之綠色消費行為分析

Analysis of green purchasing under green marketing



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摘要

環保是近年來的趨勢，許多國家已經發布規章來控制消費者和企業對環境所造成的影響。如今不只是政府，消費者也越來越有環境意識。因此，綠色消費和綠色行銷逐漸風行於商業活動中。但是綠色市場的表現卻是令人失望的。

先前的研究專注在綠色消費的心理因素影響，但是消費者的需求仍然是需要被滿足的。因此我們結合心理學和行銷學為綠色消費提出一套新的概念性架構。為此，我們選擇了低價格和高價格的產品成為我們的分析目標並且提出十四項假說。我們建立流程圖來檢驗所提出的因素以及相關假設。根據隨機抽樣的調查數據，我們使用 LISREL 來進行分析。我們先做整體消費者的測試，之後再隨著收入水準和教育水準將消費者分群。驗證的結果顯示每條假說被接受或者拒絕取決於不同種類的消費者和產品。根據我們的分析，我們發現每個因素造成的影響會隨不同種類的消費者和綠色的產品而變。不僅是環境意識，業界常使用的行銷工具也能有效影響綠色的購買意圖。這表示銷售人員想要推銷不同綠色產品給不同消費者的時候，他們應該首先分辨消費者和產品的類型然後使用不同的銷售工具。簡言之，雖然我們不能只用環境意識銷售綠色的產品，但是它確實會影響消費者，而綠色產品實際上也是可以被行銷的。

關鍵字：綠色行銷，綠色消費，消費者行為，結構方程模式，LISREL

Abstract

“Green” has been a trend for several years. Many countries have issued regulations to control the impact caused by consumers and companies. Nowadays, not only government but also consumers have more and more awareness about environment. Thus, green consumption and green marketing are gradually prevailed among business area. But performance of green market is still disappointing.

Previous researches concentrate on analyzing the psychological effect on green consumption. But the consumers' requirements of product attributes still need to be satisfied. Thus we combine psychology and marketing concept to propose a new conceptual framework for green consumption. To do so, we choose low-price and high-price products to be our objects and postulate fourteen respective hypotheses. A hypothetical model is established to analyze these constructs and their correlations in the proposed conceptual framework. Based on the survey data collected randomly in Taiwan, we use the LISREL analytical approach. At first, we use total samples to test our conceptual framework, and then we separate our samples with income-level and education-level and we test both low-price and high-price products with every kind of consumers.

The empirical results indicated that every hypothesis is accepted or rejected depends on different kinds of consumers and products. According to our analysis, we find the effects of every construct are changed with different kinds of consumers and green products. Not only environment awareness but most used marketing tools can effectively affect green purchase intention. That means when marketers want to promote different green products to different consumers, they should identify the type of consumers and products first and then use diverse marketing tools. In brief, although we can't market green products only with environment awareness, it does affect consumers and we also find that green products actually can be marketed.

Keyword: green marketing, green consumption, consumer behavior, SEM, LISREL

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寫論文的時候，時間似乎總是過得特別快，一眨眼兩年就過了，如今辛苦也有了代價。這篇碩士論文之所以可以順利如期完成，都要歸功於在我身邊一直陪伴著我的師長，朋友以及家人。首先，我要感謝我的指導教授，許鉅秉老師，從一開始訂碩士論文題目到之後的論文撰寫，老師都幫了很多的忙。老師不會限制我們思考的空間，並且會依照每個學生不同的狀況給予不同的指導，同時也會主動提供我一些論文方向，把我導引到對的軌道上，我十分的感謝許鉅秉老師。

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Chapter 1 Introduction

1.1 Motivation and background

With the continuous growth of global economics, every country becomes richer and richer. Higher GDP changes the way of consuming and producing. Speedy development of population and urbanization bring heavy environment burden caused by daily consumption. Urban resource is depleted faster and environment pollution derived from business activities is increased. In 1987, World Commission on Environment and Development (WCED) proposed the idea named “sustainable development”. It means the sustainable ecological environment and nature resource is the only possibility of long-term development of society and economics. Based on the common consensus, every country tries to find the way to combine economics development with environment protection.

Not just government, consumers also follow this trend. When consumers notice the aggravation of environment has affected living quality, even their life style, they will try to purchase those products which make minimum environment impact. On one hand consumers achieve the purpose of purchasing, and on the other hand they reduce the impact of environment. So, there is a term called “green consumption.” When consumers are under the incentive and lure of green consumption, manufacturers are forced to produce green products and use green marketing to sell these green products. So, these components form a new and developing green market. In order to be the most profitable, enterprises take the concept of environment protection as a part of their operation strategy to build up the new enterprise culture. “Green consumption” and “green marketing” have increasingly been the object in recent years (Minton et al., 1997; Kalafatis et al. 1999; Follows et al., 2000).

Under the principle of supply and demand, it seems that there would be a new environment protection market. But in recent decade, the market share of green products is still constant or even declining. The reason of the disappointing green market performance is the less positive consumers. Davis (1993) concluded those questions into two parts: over complicated green marketing and cold consumers` response. He claimed that enterprises should solve these problems by understanding and satisfying consumers` needs.

To encourage green consumption, it is very essential to understand the green

consuming intention of consumers. The most important consumer decision of consuming green products is how to maximize consumer utility and maintain the environment quality at the same time. Nowadays, enterprises not only produce green products but also use green marketing to maximize the utility of consumers. Thus enterprises can effectively raise the amount of green consumption. Based on these statements, analyzing effect of green marketing on green consumption and the major determinant of green consumption are very important objects.

1.2 Propose of research

According to the motivation and background, using green marketing is the most effective way to promote green consumption. But literatures of green consumption usually focus on psychology factors or outside interference factors and barely consider the effect of enterprises' marketing strategy. So, we try to combine factors of psychology and marketing to propose a new conceptual framework for green consumption and further analyze green consumption under green marketing. We will use socio-economic characteristic to separate our samples and we also use two different kinds of products to test our conceptual framework. One kind is low-involvement product and the other kind is high-involvement product. We will compare the analytic result between different kinds of consumers and products.

1.3 Research limit

- We only adopt some most used marketing concepts to build our new conceptual framework for green products.
- Because our samples are all collected randomly in Taiwan, we don't consider the effect of culture and the habit of purchasing.
- We only use income-level and education-level to separate our samples.

1.4 Research procedure

1. Problem definition

Discovering and identifying problem through research background and motivation. Thinking over the necessary methodology and tools related to this research. And further decide the direction and goal of this research.

2. Literature review

Colleting and reviewing papers which focus on the area of green marketing, green consumption, and consumer behavior and take literature review as the

fundamental of our conceptual framework.

3. Propose conceptual framework

Combining psychology and marketing constructs proposed by related reference to establish conceptual framework. We design measurements for each construct and postulate fourteen hypotheses.

4. Design questionnaire

We design questionnaire for both low-involvement product and high-involvement product to gather consumers' data about green purchasing.

5. Data Analysis

We use descriptive statistics to show the sample distribution and use LISREL to examine our data collected by questionnaire for different kinds of consumers and products.

6. Conclusions

Based on the analytic result, we will interpret, conclude and compare the difference between different kinds of consumers and products.



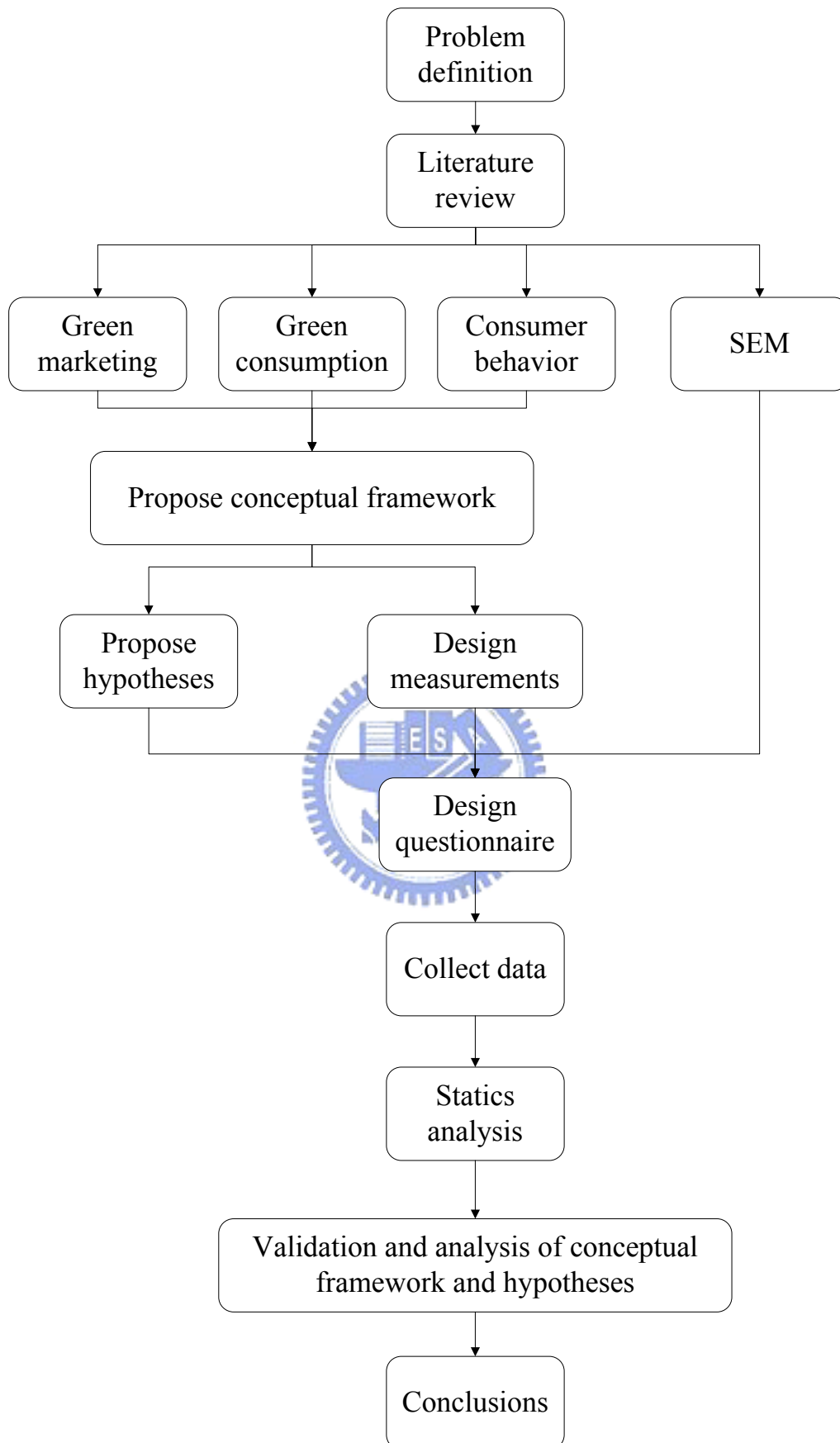


Figure 1.1 Procedure of research

Chapter 2 Literature Review

2.1 Green marketing

2.1.1 Definition of green marketing

In 1950, AMA (American Marketing Association) defined marketing as “the business activities that bring the goods and services of producers to consumers.” Until 2004, AMA redefined marketing as “marketing is a kind of organization and procedure that create, communicate and deliver value to the customers, and operate the customer relationship to benefit organization and stakeholders.” Kotler (2001) defined the process of marketing as analyzing marketing, targeting marketing, developing mix marketing and managing marketing effects. Green marketing was prevailed in the late of 1980s; it contains various business activities, like product improvement, package improvement, producing process or advertisement. The goal of green marketing is bringing environment issue into marketing. If we can make consumers consider that information of environment protection during their decision process, we can push enterprises to produce more environmental friendly products.

But many people think that green marketing is only about promoting and advertising those environment attributes of products like recyclable, refillable, or reusable. Consumers usually associate those environmental attributes with green marketing. Also those are the claims of green marketing, actually green marketing is a more extensive concept. It can be used on consumer goods, industrial products and even service.

Before providing an alternative definition, it should be noted that no one definition or terminology has been universally accepted. At the same time, the terms used in green marketing area are different, like green marketing, environmental marketing and ecological marketing. This lack of consistency makes some problems. There is no issue can't be evaluated if all researchers have a different perception of what they are researching.

Polonsky (1994) proposed a definition that encompasses all major components of other definitions. ”Green or environmental marketing consists of all activities designed to generate and facilitate exchanges for satisfying human needs or wants with minimal detrimental impact on the natural environment.” The most important

thing is that consumption must cause damage of environment, so the purpose of green marketing is to minimize the environment impact and satisfy consumers at the same time.

In figure 2.1, Rex and Baumann (2007) pointed out the difference between traditional marketing proposed by Kotler (2001) and green marketing. They thought the major area of green marketing should be the measurement of market size, identifying green consumers and positioning with eco-label. From traditional marketing aspect, there are many ways can be used to improve green marketing, like analysis of present and potential market, broaden the scale of targeted consumers. Green marketing will be more competitive if combines 4P (product, price, place, promotion) of traditional marketing strategy and eco-label that provide environment information to consumers.

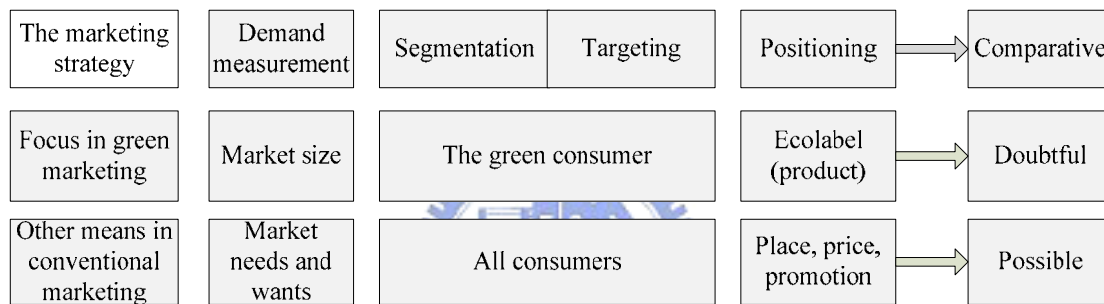


Figure 2.1 Traditional marketing strategy and green marketing strategy

Source: Rex et al. (2007)

2.1.2 Trend of green marketing

2.1.2.1 Execution intention of enterprises

Nowadays, both consumers and enterprise care environment and nature more than before. From a report that researched 16 cities, Ottman (1993) pointed out that over 50% consumers care the environment impact. A research in Australia, EPA-NSW (1994) pointed out over 85% sample consumers believe that everyone should be responsible for the environment impact and even 80% sample consumers claimed that they correct their behavior for this reason. Because the consumers demand is changed, that also pushes companies to change. Many companies realize they should be more responsible for environment. They think the goal of environment and profit ought to be the same, and that makes environment issues become a part of enterprise culture.

Keller (1987) and Shearer (1990) think some companies take green marketing as

a chance to achieve their goal. Keller (1987) 、McIntosh (1990) 、Freeman and Liedtka (1991) 、Shearer (1990) and Davis (1992) think companies have the ethic obligation to take responsibility for environment. NAAG (1990) pointed out government will enforce companies to take the responsibility and the environment strategy used by competitors will also enforce companies to change their environment marketing strategy. According to above researches, we could assume that those companies include environment concern into their marketing strategy will be more competitive than those companies without environment concern.

2.1.2.2 Regulation pressure

Governments try to protect consumers and society with green marketing, so they build up licenses mechanism to control harmful substance. Under some situations, governments try to appeal end consumers to become more responsible or punish those irresponsible consumers through levying taxes.

Environment regulations have become a tool of economic sanctions. In recent years, European Union gradually proclaims several environment regulations, like EuP (Directive of Eco-design Requirements of Energy-using Products), RoHS (Restriction of the use of certain Hazardous Substance in electronics and electricity equipment) and WEEE (Waste Electronics and Electricity Equipment). European Union uses these regulations to control manufacturers to damage environment and improve the environment quality.

2.2 Consumer behavior

2.2.1 Definition of consumer behavior

Consumer behavior is a integrate science; it includes economics, marketing, psychology and sociology. American Marketing Association(AMA) defined consumer behavior as a dynamic relationship between interaction of emotion, cognition and behavior. That also means that consumer behavior includes the feelings and thoughts experienced by consumers and the behavior during their buying process. At the same time, it also includes environment which affect consumers' emotion, cognition and behavior, like other consumers comment, advertisement marketing, product price information, package, product appearance ...etc.

2.2.2 Analysis of consumer's decision

When consumers purchase products they have to make decision. Different brand, product attributes, or appearance will affect consumers' decision. Consumers will carefully evaluate cognitive information. Sometimes the key point is not only related to the outside factors, like brand, price, purchase environment, but also the feeling perceived indirectly. Although the procedure of purchasing is complicated, marketers are very interested in consumer decision process and wish to increase sales through understanding consumer decision process.

Peter and Olson (2001) pointed out that if we take the process of making decision as the process of solving problem, then it includes problem recognition, search for alternative solution, evaluation of alternatives, purchase, post-purchase use and reevaluation of chosen alternative. They depicted above five steps as follow:

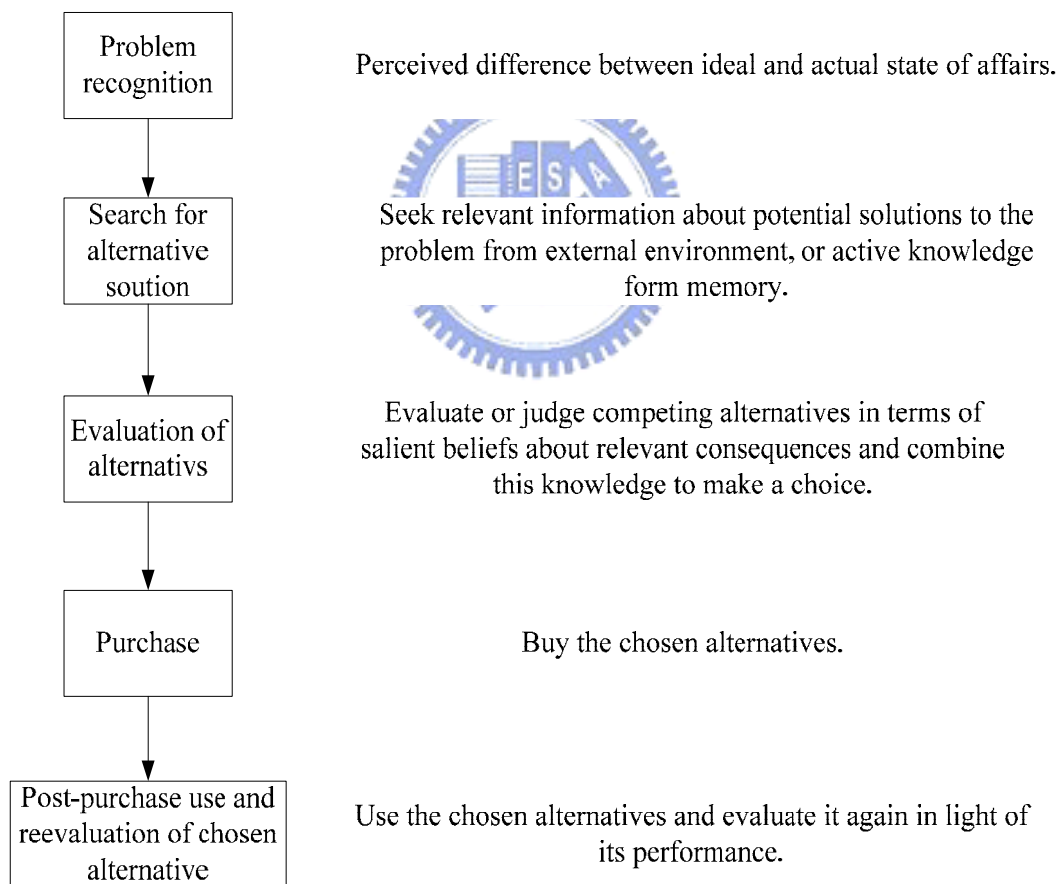


Figure 2.2 A generic model of consumer problem solving

Source: Peter and Olson (2001)

However, purchase decision process is an integrate process. It includes product understanding, product meaning, purchase environment and beliefs that come from memory and inclination. Consumers integrate above factors and make their decision from many alternatives. Peter and Olson (2001) arranged consumer cognition process as follow:

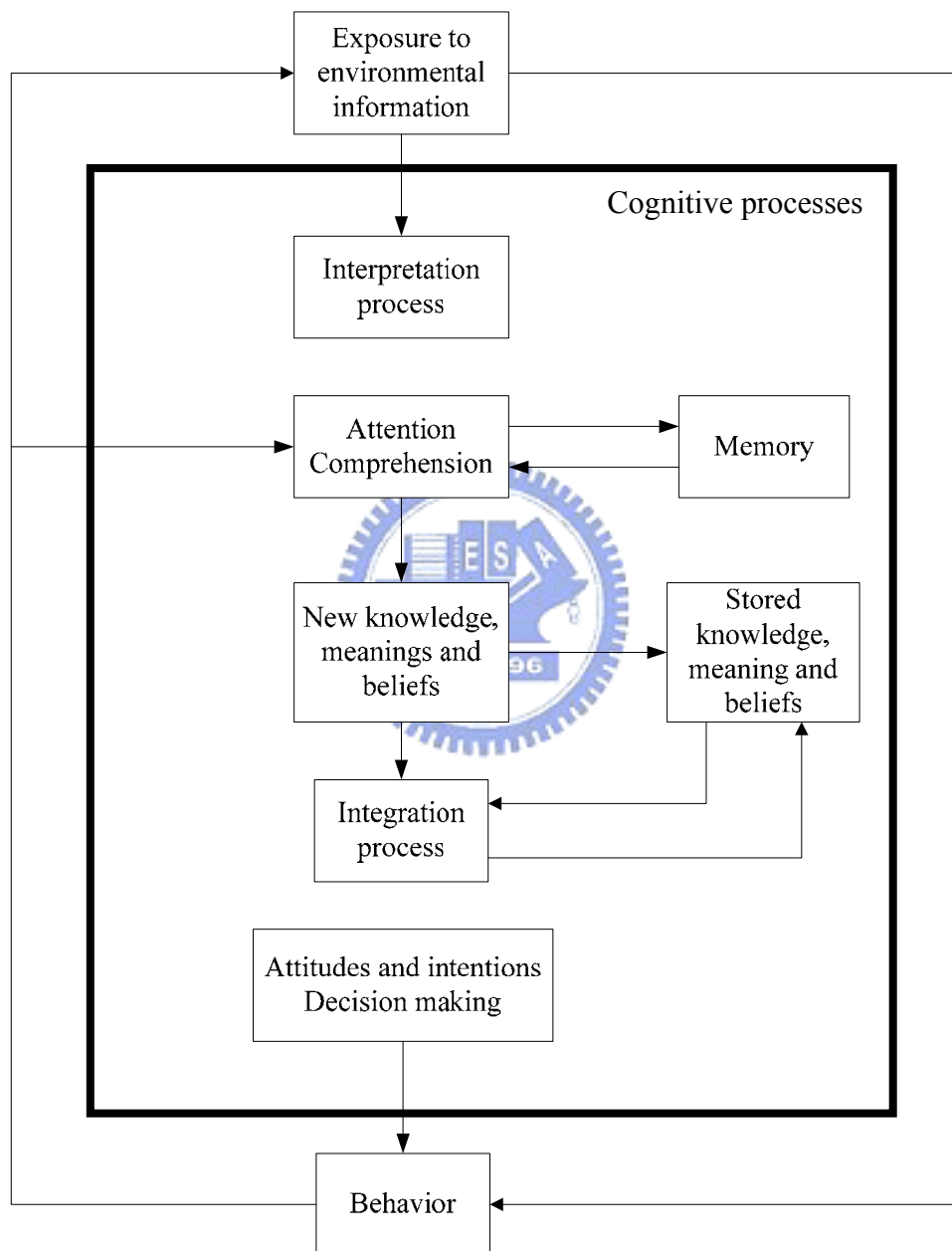


Figure 2.3 Cognitive Processes in Consumer Decision Making

Source: Peter and Olson (2001)

2.2.3 Theory of consumer behavior

Theory of reasoned action (TRA) proposed by Ajzen and Fishbein(1975) and theory of planned behavior(TPB) proposed by Ajzen(1991) are both famous theory of consumer behavior. Both theories are layer concept. It means that attitude affects intention then intention affects behavior. Ajzen and Fishbein defined attitude, intention and behavior as follow:

- Attitude: it is continuous trend that people like or dislike particular object through studying or experience.
- Behavior intention: subjective possibility of executing particular behavior, it reflects personal intention of particular behavior.
- Behavior: transferring intention to actual behavior.

