Exploratory research for DfSB: the experience and intention of using the shopping bags

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Abstract

Governments have realized that waste plastic treatment has become a significant problem and thus have gradually begun to develop green plastic. The average household generally has environmental shopping bags, but these bags may only use once or twice. Because of the fear of waste and not throwing them away, this creates another problem. While providing convenience for consumers, plastic shopping bags excessively use and undergo unsuitable recovery processing, causing a severe waste of energy and environmental pollution. Therefore, judging from the actual use status of consumers, in the process of improving the environmentally friendly design of shopping bags, it isn't easy to achieve the goal of extending their life cycle by employing reuse. This study conducts a pilot investigation to identify consumers' experience and habits towards shopping bags and collect perspective and continuous use factors. The results show that: (1) The main way of getting a shopping bag is with giveaways. (2) The primary motivation for consumers to carry shopping bags is to carry the goods. (3) Shopping malls for everyday items are the most frequent places to bring shopping bags. (4) The three most usually not used shopping bag sizes. (5) Significant changes in environmental protection are the reason for the continued use. Finally, we follow seven design strategies to suggest shopping bags design in the future.

Keywords: Design for sustainable behavior, consumer experience, shopping bags, design strategy

1. Introduction

Most of the stores offered plastic bags to consumers for convenience. But overcommit and improper recycling, and other reasons, resulting in a severe waste of energy resources and environmental pollution, especially the ultra-thin plastic bags easy to break. Most were arbitrarily discarded, as "white pollution" the primary source.

Muthu et al. (2011) show the entire life cycle phase of different shopping bags from the manufacturing stage to the disposal stage. The product disposes of the three possibilities: reuse the product for the same or other purposes; recycle the product; dispose of it off to the landfill. Human dimensions in consumer behavior rule the decision of a product's disposal phase and consequently the environmental impact. Therefore, out of all the stages of a product's life cycle, the disposal phase is critically related to ecological issues and is solely decided by the consumer's attitude and the governmental policies to facilitate the recycling of the product.

Initially, the government's policy pushes the shopping bag to replace a plastic bag to reduce the plastic bag use times and waste amount. Still, because the manufacturers make mass shopping bags, that becomes an additional giveaway. At the same time, it began to accumulate a wide range of shopping bags in many homes. The reports show that more than half of the data presented by the family has about 20 shopping bags. 40% of the respondents have more than ten shopping bags at home, equivalent to hoarding more than 100 plastic bags (Green Sense, 2010). Some respondents said there were different sizes of shopping bags at home. But some will be because of color, trademarks, and other factors that are abandoned at home. That is the situation. On the one hand, Merchants hope that the green bags promote the brand, but on the other hand, they will reduce the use of the public desire.

At present, more and more countries and regions have restricted the production, sale, and use of shopping bags. From the source to take measures of urge enterprises to produce durable, easy to recycle shopping bags. To guide and encourage the consumer to use shopping bags for promoting the comprehensive utilization of resources, protect the ecological environment, and further promote energy conservation work. The countries for shopping bags supporting policies and measures, the contents are as follows:

Japan government to reduce garbage, that started from consumer, city, town, and industry to implement the Packaging container waste management. On the other hand, the industry side legally stipulates that the relevant sector has the obligation of resource container. The packaging container must print with the identification patterns of the material, resource recycling, and other classification. Consumers had a responsibility to meet the waste reduction and classification requirements. The recycling of shopping bags is widespread in Japan. Many families used the combustible shopping bags as garbage bags when they went to the traditional markets, supermarkets, department stores. And some delivery of newspapers mans also recycled the transparent plastic bags, returned to the manufacturers, and then made other resources to use. In addition, in 2020, the Japanese government will start charging for plastic bags (Wang, 2020).

Singapore National Environment Agency (2007) announced the first Wednesday of each month as "shopping bag day," Encourage people to bring their recycling shopping bags. Through the newspapers, posters, etc., the government conveys the use of the concept of shopping bags to change people's shopping habits. According to the Environmental Bureau survey, Singapore uses only 15% of consumer shopping bags in 2018 (SPH Digital News, 2018). In 2006 Hong Kong, for the first time implementing "shopping bag day," 62% of the public responded.

In New York, took strict measures to reduce the use of plastic shopping bags, the government requested that stores larger than 5,000 square feet are required to plan an in-store recycling program and sell reusable shopping bags. Approximately 700 food stores and large retailers must recycle used bags and provide pipelines to transfer them to manufacturers or third-party recyclers. That store was supplied to the consumer's shopping bag and must be printed "Please return this bag to a participating store for recycling." (Reuters, 2007)

In addition, another incentive for the intention to carry reusable shopping bags is the brand value of the shopping bags like the shopping bag of luxurious brands, such as LV, Chanel (Fig 1), Balenciaga (Fig 2), etc.

Source: BALENCIAGA US Office website *https://www.balenciaga.com/us/bazar-handbags_cod45316920nt.html#*

Fig. 1 BALENCIAGA-Arena Leather Bazar Extra-Large Shopper Tote Bag

Source: Chanel Office website *https://www.chanel.com/tw/fashion/p/A66941B0318194305/shopping-bag-mixed-fibers-imitation-pearls-silver-tone-metal/*

Fig. 2 Chanel Shopper Bag

In real-world shopping, social status leads people to signal their sustainable behavior. Shoppers shopping at a high-status sustainable grocery chain used more shopping bags displaying the chain's name than shoppers of a lower-status sustainable chain. Since using an original shopping bag from the sustainable grocery chain does help demonstrate sustainable behavior publicly, this is valued more by the high-status sustainable grocery chain shoppers. However, status motives can motivate people to purchase at a sustainable grocery store. Shoppers of the high-status sustainable grocery chain might do it for their benefit and are not concerned with the environment, not accounting for the non-sustainable effects of buying new shopping bags (Wal et al., 2016).

Multi-sociological and psychological motivators behind consumption behavior impel people to consume insatiable products and services (Jackson, 2005). To develop a valid critique of environmentally and socially significant consumption, a better understanding of what users do with and how they interact with products, and the hidden factors behind the daily decision-making process.

Therefore, we conducted a pilot study to investigate the habits and experiences of shopping bag use, explore the current situation of shopping bag use and the cognition of shopping bags, and rethink the challenges of government policy and shopping bag design. Finally, we proposed further suggestions for the sustainable behavioral design of shopping bag use.

2. Literature Reviews

2-1 Design of sustainable behavior

Sustainable design considers environmental, economic, and social impacts enacted throughout the product lifecycle (Mattson et al., 2019). These interrelated domains often refer to the three pillars and the triple bottom line of sustainability (Elkington, 1997). Design for Sustainable Behaviour (DfSB) is a maturing research area concerned with applying design strategies to influence consumer behavior towards more sustainable action during a product use phase (Wilson et al., 2015).

From a design practice perspective, Designers shape the development of products and services which directly impact society and the environment (Papanek, 1971). The application of sustainable design strategies can significantly reduce lifecycle impacts (Lewis et al., 2001). However, consumer behavior often determines consequences that occur during use (Bhamra et al., 2008). Influencing user behavior can be challenging. Despite over a decade of campaigns encouraging consumers to behave differently and more excellent product

efficiency, consumers are slow to adopt more sustainable behaviors, and behavioral changes are often short-lived.

Designers can reduce use impacts by purposefully shaping behavior towards more sustainable practices (Bhamra et al., 2008; Lockton et al., 2008; Wever et al., 2008). Early research identified Eco-feedback (McCalley and Midden, 2006), Behavior Steering (Akrich, 1992; Jelsma and Knot, 2002), and Persuasive Technology (Fogg, 2003) as potential strategies that which can integrate into product design to influence user behavior (Lilley, 2007). Figure 3 describes each approach and indicates how power in decision-making is retained by the user or delegated to the product.