2.2.3.1 Theory of Reasoned Action (TRA)

In TRA, Subjective norm is seen as a combination of perceived expectations from relevant individuals or groups along with intentions to comply with these expectations. In other words, the person's perception that most people who are important to him or her think he should or should not perform the behavior in question. Attitude and subjective norm will influence intention and intention directly influences behavior. When people have more positive attitude toward behavior, the behavior intention is stronger; when people have more negative attitude toward behavior, the behavior intention is weaker. In figure 2.6, we can see those factors do not only influence each other in one-way. Behavior intention is influenced by attitude and subjective norm further affect behavior. And behavior feeds back attitude and subject norm. It is circulating interaction.

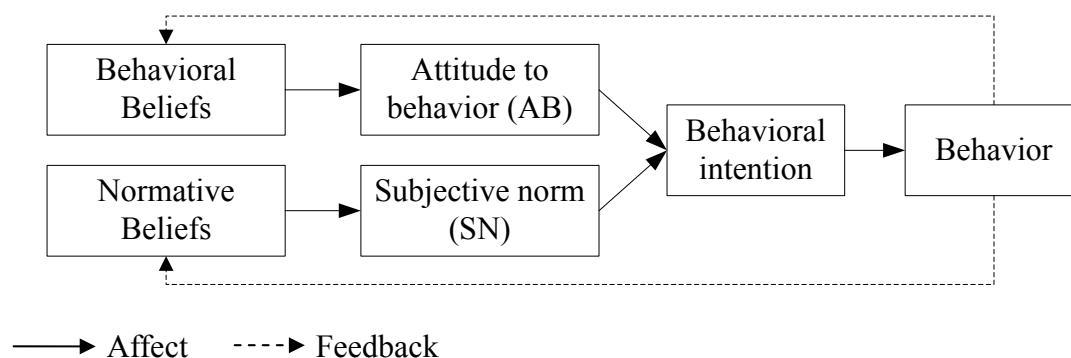


Figure 2.6 Theory of Reasoned Action (TRA)

Source: Ajzen, Fishbein (1975)

2.2.3.2 Theory of Planned Behavior (TPB)

Ajzen (1991) found that personal behavior is not totally voluntary. So, he expanded TRA and added a new concept called “perceived behavior control” then developed a new theory named theory of planned behavior (TPB). Perceived behavioral control means that consumers will evaluate personal experience and expectable obstruct before making their purchasing decision. When consumers perceive that they can control more resources and opportunities, they have stronger perceived behavioral control.

TPB contains attitude, subjective norm, perceived behavior control, behavior intention and behavior. The difference between TRA and TPB is that Ajzen proposed most personal behavior is between totally under willingness and totally not under willingness. But if the problem is extremely under control or out of control, the result of TRA and TPB is almost equal.

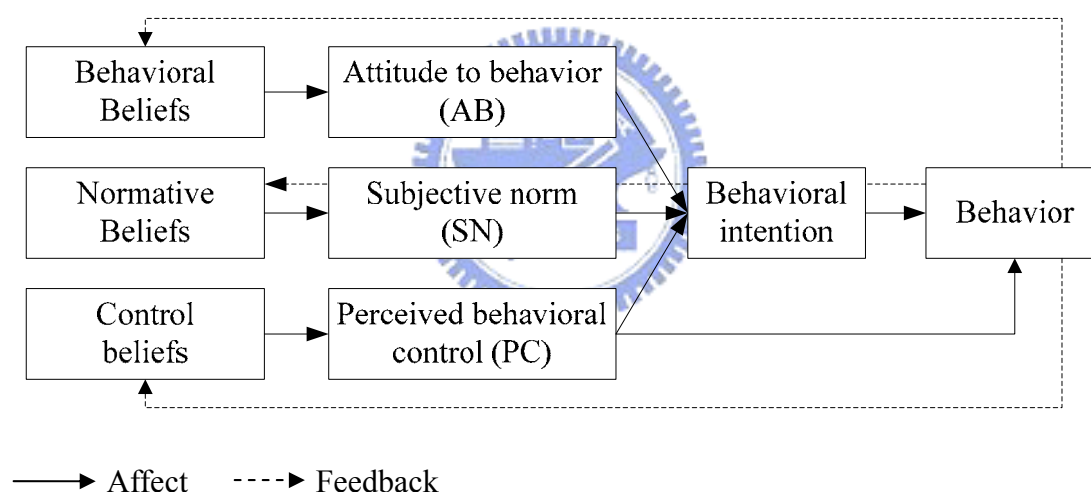


Figure 2.8 Theory of Planned Behavior (TPB)

Source: Ajzen (1991)

2.3 Green consumption

2.3.1 Definition of green consumption

The basic concept of green consumption is that people can't avoid daily purchase, so we can only do our best to reduce the impact derived from our consumption. The most concrete way is to encourage consumers to purchase environment friendly products, like: recycled paper. Reducing pollution of nature through buying those environment friendly products is what we call green consumption. Peattie (1993)

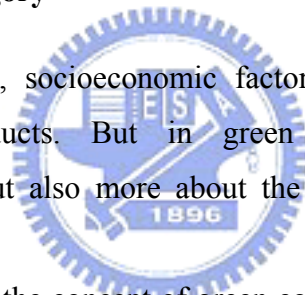
defined green consumption as “after realizing of environment depletion, consumers will try to purchase products and request companies to produce products with minimum environment impact. Consumers can achieve their purchasing goal and damage environment less. It is a sustainable and more responsible way to purchase.”

2.3.2 Trend of green consumption

Consumption behavior is the major reason of environment impact. To reduce the impact, there are two main methods. One is promoting green consumption and the other is decreasing the impact during the manufacture process of products and service. Recently, many countries use environment certificate to promote green consumption and use policy to stimulate consumers to purchase green products. And some regions even use environment regulations as economic punishment, like RoHS, WEEE, REACH announced by European Union.

2.3.3 Green consumers category

In traditional marketing, socioeconomic factor is key factors of purchasing intention of specific products. But in green marketing, it is not only socio-demographic factors but also more about the effort made by consumers for specific environment issues.



Ottman (1998) proposed the concept of green consumer is difficult to demarcate with socio-demographic factors, like: region, gender, age, education, income etc. However, the women who are 30-44 years old, well educated and high income (30000 us dollar/per year) are easiest to accept green marketing and products. Protecting beloved people and the future of their children trigger them to behavior more environmentally. Their purchasing ability and affection of peer also make them become the main marketing target. Schwartz and Miller (1991) classified American consumers into five groups:

- **True-Blues**

10 % of Americans, they have strong environment consciousness and practice what they preach. They are the most enthusiastic environment protectors. They believe they can save environment by their own and contribute energy to protect environment and affect other people.

- Greenbacks

5 % of Americans, they concern about the environment issues, but they are too busy to change their living style. They have willingness to pay more for environment friendly products. Although they are not totally active to involve activities of environment protection, they show their support by consumption. They claim that they are willing to pay 22% extra. And in this group, green consumption is very popular.

- Sprouts

33 % of Americans, they are only willing to join activities of environment protection needed less effort. Resource recycling is their major activity. Like true-blues and greenbacks, they have willingness to buy green products, but they only want to pay 4% extra.

- Grouzers

15 % of Americans, they do not believe that they can better environment. In contrast, they think that government and companies should take full responsibility. They feel confused and ignorant about environment issues. Although 45% of grouzers will do resource recycling regularly, they are not voluntary. They just cooperate with local laws but make effort for improving environment. They will also use excuses to rationalize their laziness, like: we are too busy, the price is too high, there is nothing changed even we try our best...etc.

- Basic Browns

37 % of Americans, they ignore environment issues, they will find excuses for themselves. They think environment issues are not so serious. Because of their indifference, in this group, the rate of resource recycling and green consumption is low.

Table 2.1 Green consumers' category and their distribution

	1990	1996	Characteristic
True-Blues	11%	10%	Active environmentalists
Greenback	11%	5%	
Sprouts	26%	33%	Swing group
Grouzers	24%	15%	Not Active environmentalists
Basic Browns	28%	37%	

Source: Schwartz and Miller (1991)

Chapter 3 Conceptual framework and hypotheses

3.1 Conceptual framework

In this chapter, we propose our conceptual framework, and we will define every construct. The independent constructs are environment awareness and outside interference. The mediators are products involvement, consumer perceived value, consumer perceived risk and green purchase attitude. And the dependent construct is green purchase intention.

3.1.1 Independent constructs

- Environment Awareness

Environment concern and environment knowledge are most used constructs of green consumption. Environment concern means that consumers are worried about the environment impact. When consumers are concerned about environment, they have stronger willingness to purchase green products. Baldassare and Katz (1992) proposed that personal environment threat is a better predictor of overall environment practices than demographic variable and political factors.

Fryxell (2003) defined environment knowledge is general knowledge of the facts and concepts of nature and ecosystem. It includes the impacts and understanding of environment and how to maintain sustainable development. Comparing to environment concern, environment knowledge does not just consider the environment impact but also understand the reasons and solutions of environment problems. Hines et al. (1987) proposed that environment knowledge is most important factor of predicting environment protection behavior. Rokicka (2002) proposed those who have higher level of environment knowledge will behave more environmentally. And Mostafa (2006) also proved the positive relationship between environment knowledge and green purchase intention.

Based on previous research, environment concern is defined as inside feeling about environment impact and environment knowledge is defined as outside actual knowledge about whole environment system. So, in this thesis, we integrate inside feeling and outside knowledge into a concept called environment awareness.

- **Outside Interference**

According to the TRA proposed by Ajzen and Fishbein (1975), consumers' attitude and other people's comment both affect consumers. And the affection comes from other people's comment called "subjective norm" in TRA. Ajzen (1991) further proposed "perceived behavioral control" in the theory of planned behavior. Subjective norm and perceived behavioral control are both seldom used in previous research about green consumption but they are actually important factors. In this thesis, we integrate these two factors into "Outside Interference" and consider it as an influence factor.

3.1.2 Mediators

- **Product-related information acquisition**

The perceived information about product is an important determinant during consumer decision process. Many researchers studied in this field, some of them research product information (Chang et al. 1994; Russo et al. 1998; Meyvis et al. 2002) and some other of them research about advertisement (Resnik et al. 1977; Rajeev et al. 1986; Smith 1993). Product-related information acquisition means that consumers perceive those information of product and that can affect consumers' decision making.

Product-related information acquisition is seldom considered to build conceptual framework for green products. But the concept of product-related information acquisition is actually be used by consumers when they make their purchase decision. So we use product-related information acquisition to build up conceptual framework and consider it as an important construct.

- **Consumer perceived value**

In practice, enterprises regularly use price as main marketing tool. Although many researchers proposed different opinions of price, there is still consensus. Doubtless, price is a very important factor of purchasing decision.

In previous researches (Lichtenstein et al. 1988&1993; Huang et al. 2004), researchers used price-quality inference and price consciousness to describe price. Price-quality inference is a kind of beliefs, "high price, high quality" and "low price, low quality". Monroe and Petroschius (1981) characterize a shopper as price conscious, "to the degree he/she is unwilling to pay a higher price for a

product,” and if the price is greater than what is acceptable to pay, the buyer may refrain from buying. Moreover, the price conscious shopper will not be willing to pay for distinguishing features of a product if the price difference for these features is too large. Monroe and Krishnan (1985) took price as a part of product attributes to stimulate consumption. Meyer (2001) pointed out price is the most important factor of cost, but product price is not just the money have to be paid. Peter and Olson (2001) proposed that consumers also take the time they spend, the effort they make and the value they can get as a part of product price.

According to above research, price is an important factor to influence purchasing decision. But consumers do not only consider the price but also the value they perceived. In this thesis, we depict price as consumer perceived value. It is more extensive than monetary cost. It includes price comparison, willingness to pay more and perceived worthiness.

- Consumer perceived risk

The concept of perceived risk was introduced by Bauer (1967) to the marketing field. Early work focused on the risk taking and information handling in consumer behavior, and there were several conceptual framework developed. Various conceptualizations of the perceived risk construct were proposed in recent two decades (Ivan 1975; Gemunden 1985; Ingene and Hughes 1985; Dowling 1986). The concept of perceived risk usually correlated to the consumers' perceptions of the uncertainty and adverse consequences of buying a product or service. Generally, consumer perceived risk comes from uncertainty.

In this thesis, we emphasize on the uncertainty of purchasing green products. Because most consumers are not familiar with green products, they would be more anxious about purchasing green products. Calfee and Ringold (1988) proposed consumers will naturally doubt about those environment information unless they have trustable basis of assessment. Brown et al. (1998) pointed out it is hard for consumers to believe environment information. Mostafa (2006) proposed that there is negative relationship between doubt of green products' environment information and green purchasing intention.

- Green Purchasing Attitude

The consumer purchasing attitude means that whether consumers like the products or not. Through experiencing or learning, when consumers continuously like the specific product, then we could say the consumer purchasing attitude of the specific product is positive. If consumers continuously dislike the specific product, then we could say the consumer purchasing attitude of the specific product is negative. So, green purchasing attitude is that if consumers like or dislike those green products.

3.1.3 Dependent construct

- Green Purchasing Intention

Green purchasing intention means consumers' willingness of purchasing green products. When consumers have strong willingness to purchase specific products that means the purchasing intention of the specific products is high. If consumers have less willingness to purchase specific products that means the purchasing intention of the specific products is low. And the higher purchasing intention also means more possibility of actual consumption.

Table 3.1 Decision Factors and Influence Factors

Independent constructs	Mediators	Dependent construct
Environment Awareness Outside Interference	Product-related information acquisition Green Purchase Attitude Consumer perceived value Consumer perceived risk	Green Purchase Intention

3.2 Hypotheses

Many researchers proposed consumer perception of price, quality, and value are important determinants of shopping behavior and product choice (Bishop, 1984; Doyle, 1984; Sawyer and Dickson, 1984; Schlechter, 1984; Jacoby and Olson, 1985; Chapman et al., 1999). They are obvious and critical constructs to evaluate consumer behavior.

Lichtenstein et al. (1988) proposed that price consciousness is negatively related to products involvement. And Huang et al. (2004) proposed that price-quality inference is negatively related to consumers' attitude under purchasing gray market goods. In previous researches (Monroe, 1973; Chang et al., 1994; Bari et al., 1995;

Chen et al., 1998; Alford et al., 2002), they all explored the relationship between price and purchasing intention. Boris et al. (2004) develop a model of relationship with perceived value, perceived price, perceived quality and perceived risk. They tested the relationships with SEM (structural equation modeling), and they found that statistically significant relationships exist among these factors. We also assume higher price will trigger more willingness of involvement and when consumers feel more valuable then they will feel less risky too.

H1a: Consumer perceived value is positively related to product-related information acquisition.

H1b: Consumer perceived value is negatively related to Consumer perceived risk.

H1c: Consumer perceived value is positively related to Green purchase attitude.

H1d: Consumer perceived value is positively related to Green purchase intention.

Bauer (1967) pointed out that the different price brings the different risk. Generally, consumers will be more interested in the riskier products. They will spend more time searching information and understanding products. Therefore once consumers understand more about products, they will feel less risky. So we assume that higher product-related information acquisition would cause less consumer perceived risk.

And Brown et al. (1998) pointed out it is hard for consumers to believe environment information of green products. Once consumers can receive trustable information, they will be more positive toward green products. Thus we also assume that higher product-related information acquisition would cause more positive green purchase attitude.

H2a: Product-related information acquisition is negatively related to Consumer perceived risk.

H2b: Product-related information acquisition is positively related to Green purchase attitude.

Bauer (1967) proposed the concept of consumer perceived risk. Because uncertainty discomforts consumers and people tend to avoid loss, consumer perceived risk is an important construct. Roselius (1971) and Taylor (1974) proposed consumers often use strategy to reduce risk before they purchase. Verhagen et al. (2006) address the relationships between perceptions of trust and risk in intermediaries and sellers at an EM and consumers' purchase attitude. Mitchell (1999) proposed that perceived risk would affect consumers' behavior. Because consumers usually rather avoid mistakes than maximize utility in purchasing. According to previous researches (Taylor, 1974; Dowling et al., 1994), Lim (2003) concluded that the more risk consumers perceive, the less likely they will purchase.

H3a: Consumer perceived risk is negatively related to Green purchase attitude.

H3b: Consumer perceived risk is negatively related to Green purchase intention.

Many researchers proposed the relationship between environment concern and attitude or intention toward green consumption (Kinnear et al. 1974; Axelrod et al., 1993; Minton et al. 1997; Lee 1999; Chan 2001; Mostafa 2006). And several researchers proposed that environment knowledge is an important predictor of green consumption (Hines et al. 1987; Rokicka, 2002; Mostafa, 2006). Ramsey and Rickson (1976) proposed the positive relationship between environmental knowledge and attitude. Laroche et al. (1996) studied the impact of the knowledge variable on the relationship between ecological attitude and behavior. Dispoto (1977), Synodinos (1990) and Schahn et al. (1990) concluded knowledge has strong influence on environmental behavior. But some researchers (Grunert and Kristensen 1992, Martin and Simintiras 1995) just take environmental knowledge as a moderating variable of the relationship between attitude and behavior. In this thesis, we further postulate that environment awareness is related to Product-related information acquisition, because consumers with more environment awareness usually have more interest of green products. And we assume that environment awareness can make consumers feel more value of green products and more interested in understanding green products.

H4a: Environment awareness is positively related to Consumer perceived value.

H4b: Environment awareness is positively related to Products involvement.

H4c: Environment awareness is positively related to Green purchase attitude.

H4d: Environment awareness is positively related to Green purchase intention.

Besides those constructs mentioned above, there are still some other factors influencing consumers. Based on the subjective norm derived from TRA (Ajzen and Fishbein, 1975) and perceived behavioral control derived from TPB (Ajzen, 1991), we integrate the reference group into a construct named outside interference. The more interference consumers face, the less they want to purchase green products. So we assume that outside interference is negatively related to green purchase intention.

H5: Outside interference is negatively related to Green purchase intention.

Because our conceptual framework follows the concept of TRA and TPB, we will also examine the relationships between attitude and intention.

H6: Green purchase attitude is positively related to Green purchase intention.

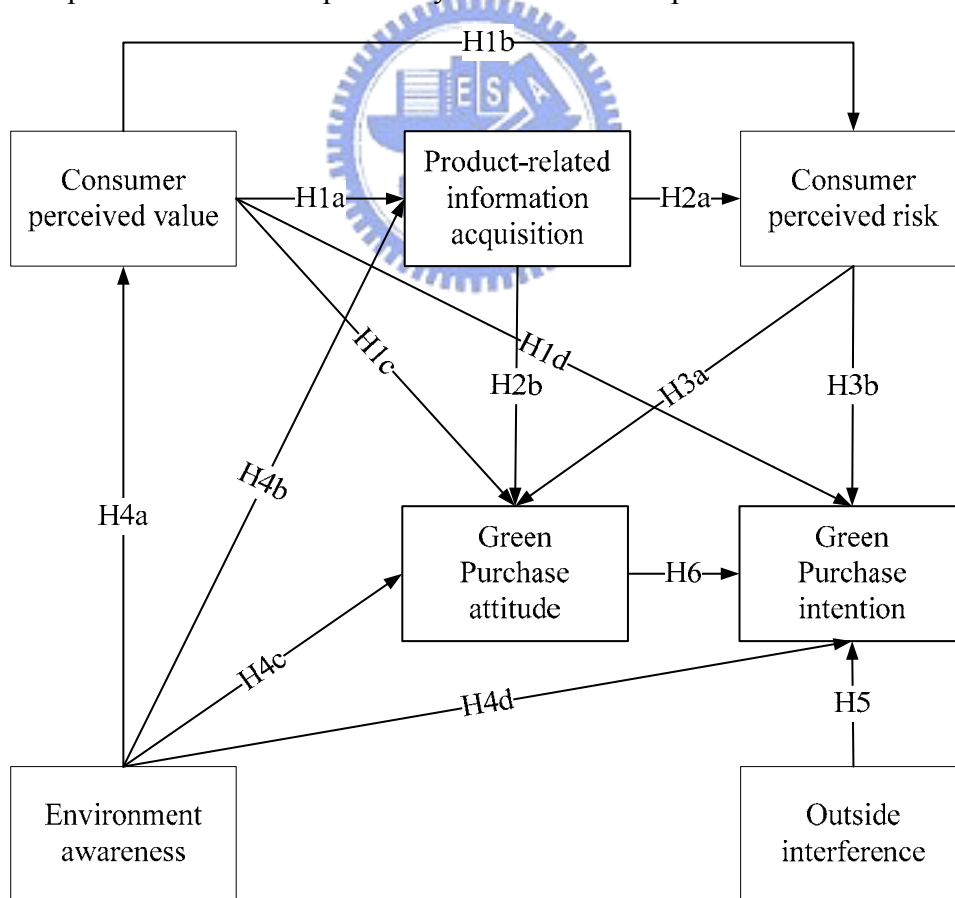


Figure 3.1 Conceptual Framework of green consumption

3.3 Measurements

Our questionnaire uses Likert five-point scales. The choices are “agree”, “slightly agree”, “average”, “slightly disagree” and “disagree” separately. In our thesis, we choose one low-price product and one high-price product to be our objects, because we want to analyze how to apply our conceptual framework for each kind of green product. We consider recycled paper as low-price product and variable-frequency air conditioner (variable-frequency AC) as high-price product.

We conclude seven constructs and design two or three measurements to describe each construct for both products. We cite some measurements directly from previous researches and propose some measurements derived from the concepts of previous researches or theories. For example, the measurements of outside interference, green purchase attitude and green purchase intention are derived from the concept proposed by TRA and TPB. We define them in Table 3.2:

Table 3.2 Measurements of each construct

Construct	Measurements	Definition	Reference
Product-related information acquisition	Interest in product	Consumers are interested in this green product	Peter and Olson (2001); Howard et al(1969)
	Active search	Consumers want to understand product actively	Peter and Olson (2001);
	Information searching amount	The amount of information will be searched by consumers	Del et al (2001); Peter and Olson (2001);
Consumer perceived value	Price comparison	Consumers compare the price of this green product and other products in the same kind	Dhruv et al (1998); Le Boutillier et al(1994); Vanhuele et al(2002)
	Willingness to pay more	Consumers are willing to pay more for this green product	Monroe et al(1981); Vlosky et al(1999); Laroche et al(2001)
	Perceived worthiness	Consumers think if it is worthy to purchase this green products	Valarie (1988); Dhruv et al (1998); Margareta et al(1997)

Table 3.2 Measurements of each construct (*continued*)

Construct	Measurements	Definition	Reference
Consumer perceived value	Perceived worthiness	Consumers think if it is worthy to purchase this green products	Valarie (1988); Dhruv et al (1998); Margareta et al(1997)
Environment awareness	Environment concern degree	The degree of consumers` concern about the environmental issues	Mostafa (2006); Minton et al. (1997); Chan (2000)
	Personal behavior	Consumers act for environment protection	Schwartz et al. (1991); Stern(1999)
	Effect other people	Consumes effect other people for environment protection	Schwartz et al.(1991); Stern(1999)
	Actual environment knowledge	Consumers` factual knowledge about environment issues	Chan (2000); Hines et al. (1987); Rokicka (2002); Mostafa (2006);
Consumer perceived risk	Perceived information risk	Consumers` worry about the truthfulness of information delivered by products or commercials	Howard et al(1969); Peter and Olson (2001); Lim(2003)
	Perceived performance risk	Consumers` worry about the lower product attributes of green products	Peter and Olson (2001); Lim(2003);
	Perceived effectiveness	Consumers perceive the effectiveness of purchasing green product for environment protection.	Scholder et al. (1991); Berger et al. (1992); Del et al. (2001); Peter and Olson (2001)
Outside interference	Purchase experience consulting	The effect of purchasing caused by previous purchasing experience	Ajzen(1991) Fishbein and Ajzen (1975)

Table 3.2 Measurements of each construct (*continued*)

Construct	Measurements	Definition	Reference
Outside interference	Comments from relatives and friends	The effect of purchasing caused by other people's opinion	Ajzen(1991) Fishbein and Ajzen (1975)
	Convenience of purchasing	The effect of purchasing caused by convenience of purchasing	Ajzen(1991) Fishbein and Ajzen (1975)
Green purchase attitude	Positive attitude	The positive attitude of purchasing this green product	Mostafa (2006); Minton et al. (1997); Chan (2000)
	Support degree	The degree of supporting this green product	Schwartz et al(1991); Kilbournea (2002)
Green purchase intention	Positive intention	The positive intention of purchasing this green product	Schwartz et al(1991); Stern(1999)
	Willingness of change	Consumers are willing to change to purchase this green product	Kilbournea et al(2002); Lindenberg et al (2007)
	Potential purchase behavior	Consumers plan and desire to purchase this green product.	Chan (2000); Hines et al. (1987); Rokicka (2002); Mostafa (2006);

Chapter 4 Methodology

4.1 Descriptive Statistics

We use descriptive statistics to explain the structure of sample data and show the distribution of our sample.

4.2 Reliability

Reliability means the trustworthiness of measurement, like accuracy or precision. It also represents the stability or consistency of result. Reliability is depended on error of measurement. It reflects the degree of trustworthiness of measuring tools or procedures.

There are three kinds of reliability: equivalence, stability, and consistency. Equivalence divides into alternate forms and split-half. Stability concludes test-retest. And consistency divides into split-half, Kuder-Richarson and Cronbach's α . They are suitable for different proposes and situations. In this thesis, we use Cronbach's α value to test the consistency of measurements of each factor. Because Cronbach's α value is most suitable for testing reliability under Likert scale.

Cronbach's α is proposed by Cronbach(1951). Cronbach proposed a principle to determine reliability. $\alpha < 0.35$ represents low reliability, $0.35 < \alpha < 0.70$ represents middle reliability and $\alpha > 0.70$ represents high reliability. In practice, as long as $\alpha > 0.60$, we can claim reliability is acceptable.

$$\frac{N}{N-1} \left(\frac{\sigma_X^2 - \sum_{i=1}^N \sigma_{Y_i}^2}{\sigma_X^2} \right)$$

N = the number of components (items)

σ_X^2 = the variance of the observed total test

$\sigma_{Y_i}^2$ = the variance of component i

4.3 Validity

Validity is a scale to examine the degree of measurement. In this thesis, we use content validity and construct validity to measure effectiveness of model.

- Content validity

Content validity means the degree of subject covered by measurement tools. It is used to check whether the degree or scope of measurement can really represent original content or meaning or not. It involves a subjective judgments that if measurement has enough validity. The key factor of content validity is the procedure followed when we develop measurement.

- Construct validity

Construct validity means that if construct can reflect actual situation. Construct validity divides into convergent validity and discriminate validity. Convergent validity means those items come from the same construct should be highly related to each other. Discriminate validity means those items come from the same construct should be lowly related to each other.

In this thesis, we will do t-test for factor loading of every indicator variable after finishing confirmatory equation analysis. If the t value of factor loading comes from every indicator variable and its construct is higher than 1.645, it means that every measured variables can effectively measure the common construct.

About testing discriminate validity, we take variance extracted estimate as indicator. Usually, variance extracted estimate of measurement construct should be higher than 0.5 to fit in with the standard proposed by Fornell and Larcker (1981).

4.4 Structural Equation Modeling (SEM)

Structural equation modeling is usually categorized as advanced statistics. It belongs to a part of multivariate statistics and integrates factor analysis and path analysis. SEM concludes the relationships between manifest variables, latent variables, error variables and further obtains direct effects, indirect effects and total effects caused from independence variables to dependence variables.

A whole SEM has two basic models. One is measurement model and another is structural model. Measurement model is consisted of latent variables and observed variables. It reflects the relationships between observed variables and latent variables.

And structural model explains the relationships between latent variables. And we can these two parts in figure 3.2 to accomplish a whole SEM.

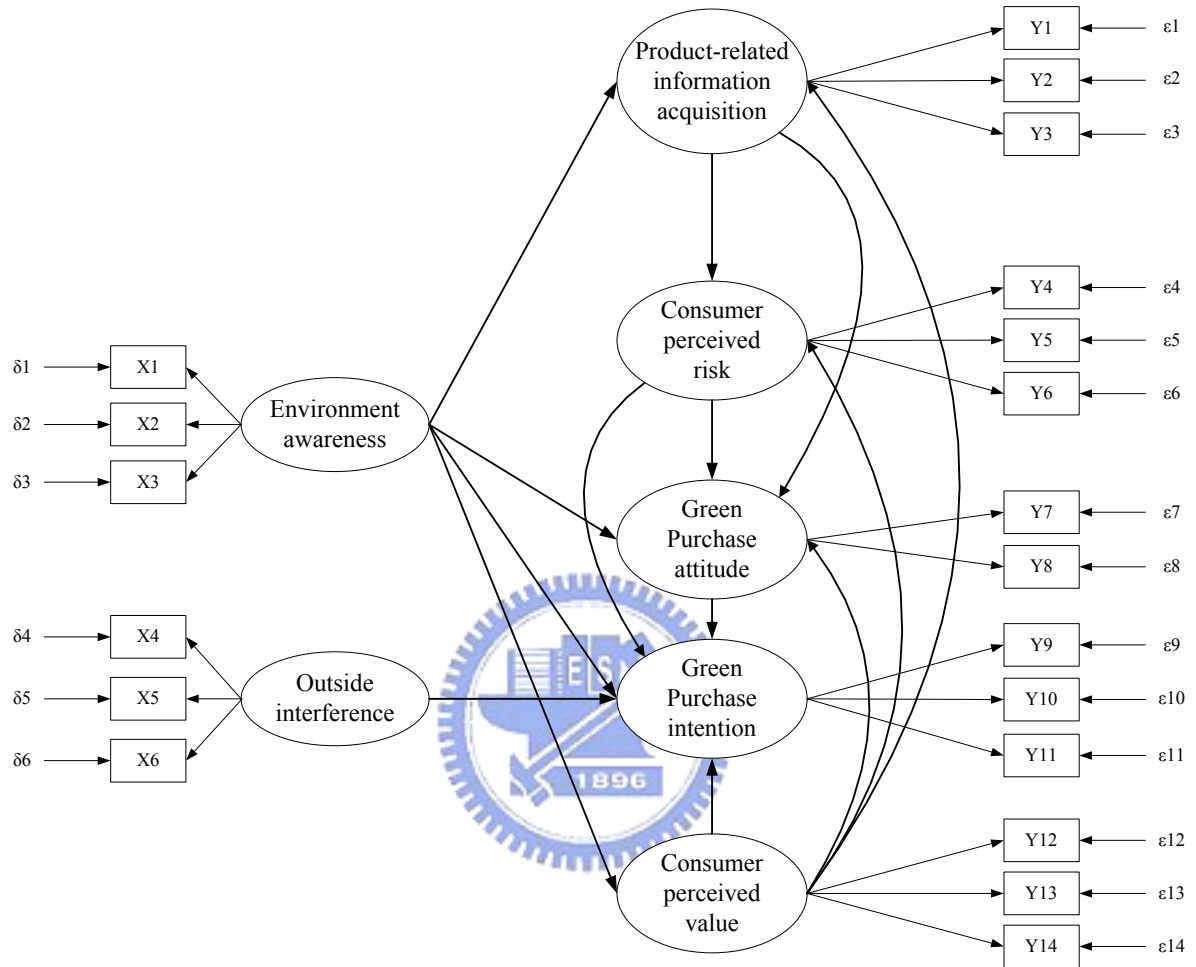


Figure 4.1 Structural model of proposed conceptual framework

4.5 Goodness-of-Fit index of model

After calculating every parameter in hypothetical model, we can evaluate the fitness between hypothetical model and practical data through different statistics procedure and goodness-of-fit index. Jöreskog & Sörbom (1993) pointed out that concept of measurement model concludes measurement, reliability and validity. So, the complete analysis of structural model consist of (1)calculation of factor loading of each variable, (2)testing the fitness between data and measurement model of each factor, (3)calculation of the relationship between each latent variable, and (4) testing the fitness between whole model and data.

There are eight common indexes used to test the fitness of causal models.

- χ^2 test
- χ^2 / df
- Root mean square error of approximation; RMSEA
- Comparative-fit index; CFI
- Goodness-of-fit index; GFI
- Adjusted goodness-of-fit index; AGFI
- Normed fit index; NFI
- Non-normed fit index; NNFI



Table 4.1 Goodness-of-Fit index of model

Index	Threshold value
χ^2 test	The smaller; the better
χ^2 / df	<2 is perfect, <5 is acceptable
RMSEA	<0.05 is perfect, <0.08 is good, <1 is acceptable
CFI	>0.9
GFI	>0.9
AGFI	>0.9
NFI	>0.9
NNFI	>0.9

Chapter 5 Analysis of results

5.1 Sample analysis

We retrieved 520 questionnaires, except unavailable questionnaires, there are still 470 questionnaires. We investigate the socioeconomic variables of participants, like sex, age, education level and income level. Because we are going to test two kinds of green products, there is one part for each product in our questionnaire. Participants have to fill both parts in the same time, and that means we have the data of both products from the same people. The structure of sample integrates in the following table:

Table 5.1 Sample structure

		Amount	Percentage
Sex	Male	238	50.6%
	Female	232	49.4%
	Total	470	100%
Education level	Senior high school (and below)	42	8.9%
	College	218	46.4%
	Master (and above)	210	44.7%
	Total	470	100%
Age	18~24	156	33.2%
	25~30	125	26.6%
	30~40	62	13.2%
	40~50	60	12.8%
	Above 50	67	14.2%
	Total	470	100%
Income level (NT dollar/per year)	Under 100,000	155	32.9%
	100,000~300,000	115	24.5%
	300,000~500,000	98	20.9%
	500,000~1,000,000	62	13.2%
	Above 1,000,000	40	8.5%
	Total	470	100%

5.2 Reliability and validity analysis

Before we use LISREL to validate out hypotheses, we have to validate the reliability of samples firstly. If the reliability of construct is high, it means these measurements under that construct are consistent to describe construct. If the reliability of construct is low, it means these measurements under that construct are not consistent to describe construct, then we have to delete one or some measurements to increase reliability to maintain the consistency. According to the standard proposed by Cronbach(1951), Cronbach's α value should be higher than 0.7. After we adjust measurements with Cronbach's α value, we will further calculate factor loading of each measurement. We delete those measurements with factor loadings under 0.5.

Table 5.2 Adjusted Cronbach's α value (Recycled paper)

Measurement	Delete	Cronbach's α value
Consumer perceived value	price comparison	0.7151
Consumer perceived risk	X	0.6960
Product-related information acquisition	X	0.8333
Outside interference	convenience of purchasing	0.8186
Environment awareness	environment knowledge	0.7491
Green purchase attitude	X	0.8587
Green purchase intention	X	0.7205

Table 5.3 Adjusted Cronbach's α value (Variable-frequency AC)

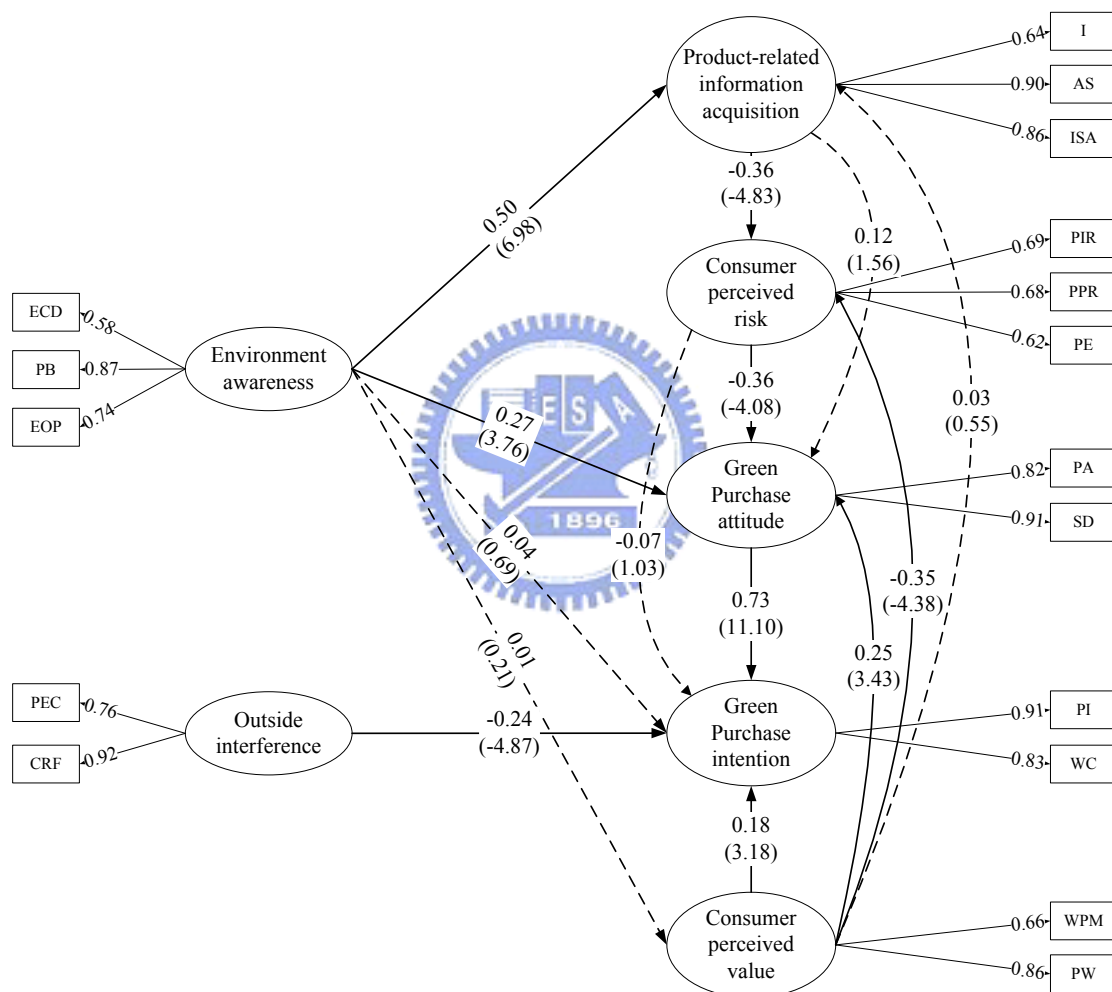
Measurement	Delete	Cronbach's α value
Consumer perceived value	price comparison	0.7475
Consumer perceived risk	X	0.7514
Product-related information acquisition	X	0.8531
Outside interference	X	0.7499
Environment awareness	environment knowledge	0.7491
Green purchase attitude	X	0.8374
Green purchase intention	X	0.7116

Table 5.4 Adjustment with factor loading

Product	Delete
Recycled paper	Potential purchase behavior (0.41)
Variable-frequency AC	Convenience of purchasing (0.47) Potential purchase behavior (0.43)

5.3 Structural Model

5.3.1 Structural model of recycled paper



Note :I=interest in product; AS=active search; ISA=information searching amount; PIR=perceived information risk; PPR=perceived performance risk; PE=perceived effectiveness; PA=positive attitude; SD=support degree; PI=positive intention; WC=willingness to change; WPM= willingness to pay more; PW=perceived worthiness; ECD=environment concern degree; PB=personal behavior; EOP=effect other people; PEC=purchase experience consulting; CRF=comment from relatives and friend.

Figure 5.1 Structural model (Recycled paper)

Table 5.5 Goodness-of-fit of structural model (Recycled paper)

Index	Structural model
χ^2	334.92
df	120
χ^2 / df	2.791
RMSEA	0.076
CFI	0.944
GFI	0.893
AGFI	0.847
NFI	0.917
NNFI	0.928

We can see most indexes of this structural model is acceptable, even perfect, so we can claim this structural model have great goodness-of-fit.