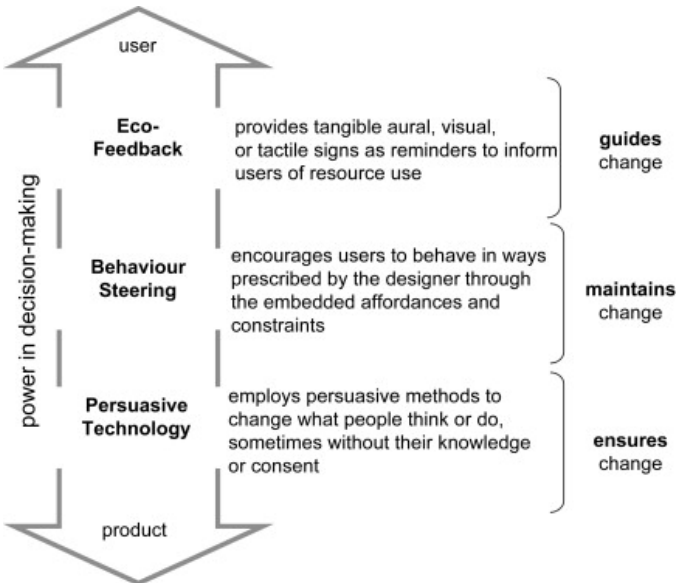

Fig 3. Strategies for designing sustainable behavior (Lilley, 2009)

For instance, Lilley et al. (2005) discussed three product-led interventions within a larger context of other types of interventions. Yet, many studies have also explored and refined design interventions on consumer behavior. There is a need to combine existing theories into a framework on consumer behavioral change. Fig. 4 shows the consumer behavioral change framework that is the result of relevant influential attributes and design interventions/attributes (Chan et al., 2014, Daae and Boks, 2015, Klöckner and Blöbaum, 2010, Lilley, 2009, Zachrisson and Boks, 2010; Szopik-Depczyńska et al., 2018). The influential attributes include attitude, social characteristics, intentions, and affection. These attributes may come from knowledge, beliefs, subjective values, norms (personal and social), social roles, constraints, emotions, etc. In addition, the design interventions/strategies include eco-feedback, behavior steering, and persuasive technology.

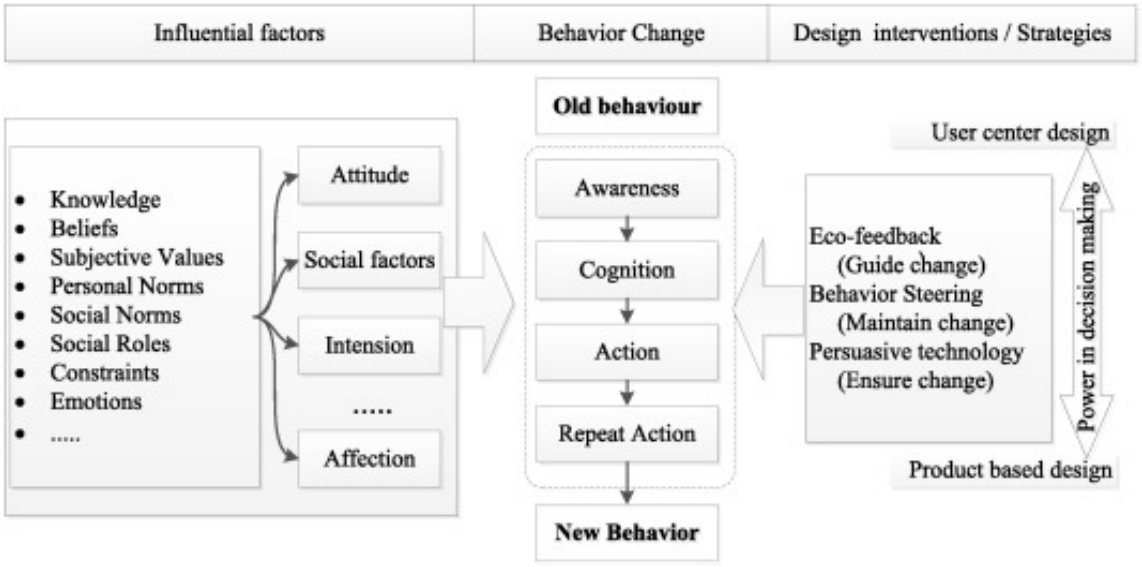

Fig 4. The hybrid framework of behavioral change (Bhamra et al., 2008, Chan et al., 2014, Daae and Boks, 2015, Klöckner and Blöbaum, 2010, Lilley, 2009, Zachrisson and Boks, 2010)

There are currently high levels of concern about consumer behavior changes before the eco-design of products or processes. Prior studies have presented the importance of Design for Sustainable Behavior (DfSB). DfSB contemplates understanding users' behavior and establishing a target behavior by applying strategies that enable it, combining good design and effectiveness (Boks, 2012; Lockton et al., 2013). Lilley (2009) presents three strategies to induce sustainable behavior (Fig.3): 1. eco-feedback: providing tangible, auditory, visual, or tactile information as reminders to users about resource usage; 2. behavior steering: encouraging users to behave as planned by designers through benefits and/or constraints; and 3. persuasive technology: applying persuasive methods to change what people think or do, sometimes without their knowledge or consent. The first strategy directs the change, the second maintains it, and the third guarantees it, and all intervention levels can influence the user's behavior. Besides that, decision-making power varies, being either focused on the user or the product. Theoretically, DfSB the main approaches on 1. the study of user's mental models; 2. DfSB applicability; 3. comprehension of user's behavior, 4. translation of perceptions for use in early design phases; and 5. DfSB interventions and evaluation of their effectiveness (Wever, 2012).

Zachrisson and Boks (2010, 2012) propose a framework that considers users' attitudes towards a specific behavior determined by the product's design (good or service). They believe that a particular behavior suggestion can lead to different perspectives. According to their framework, there is a relationship between negative and positive behavior levels: inform, persuade, and determine. As the users' beliefs, attitudes and intentions align with the desired behavior. More user control can give. If the user shows a positive behavior that would be beneficial to make a habit, the product should try to keep the context around the behavior as stable as possible. Conversely, if the user shows a negative behavior or pattern that needs to break, this is impossible can be achieved by making the habit. In that case, product control should target; namely, the product should design to avoid or make that habit strange.

Otherwise, eleven strategies identified in existing product design allocate considering the varying levels of force and salience (Tromp et al., 2011): 1.create a perceivable barrier to undesired behavior, 2.make unacceptable user behavior overt (shame), 3.make the behavior a necessary activity to perform to make use of the product function, 4.provide the user with arguments for a specific behavior, 5.suggest actions, 6.trigger different motivations for the same behavior, 7.elicit emotions to trigger action tendencies, 8.activate physiological processes to induce behavior, 9.create optimal conditions for specific behaviors, 10.trigger human tendencies for automatic behavioral responses, and 11.make the desired behavior the only possible behavior to perform.

2-2 DfSB strategies

In our living space, where the environment protected the message, for example, for garbage classification, recycling, material reuse, or the government's environmental policy, which all the message was relevant to environment protection, called "Green Message." Beyond that, human body language and behaviors could present the meaning of Green Messages, too. When we started the environmentally friendly lifestyle or behaviors, that could affect other people's behaviors. Unfortunately, Consumers with environmental awareness do not mean that there is actual environmental protection behavior. That leads us to think about the relationship between consumers' performance of sustainability behavior and their motivation to use shopping bags.

Regarding customers' behavior based on the awareness of green information, the knowledge, attitude, reuse, and resource recovery of those who have participated in environmental protection activities are significantly better than those who have not (Chen, 2003). However, an issue worthy of attention is the gap between "attitude and behavior," that is, "having environmental knowledge and strong environmental protection values, attitudes, and intentions often fail to translate into green consumption and other actual environmental behaviors" (Peattie, 2010; Ceglia et al., 2015, Hanss et al., 2016). Assuming that intention and behavior are closely related, it is difficult to explain why consumers have a positive attitude towards environmental protection or green consumption but do not follow the purpose of green consumption (Young et al., 2009, Nguyen et al., 2018; ElHaffar, 2020).

There have seven strategies that can apply within the design (shown in table 1). That provided an understanding of behavioral change's psychological and behavioral factors and identified ways to use it within a design context (Tang, 2010; Tang and Bhamra, 2008).

Table 1. Design intervention strategies and examples (Wilson et al., 2015)

Strategies	Aim	How it works
1. Eco-Information – design-oriented education	To make consumables visible, understandable, and accessible to inspire consumers to reflect upon their use of resources.	1. The product expresses the presence and consumption of resources, e.g., water, energy, etc. 2. The product encourages the user to interact with resource use.