Table 5.6 Test results of the hypotheses (Recycled paper)

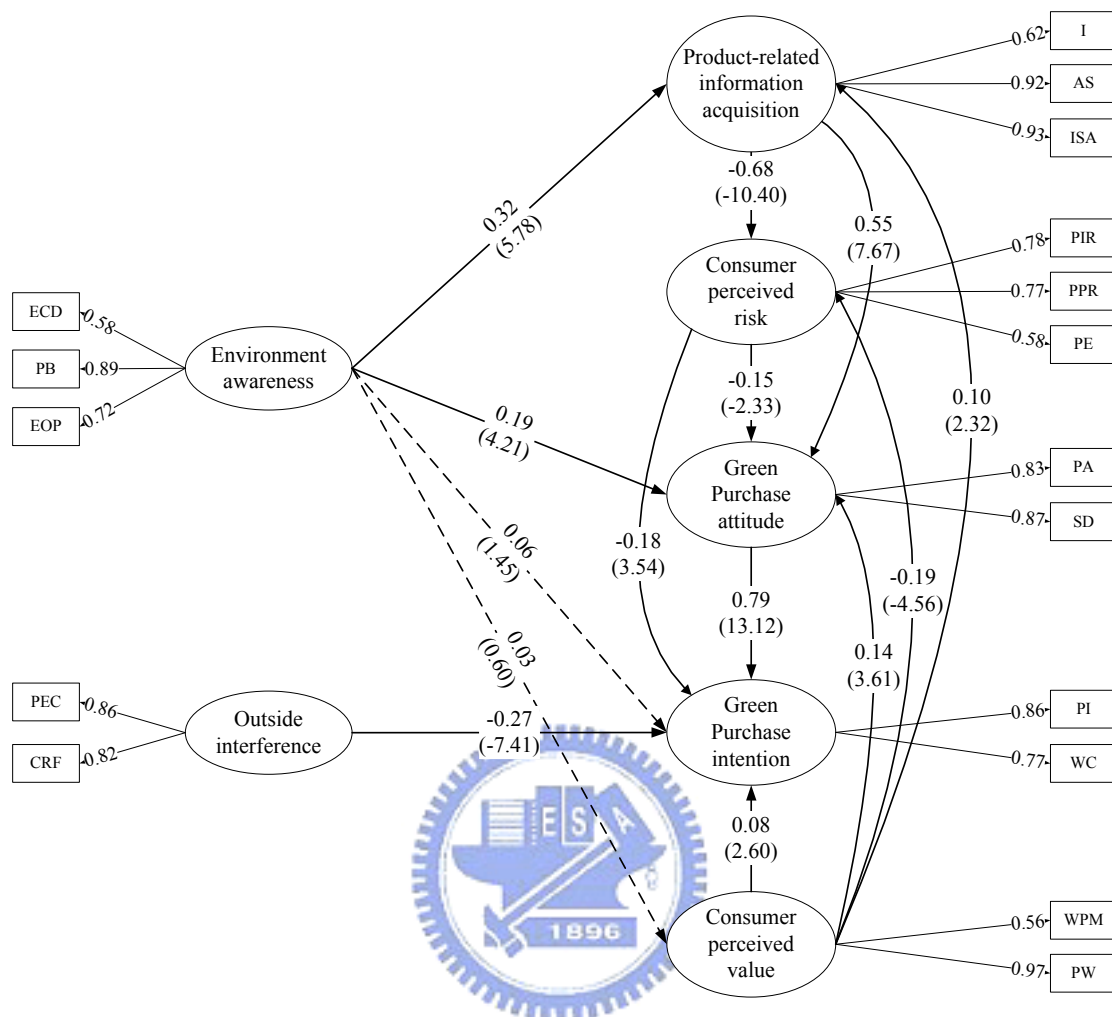
Hypotheses	t-value	Test results
Environment awareness → Consumer perceived value	0.21	Rejected
Environment awareness → Product-related information acquisition	6.98***	Accepted
Environment awareness → Green purchase attitude	3.76***	Accepted
Environment awareness → Green purchase intention	0.69	Rejected
Outside interference → Green purchase intention	-4.87***	Accepted
Product-related information acquisition → Consumer perceived risk	-4.83***	Accepted
Product-related information acquisition → Green purchase attitude	1.54	Rejected
Consumer perceived value → Product-related information acquisition	0.55	Rejected
Consumer perceived value → Consumer perceived risk	-4.38***	Accepted
Consumer perceived value → Green purchase attitude	3.43***	Accepted
Consumer perceived value → Green purchase intention	3.18***	Accepted
Consumer perceived risk → Green purchase attitude	-4.08***	Accepted
Consumer perceived risk → Green purchase intention	-1.03	Rejected
Green purchase attitude → Green purchase intention	11.13***	Accepted

Note: $t\ value > 1.645$, $*p < 0.1$; $t\ value > 1.96$, $**p < 0.05$; $t\ value > 2.58$, $***p < 0.01$

Table 5.7 Effects on latent variable (Recycled paper)

Affected latent variable: Product-related information acquisition			
	Indirect effects	Direct effects	Total effects
Environment awareness	X	0.50	0.50
Affected latent variable: Consumer perceived risk			
	Indirect effects	Direct effects	Total effects
Environment awareness	-0.18	X	-0.89
Product-related information acquisition	X	-0.36	
Consumer perceived value	X	-0.35	
Affected latent variable: Green purchase attitude			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.06	0.27	0.47
Product-related information acquisition	0.13	X	
Consumer perceived risk	X	-0.36	
Consumer perceived value	0.13	0.25	
Affected latent variable: Green purchase intention			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.24	X	1.01
Product-related information acquisition	0.09	X	
Consumer perceived risk	-0.26	X	
Consumer perceived value	0.27	0.18	
Outside interference	X	-0.24	
Green purchase attitude	X	0.73	

5.3.2 Structural model of Variable-frequency AC



Note :I=interest in product; AS=active search; ISA=information searching amount; PIR=perceived information risk; PPR=perceived performance risk; PE=perceived effectiveness; PA=positive attitude; SD=support degree; PI=positive intention; WC=willingness to change; WPM= willingness to pay more; PW=perceived worthiness; ECD=environment concern degree; PB=personal behavior; EOP=effect other people; PEC=purchase experience consulting; CRF=comment from relatives and friend.

Figure 5.2 Structural model (Variable-frequency AC)

Table 5.8 Goodness-of-fit of structural model (Variable-frequency AC)

Index	Structural model
χ^2	787.42
df	137
χ^2 / df	5.7476
RMSEA	0.102
CFI	0.931
GFI	0.854
AGFI	0.797
NFI	0.911
NNFI	0.915

We can see most indexes of this structural model is acceptable, even perfect, so we can claim this structural model have great goodness-of-fit.

Table 5.9 Test results of the hypotheses (Variable-frequency AC)

Hypotheses	t-value	Test results
Environment awareness → Consumer perceived value	0.60	Rejected
Environment awareness → Product-related information acquisition	5.78 ^{***}	Accepted
Environment awareness → Green purchase attitude	4.21 ^{***}	Accepted
Environment awareness → Green purchase intention	1.45	Rejected
Outside interference → Green purchase intention	-7.41 ^{***}	Accepted
Product-related information acquisition → Consumer perceived risk	-10.40 ^{***}	Accepted
Product-related information acquisition → Green purchase attitude	7.67 ^{***}	Accepted
Consumer perceived value → Product-related information acquisition	2.32 ^{**}	Accepted
Consumer perceived value → Consumer perceived risk	-4.56 ^{***}	Accepted
Consumer perceived value → Green purchase attitude	3.61 ^{***}	Accepted
Consumer perceived value → Green purchase intention	2.60 ^{***}	Accepted
Consumer perceived risk → Green purchase attitude	-2.33 ^{**}	Accepted
Consumer perceived risk → Green purchase intention	-3.54 ^{***}	Accepted
Green purchase attitude → Green purchase intention	13.12 ^{***}	Accepted

Note: $t\ value > 1.645$, $*p < 0.1$; $t\ value > 1.96$, $**p < 0.05$; $t\ value > 2.58$, $***p < 0.01$

Table 5.10 Effects on latent variable (Variable-frequency AC)

Affected latent variable: Product-related information acquisition			
	Indirect effects	Direct effects	Total effects
Environment awareness	X	0.32	0.32
Affected latent variable: Consumer perceived risk			
	Indirect effects	Direct effects	Total effects
Environment awareness	-0.22	X	-1.09
Product-related information acquisition	X	-0.68	
Consumer perceived value	X	-0.19	
Affected latent variable: Green purchase attitude			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.21	0.19	1.04
Product-related information acquisition	0.10	0.55	
Consumer perceived risk	X	-0.15	
Consumer perceived value	0.10	0.14	
Affected latent variable: Green purchase intention			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.32	X	1.32
Product-related information acquisition	0.51	X	
Consumer perceived risk	-0.12	-0.18	
Consumer perceived value	0.19	0.08	
Outside interference	X	-0.27	
Green purchase attitude	X	0.79	

5.4 Analysis of Result

From above result, there are some hypotheses rejected when consumer purchase recycled paper. When consumers purchase recycled paper, consumer perceived value will not positively affect product-related information acquisition, product-related information acquisition will not positively affect green purchase attitude and consumer perceived risk will not negatively affect green purchase intention. But when consumers purchase variable-frequency AC, they are all accepted. That shows consumers will not pay more attention to the low-price green products and the products information perceived by consumers will not change consumers` attitude toward low-price green products. And the perceived risk of low-price green products will not affect green purchase intention either.

We calculate the effect on every latent variable, but our research focuses on the effect on green purchase intention. We can find the effect caused by product-related information acquisition is much different between these two models. When consumers purchase variable-frequency AC, the effect caused by product-related information acquisition is much stronger than purchase recycled paper. That also means that when consumer purchase high-price product, product-related information acquisition is an important factor. The more consumers understand products, the more purchase intention they will have. But there are some results are not similar with the observed phenomenon. When consumers purchase high-price products, the effect caused by consumer perceived value should be higher than purchase low-price products and the effect caused by environment awareness should be slighter than purchase low-price products. Thus we try to separate consumers into different groups to further analyze those hypotheses.

Table 5.11 comparison of effects on green purchase intention

Latent variables	Recycled paper	Variable-frequency AC
Environment awareness	0.24	0.32
Product-related information acquisition	0.09	0.51
Consumer perceived risk	-0.26	-0.30
Consumer perceived value	0.45	0.27

5.5 Sample Clustering

We separate our samples into four groups to observe and compare the difference. For each product, we will separate our samples with income level and education level. We base on income level to separate samples into low-income and high-income and we base on education level to separate samples into low-education and high-education to compare analysis results. And we define those groups as follows:

- Low-income: people with lower income (under 300,000NT/per year); the main group is students.
- High-income: people with higher income (above 300,000NT/per year); the main group is employees.
- College: education level is college and under college
- Pro-graduate: education level is master and above master

Table 5.12 Sample clustering

Product	Groups			
	Recycled paper (Sample amount)	Low-income (270)	High-income (200)	College (260)
Variable-frequency AC (Sample amount)	Low-income (270)	High-income (200)	College (260)	Pro-graduate (210)

5.6 Reliability and validity analysis (Sample clustering)

Before we use LISREL to validate out hypotheses, we have to validate the reliability of samples firstly. Reliability means the consistency of measurements. If the reliability of construct is high, it means these measurements under that construct are consistent to describe construct. If the reliability of construct is low, it means these measurements under that construct are not consistent to describe construct, then we have to delete one or some measurements to increase reliability to maintain the consistency. According to the standard proposed by Cronbach(1951), Cronbach's α value should be higher than 0.7. Below tables are Cronbach's α value of each construct with different groups and different products:

Table 5.13 Cronbach's α value (Low-income, recycled paper)

Construct	Measurements	Cronbach's α value	Cronbach's α value (if item deleted)
Product-related information acquisition	Interest in product	0.8136	0.8681
	Active search		0.6171
	Information searching amount		0.7024
Consumer perceived value	Price comparison	0.6125	0.7172
	Willingness to pay more		0.2675
	Perceived worthiness		0.3558
Environment awareness	Actual environment knowledge	0.6055	0.7709
	Environment concern degree		0.5194
	Personal behavior		0.4239
	Effect other people		0.4306
Consumer perceived risk	Perceived information risk	0.7410	0.6642
	Perceived performance risk		0.6572
	Perceived effectiveness		0.6459
Outside interference	Purchase experience consulting	0.6188	0.3486
	Comments from relatives and friends		0.2789
	Convenience of purchasing		0.7695
Green purchase attitude	Positive attitude	0.8141	X
	Support degree		X
Green purchase intention	Positive intention	0.6146	0.4311
	Potential purchase behavior		0.2796
	Willingness of change		0.8228

Table 5.14 Cronbach's α value (High-income, recycled paper)

Construct	Measurements	Cronbach's α value	Cronbach's α value (if item deleted)
Product-related information acquisition	Interest in product	0.8232	0.8559
	Active search		0.6779
	Information searching amount		0.7001
Consumer perceived value	Price comparison	0.6410	0.7528
	Willingness to pay more		0.2756
	Perceived worthiness		0.3929
Environment awareness	Actual environment knowledge	0.5399	0.7898
	Environment concern degree		0.4969
	Personal behavior		0.2726
	Effect other people		0.3072
Consumer perceived risk	Perceived information risk	0.7363	0.6007
	Perceived performance risk		0.6956
	Perceived effectiveness		0.6556
Outside interference	Purchase experience consulting	0.6963	0.4200
	Comments from relatives and friends		0.3364
	Convenience of purchasing		0.8658
Green purchase attitude	Positive attitude	0.8739	X
	Support degree		X
Green purchase intention	Positive intention	0.7842	0.6191
	Potential purchase behavior		0.6516
	Willingness of change		0.8665

Table 5.15 Cronbach's α value (College, recycled paper)

Construct	Measurements	Cronbach's α value	Cronbach's α value (if item deleted)
Product-related information acquisition	Interest in product	0.7986	0.8381
	Active search		0.6404
	Information searching amount		0.6715
Consumer perceived value	Price comparison	0.6457	0.7553
	Willingness to pay more		0.2888
	Perceived worthiness		0.4011
Environment awareness	Actual environment knowledge	0.5866	0.8021
	Environment concern degree		0.5218
	Personal behavior		0.3469
	Effect other people		0.3625
Consumer perceived risk	Perceived information risk	0.7304	0.5699
	Perceived performance risk		0.6687
	Perceived effectiveness		0.6950
Outside interference	Purchase experience consulting	0.6727	0.4038
	Comments from relatives and friends		0.3637
	Convenience of purchasing		0.8149
Green purchase attitude	Positive attitude	0.8150	X
	Support degree		X
Green purchase intention	Positive intention	0.7239	0.5330
	Potential purchase behavior		0.4888
	Willingness of change		0.8808

Table 5.16 Cronbach's α value (Master, recycled paper)

Construct	Measurements	Cronbach's α value	Cronbach's α value (if item deleted)
Product-related information acquisition	Interest in product	0.8324	0.8778
	Active search		0.6627
	Information searching amount		0.7117
Consumer perceived value	Price comparison	0.5895	0.6696
	Willingness to pay more		0.1895
	Perceived worthiness		0.4919
Environment awareness	Actual environment knowledge	0.5421	0.7606
	Environment concern degree		0.4361
	Personal behavior		0.3438
	Effect other people		0.3649
Consumer perceived risk	Perceived information risk	0.7349	0.6787
	Perceived performance risk		0.6415
	Perceived effectiveness		0.6240
Outside interference	Purchase experience consulting	0.6336	0.3439
	Comments from relatives and friends		0.3099
	Convenience of purchasing		0.7934
Green purchase attitude	Positive attitude	0.8620	X
	Support degree		X
Green purchase intention	Positive intention	0.7190	0.5774
	Potential purchase behavior		0.5245
	Willingness of change		0.8186

Table 5.17 Cronbach's α value (Low-income, variable-frequency AC)

Construct	Measurements	Cronbach's α value	Cronbach's α value (if item deleted)
Product-related information acquisition	Interest in product	0.8275	0.9191
	Active search		0.6595
	Information searching amount		0.6677
Consumer perceived value	Price comparison	0.7021	0.7698
	Willingness to pay more		0.4711
	Perceived worthiness		0.4445
Environment awareness	Actual environment knowledge	0.6005	0.7709
	Environment concern degree		0.5194
	Personal behavior		0.4239
	Effect other people		0.4306
Consumer perceived risk	Perceived information risk	0.8002	0.7338
	Perceived performance risk		0.7082
	Perceived effectiveness		0.7395
Outside interference	Purchase experience consulting	0.7617	0.5496
	Comments from relatives and friends		0.5976
	Convenience of purchasing		0.8485
Green purchase attitude	Positive attitude	0.7995	X
	Support degree		X
Green purchase intention	Positive intention	0.7322	0.5457
	Potential purchase behavior		0.5137
	Willingness of change		0.8941

Table 5.18 Cronbach's α value (High-income, variable-frequency AC)

Construct	Measurements	Cronbach's α value	Cronbach's α value (if item deleted)
Product-related information acquisition	Interest in product	0.8729	0.9076
	Active search		0.7669
	Information searching amount		0.7824
Consumer perceived value	Price comparison	0.7031	0.7925
	Willingness to pay more		0.4182
	Perceived worthiness		0.4152
Environment awareness	Actual environment knowledge	0.5399	0.7898
	Environment concern degree		0.4969
	Personal behavior		0.2726
	Effect other people		0.3072
Consumer perceived risk	Perceived information risk	0.8289	0.7794
	Perceived performance risk		0.7081
	Perceived effectiveness		0.8014
Outside interference	Purchase experience consulting	0.6878	0.6122
	Comments from relatives and friends		0.5636
	Convenience of purchasing		0.8733
Green purchase attitude	Positive attitude	0.8834	X
	Support degree		X
Green purchase intention	Positive intention	0.6780	0.5272
	Willingness of change		0.5625
	Potential purchase behavior		0.8083

Table 5.19 Cronbach's α value (College, variable-frequency AC)

Construct	Measurements	Cronbach's α value	Cronbach's α value (if item deleted)
Product-related information acquisition	Interest in product	0.8797	0.9211
	Active search		0.7706
	Information searching amount		0.7889
Consumer perceived value	Price comparison	0.7148	0.8095
	Willingness to pay more		0.4397
	Perceived worthiness		0.4488
Environment awareness	Actual environment knowledge	0.5866	0.8021
	Environment concern degree		0.5218
	Personal behavior		0.3469
	Effect other people		0.3625
Consumer perceived risk	Perceived information risk	0.8242	0.7794
	Perceived performance risk		0.7347
	Perceived effectiveness		0.7586
Outside interference	Purchase experience consulting	0.7739	0.5884
	Comments from relatives and friends		0.5803
	Convenience of purchasing		0.8551
Green purchase attitude	Positive attitude	0.8667	X
	Support degree		X
Green purchase intention	Positive intention	0.7429	0.5802
	Potential purchase behavior		0.5746
	Willingness of change		0.8417

Table 5.20 Cronbach's α value (Master, variable-frequency AC)

Construct	Measurements	Cronbach's α value	Cronbach's α value (if item deleted)
Product-related information acquisition	Interest in product	0.8166	0.9174
	Active search		0.6396
	Information searching amount		0.6354
Consumer perceived value	Price comparison	0.6017	0.7008
	Willingness to pay more		0.2481
	Perceived worthiness		0.3649
Environment awareness	Actual environment knowledge	0.5421	0.7606
	Environment concern degree		0.4361
	Personal behavior		0.3438
	Effect other people		0.3649
Consumer perceived risk	Perceived information risk	0.7557	0.6690
	Perceived performance risk		0.5583
	Perceived effectiveness		0.7789
Outside interference	Purchase experience consulting	0.7559	0.5713
	Comments from relatives and friends		0.5368
	Convenience of purchasing		0.8612
Green purchase attitude	Positive attitude	0.7765	X
	Support degree		X
Green purchase intention	Positive intention	0.7734	0.5528
	Potential purchase behavior		0.5430
	Willingness of change		0.9022

From above tables, we can see some constructs are not higher than 0.7, so we have to do adjustment. We will delete some measurements to raise the Cronbach's α value above 0.7. Below tables are adjusted Cronbach's α value of each construct with different groups and different products:

Table 5.21 Adjusted Cronbach's α value (Low-income, recycled paper)

Construct	Cronbach's α value	Measurements adjustment
Product-related information acquisition	0.8136	None
Consumer perceived value	0.7172	Delete "price comparison"
Environment awareness	0.7709	Delete "environment knowledge"
Consumer perceived risk	0.7410	None
Outside interference	0.7695	Delete "convenience of purchasing"
Green purchase attitude	0.8141	None
Green purchase intention	0.8228	Delete "potential purchase behavior"

Table 5.22 Adjusted Cronbach's α value (High-income, recycled paper)

Construct	Cronbach's α value	Measurements adjustment
Product-related information acquisition	0.8232	None
Consumer perceived value	0.7528	Delete "price comparison"
Environment awareness	0.7898	Delete "environment knowledge"
Consumer perceived risk	0.7363	None
Outside interference	0.8658	Delete convenience of purchasing"
Green purchase attitude	0.8793	None
Green purchase intention	0.7842	None

Table 5.23 Adjusted Cronbach's α value (College, recycled paper)

Construct	Cronbach's α value	Measurements adjustment
Product-related information acquisition	0.7986	None
Consumer perceived value	0.7553	Delete "price comparison"
Environment awareness	0.8021	Delete "environment knowledge"
Consumer perceived risk	0.7304	None
Outside interference	0.8149	Delete "convenience of purchasing"
Green purchase attitude	0.8150	None
Green purchase intention	0.7239	None

Table 5.24 Adjusted Cronbach's α value (Master, recycled paper)

Construct	Cronbach's α value	Measurements adjustment
Product-related information acquisition	0.8324	None
Consumer perceived value	0.6696	Delete "price comparison"
Environment awareness	0.7606	Delete "environment knowledge"
Consumer perceived risk	0.7349	None
Outside interference	0.7934	Delete "convenience of purchasing"
Green purchase attitude	0.8620	None
Green purchase intention	0.7190	None

Table 5.25 Adjusted Cronbach's α value (Low-income, variable-frequency AC)

Construct	Cronbach's α value	Measurements adjustment
Product-related information acquisition	0.8275	None
Consumer perceived value	0.7021	None
Environment awareness	0.7709	Delete "environment knowledge"
Consumer perceived risk	0.8002	None
Outside interference	0.7617	None
Green purchase attitude	0.7995	None
Green purchase intention	0.7322	None

Table 5.26 Adjusted Cronbach's α value (High-income, variable-frequency AC)

Construct	Cronbach's α value	Measurements adjustment
Product-related information acquisition	0.8729	None
Consumer perceived value	0.7031	None
Environment awareness	0.7898	Delete "environment knowledge"
Consumer perceived risk	0.8289	None
Outside interference	0.8733	Delete "convenience of purchasing"
Green purchase attitude	0.8834	None
Green purchase intention	0.8033	Delete "potential purchase behavior"

Table 5.27 Adjusted Cronbach's α value (College, variable-frequency AC)

Construct	Cronbach's α value	Measurements adjustment
Product-related information acquisition	0.8797	None
Consumer perceived value	0.7148	None
Environment awareness	0.8021	Delete "environment knowledge"
Consumer perceived risk	0.8242	None
Outside interference	0.7739	None
Green purchase attitude	0.8667	None
Green purchase intention	0.7429	None

Table 5.28 Adjusted Cronbach's α value (Master, variable-frequency AC)

Construct	Cronbach's α value	Measurements adjustment
Product-related information acquisition	0.8116	None
Consumer perceived value	0.7008	Delete "price comparison"
Environment awareness	0.7606	Delete "environment knowledge"
Consumer perceived risk	0.7557	None
Outside interference	0.7559	None
Green purchase attitude	0.7765	None
Green purchase intention	0.7344	None

After we adjust measurements, we further calculate composite reliability to check reliability again. Diamantopoulos and Siguaw (2000), Bagozzi and Yi (1998) proposed composite reliability of latent variables should be over 0.6. We integrate Cronbach's α value, factor loading and composite reliability in following tables:

Table 5.29 Composite reliability (Low-income, recycled paper)

Construct	Measurement	Adjusted Cronbach's α value	Factor loading	Composite reliability
Product-related information acquisition	Interest in product	0.8136	0.59	0.8315
	Active search		0.93	
	Information searching amount		0.82	
Consumer perceived value	Willingness to pay more	0.7172	0.69	0.7325
	Perceived worthiness		0.81	
Environment awareness	Environment concern degree	0.7709	0.62	0.7930
	Personal behavior		0.90	
	Effect other people		0.72	
Consumer perceived risk	Perceived information risk	0.7410	0.71	0.7455
	Perceived performance risk		0.71	
	Perceived effectiveness		0.69	
Outside interference	Purchase experience consulting	0.7695	0.94	0.7971
	Comments from relatives and friends		0.67	
Green purchase attitude	Positive attitude	0.8141	0.74	0.8212
	Support degree		0.92	
Green purchase intention	Positive intention	0.8288	0.88	0.8336
	Willingness of change		0.81	

Table 5.30 Composite reliability (High-income, recycled paper)

Construct	Measurement	Adjusted Cronbach's α value	Factor loading	Composite reliability
Product-related information acquisition	Interest in product	0.8232	0.65	0.8350
	Active search		0.84	
	Information searching amount		0.88	
Consumer perceived value	Willingness to pay more	0.7528	0.63	0.7975
	Perceived worthiness		0.97	
Environment awareness	Environment concern degree	0.7898	0.64	0.8177
	Personal behavior		0.91	
	Effect other people		0.76	
Consumer perceived risk	Perceived information risk	0.7363	0.73	0.7303
	Perceived performance risk		0.69	
	Perceived effectiveness		0.67	
Outside interference	Purchase experience consulting	0.8658	0.88	0.8694
	Comments from relatives and friends		0.87	
Green purchase attitude	Positive attitude	0.8739	0.82	0.8781
	Support degree		0.94	
Green purchase intention	Positive intention	0.7842	0.94	0.8202
	Willingness of change		0.82	
	Potential purchase behavior		0.54	

Table 5.31 Composite reliability (College, recycled paper)

Construct	Measurement	Adjusted Cronbach's α value	Factor loading	Composite reliability
Product-related information acquisition	Interest in product	0.7986	0.61	0.8125
	Active search		0.83	
	Information searching amount		0.85	
Consumer perceived value	Willingness to pay more	0.7553	0.71	0.7667
	Perceived worthiness		0.86	
Environment awareness	Environment concern degree	0.8021	0.63	0.8302
	Personal behavior		0.95	
	Effect other people		0.76	
Consumer perceived risk	Perceived information risk	0.7304	0.82	0.7431
	Perceived performance risk		0.68	
	Perceived effectiveness		0.59	
Outside interference	Purchase experience consulting	0.8149	0.89	0.8254
	Comments from relatives and friends		0.78	
Green purchase attitude	Positive attitude	0.8150	0.74	0.8295
	Support degree		0.94	
Green purchase intention	Positive intention	0.7239	0.93	0.7847
	Willingness of change		0.85	
	Potential purchase behavior		0.38	

Table 5.32 Composite reliability (Master, recycled paper)

Construct	Measurement	Adjusted Cronbach's α value	Factor loading	Composite reliability
Product-related information acquisition	Interest in product	0.8324	0.63	0.8447
	Active search		0.90	
	Information searching amount		0.86	
Consumer perceived value	Willingness to pay more	0.6696	0.67	0.6835
	Perceived worthiness		0.77	
Environment awareness	Environment concern degree	0.7606	0.64	0.7806
	Personal behavior		0.84	
	Effect other people		0.72	
Consumer perceived risk	Perceived information risk	0.7349	0.64	0.7362
	Perceived performance risk		0.71	
	Perceived effectiveness		0.73	
Outside interference	Purchase experience consulting	0.7934	0.84	0.7986
	Comments from relatives and friends		0.79	
Green purchase attitude	Positive attitude	0.8620	0.83	0.8645
	Support degree		0.92	
Green purchase intention	Positive intention	0.7190	0.88	0.7714
	Willingness of change		0.81	
	Potential purchase behavior		0.46	

Table 5.33 Composite reliability (Low-income, variable-frequency AC)

Construct	Measurement	Adjusted Cronbach's α value	Factor loading	Composite reliability
Product-related information acquisition	Interest in product	0.8275	0.55	0.8521
	Active search		0.91	
	Information searching amount		0.94	
Consumer perceived value	Price comparison	0.7021	0.45	0.7312
	Willingness to pay more		0.72	
	Perceived worthiness		0.87	
Environment awareness	Environment concern degree	0.7709	0.61	0.7940
	Personal behavior		0.90	
	Effect other people		0.72	
Consumer perceived risk	Perceived information risk	0.8002	0.75	0.7998
	Perceived performance risk		0.78	
	Perceived effectiveness		0.74	
Outside interference	Purchase experience consulting	0.7617	0.90	0.7836
	Comments from relatives and friends		0.80	
	Convenience of purchasing		0.47	
Green purchase attitude	Positive attitude	0.7995	0.74	0.8078
	Support degree		0.90	
Green purchase intention	Positive intention	0.7322	0.93	0.8014
	Willingness of change		0.87	
	Potential purchase behavior		0.41	

Table 5.34 Composite reliability (High-income, variable-frequency AC)

Construct	Measurement	Adjusted Cronbach's α value	Factor loading	Composite reliability
Product-related information acquisition	Interest in product	0.8729	0.71	0.8832
	Active search		0.93	
	Information searching amount		0.88	
Consumer perceived value	Price comparison	0.7031	0.46	0.7420
	Willingness to pay more		0.76	
	Perceived worthiness		0.85	
Environment awareness	Environment concern degree	0.7898	0.63	0.8214
	Personal behavior		0.95	
	Effect other people		0.73	
Consumer perceived risk	Perceived information risk	0.8289	0.77	0.8313
	Perceived performance risk		0.87	
	Perceived effectiveness		0.72	
Outside interference	Purchase experience consulting	0.8733	0.89	0.8441
	Comments from relatives and friends		0.82	
Green purchase attitude	Positive attitude	0.8834	0.86	0.8830
	Support degree		0.92	
Green purchase intention	Positive intention	0.8033	0.89	0.8505
	Willingness of change		0.83	

Table 5.35 Composite reliability (College, variable-frequency AC)

Construct	Measurement	Adjusted Cronbach's α value	Factor loading	Composite reliability
Product-related information acquisition	Interest in product	0.8797	0.71	0.8904
	Active search		0.93	
	Information searching amount		0.91	
Consumer perceived value	Price comparison	0.7148	0.40	0.7409
	Willingness to pay more		0.78	
	Perceived worthiness		0.87	
Environment awareness	Environment concern degree	0.8021	0.61	0.7950
	Personal behavior		0.98	
	Effect other people		0.74	
Consumer perceived risk	Perceived information risk	0.8242	0.76	0.8264
	Perceived performance risk		0.82	
	Perceived effectiveness		0.77	
Outside interference	Purchase experience consulting	0.7739	0.86	0.7826
	Comments from relatives and friends		0.84	
	Convenience of purchasing		0.48	
Green purchase attitude	Positive attitude	0.8667	0.85	0.8669
	Support degree		0.90	
Green purchase intention	Positive intention	0.7429	0.84	0.7926
	Willingness of change		0.84	
	Potential purchase behavior		0.54	

Table 5.36 Composite reliability (Master, variable-frequency AC)

Construct	Measurement	Adjusted Cronbach's α value	Factor loading	Composite reliability
Product-related information acquisition	Interest in product	0.8166	0.53	0.8450
	Active search		0.92	
	Information searching amount		0.92	
Consumer perceived value	Willingness to pay more	0.7008	0.79	0.7088
	Perceived worthiness		0.69	
Environment awareness	Environment concern degree	0.7606	0.64	0.7806
	Personal behavior		0.84	
	Effect other people		0.72	
Consumer perceived risk	Perceived information risk	0.7557	0.80	0.7679
	Perceived performance risk		0.80	
	Perceived effectiveness		0.56	
Outside interference	Purchase experience consulting	0.7559	0.90	0.7893
	Comments from relatives and friends		0.82	
	Convenience of purchasing		0.47	
Green purchase attitude	Positive attitude	0.7765	0.73	0.7853
	Support degree		0.87	
Green purchase intention	Positive intention	0.7734	0.95	0.8149
	Willingness of change		0.86	
	Potential purchase behavior		0.45	

According to above tables, we can see the composite reliability of each construct with different groups and different products are all over 0.6 and most value of composite reliability are between 0.7 and 0.9. Kline (1998) proposed the value of composite reliability above 0.9 is excellent; the value of composite reliability around 0.8 is very good; the value of composite reliability around 0.7 is moderate and the value of composite reliability above 0.5 is the acceptable limit. The most composite reliability's value listed above are between 0.7 and 0.9, so we can claim those samples are high reliability level. And we most factor loadings are higher than 0.5, so we can claim we have good validity too.

5.7 Measurement models analyzing

Now we are going to check the goodness-of-fit of measurement models. The factor loading should be between 0.5 and 0.95 for maintaining good validity. We can see there are some factor loadings not above 0.5. Those factor loadings which are below 0.5 may cause poor goodness-of-fit of measurement models. So we delete those measurements to test if the goodness-of-fit will be better.

Table 5.37 Adjustment of measurement model

Products	Groups	Adjustment
Recycled paper	Low-income	None
	High-income	None
	College	Delete "Potential purchase behavior"
	Master	Delete "Potential purchase behavior"
Variable-frequency AC	Low-income	Delete "Price comparison" , "Potential purchase behavior" and "Convenience of purchasing"
	High-income	Delete "Price comparison"
	College	Delete "Price comparison" and "Convenience of purchasing"
	Master	Delete "Convenience of purchasing" and "Potential purchase behavior"

Table 5.38 Measurement model (Low-income, recycled paper)

Index	Original goodness-of-fit
χ^2	274.98
df	98
χ^2 / df	2.8059
RMSEA	0.082
CFI	0.927
GFI	0.893
AGFI	0.832
NFI	0.893
NNFI	0.899

There is no factor loading under 0.5; we will just calculate the goodness-of-fit of original measurement model. We can see the value of each index is acceptable, so we can claim the result indicates a good fit for the proposed measurement model and we will use this measurement model for structural model.

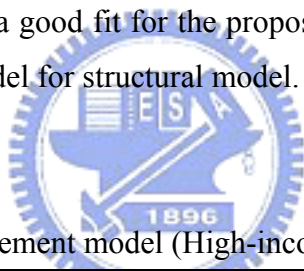


Table 5.39 Measurement model (High-income, recycled paper)

Index	Original goodness-of-fit
χ^2	274.23
df	114
χ^2 / df	2.4055
RMSEA	0.084
CFI	0.948
GFI	0.867
AGFI	0.801
NFI	0.916
NNFI	0.930

There is no factor loading under 0.5; we will just calculate the goodness-of-fit of original measurement model. We can see the value of each index is acceptable, so we can claim the result indicates a good fit for the proposed measurement model and we will use this measurement model for structural model.

Table 5.40 Measurement model (College, recycled paper)

Index	Original goodness-of-fit	Delete “Potential purchase behavior”
χ^2	305.7	242.67
df	114	98
χ^2 / df	2.6816	2.4762
RMSEA	0.081	0.075
CFI	0.934	0.949
GFI	0.884	0.901
AGFI	0.826	0.845
NFI	0.902	0.919
NNFI	0.911	0.929

The factor loading of measurement named potential purchase behavior is under 0.5. After adjustment, we can see all goodness-of-fit indexes are improved, so we will delete it.

Table 5.41 Measurement model (Master, recycled paper)

Index	Original goodness-of-fit	Delete “Potential purchase behavior”
χ^2	190.95	160.32
df	114	98
χ^2 / df	1.675	1.6359
RMSEA	0.057	0.055
CFI	0.964	0.970
GFI	0.908	0.917
AGFI	0.862	0.871
NFI	0.922	0.931
NNFI	0.952	0.959

The factor loading of measurement named potential purchase behavior is under 0.5. After adjustment, we can see all goodness-of-fit indexes are improved, so we will delete it.

Table 5.42 Measurement model (Low-income, variable-frequency AC)

Index	Original goodness-of-fit	Delete “Price comparison” , ”Potential purchase behavior” and “Convenience of purchasing”
χ^2	388.83	180.89
<i>df</i>	149	98
χ^2 / df	2.6096	1.8458
RMSEA	0.077	0.056
CFI	0.945	0.977
GFI	0.874	0.927
AGFI	0.822	0.886
NFI	0.916	0.952
NNFI	0.929	0.968

The factor loadings of measurement named price comparison, potential purchase behavior and convenience of purchasing are under 0.5. After adjustment, we can see all goodness-of-fit indexes are improved, so we will delete them.

Table 5.43 Measurement model (High-income, variable-frequency AC)

Index	Original goodness-of-fit	Delete “Price comparison”
χ^2	225.69	187.06
<i>df</i>	114	98
χ^2 / df	1.9797	1.9088
RMSEA	0.070	0.067
CFI	0.970	0.980
GFI	0.888	0.901
AGFI	0.832	0.845
NFI	0.944	0.960
NNFI	0.959	0.972

The factor loading of measurement named price comparison is under 0.5. After adjustment, we can see all goodness-of-fit indexes are improved, so we will delete it..

Table 5.44 Measurement model (College, variable-frequency AC)

Index	Original goodness-of-fit	Delete “Price comparison” and “Convenience of purchasing”
χ^2	430.83	254.73
df	149	114
χ^2 / df	2.8915	2.9425
RMSEA	0.085	0.069
CFI	0.947	0.966
GFI	0.857	0.901
AGFI	0.799	0.852
NFI	0.924	0.944
NNFI	0.932	0.954

The factor loading of measurement named price comparison and convenience of purchasing is under 0.5. After adjustment, we can see all goodness-of-fit indexes are improved, so we will delete them.

Table 5.45 Measurement model (Master, variable-frequency AC)

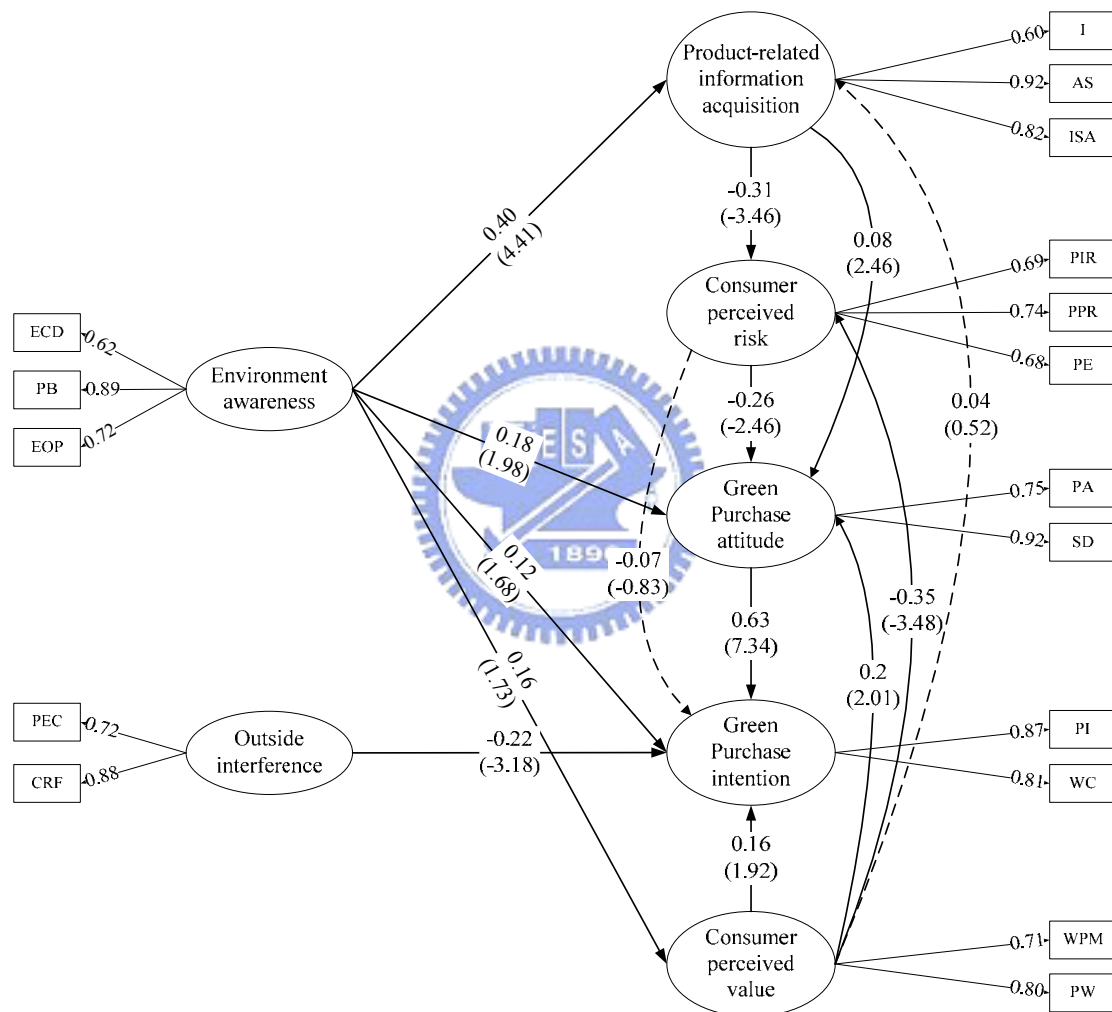
Index	Original goodness-of-fit	Delete “Potential purchase behavior” and “Convenience of purchasing”
χ^2	262.46	144.01
df	131	98
χ^2 / df	2.0035	1.4695
RMSEA	0.069	0.047
CFI	0.965	0.985
GFI	0.883	0.925
AGFI	0.831	0.883
NFI	0.934	0.956
NNFI	0.954	0.979

The factor loadings of measurement named potential purchase behavior and convenience of purchasing are under 0.5. After adjustment, we can see all goodness-of-fit indexes are improved, so we will delete them.

5.8 Structural model (Sample Clustering)

After adjusting measurement models, we are going use LISREL 8 to do the path analysis and check those hypotheses proposed by us. We use t-value of every path to check if each hypothesis accepted or rejected. If the t-value of path is under 1.645, this hypothesis is rejected; if the t-value of path is above 1.645, this hypothesis is accepted. Besides, we will also calculate the direct effects and indirect effects.

5.4.1 Low-income, recycled paper



Note :I=interest in product; AS=active search; ISA=information searching amount; PIR=perceived information risk; PPR=perceived performance risk; PE=perceived effectiveness; PA=positive attitude; SD=support degree; PI=positive intention; WC=willingness to change; WPM= willingness to pay more; PW=perceived worthiness; ECD=environment concern degree; PB=personal behavior; EOP=effect other people; PEC=purchase experience consulting; CRF=comment from relatives and friend.

Figure 5.3 Structural model (Low-income, recycled paper)

Table 5.46 Goodness-of-fit of structural model (Low-income, recycled paper)

Index	Structural model
χ^2	237.40
<i>df</i>	104
χ^2 / df	2.2827
RMSEA	0.080
CFI	0.924
GFI	0.877
AGFI	0.819
NFI	0.875
NNFI	0.901

We can see most indexes of this structural model is acceptable, even perfect, so we can claim this structural model have great goodness-of-fit.