		Examples: Power-Aware Cord – Seeing Personal Energy Consumption (Interactive Institute, 2004). Tyranny of the Plug Kitchen Machines – Powering the product (Van Hoff, 2003).
2. Eco-Choice – design-oriented empowerment	To encourage consumers to think about their user behavior and take responsibility for their actions by providing them with options.	Users have a choice, and the product enables sustainable use to take place. Example: Domestic Energy Display – household system-level concept (Design Council, 2005).
3. Eco-feedback – design-oriented links to environmentally or socially responsible action	To inform users clearly about what they are doing and facilitate consumers to make environmentally and socially responsible decisions by offering real-time feedback.	The product provides tangible aural, visual, or tactile signs as reminders to inform users of resource use. Example: Wattson – the wireless energy monitor, raises awareness of energy used in the home (DIY Kyoto, 2005).
4. Eco-spur – design-oriented rewarding incentive and penalty	To inspire users to explore more sustainable usage through providing rewordings to 'prompt' good behavior or penalties to 'punish' unsustainable use.	The product shows the user the consequences of their actions through 'rewarding incentives' and 'penalties.' Example: Flower Lamp – Rewarding Energy Behaviors (Interactive Institute, 2004).
5. Eco-steer – design-oriented affordances and constraints	To facilitate users adopt more environmentally or socially desirable use habits through the prescriptions and/or constraints of use embedded in the product design.	The product contains affordances and constraints which encourage users to adopt more sustainable use habits or reform existing unsustainable habits. Example: Unilever Powder Tablet – Counteracting excessive amounts of washing powder consumption by prescribing the correct dose (Unilever, 2000).

6. Eco-technical intervention – design-oriented technical intervention	To restrain existing use habits and automatically persuade or control user behavior by design combined with advanced technology.	The product utilizes advanced technology to persuade or control user behavior automatically. Example: Energy Curtain – Interacting with Daily Light Cycles (Interactive Institute, 2004).
7. Clever design	To automatically act environmentally or socially without raising awareness or changing user behavior purely through innovative product design.	The design solution decreases environmental impacts without changing the user's behavior. Example: Integrated toilet and washbasin – decreases water use by reusing water for hand-washing to flush the toilet.

3. Methods

According to the above frameworks and the various influencing factors of consumer behavior. Revies the situation in Taiwan, although there are policies to promote shopping bags instead of plastic bags and shopping malls to provide cartons instead of bags, there is little research on the use of shopping bags among the environmental behavior of Taiwanese consumers. Therefore, this study first begins with a survey of users' experiences to explore consumers' habits in using shopping bags. And then review the further improvement of shopping design and the direction of behavioral research.

3-1 Research Processing

This article is an exploratory study. Most of the current research articles on green living and sustainable behavior in Taiwan discuss energy-saving and power-saving behaviors and seldom discuss the behaviors of eco-friendly shopping bags. Therefore, this study attempts to explore the consumer for use in life the sustainable behavior research of the environmental protection shopping bag, to understand the current situation of the preliminary.

In addition, the small number of samples is limited because the samples with excluding insufficient survey data, so statistics and analysis only start from illustrations with complete data, which can use for further research and reference. The research process is as follows:

First, this study conducted a preliminary survey on consumers' perception of environmentally friendly shopping. Based on the preliminary questionnaire survey results, we added questions to understand better the design of shopping bags that aim to change environmental protection behaviors to reduce the materials used and extend the service life of reusable shopping bags evolving consumer behavior. Finally, this study used descriptive statistical analysis and cross analysis as the data analysis tools to fully understand modern consumers' behavioral expressions and value for adopting reusable shopping bags.

3-2 Participant

We adopt street interviews to find the shopping bag users directly, including designed questionnaires and open interviews. Although it is an exploratory study, there are still interviews and discussions that need research tools to help the investigation process focus on the topic. The interviews conduct at various locations, such as large-scale supermarkets, mini-supermarkets, department stores, and traditional food markets. The only condition of the interviewees was that they carried shopping bags when they went out shopping. The research object is people's behavior of using shopping bags in their daily lives when shopping.

Due to the street access process, adopt randomly invited 33 respondents' questionnaire investigated and interview. However, in nine respondents in answer content, there are still some gaps and, due to time constraints, did not complete the full interview, so this study ended with 24 respondents' data are analyzed and discussed. This study randomly invited 24 consumers engaged in shopping to conducting a face-to-face questionnaire survey.

3-3 Interviews and Questionnaire surveys

In this study, an open interview and a questionnaire were used to collect data. The available interview content took the shopping bags carried by the interviewees as the topic of the discussion, which divide into the fundamental questions of the development, such as the experience of using shopping bags, the idea of the design of shopping bags, the way of using shopping bags, the concept of choosing shopping bags, etc. It extended the interview questions according to the different situations of the interviewees at that time. In addition, the questionnaire design divides into four stages. The first stage is the primary data survey; the second stage is on the current use situation of shopping bags; the third stage is the cross-analysis of gender, age, monthly income, and consumer behavior of using reusable shopping bags. SPSS tools mainly use to analyze frequency distribution and descriptive statistics to understand the current situation.

The characteristics of respondents include gender, age, monthly income, and the number of shopping bags at home, the usage of shopping bags, the current situation of shopping bags, the most frequent places of carrying shopping bags, the most frequent size of carrying shopping bags, the reason of continuous use of shopping bag, and the influence of user behavior.

4. Result and discussion

4-1 Descriptive analysis

This study collected 24 valid samples, and all respondents had the experience of carrying shopping bags when shopping. There are twenty-one females and three males (Fig. 5). Regarding age distribution, three respondents were 15~19 years old, twenty were 20~24 years old, and one was 25~29 years old (Fig. 6). In terms of the income distribution, one respondent monthly earned less than TWD 2,000; Four respondents monthly earn TWD 2,001 to 5,000; thirteen respondents monthly earn TWD 5,001 to 10,000; Five respondents monthly earn TWD 10,001 to 20,000; One respondent monthly earns TWD 20,001 to 30,000 (Fig. 7).

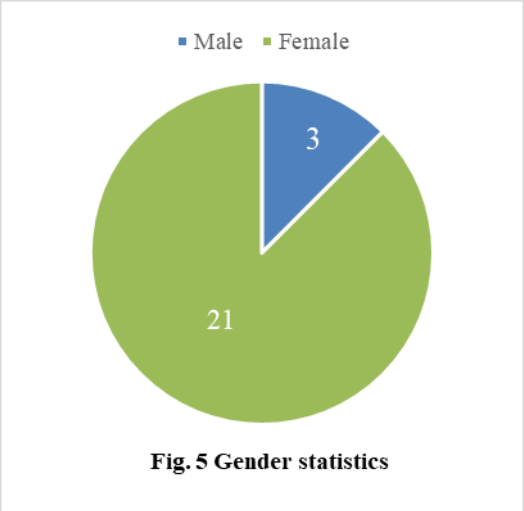

Fig. 5 Gender statistics

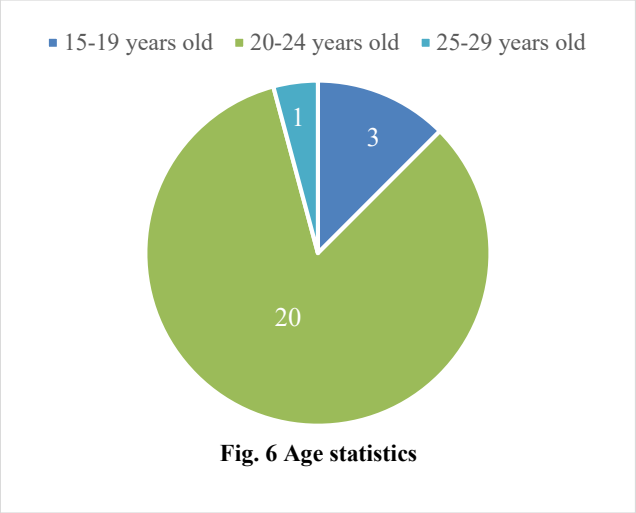

Fig. 6 Age statistics

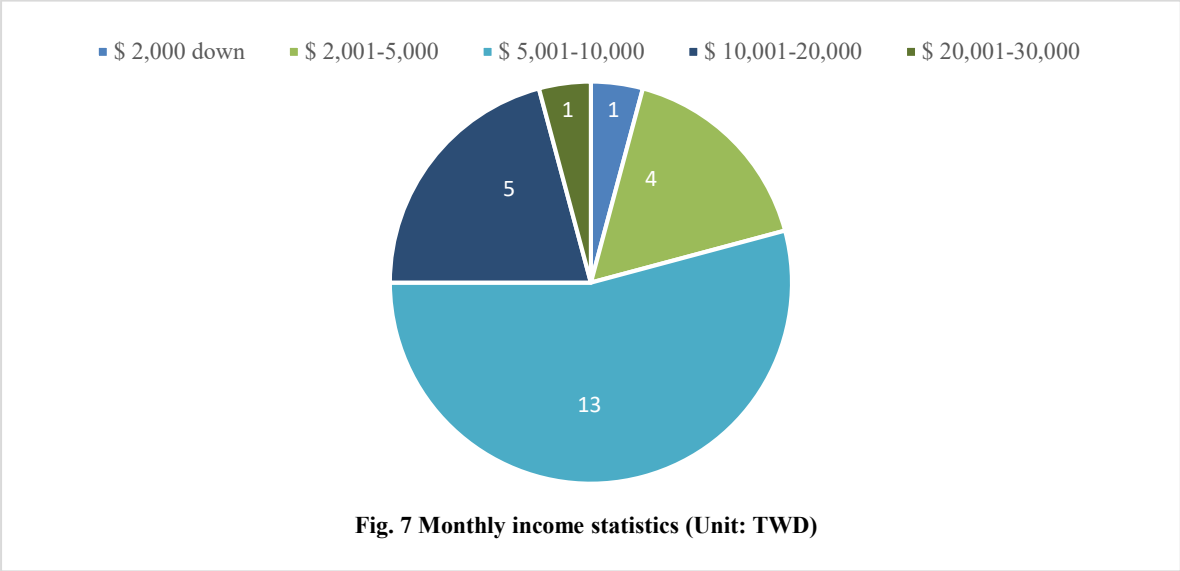

Fig. 7 Monthly income statistics (Unit: TWD)

Almost every respondent had one to three shopping bags in their home at least, and even ten of them had more than three shopping bags. So, the ubiquity of shopping bags is apparent (Fig. 8). The results show that females start to use shopping bags earlier than males (Fig. 9), reflecting that woman realize environmental issues earlier and are willing to take action (Yen et al., 2011; Tu and Kao, 2011; Lin, 2012). In the past three years, there has been an increase in the number of people who have started to use shopping bags instead of plastic bags due to the government's promotion of environmental protection policies and gradually raising consumers' awareness of environmental protection.

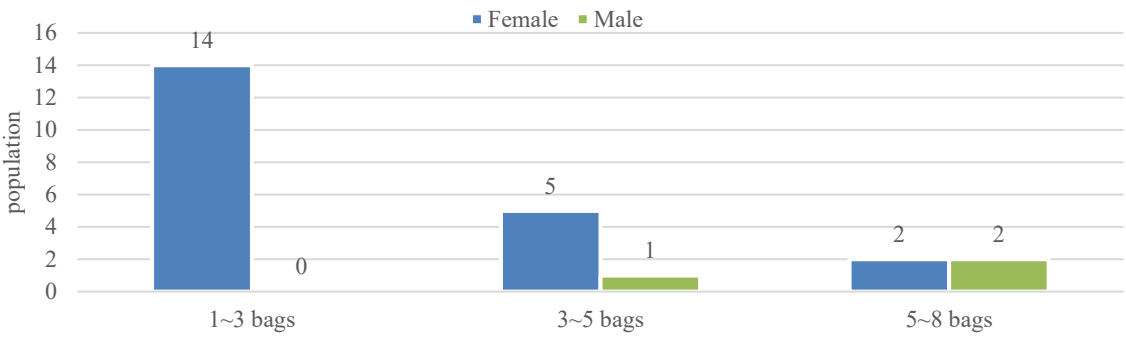

Fig. 8 Cross Analysis of Gender and Number of Shopping Bags in House

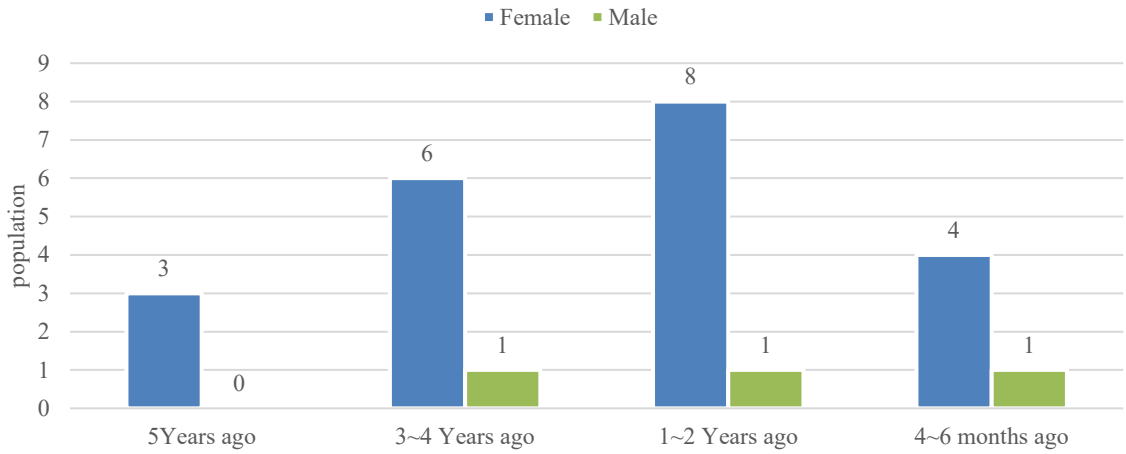

Fig. 9 Cross Analysis of Gender and the Time of Starting to Use Shopping Bags Instead of Plastic Bags

Regarding the usual frequency of going shopping, nine out of twenty-four males and females were likely to shop every two or three days, and particularly females were more (Fig. 10).

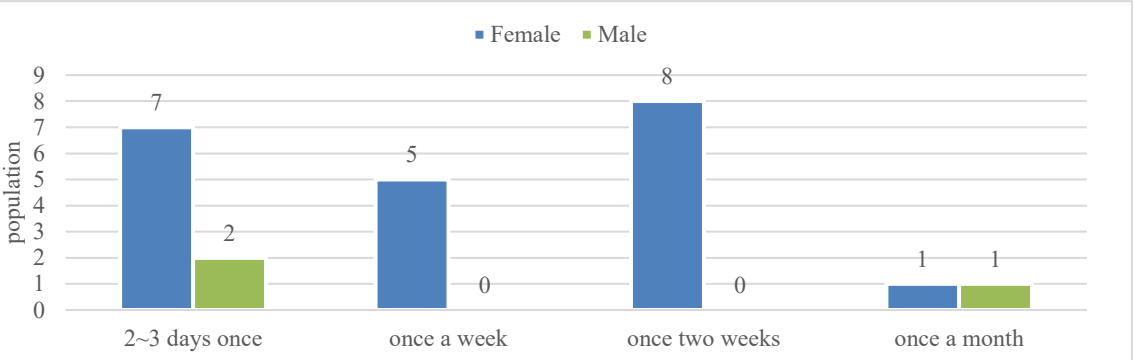

Fig. 10 Cross Analysis of Gender and the Frequency of Going Shopping in the Usual

According to Fig.11, 12, and 13, respondents with a monthly income of TWD 2,000 down accumulated about three to five shopping bags in the house and started to use shopping bags instead of plastic bags in the past one to two years, and the shopping frequency was once every two weeks. Respondents with a monthly income of TWD 5,001 to 10,000 have accumulated about one to three shopping bags in the house, and most of them started to use shopping bags instead of plastic bags one to two years ago or nearly four to six months ago. Most of them go shopping once every two to three days.

Respondents with a monthly income of TWD 10,001 to 20,000 accumulate one to three or five to eight shopping bags in the house, and most of them started to use shopping bags instead of plastic bags three to four years ago or nearly one to two years ago. Most of them go shopping once every two to three days.

Respondents with a monthly income of TWD 20,001 to 30,000 accumulate about three to five shopping bags in the house, and most of them started to use shopping bags instead of plastic bags in the past three to four years, and the shopping frequency is once every two weeks.

Almost every income range has accumulated several shopping bags at home. More people have started to use shopping bags instead of plastic bags in the past one to two years. In addition, four respondents started to use shopping bags earlier than five years ago, with monthly incomes ranging from TWD 2,001 to 5,000 and TWD 5,001 to 10,000, respectively. Although there is no absolute relationship between income and the start of using shopping bags, it can know that the habit of using shopping bags began five years ago. Regarding shopping times, respondents with a monthly income of TWD 5,001 to 10,000 and a monthly income of TWD 10,001 to 20,000 tend to shop once every two to three days, while respondents with higher and lower incomes tend to shop once every day two weeks. Respondents who accumulated many shopping bags used shopping bags for a long time and shopped more frequently are concentrated in the income range of TWD 5,001 to 10,000 per month.