Table 5.47 Test results of the hypotheses (Low-income, recycled paper)

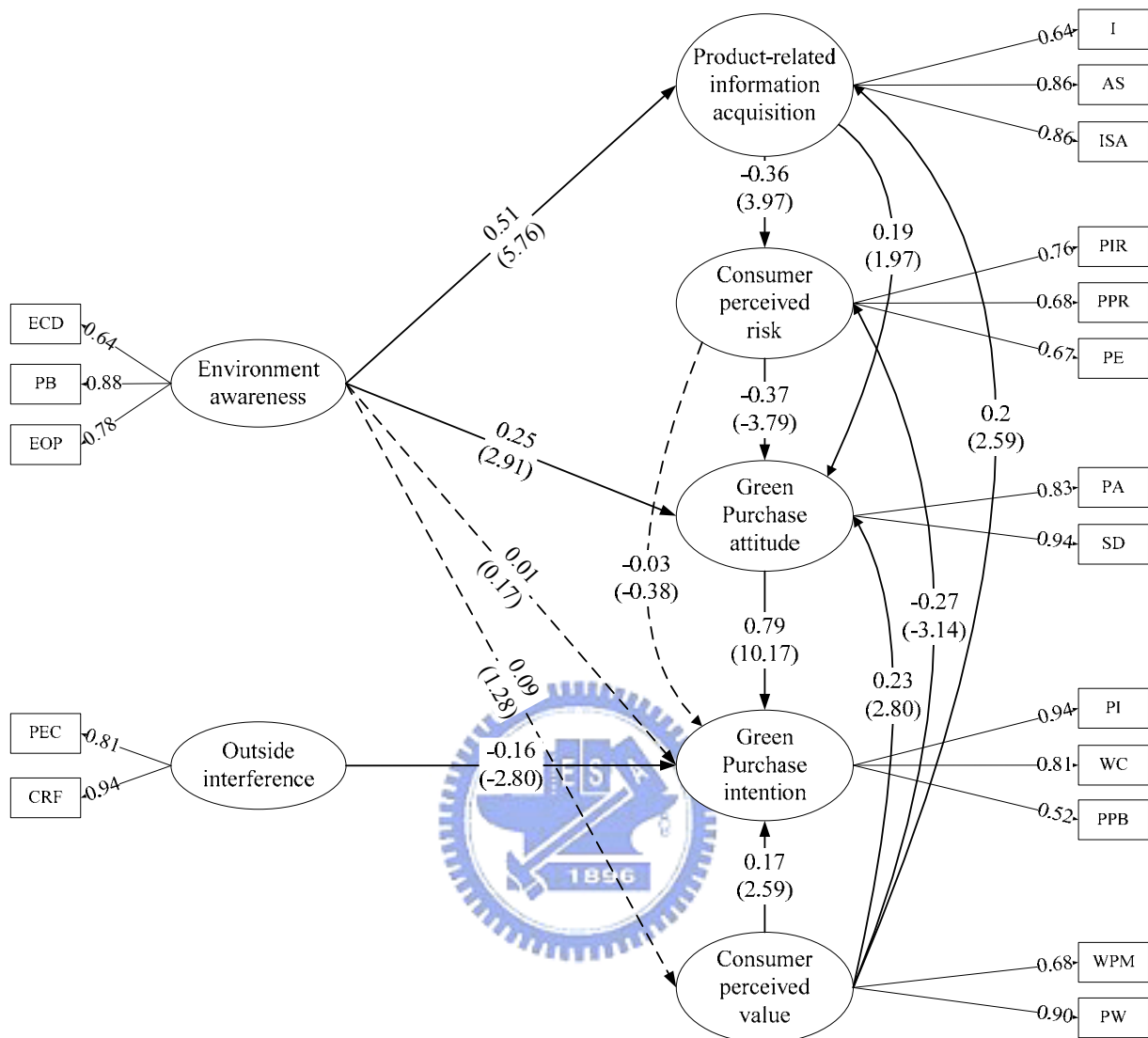
Hypotheses	t-value	Test results
Environment awareness → Consumer perceived value	1.73 [*]	Accepted
Environment awareness → Product-related information acquisition	4.41 ^{***}	Accepted
Environment awareness → Green purchase attitude	1.98 ^{**}	Accepted
Environment awareness → Green purchase intention	1.68 [*]	Accepted
Outside interference → Green purchase intention	-3.18 ^{***}	Accepted
Product-related information acquisition → Consumer perceived risk	-3.46 ^{***}	Accepted
Product-related information acquisition → Green purchase attitude	2.46 ^{**}	Accepted
Consumer perceived value → Product-related information acquisition	0.52	Rejected
Consumer perceived value → Consumer perceived risk	-3.48 ^{***}	Accepted
Consumer perceived value → Green purchase attitude	2.01 ^{**}	Accepted
Consumer perceived value → Green purchase intention	1.92 [*]	Accepted
Consumer perceived risk → Green purchase attitude	-2.46 ^{**}	Accepted
Consumer perceived risk → Green purchase intention	-0.83	Rejected
Green purchase attitude → Green purchase intention	7.34 ^{***}	Accepted

Note: *t value*>1.645, ^{*}*p*<0.1; *t value*>1.96, ^{**}*p*<0.05; *t value*>2.58, ^{***}*p*<0.01

Table 5.48 Effects on latent variables (Low-income, recycled paper)

Affected latent variable: Product-related information acquisition			
	Indirect effects	Direct effects	Total effects
Environment awareness	X	0.4	0.4
Affected latent variable: Consumer perceived risk			
	Indirect effects	Direct effects	Total effects
Environment awareness	-0.18	X	-0.84
Product-related information acquisition	X	-0.31	
Consumer perceived value	X	-0.35	
Affected latent variable: Consumer perceived value			
	Indirect effects	Direct effects	Total effects
Environment awareness	X	0.16	0.16
Affected latent variable: Green purchase attitude			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.11	0.18	0.48
Product-related information acquisition	0.08	0.08	
Consumer perceived risk	X	-0.26	
Consumer perceived value	0.09	0.2	
Affected latent variable: Green purchase intention			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.18	0.12	0.99
Product-related information acquisition	0.1	X	
Consumer perceived risk	-0.16	X	
Consumer perceived value	0.18	0.16	
Outside interference	X	-0.22	
Green purchase attitude	X	0.63	

5.4.2 High-income, recycled paper



Note: I=interest in product; AS=active search; ISA=information searching amount; PIR=perceived information risk; PPR=perceived performance risk; PE=perceived effectiveness; PA=positive attitude; SD=support degree; PI=positive intention; WC=willingness to change; PPB=potential purchase behavior; WPM= willingness to pay more; PW=perceived worthiness; ECD=environment concern degree; PB=personal behavior; EOP=effect other people; PEC=purchase experience consulting; CRF=comment from relatives and friends.

Figure 5.4 Structural model (High-income, recycled paper)

Table 5.49 Goodness-of-fit of structural model (High-income, recycled paper)

Index	Structural model
χ^2	316.22
<i>df</i>	119
χ^2 / df	2.6573
RMSEA	0.091
CFI	0.935
GFI	0.850
AGFI	0.784
NFI	0.903
NNFI	0.917

We can see most indexes of this structural model is acceptable, even perfect, so we can claim this structural model have great goodness-of-fit.

Table 5.50 Test results of the hypotheses (High-income, recycled paper)

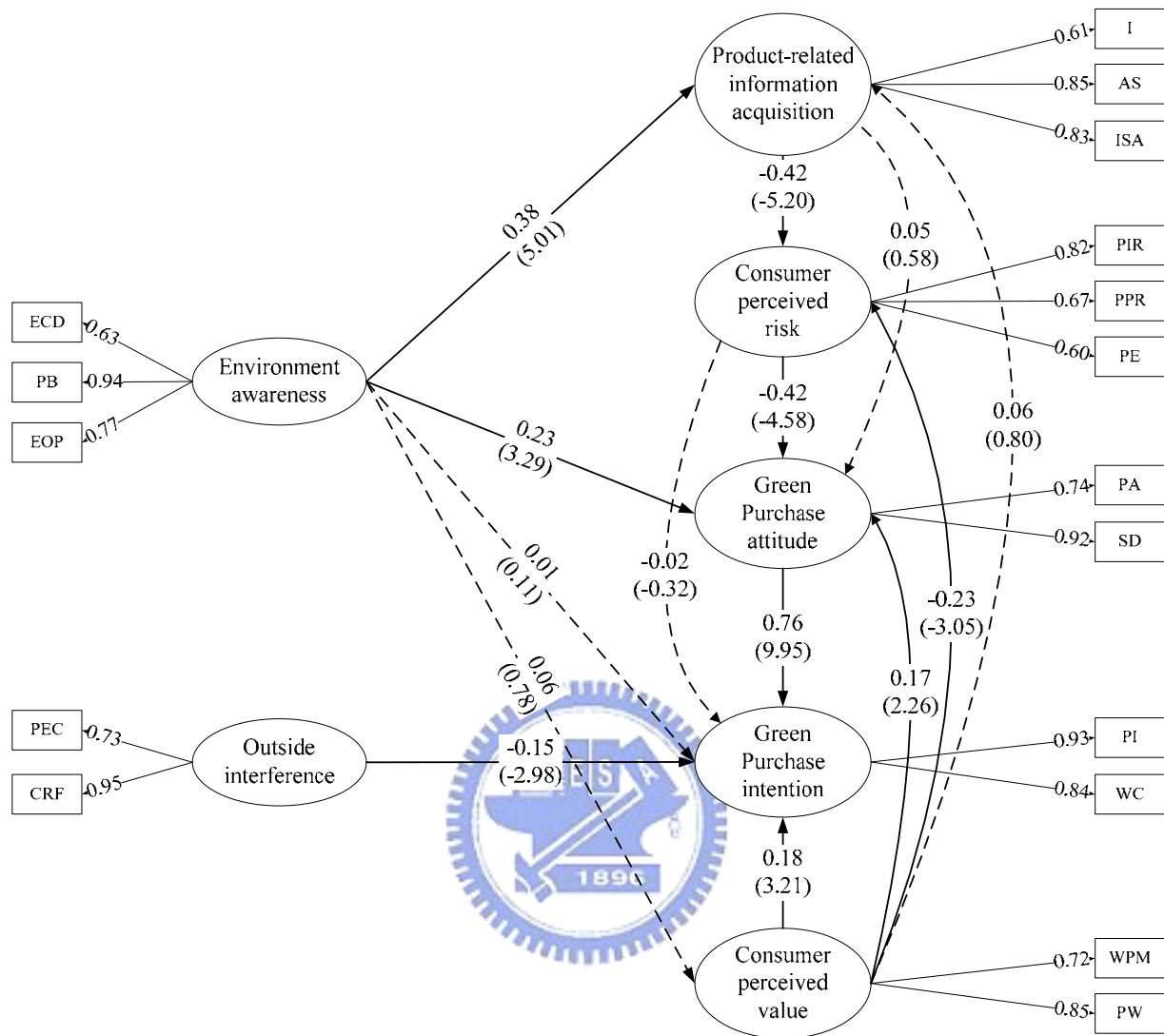
Hypotheses	t-value	Test results
Environment awareness → Consumer perceived value	1.28	Rejected
Environment awareness → Product-related information acquisition	5.76 ^{***}	Accepted
Environment awareness → Green purchase attitude	2.91 ^{***}	Accepted
Environment awareness → Green purchase intention	0.17	Rejected
Outside interference → Green purchase intention	-2.80 ^{***}	Accepted
Product-related information acquisition → Consumer perceived risk	-3.97 ^{***}	Accepted
Product-related information acquisition → Green purchase attitude	1.97 ^{**}	Accepted
Consumer perceived value → Product-related information acquisition	2.59 ^{***}	Accepted
Consumer perceived value → Consumer perceived risk	-3.14 ^{***}	Accepted
Consumer perceived value → Green purchase attitude	2.80 ^{***}	Accepted
Consumer perceived value → Green purchase intention	2.59 ^{***}	Accepted
Consumer perceived risk → Green purchase attitude	-3.79 ^{***}	Accepted
Consumer perceived risk → Green purchase intention	-0.38	Rejected
Green purchase attitude → Green purchase intention	10.17 ^{***}	Accepted

Note: *t value* > 1.645, **p* < 0.1; *t value* > 1.96, ***p* < 0.05; *t value* > 2.58, ****p* < 0.01

Table 5.51 Effects on latent variables (High-income, recycled paper)

Affected latent variable: Product-related information acquisition			
	Indirect effects	Direct effects	Total effects
Environment awareness	X	0.51	0.71
Consumer perceived value	X	0.2	
Affected latent variable: Consumer perceived risk			
	Indirect effects	Direct effects	Total effects
Environment awareness	-0.18	X	-0.88
Product-related information acquisition	X	-0.36	
Consumer perceived value	X	-0.34	
Affected latent variable: Green purchase attitude			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.16	0.25	0.75
Product-related information acquisition	0.13	0.19	
Consumer perceived risk	X	-0.37	
Consumer perceived value	0.16	0.23	
Affected latent variable: Green purchase intention			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.33	X	1.41
Product-related information acquisition	0.26	X	
Consumer perceived risk	-0.29	X	
Consumer perceived value	0.31	0.17	
Outside interference	X	-0.16	
Green purchase attitude	X	0.79	

5.4.3 College, recycled paper



Note: I=interest in product; AS=active search; ISA=information searching amount; PIR=perceived information risk; PPR=perceived performance risk; PE=perceived effectiveness; PA=positive attitude; SD=support degree; PI=positive intention; WC=willingness to change; WPM= willingness to pay more; PW=perceived worthiness; ECD=environment concern degree; PB=personal behavior; EOP=effect other people; PEC=purchase experience consulting; CRF=comment from relatives and friends.

Figure 5.5 Structural model (College, recycled paper)

Table 5.52 Goodness-of-fit of structural model (College, recycled paper)

Index	Structural model
χ^2	285.43
df	104
χ^2 / df	2.7445
RMSEA	0.082
CFI	0.932
GFI	0.885
AGFI	0.831
NFI	0.901
NNFI	0.912

We can see most indexes of this structural model is acceptable, even perfect, so we can claim this structural model have great goodness-of-fit.

Table 5.53 Test results of the hypotheses (College, recycled paper)

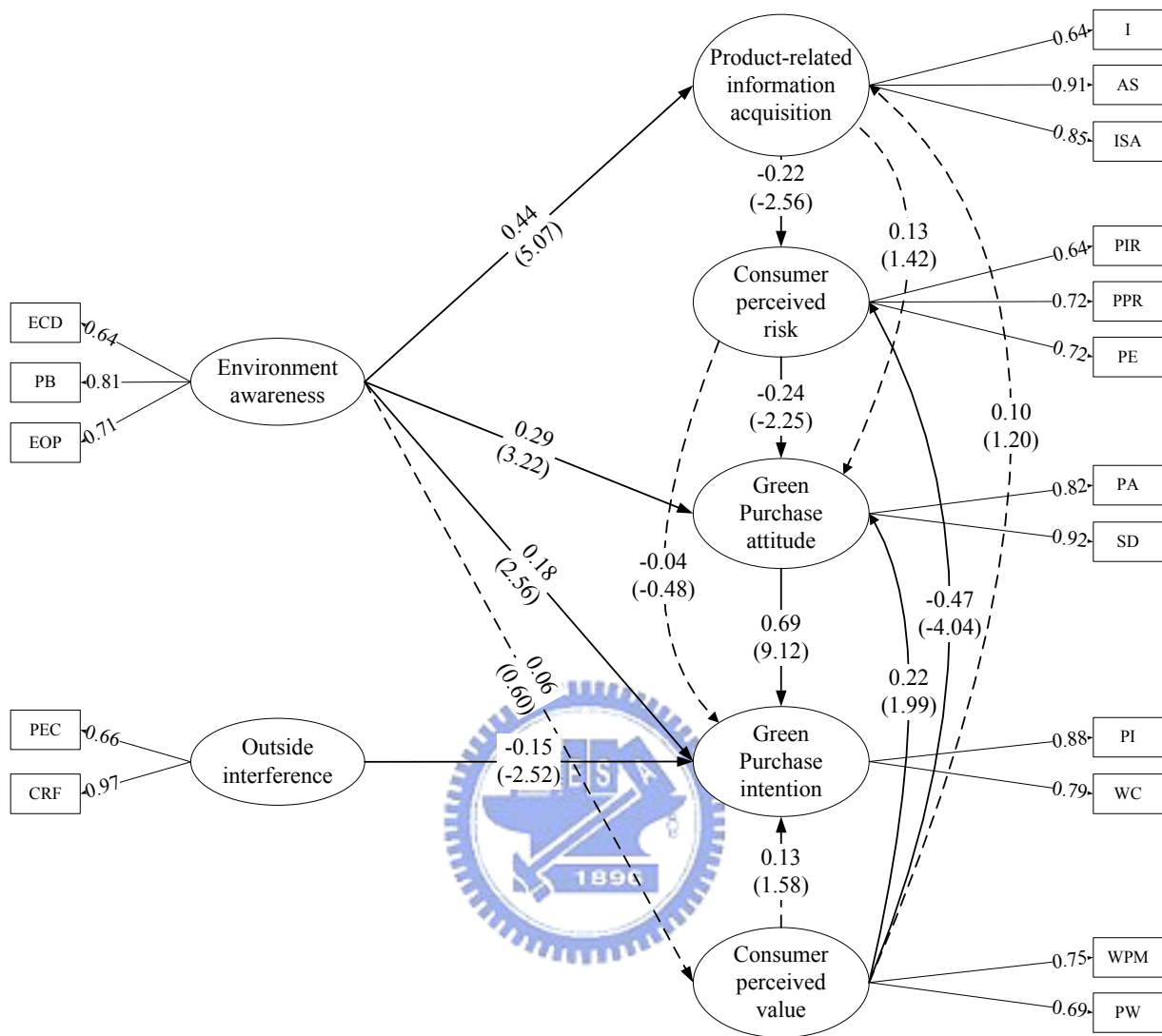
Hypotheses	t-value	Test results
Environment awareness → Consumer perceived value	0.78	Rejected
Environment awareness → Product-related information acquisition	5.01 ^{***}	Accepted
Environment awareness → Green purchase attitude	3.29 ^{***}	Accepted
Environment awareness → Green purchase intention	0.11	Rejected
Outside interference → Green purchase intention	-2.98 ^{***}	Accepted
Product-related information acquisition → Consumer perceived risk	-5.20 ^{***}	Accepted
Product-related information acquisition → Green purchase attitude	0.58	Rejected
Consumer perceived value → Product-related information acquisition	0.80	Rejected
Consumer perceived value → Consumer perceived risk	-3.05 ^{***}	Accepted
Consumer perceived value → Green purchase attitude	2.26 ^{**}	Accepted
Consumer perceived value → Green purchase intention	3.21 ^{***}	Accepted
Consumer perceived risk → Green purchase attitude	-4.58 ^{***}	Accepted
Consumer perceived risk → Green purchase intention	-0.32	Rejected
Green purchase attitude → Green purchase intention	9.95 ^{***}	Accepted

Note: t value > 1.645, $*p < 0.1$; t value > 1.96, $**p < 0.05$; t value > 2.58, $***p < 0.01$

Table 5.54 Effects on latent variables (College, recycled paper)

Affected latent variable: Product-related information acquisition			
	Indirect effects	Direct effects	Total effects
Environment awareness	X	0.38	0.38
Affected latent variable: Consumer perceived risk			
	Indirect effects	Direct effects	Total effects
Environment awareness	-0.16	X	-0.91
Product-related information acquisition	X	-0.42	
Consumer perceived value	X	-0.23	
Affected latent variable: Green purchase attitude			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.07	0.23	0.33
Product-related information acquisition	0.18	X	
Consumer perceived risk	X	-0.42	
Consumer perceived value	0.1	0.17	
Affected latent variable: Green purchase intention			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.23	X	1.04
Product-related information acquisition	0.13	X	
Consumer perceived risk	-0.32	X	
Consumer perceived value	0.21	0.18	
Outside interference	X	-0.15	
Green purchase attitude	X	0.76	

5.4.4 Master, recycled paper



Note :I=interest in product; AS=active search; ISA=information searching amount; PIR=perceived information risk; PPR=perceived performance risk; PE=perceived effectiveness; PA=positive attitude; SD=support degree; PI=positive intention; WC=willingness to change; WPM= willingness to pay more; PW=perceived worthiness; ECD=environment concern degree; PB=personal behavior; EOP=effect other people; PEC=purchase experience consulting; CRF=comment from relatives and friend.

Figure 5.6 Structural model (Master, recycled paper)

Table 5.55 Goodness-of-fit of structural model (Master, recycled paper)

Index	Structural model
χ^2	218.01
df	10
χ^2 / df	2.0963
RMSEA	0.072
CFI	0.947
GFI	0.891
AGFI	0.839
NFI	0.907
NNFI	0.931

We can see most indexes of this structural model is acceptable, even perfect, so we can claim this structural model have great goodness-of-fit.

Table 5.56 Test results of the hypotheses (Master, recycled paper)

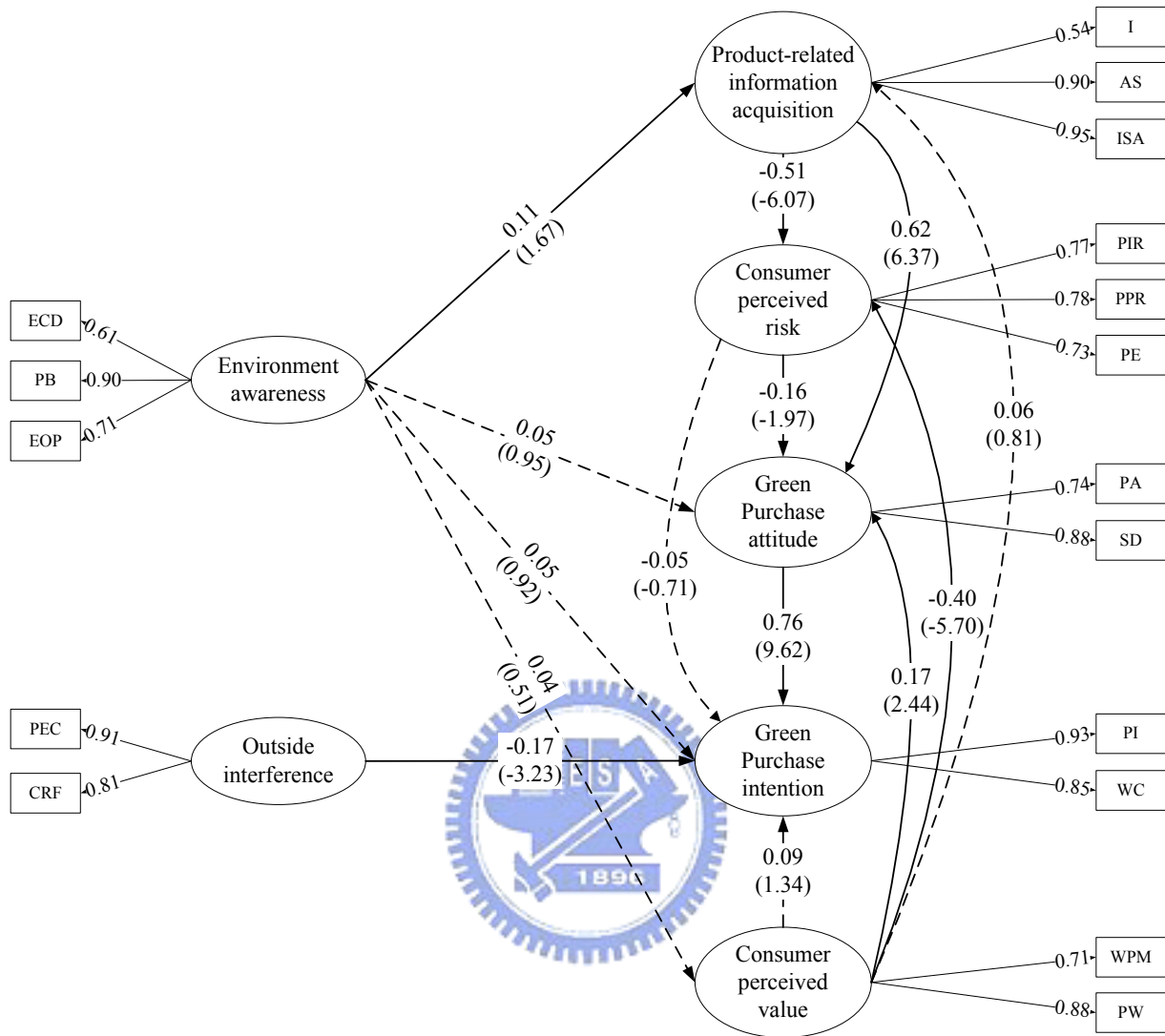
Hypotheses	t-value	Test results
Environment awareness → Consumer perceived value	0.60	Rejected
Environment awareness → Product-related information acquisition	5.07***	Accepted
Environment awareness → Green purchase attitude	3.22***	Accepted
Environment awareness → Green purchase intention	2.56**	Accepted
Outside interference → Green purchase intention	-2.52**	Accepted
Product-related information acquisition → Consumer perceived risk	-2.56**	Accepted
Product-related information acquisition → Green purchase attitude	1.42	Rejected
Consumer perceived value → Product-related information acquisition	1.20	Rejected
Consumer perceived value → Consumer perceived risk	-4.04***	Accepted
Consumer perceived value → Green purchase attitude	1.99**	Accepted
Consumer perceived value → Green purchase intention	1.58	Rejected
Consumer perceived risk → Green purchase attitude	-2.25**	Accepted
Consumer perceived risk → Green purchase intention	-0.48	Rejected
Green purchase attitude → Green purchase intention	9.12***	Accepted

Note: $t \text{ value} > 1.645$, $*p < 0.1$; $t \text{ value} > 1.96$, $**p < 0.05$; $t \text{ value} > 2.58$, $***p < 0.01$

Table 5.57 Effects on latent variables (Master, recycled paper)

Affected latent variable: Product-related information acquisition			
	Indirect effects	Direct effects	Total effects
Environment awareness	X	0.44	0.44
Affected latent variable: Consumer perceived risk			
	Indirect effects	Direct effects	Total effects
Environment awareness	-0.1	X	-0.79
Product-related information acquisition	X	-0.22	
Consumer perceived value	X	-0.47	
Affected latent variable: Green purchase attitude			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.02	0.29	0.45
Product-related information acquisition	0.05	X	
Consumer perceived risk	X	-0.24	
Consumer perceived value	0.11	0.22	
Affected latent variable: Green purchase intention			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.22	0.18	1.04
Product-related information acquisition	0.04	X	
Consumer perceived risk	-0.17	X	
Consumer perceived value	0.23	X	
Outside interference	X	-0.15	
Green purchase attitude	X	0.69	

5.4.5 Low-income, variable-frequency AC



Note :I=interest in product; AS=active search; ISA=information searching amount; PIR=perceived information risk; PPR=perceived performance risk; PE=perceived effectiveness; PA=positive attitude; SD=support degree; PI=positive intention; WC=willingness to change; WPM= willingness to pay more; PW=perceived worthiness; ECD=environment concern degree; PB=personal behavior; EOP=effect other people; PEC=purchase experience consulting; CRF=comment from relatives and friend.