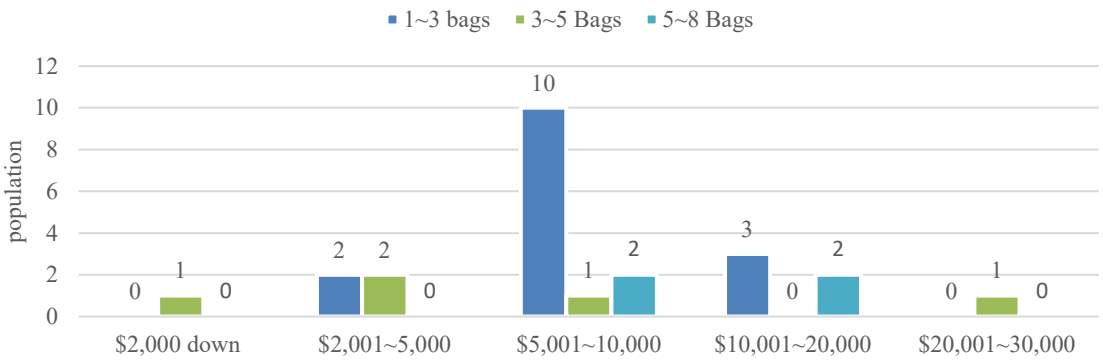

Fig. 11 Cross Analysis of Monthly Income and Number of Shopping Bags in House

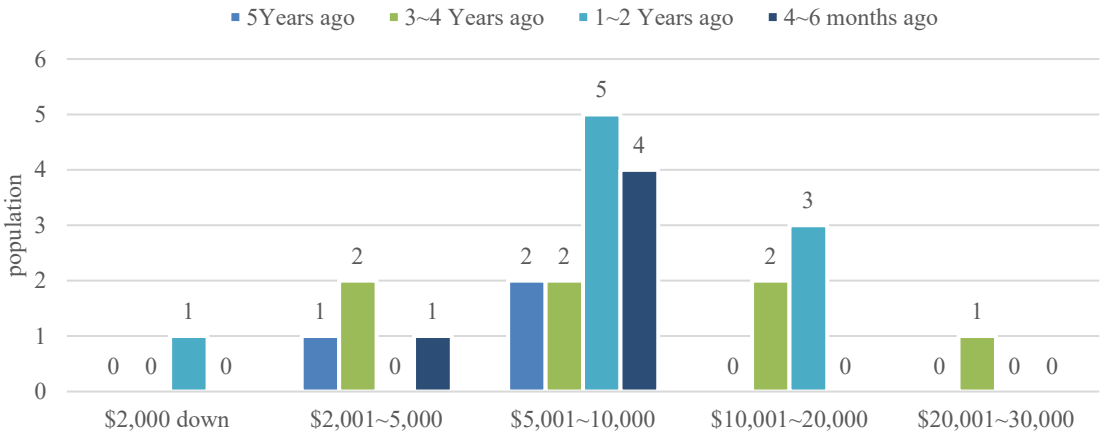

Fig. 12 Cross Analysis of Monthly Income and Time of Starting to Use Shopping Bags Instead of Plastic Bags

Fig. 13 Cross Analysis of Monthly Income and Usual Frequency of Going Shopping

4-2 Way for getting shopping bags

The top three ways for getting shopping bags were "1. buying products with shopping bags as gifts", "2. offered as gifts by the shopping place", "8. Buying at the lifestyle department store" (Fig. 14). The female respondents usually obtained the shopping bag by the gift of the product. The most common way for male respondents to get shopping bags was because of the complimentary shopping place. Some respondents still use shopping to get shopping bags, and they tend to buy shopping bags from lifestyle department stores (e.g., Daiso, Xiaobei, Poya). It can see that the majority of respondents still get shopping bags as gifts.

Fig. 14 Cross Analysis of Gender and Ways of Obtaining Shopping Bags

It further learns that in terms of age distribution (Fig. 15), "1. buying products with shopping bags as gifts", "2. offered as gifts by the shopping place", and "3. Gift from others" that more respondents were twenty to twenty-four years old and the monthly income during TWD 5,001 to 10,000. And otherwise "8. Shopping bags in Living department stores (EX: Daiso, Xiaobei, Poya)", while more respondents with a monthly income of TWD 2,001 to 5,000 (Fig. 16).

Fig. 15 Cross Analysis of Age and Ways of Obtaining Shopping Bags

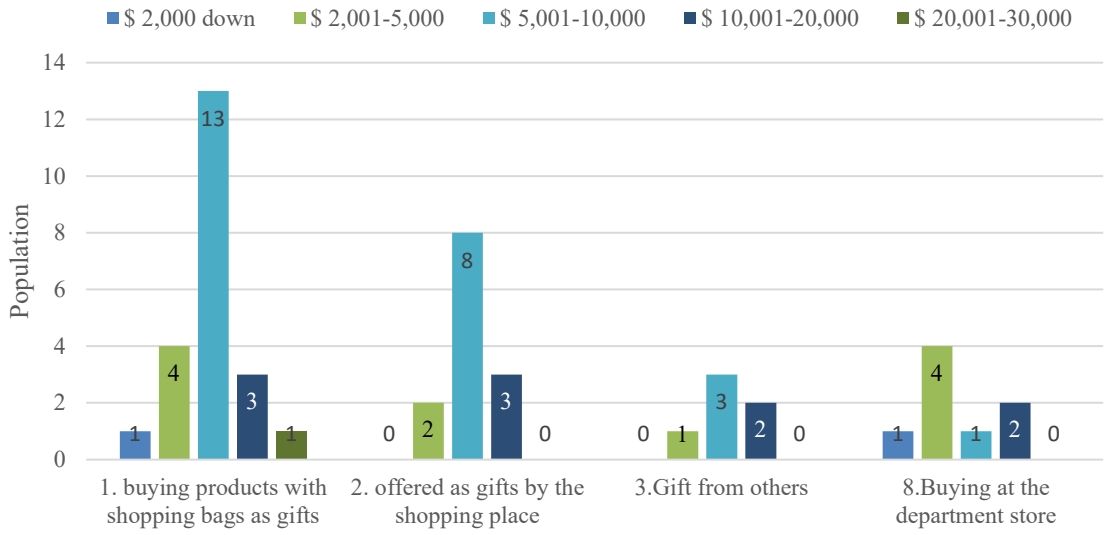

Fig. 16 Cross Analysis of Monthly Income and Ways of Obtaining Shopping Bags

4-3 Motivation for carrying shopping bags while shopping

The motivation for carrying shopping bags is to bring goods and reduce plastic bags in response to environmental protection. And Another is to take shopping bags by yourself because shopping places do not provide free packs (Fig. 17).

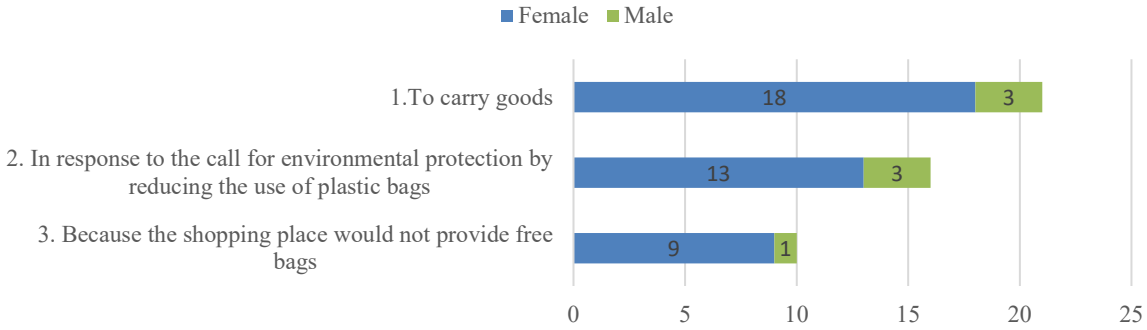

Fig. 17 Cross Analysis of Gender and Motivation for Carrying Shopping Bags While shopping

Further learned "2. In response To the call for environmental protection by reducing the use of plastic", and" 3. Because the shopping place would not provide free bags ", that more respondents were twenty to twenty-four years old (Fig. 18) and the monthly income during TWD 5,001 to 10,000 (Fig. 19).