Figure 5.7 Structural model (Low-income, variable-frequency AC)

Table 5.58 Goodness-of-fit of structural model (Low-income, variable-frequency AC)

Index	Structural model
χ^2	247.83
<i>df</i>	103
χ^2 / df	2.4061
RMSEA	0.072
CFI	0.954
GFI	0.902
AGFI	0.855
NFI	0.928
NNFI	0.940

We can see most indexes of this structural model is acceptable, even perfect, so we can claim this structural model have great goodness-of-fit.

Table 5.59 Test results of the hypotheses (Low-income, variable-frequency AC)

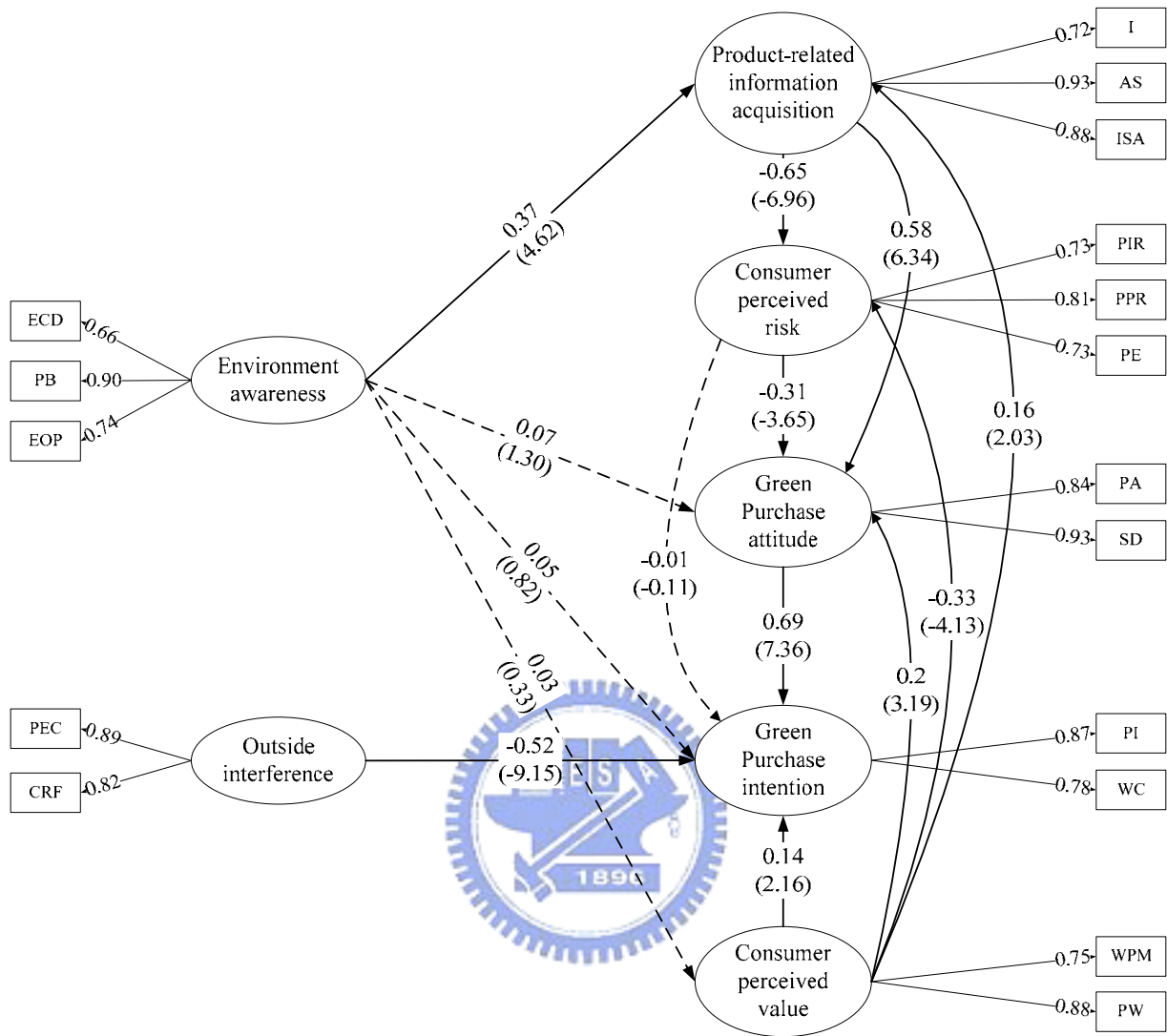
Hypotheses	t-value	Test results
Environment awareness → Consumer perceived value	0.51	Rejected
Environment awareness → Product-related information acquisition	1.67*	Accepted
Environment awareness → Green purchase attitude	0.95	Rejected
Environment awareness → Green purchase intention	0.92	Rejected
Outside interference → Green purchase intention	-3.23***	Accepted
Product-related information acquisition → Consumer perceived risk	-6.07***	Accepted
Product-related information acquisition → Green purchase attitude	6.37***	Accepted
Consumer perceived value → Product-related information acquisition	0.81	Rejected
Consumer perceived value → Consumer perceived risk	-5.70***	Accepted
Consumer perceived value → Green purchase attitude	2.44**	Accepted
Consumer perceived value → Green purchase intention	1.34	Rejected
Consumer perceived risk → Green purchase attitude	-1.97**	Accepted
Consumer perceived risk → Green purchase intention	-0.71	Rejected
Green purchase attitude → Green purchase intention	9.62***	Accepted

Note: $t \text{ value} > 1.645$, $*p < 0.1$; $t \text{ value} > 1.96$, $**p < 0.05$; $t \text{ value} > 2.58$, $***p < 0.01$

Table 5.60 Effects on latent variables (Low-income, variable-frequency AC)

Affected latent variable: Product-related information acquisition			
	Indirect effects	Direct effects	Total effects
Environment awareness	X	0.11	0.11
Affected latent variable: Consumer perceived risk			
	Indirect effects	Direct effects	Total effects
Environment awareness	-0.06	X	-0.97
Product-related information acquisition	X	-0.51	
Consumer perceived value	X	-0.40	
Affected latent variable: Green purchase attitude			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.08	X	0.85
Product-related information acquisition	0.08	0.62	
Consumer perceived risk	X	-0.16	
Consumer perceived value	0.06	0.17	
Affected latent variable: Green purchase intention			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.06	X	1.24
Product-related information acquisition	0.53	X	
Consumer perceived risk	-0.12	X	
Consumer perceived value	0.18	X	
Outside interference	X	-0.17	
Green purchase attitude	X	0.76	

5.4.6 High-income, variable-frequency AC



Note :I=interest in product; AS=active search; ISA=information searching amount; PIR=perceived information risk; PPR=perceived performance risk; PE=perceived effectiveness; PA=positive attitude; SD=support degree; PI=positive intention; WC=willingness to change; WPM= willingness to pay more; PW=perceived worthiness; ECD=environment concern degree; PB=personal behavior; EOP=effect other people; PEC=purchase experience consulting; CRF=comment from relatives and friend.

Figure 5.8 Structural model (High-income, variable-frequency AC)

Table 5.61 Goodness-of-fit of structural model (High-income, variable-frequency AC)

Index	Structural model
χ^2	293.62
df	104
χ^2 / df	2.8233
RMSEA	0.096
CFI	0.954
GFI	0.852
AGFI	0.782
NFI	0.933
NNFI	0.939

We can see most indexes of this structural model is acceptable, even perfect, so we can claim this structural model have great goodness-of-fit.

Table 5.62 Test results of the hypotheses (High-income, variable-frequency AC)

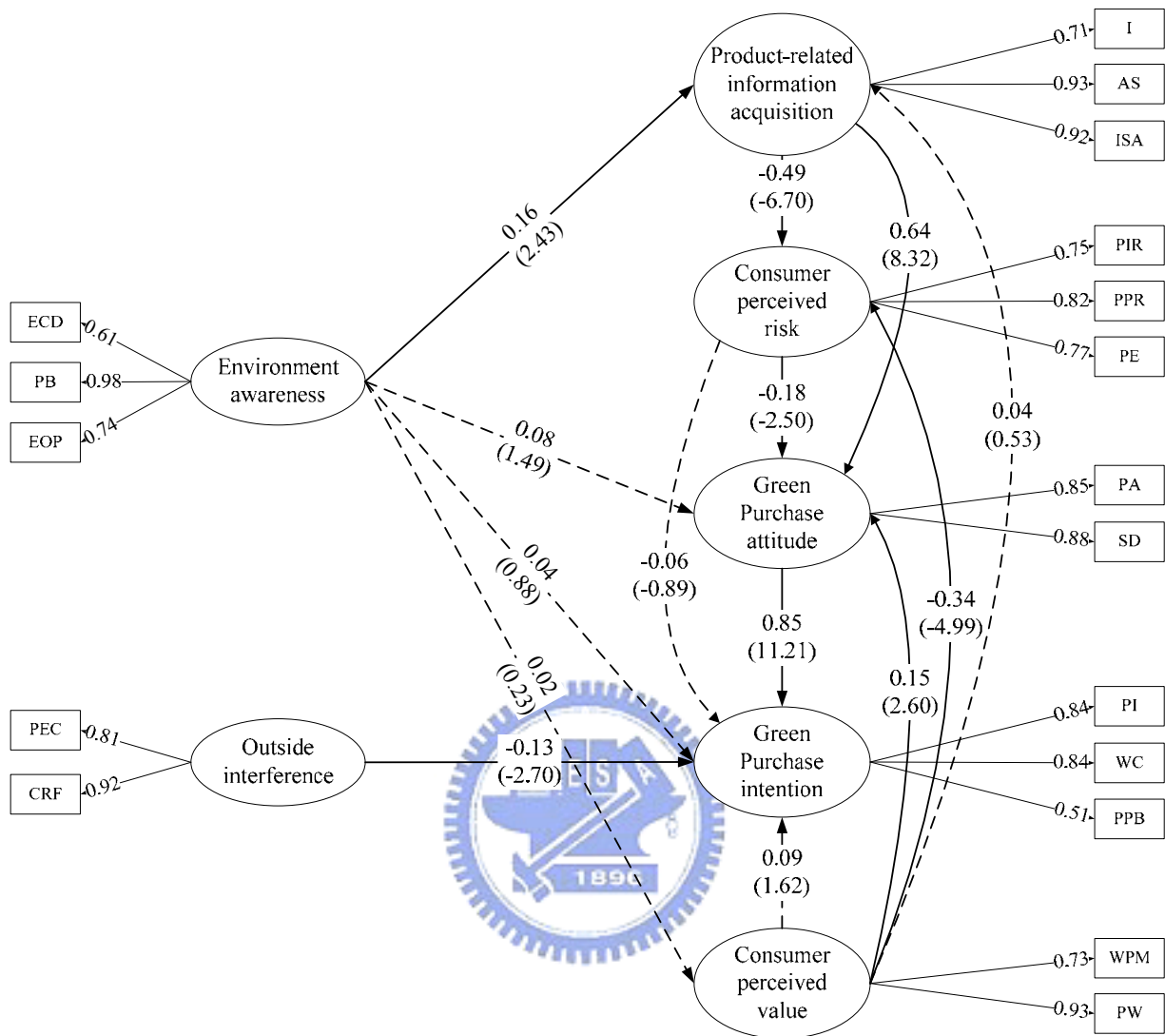
Hypotheses	t-value	Test results
Environment awareness → Consumer perceived value	0.33	Rejected
Environment awareness → Product-related information acquisition	4.62 ^{***}	Accepted
Environment awareness → Green purchase attitude	1.30	Rejected
Environment awareness → Green purchase intention	0.82	Rejected
Outside interference → Green purchase intention	-9.15 ^{***}	Accepted
Product-related information acquisition → Consumer perceived risk	-6.96 ^{***}	Accepted
Product-related information acquisition → Green purchase attitude	6.34 ^{***}	Accepted
Consumer perceived value → Product-related information acquisition	2.03 ^{**}	Accepted
Consumer perceived value → Consumer perceived risk	-4.13 ^{***}	Accepted
Consumer perceived value → Green purchase attitude	3.19 ^{***}	Accepted
Consumer perceived value → Green purchase intention	2.16 ^{**}	Accepted
Consumer perceived risk → Green purchase attitude	-3.65 ^{***}	Accepted
Consumer perceived risk → Green purchase intention	-0.11	Rejected
Green purchase attitude → Green purchase intention	7.36 ^{***}	Accepted

Note: $t \text{ value} > 1.645$, $*p < 0.1$; $t \text{ value} > 1.96$, $**p < 0.05$; $t \text{ value} > 2.58$, $***p < 0.01$

Table 5.63 Effects on latent variables (High-income, variable-frequency AC)

Affected latent variable: Product-related information acquisition			
	Indirect effects	Direct effects	Total effects
Environment awareness	X	0.37	0.37
Affected latent variable: Consumer perceived risk			
	Indirect effects	Direct effects	Total effects
Environment awareness	-0.24	X	m
Product-related information acquisition	X	-0.65	-1.22
Consumer perceived value	X	-0.33	
Affected latent variable: Green purchase attitude			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.29	X	1.19
Product-related information acquisition	0.2	0.58	
Consumer perceived risk	X	-0.31	
Consumer perceived value	0.23	0.2	
Affected latent variable: Green purchase intention			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.2	X	1.14
Product-related information acquisition	0.54	X	
Consumer perceived risk	-0.21	X	
Consumer perceived value	0.30	0.14	
Outside interference	X	-0.52	
Green purchase attitude	X	0.69	

5.4.7 College, variable-frequency AC



Note :I=interest in product; AS=active search; ISA=information searching amount; PIR=perceived information risk; PPR=perceived performance risk; PE=perceived effectiveness; PA=positive attitude; SD=support degree; PI=positive intention; WC=willingness to change; PPB=potential purchase behavior; WPM= willingness to pay more; PW=perceived worthiness; ECD=environment concern degree; PB=personal behavior; EOP=effect other people; PEC=purchase experience consulting; CRF=comment from relatives and friend.

Figure 5.9 Structural model (College, variable-frequency AC)

Table 5.64 Goodness-of-fit of structural model (College, variable-frequency AC)

Index	Structural model
χ^2	474.13
<i>df</i>	137
χ^2 / df	3.4608
RMSEA	0.097
CFI	0.926
GFI	0.838
AGFI	0.776
NFI	0.905
NNFI	0.908

We can see most indexes of this structural model is acceptable, even perfect, so we can claim this structural model have great goodness-of-fit.

Table 5.65 Test results of the hypotheses (College, variable-frequency AC)

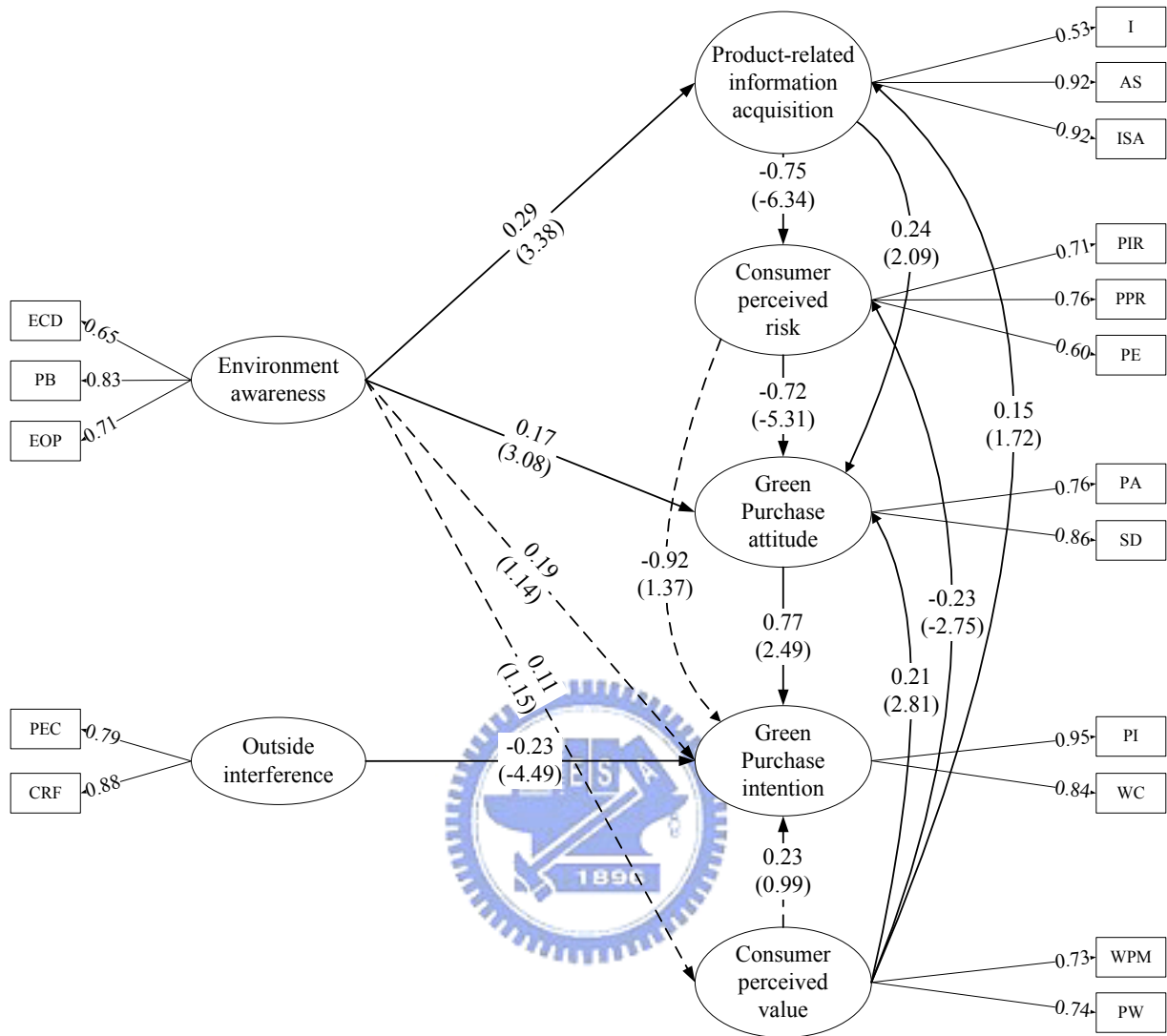
Hypotheses	t-value	Test results
Environment awareness → Consumer perceived value	0.23	Rejected
Environment awareness → Product-related information acquisition	2.43**	Accepted
Environment awareness → Green purchase attitude	1.49	Rejected
Environment awareness → Green purchase intention	0.88	Rejected
Outside interference → Green purchase intention	-2.70***	Accepted
Product-related information acquisition → Consumer perceived risk	-6.70***	Accepted
Product-related information acquisition → Green purchase attitude	8.32***	Accepted
Consumer perceived value → Product-related information acquisition	0.53	Rejected
Consumer perceived value → Consumer perceived risk	-4.99***	Accepted
Consumer perceived value → Green purchase attitude	2.60**	Accepted
Consumer perceived value → Green purchase intention	1.62	Rejected
Consumer perceived risk → Green purchase attitude	-2.50**	Accepted
Consumer perceived risk → Green purchase intention	-0.89	Rejected
Green purchase attitude → Green purchase intention	11.21***	Accepted

Note: *t value* > 1.645, **p* < 0.1; *t value* > 1.96, ***p* < 0.05; *t value* > 2.58, ****p* < 0.01

Table 5.66 Effects on latent variables (College, variable-frequency AC)

Affected latent variable: Product-related information acquisition			
	Indirect effects	Direct effects	Total effects
Environment awareness	X	0.16	0.16
Affected latent variable: Consumer perceived risk			
	Indirect effects	Direct effects	Total effects
Environment awareness	-0.08	X	
Product-related information acquisition	X	-0.49	-0.91
Consumer perceived value	X	-0.34	
Affected latent variable: Green purchase attitude			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.12	X	
Product-related information acquisition	0.09	0.64	0.88
Consumer perceived risk	X	-0.18	
Consumer perceived value	0.06	0.15	
Affected latent variable: Green purchase intention			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.1	X	1.47
Product-related information acquisition	0.62	X	
Consumer perceived risk	-0.15	X	
Consumer perceived value	0.18	X	
Outside interference	X	-0.13	
Green purchase attitude	X	0.85	

5.4.8 Master, variable-frequency AC



Note :I=interest in product; AS=active search; ISA=information searching amount; PIR=perceived information risk; PPR=perceived performance risk; PE=perceived effectiveness; PA=positive attitude; SD=support degree; PI=positive intention; WC=willingness to change; WPM= willingness to pay more; PW=perceived worthiness; ECD=environment concern degree; PB=personal behavior; EOP=effect other people; PEC=purchase experience consulting; CRF=comment from relatives and friend.