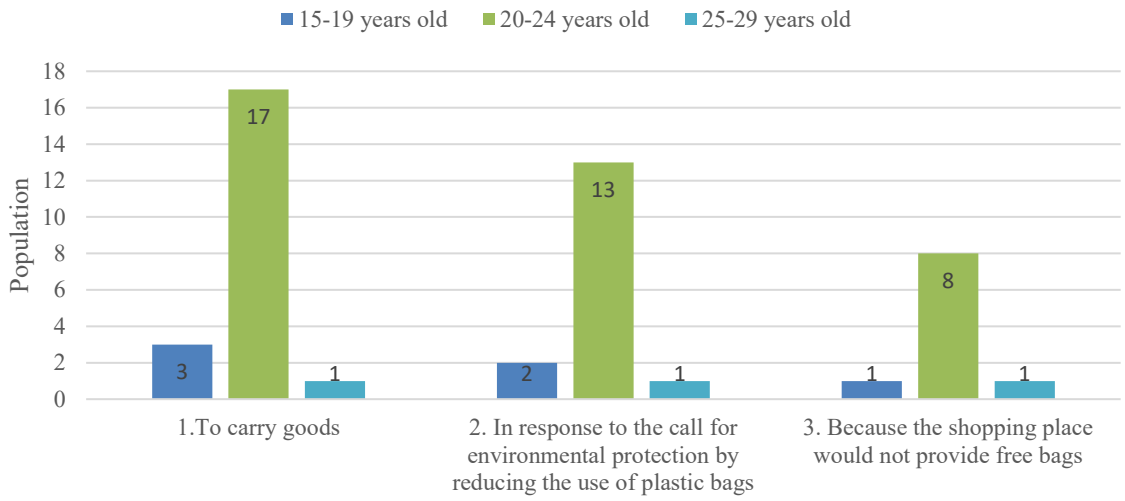

Fig. 18 Cross Analysis of Age and Motivation for Carrying Shopping Bags While shopping

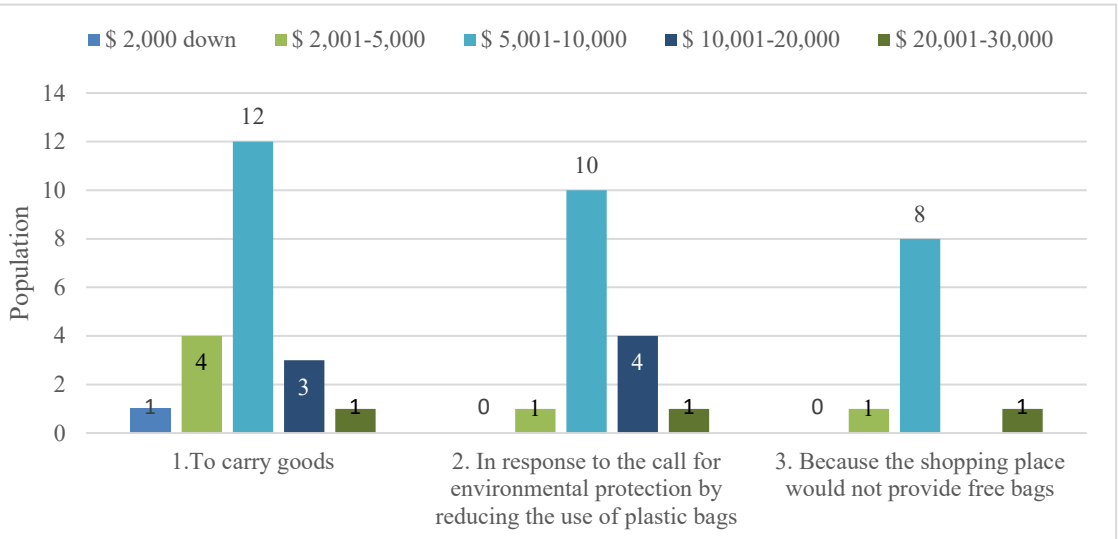

Fig. 19 Cross Analysis of Monthly Income and Motivation for Carrying Shopping Bags While shopping

4-4 The most frequent place to go with shopping bags

The top three shopping places most frequently visited by all respondents with shopping bags (Fig. 20): "2. mart (e.g., PX mart, Simple mart)"," 4. Hypermarket (e.g., Carrefour)", 3. Lifestyle department stores (Xiaobei, Poya) that more respondents were twenty to twenty-four years old (Fig. 21) and the monthly income during TWD 5,001 to 10,000 (Fig. 22).

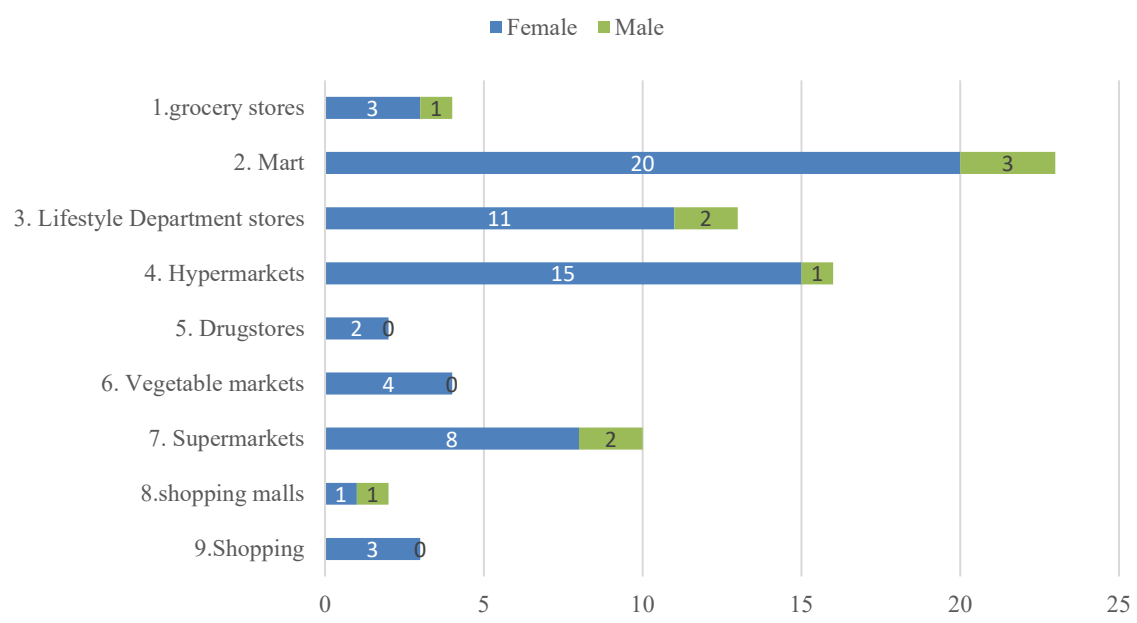

Fig. 20 Cross Analysis of Gender and Most Frequent Place to Go with Shopping Bags

Fig. 21 Cross Analysis of Age and Most Frequent Place to Go with Shopping Bags

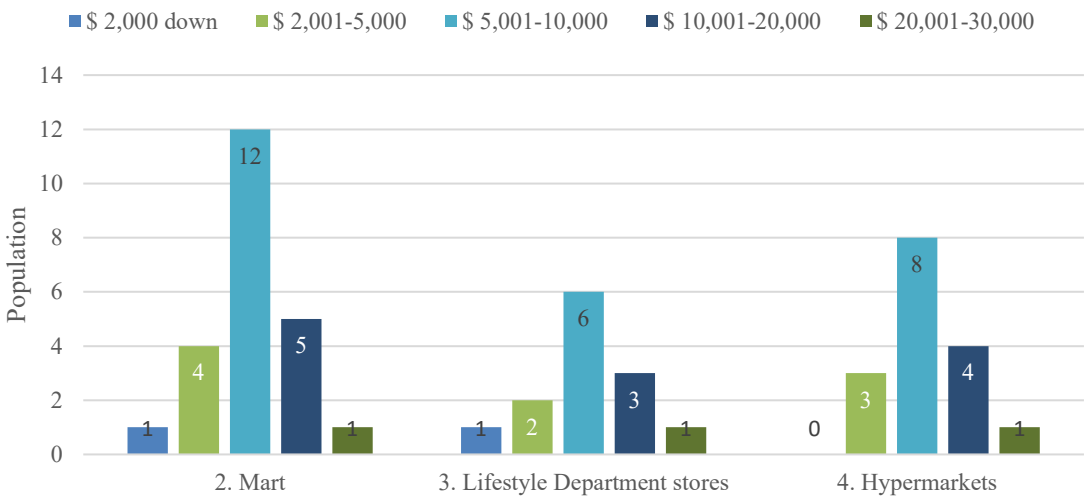

Fig. 22 Cross Analysis of Monthly Income and Most Frequent Place to Go with Shopping Bags

As can be seen from Figure 23, the respondents had one to three and five to eight shopping bags in the house, and their top three shopping places are "2. Mart", "4. Hypermarkets", "3. Lifestyle Department stores". The respondents had three to five shopping bags in the house, and their top three shopping places are "2. Mart", "4. Hypermarkets", "3. Lifestyle Department stores".

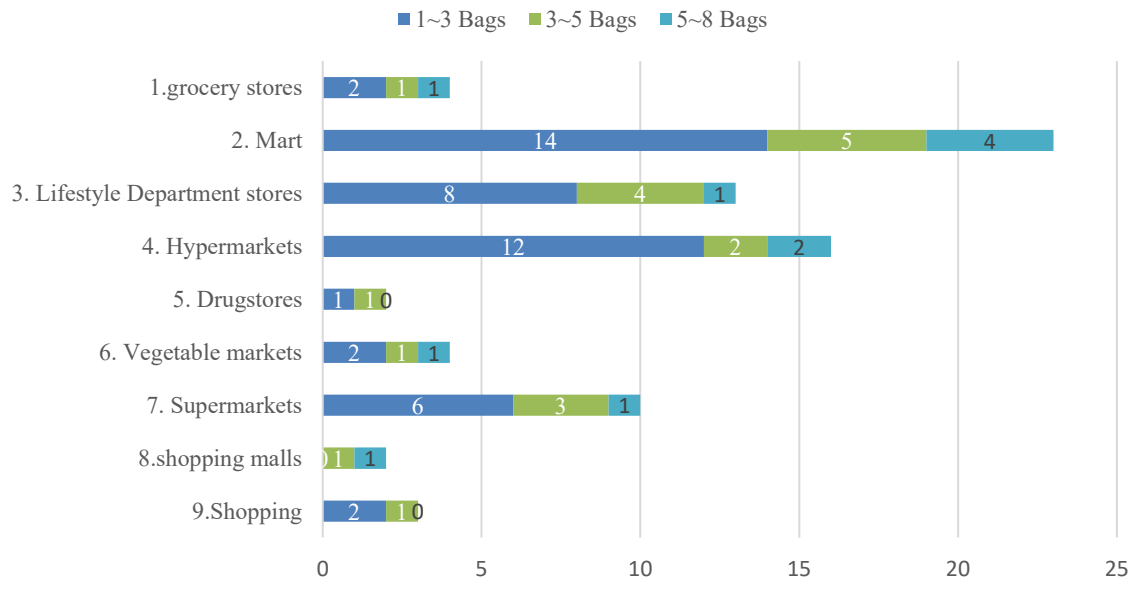

Fig. 23 Cross Analysis of the Number of Shopping Bags in the House and Most Frequent Place to Go with Shopping Bags

4-5 Size of Most Frequently Carried Shopping Bags

The most common size bags carried by females and males were "2. Wide type with medium capacity (L30 x W40 cm)", "3. Wide type with small capacity (L16 x W20 cm)" and "5. Long type with medium capacity

(L30 x W18 cm)" (Fig. 24 and Fig. 25). Furthermore, most of the female respondents aged 20-24 with a monthly income of TWD 5,001 to 10,000 were more likely to carry the "2. Wide type with medium capacity (L30 x W40 cm)" (Fig. 26 and Fig. 27).

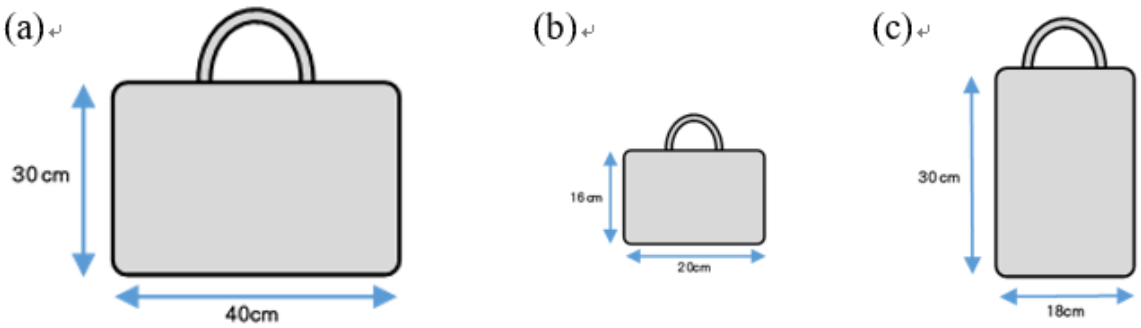

Fig 24. Bags of (a) Wide Type with Medium (b) Wide Type with Small (c) Long Type with Capacity Medium Capacity

Fig. 25 Cross Analysis of Gender and Size of the Most Frequently Carried Shopping Bags

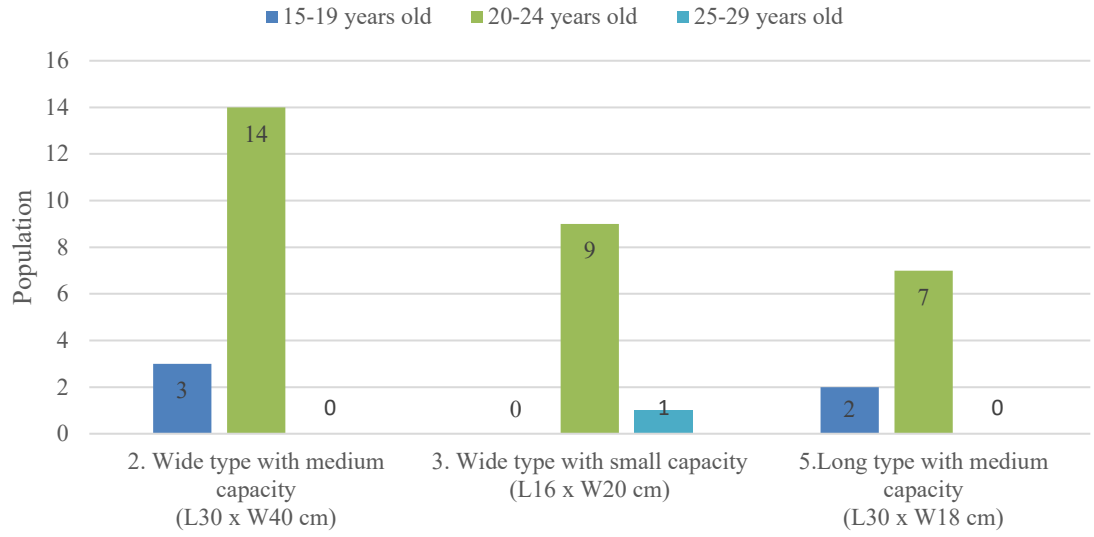

Fig. 26 Cross Analysis of Age and Size of the Most Frequently Carried Shopping Bags

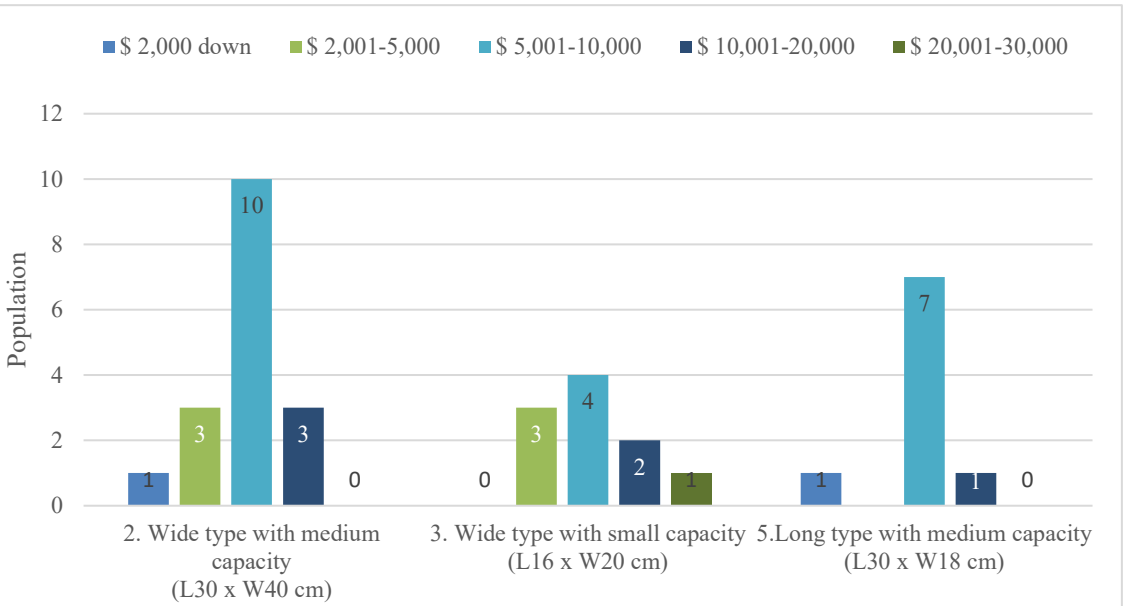

Fig. 27 Cross Analysis of Monthly Income and Most Frequent Place to Go with Shopping Bags

The top three commonly used shopping bag sizes are "2. Wide type with medium capacity (L30 x W40 cm)", "3. Wide type with small capacity (L16 x W20 cm)" and "5. Long type with medium capacity (L30 x W18 cm)" (Figure 28). The respondents with 1~3 and 5~8 shopping bags in-house usually use 2. Broad type with medium capacity (L30 x W40 cm)". For those with 3 to 5 shopping bags in the house, they usually use "2. Wide type with medium capacity (L30 x W40 cm)", "3. Wide type with small capacity (L16 x W20 cm)". Visible typical size more comprehensive version design. In addition, this shows the size of shopping bags

that may accumulate unused, 1. Wide type with big capacity (L45 x W80 cm), 4. Long type with big capacity (L50 x W30 cm), 6 Long type with small capacity (L20 x W15 cm).