Figure 5.10 Structural model (Master, variable-frequency AC)

Table 5.67 Goodness-of-fit of structural model (Master, variable-frequency AC)

Index	Structural model
χ^2	206.28
<i>df</i>	104
χ^2 / df	1.9835
RMSEA	0.069
CFI	0.973
GFI	0.896
AGFI	0.847
NFI	0.948
NNFI	0.964

We can see most indexes of this structural model is acceptable, even perfect, so we can claim this structural model have great goodness-of-fit.

Table 5.68 Test results of the hypotheses (Master, variable-frequency AC)

Hypotheses	t-value	Test results
Environment awareness → Consumer perceived value	1.15	Rejected
Environment awareness → Product-related information acquisition	3.38***	Accepted
Environment awareness → Green purchase attitude	3.08***	Accepted
Environment awareness → Green purchase intention	1.14	Rejected
Outside interference → Green purchase intention	-4.49***	Accepted
Product-related information acquisition → Consumer perceived risk	-6.34***	Accepted
Product-related information acquisition → Green purchase attitude	2.09**	Accepted
Consumer perceived value → Product-related information acquisition	1.72*	Accepted
Consumer perceived value → Consumer perceived risk	-2.75**	Accepted
Consumer perceived value → Green purchase attitude	2.81**	Accepted
Consumer perceived value → Green purchase intention	0.99	Rejected
Consumer perceived risk → Green purchase attitude	-5.31***	Accepted
Consumer perceived risk → Green purchase intention	-1.37	Rejected
Green purchase attitude → Green purchase intention	2.49**	Accepted

Note: *t* value > 1.645, **p* < 0.1; *t* value > 1.96, ***p* < 0.05; *t* value > 2.58, ****p* < 0.01

Table 5.69 Effects on latent variable (Master, variable-frequency AC)

Affected latent variable: Product-related information acquisition			
	Indirect effects	Direct effects	Total effects
Environment awareness	X	0.29	0.29
Affected latent variable: Consumer perceived risk			
	Indirect effects	Direct effects	Total effects
Environment awareness	-0.22	X	-1.20
Product-related information acquisition	X	-0.75	
Consumer perceived value	X	-0.23	
Affected latent variable: Green purchase attitude			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.23	0.17	0.95
Product-related information acquisition	0.54	0.24	
Consumer perceived risk	X	-0.72	
Consumer perceived value	0.28	0.21	
Affected latent variable: Green purchase intention			
	Indirect effects	Direct effects	Total effects
Environment awareness	0.31	X	1.28
Product-related information acquisition	0.60	X	
Consumer perceived risk	-0.55	X	
Consumer perceived value	0.38	X	
Outside interference	X	-0.23	
Green purchase attitude	X	0.77	

5.9 Difference analysis

5.9.1 Compare products types

When consumers face the higher price products, they will be more realistic. That means the emotion of environment issue has less effects on purchasing. So, when we compare result of recycled paper and variable-frequency AC, we will mainly focus on consumer perceived value, product-related information acquisition and environment awareness.

Firstly, we compare the effect caused by consumer perceived value on green purchase intention. No matter recycled paper or variable-frequency AC, consumer perceived value both has great effect on green purchase intention. Thus, we can say consumer perceived value is always important. Then, we compare the effects caused by product-related information acquisition on green purchase intention. We can see product-related information acquisition has stronger effect on green purchase intention under testing variable-frequency AC. So, when consumers purchase high price products, product-related information acquisition is an important determinant. And previously we assume that environment awareness positively affect consumer perceived value, green purchase attitude and green purchase intention. According to analytic result, environment awareness has strong effect under recycled paper than variable-frequency AC. That shows when the product's price is higher; the effect caused by environment awareness is slighter. We can conclude that when consumers purchase low price products, they will care more about environment.

Table 5.70 Comparison of under different product

Product-related information acquisition				
	Low-income	High-income	College	Pro-graduate
Recycled paper	0.10	0.26	0.13	0.04
Variable-frequency AC	0.53	0.54	0.62	0.60
Environment awareness				
	Low-income	High-income	College	Master
Recycled paper	0.30	0.33	0.23	0.40
Variable-frequency AC	0.06	0.20	0.10	0.31

5.9.2 Compare consumers types

Products have different kinds, so do consumers. So, we base on different characteristics to separate our samples to identify the difference.

The financial cost is an objective and important factor of purchasing and it is directly related to the income level of consumers. We use income level to separate consumers to see how consumers react under different income level. In our study, the income-level consumers are almost teenagers and high-income consumers are almost middle-aged people. We observe that the effect caused by consumer perceived value and consumer perceived risk of high-income people are stronger than low-income people. We think that is because middle-aged people are usually more realistic than teenagers. They care more about the performance, utility and benefit of products than environment. Besides, we also observe that when low-income consumers purchase products with high price, like variable-frequency AC, the effect of environment awareness becomes quite slight. The reason may be that when consumers realize they can't afford this product, they will become more realistic.

And the comparison between college and master focuses on the effect on green purchase intention caused by environment awareness. We use education level to separate consumers to see how consumers react under different education level. We assume that people with higher education level will concern more about environment issue and the environment awareness will have more effects on their green purchasing intention. According to analytic result, no matter what product, master group has stronger effects caused by environment awareness than college group.

Table 5.71 Comparison of different consumers

	Consumer perceived value		Consumer perceived risk	
	Low-income	High-income	Low-income	High-income
Recycled paper	0.34	0.48	-0.16	-0.29
Variable-frequency AC	0.18	0.44	-0.12	-0.21
	Environment awareness			
	College	Master	Low-income	High-income
Recycled paper	0.23	0.40	0.30	0.33
Variable-frequency AC	0.10	0.31	0.06	0.20

Chapter 6 Conclusions

6.1 Conclusions

This paper presents a conceptual framework for green products. To do so, fourteen respective hypotheses are postulated, and examined through the LISREL analytical approach, where a hypothetical model is established to analyze these constructs and their correlations in the proposed conceptual framework.

This study adds one distinctive feature to the previous literature on interpretation of green consumption. Previous researches focused on the relationships between psychology and green consumption. In this study, we combine marketing tools and psychology to analyze green consumption. First, the established conceptual framework links every independent variable, mediator and dependent variable. Each linkage means a hypothesis proposed by us. Based on the survey data collected randomly in Taiwan, the numerical results have indicated that every hypothesis is accepted or rejected depends on the kinds of consumers or products. Not only environment awareness but also most used marketing tools can effectively affect green purchase intention. According to above analysis, we can see there are different effects of every construct under different kinds of consumers or green products. That means when marketers want to promote different green products to different consumers, they should use diverse marketing tools.

6.2 Marketing implication

- **Environment awareness does have effects on green purchase intention**

In general, environment awareness is considered as the most important factor to affect green consumption. Environment awareness may be an incentive to let consumers purchase green product. But in our study, we can see that the environment awareness is not the most important determinant.

From our analytic result, under testing low-involvement products, the environment awareness has strong effects on green purchase intention. But under testing high-involvement products, the environment awareness has slight effect on green purchase intention. That is because the low-involvement products are usually low-price or daily use goods; they don't have much difference of product attributes. Under this situation, consumers will care more about the environment

awareness, so people tend to purchase low-involvement products because of environment awareness.

But the high-involvement products are usually high- price or durable goods; there is much difference between products. Under this situation, consumers will be more realistic and care more about the benefit and product attributes brought by products than environment awareness, so the environment awareness slightly affects green purchase intention. In our analytic result, environment awareness can affect green purchase intention directly or indirectly through other constructs. Although effect of environment awareness is changed under different kinds of consumers or products, it still works.

- **High-price green products are not moral products**

In previous literatures, researchers usually used psychology constructs to build conceptual framework for green products. The angle that they try to analyze green consumption is from inside and outside emotion. But in our study, we use several construct about marketing to build our conceptual framework, because we think the green products also can be promoted. According to the analytic result, we can find environment awareness is not the only and most important factor to affect green purchase. That means people will not buy green products just because they concern about the environment issues. That also means we should not consider green products as moral goods and only use moral incentives to sell them. We can see Product-related information acquisition, consumer perceived value and consumer perceived risk all effectively affect green purchase intention. We prove that green products still are affected by marketing tools, and it is available for us to make marketing strategy for green products.

- **Environment awareness has no effects on consumer perceived value**

In our thesis, we assume that environment awareness will affect consumer perceived value. Once consumer has more environment awareness, they will perceive more value about purchasing green products. But according to analytic result, we find the hypothesis between environment awareness and consumer perceived value does not exist at all. Thus, we can say consumer perceive value

is realistic construct and it is only about product attribute but the feeling of consumers.

- **Effects of product-related information acquisition depends on different products**

Product-related information acquisition means the level of consumers' perceived product information. People will pay less attention on low-price products but they will pay more attention on high-price products. Based on this definition, we compare the result and difference of low-price and high-price green products. We find under testing low-price green products; the effect of product-related information acquisition on green purchase intention is slight. But under testing high-price products, the effect of product-related information acquisition on green purchase intention is strong.

- **How to promote low-price green products**

First of all, the effect of consumer perceived value is still important when we market low-price green products. So, marketers should make consumers feel valuable then they will buy your products. When we market low-price green products, we can also use environment awareness to be our marketing tool. Environment awareness can indirectly affect green purchase intention through product-related information acquisition, consumer perceived risk and green purchase attitude. In general, when consumers face the low-price products, they can only perceived slight value from financial part. So, we can sell our products through satisfying their needs of protecting environment. We can lead consumers to purchase green products by motivating them with environment awareness.

- **How to promote high-price green products**

When marketers face high-price green products, environment awareness should not be the most important marketing tool. When consumers purchase high-price products, they will become more realistic. Under this situation, we should sell high-price green products as other normal high-price products. We tell consumers the benefit and advantage brought by our products, and we focus on the improved product attributes but how can it better the world. But that

doesn't mean that environment awareness is useless under this situation. According to our hypotheses result, under testing high-involvement products, environment awareness can positively affect product-related information acquisition, and the effect of product-related information acquisition on green purchase intention is strong too. So environment awareness can still affect consumers to purchase high-involvement green products.

Besides, when consumers purchase high-involvement products, they will feel riskier. From analytic result, consumer perceived risk has great effect on green purchase intention under testing high-involvement products. We also find that product-related information acquisition has great effect on green purchase intention under testing high-involvement products. And we also find product-related information acquisition has great effect on consumer perceived risk. That shows when consumers understand more about products, they will feel more safety. Thus, we can use product-related information acquisition to reduce the negative effect caused by consumer perceived risk and increase green purchase intention. For example, we can design some channel to let consumers can easily gain the information of our products.

6.3 Directions for future research

1. According to previous researches, environment knowledge is an important factor of green consumption. And price comparison also is considered as a determinant of consumer behavior. But in our study, they seem to be useless. We think the reason is they should be isolated from environment awareness and consumer perceived value. The future research can consider environment knowledge and price comparison as a single construct respectively and analyze the effects caused by environment knowledge and price comparison more clearly.
2. In our study, we separate consumers with income-level and education-level to compare the difference of result. But there are still some other kinds of consumers not tested. Future research can use other characteristics like personality or even environment knowledge to do the sample clustering.
3. Our samples are all focused on Taiwan, so the conceptual framework proposed by us is suitable for Taiwan people. But consumers with different culture may not be explained by this conceptual framework. Future research can collect samples from other country and compare the difference.

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Appendix

親愛的先生/女士，您好：

這是一份關於購買綠色產品(環保產品)的學術問卷，主要是探討消費者對於綠色產品(環保產品)的購買研究。本研究將針對「再生紙張」與「變頻空調」進行研究。希望藉由您的寶貴意見，了解消費者購買綠色產品的考量因素。您所填的所有資料僅作「學術論文」分析用途，並且完全保密，請您放心填寫，感激您的協助與幫忙。

國立交通大學 交通運輸研究所

填答者資料調查

性別 男 女

年齡 18~24 25~30 30~40 40~50 50 以上

年收入 10 萬以下 10~30 萬 30~50 萬 50~100 萬 100 萬以上

最高學歷 國小 國中 高中職 大專 研究所以上

請您對以下題目的同意程度圈選 1 至 5 的評分，其中「不同意」給 1 分，「很同意」給 5 分，以此類推。

- | | 不
同
意 | 稍
微
不
同
意 | 普
通 | 稍
微
同
意 | 很
同
意 |
|--------------------------------|-------------|-----------------------|--------|------------------|-------------|
| 1. 我會擔心環境衝擊對人類帶來的影響..... | 1 | 2 | 3 | 4 | 5 |
| 2. 我不希望環境繼續惡化下去..... | 1 | 2 | 3 | 4 | 5 |
| 3. 我願意幫助減少環境破壞..... | 1 | 2 | 3 | 4 | 5 |
| 4. 我會主動關心環境破壞的相關資訊..... | 1 | 2 | 3 | 4 | 5 |
| 5. 我會支持並身體力行環保活動(ex:資源回收)..... | 1 | 2 | 3 | 4 | 5 |
| 6. 我會向他人提倡環保概念..... | 1 | 2 | 3 | 4 | 5 |

7. 我會邀請他人一同進行環保活動(ex:資源回收).....1 2 3 4 5

「再生紙」購買調查

參考資料

A4 再生紙 500 張參考市價：120 塊台幣

A4 一般紙張 500 張參考市價：105 塊台幣

● 請問您是否曾經購買過「再生紙」 是 否

● 以下對於「再生紙張」的敘述，知道的請打勾

- () 每製造一公噸紙張（約相當於五千份報紙）須消耗二十棵二十年到四十年的樹木。
- () 使用廢紙來造紙比用原木紙漿可以減少空氣污染、水污染與能源消耗。
- () 報章雜誌使用的黏膠會降低再生紙的品質。
- () 再生紙漿必須添加一定比例的原生紙漿，否則容易造成品質低劣或製造流程的問題。
- () 再生紙價格比原木紙漿做的紙類貴是因為多了一道脫墨的加工。

● 本問卷評分方式：請針對題目說明與題意填答。請您對题目的同意程度圈選 1 至 5 的評分，其中「不同意」給 1 分，「很同意」給 5 分，以此類推。

- | | 1 | 2 | 3 | 4 | 5 |
|--|-------------|-----------------------|--------|------------------|--------|
| | 不
同
意 | 稍
微
不
同
意 | 普
通 | 稍
微
同
意 | 同
意 |
| 1. 我經常使用再生紙..... | 1 | 2 | 3 | 4 | 5 |
| 2. 我對再生紙很有興趣..... | 1 | 2 | 3 | 4 | 5 |
| 3. 我會希望瞭解再生紙的產品資訊..... | 1 | 2 | 3 | 4 | 5 |
| 4. 我會主動搜尋再生紙的相關產品資訊..... | 1 | 2 | 3 | 4 | 5 |
| 5. 我會仔細比較再生紙跟一般紙張的產品差異性(功能、外觀、品牌)..... | 1 | 2 | 3 | 4 | 5 |
| 6. 我會從各種管道搜尋再生紙的產品資訊..... | 1 | 2 | 3 | 4 | 5 |

	1	2	3	4	5
			稍 微 不 同 意	普 通	稍 微 同 意
7. 我會在參考足夠產品資訊後才決定是否購買再生紙.....	1	2	3	4	5
8. 我會比較再生紙和其他一般紙張的價格.....	1	2	3	4	5
9. 我無法接受再生紙與一般紙張有過大的價差.....	1	2	3	4	5
10. 我介意再生紙的價格比一般紙張高.....	1	2	3	4	5
11. 我不願意多花錢購買再生紙.....	1	2	3	4	5
12. 我覺得不值得多花錢購買再生紙.....	1	2	3	4	5
13. 與其購買再生紙，我寧可購買較便宜的一般紙張.....	1	2	3	4	5
14. 我對再生紙持有正面態度.....	1	2	3	4	5
15. 我支持使用回收廢紙製作的再生紙.....	1	2	3	4	5
16. 我會考慮購買再生紙.....	1	2	3	4	5
17. 我會考慮改為使用再生紙.....	1	2	3	4	5
18. 購買前我會參考親朋好友的使用經驗.....	1	2	3	4	5
19. 「親朋好友的使用經驗」對我很有影響力.....	1	2	3	4	5
20. 我希望親朋好友認同我購買再生紙.....	1	2	3	4	5
21. 「親朋好友的意見」對我很有影響力.....	1	2	3	4	5
22. 我希望有方便的購買管道.....	1	2	3	4	5
23. 我覺得有方便的購買管道很重要.....	1	2	3	4	5

- | | | | | | |
|-------------------------------------|---|---|-----------|----|----------|
| 24. 我會懷疑再生紙是否真的對環境有幫助..... | 1 | 2 | 3 | 4 | 5 |
| | | | 稍微
不同意 | 普通 | 稍微
同意 |
| 25. 我會懷疑再生紙提供環保憑證是否可靠..... | 1 | 2 | 3 | 4 | 5 |
| 26. 我會擔心再生紙的紙張品質過於低劣..... | 1 | 2 | 3 | 4 | 5 |
| 27. 我會擔心再生紙張使用上(書寫、列印)的效果不如預期..... | 1 | 2 | 3 | 4 | 5 |
| 28. 我擔心再生紙是否真的可以減少對環境的衝擊..... | 1 | 2 | 3 | 4 | 5 |
| 29. 我擔心再生紙的製作過程(使用過程)反而產生更多的污染..... | 1 | 2 | 3 | 4 | 5 |



「變頻空調」購買調查

參考資料

變頻空調 (國際牌, 分離式, 五坪大小用) 參考市價: 24,900 塊台幣

傳統空調 (國際牌, 分離式, 五坪大小用) 參考市價: 17,500 塊台幣

- 請問您是否購買過「變頻空調」 是 否

- 以下對於「變頻空調」的敘述, 知道的請打勾

- () 變頻空調有分為直流電與交流電。
- () 直流變頻空調比交流變頻空調更為省電。
- () 變頻空調的電流較平穩, 因此可比非變頻空調省電達三十%到五十%。
- () 傳統非變頻空調, 壓縮機會不斷開關, 不僅容易折損壓縮機壽命, 而且耗費多餘的電力。
- () 變頻分離式空調, 會依室內開啟的機台數來決定提供的冷媒流量, 不會浪費用電。

- 本問卷評分方式: 請針對題目說明與題意填答。請您對题目的同意程度圈選 1 至 5 的評分, 其中「不同意」給 1 分, 「很同意」給 5 分, 以此類推。

- | | 1 | 2 | 3 | 4 | 5 |
|---------------------------------------|-------------|-----------------------|--------|------------------|--------|
| | 不
同
意 | 稍
微
不
同
意 | 普
通 | 稍
微
同
意 | 同
意 |
| 1. 我有購買變頻空調的經濟能力..... | 1 | 2 | 3 | 4 | 5 |
| 2. 我有認真思考過要購買變頻空調..... | 1 | 2 | 3 | 4 | 5 |
| 3. 我對變頻空調這項產品有興趣..... | 1 | 2 | 3 | 4 | 5 |
| 4. 我希望瞭解變頻空調的產品資訊..... | 1 | 2 | 3 | 4 | 5 |
| 5. 購買變頻空調前我會主動搜尋相關資訊..... | 1 | 2 | 3 | 4 | 5 |
| 6. 我會仔細比較變頻空調跟傳統空調的產品差異性(功能、外觀、品牌)... | 1 | 2 | 3 | 4 | 5 |

- | | 1 | 2 | 3 | 4 | 5 |
|---------------------------------|---|---|-----------|----|----------|
| 7. 我會從各種管道搜尋變頻空調的產品資訊..... | 1 | 2 | 3 | 4 | 5 |
| | | | 稍微
不同意 | 普通 | 稍微
同意 |
| 8. 我會在參考足夠產品資訊後才決定是否購買變頻空調..... | 1 | 2 | 3 | 4 | 5 |
| 9. 我會比較變頻空調和傳統空調的價差..... | 1 | 2 | 3 | 4 | 5 |
| 10. 我無法接受變頻空調與傳統空調有過大的價差..... | 1 | 2 | 3 | 4 | 5 |
| 11. 我介意變頻空調的價格比傳統空調高..... | 1 | 2 | 3 | 4 | 5 |
| 12. 我不願意多花錢購買變頻空調..... | 1 | 2 | 3 | 4 | 5 |
| 13. 我覺得不值得多花錢購買變頻空調..... | 1 | 2 | 3 | 4 | 5 |
| 14. 與其購買變頻空調，我寧可購買較便宜的傳統空調..... | 1 | 2 | 3 | 4 | 5 |
| 15. 我對變頻空調持有正面的態度..... | 1 | 2 | 3 | 4 | 5 |
| 16. 我支持使用比較節省電力的變頻空調..... | 1 | 2 | 3 | 4 | 5 |
| 17. 我願意購買變頻空調..... | 1 | 2 | 3 | 4 | 5 |
| 18. 我願意改為使用變頻空調..... | 1 | 2 | 3 | 4 | 5 |
| 19. 購買變頻空調前我會參考親朋好友的使用經驗..... | 1 | 2 | 3 | 4 | 5 |
| 20. 我覺得「親朋好友的使用經驗」對我很有影響力..... | 1 | 2 | 3 | 4 | 5 |
| 21. 我希望親朋好友認同我購買變頻空調..... | 1 | 2 | 3 | 4 | 5 |
| 22. 我覺得「親朋好友的意見」對我很有影響力..... | 1 | 2 | 3 | 4 | 5 |
| 23. 我希望有方便的購買管道..... | 1 | 2 | 3 | 4 | 5 |

24. 我覺得有方便的購買管道很重要.....1 2 3 4 5
25. 我會擔心購買到的並不是真正的變頻空調.....1 2 3 4 5
26. 我會懷疑環保憑證的可靠性.....1 2 3 4 5
27. 我會擔心變頻空調在保養和維修上比較麻煩.....1 2 3 4 5
28. 我會擔心變頻空調的使用方式與傳統空調不同.....1 2 3 4 5
29. 我擔心變頻空調是否真的可以減少對環境的衝擊.....1 2 3 4 5
30. 我擔心變頻空調的使用過程反而產生更多的污染.....1 2 3 4 5

1 2 3 4 5
 不 稍 普 稍 同
 同 微 通 微 意
 意 不 同 同 意