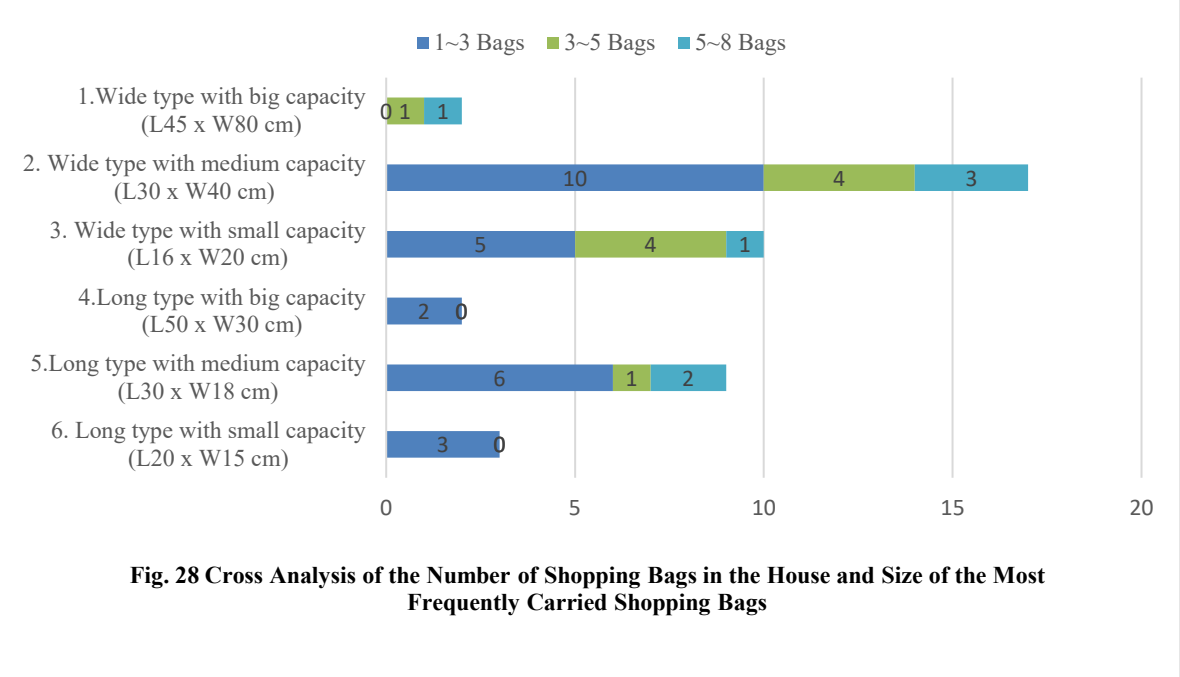

Fig. 28 Cross Analysis of the Number of Shopping Bags in the House and Size of the Most Frequently Carried Shopping Bags

4-6 Reasons for continuous use of shopping bags and change of the use of reusable shopping bags

The respondents continue to use reusable shopping bags mainly. They think that such reuse is very environmentally friendly because they carry the bags for convenience or believe reusable shopping bags are durable and cost-effective (Fig. 29).

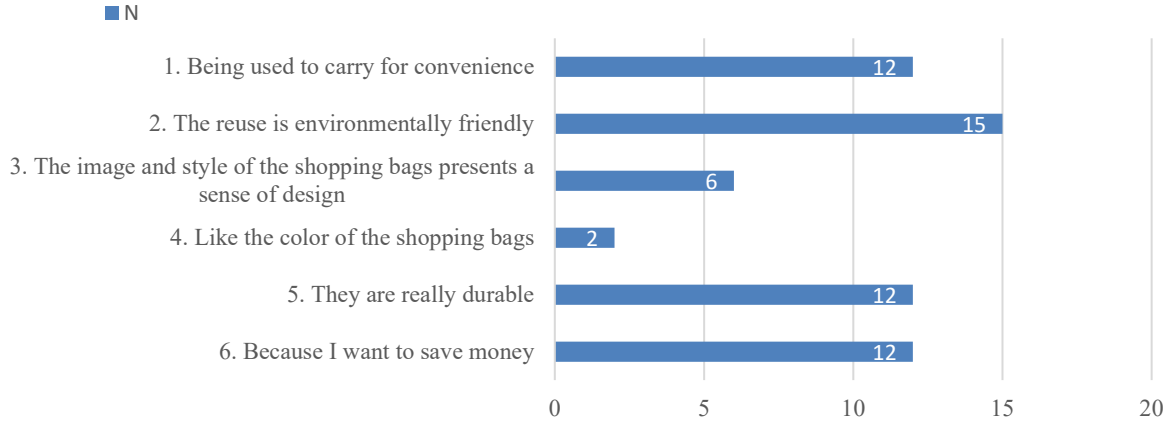

Fig. 29 Reasons for Respondents' Continuous Use of Shopping Bags

Most respondents felt an actual reduction in plastic bag use and a habit of carrying shopping bags in their bag, car, or car when they went out, but also found that they accumulated more shopping bags they didn't use (Fig. 30). Most environmental behavior research discusses the gap between intention and behavior, and

people always forget to carry the shopping bag. This problem seems to have been checked by all sorts of design functions and gradually solve. But subsequently followed by over manufacturing, hoarding, and supply exceeds demand. Make shopping bags become hoarding items, contrary to the original shopping bags instead of plastic bags. Other habits have also emerged, such as collecting designer bags or bags with brand logos.

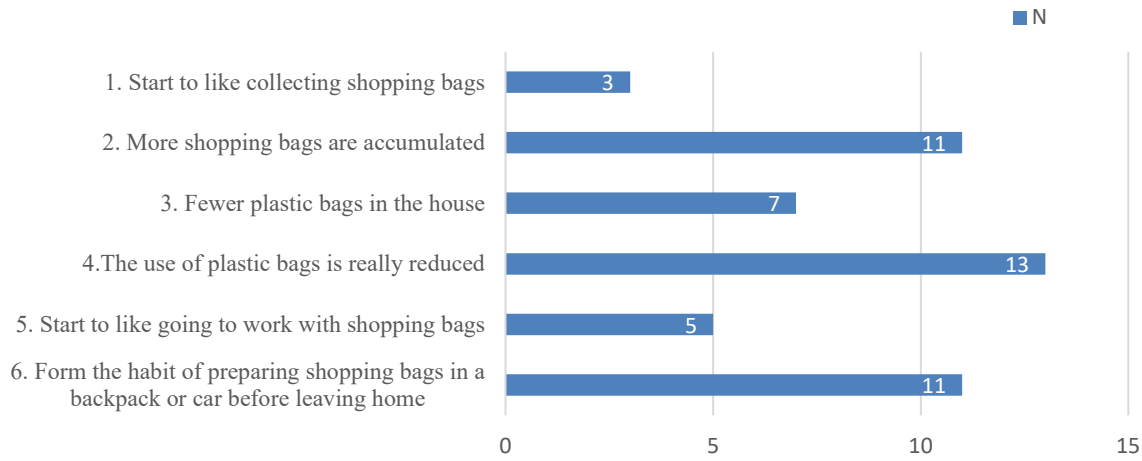

Fig. 30 Reasons for Respondents' Continuous Use of Shopping Bags

According to the respondents, the shopping bags they currently have required improvement on specific points, such as "Idler shopping bags have accumulated," "The design is too ugly," "It is more difficult to store too many" (Fig. 31).

Fig. 31 Disadvantage of Reusable Shopping Bags

5. General discussion

1. The main way of getting a shopping bag

The first three main ways to get shopping bags in Taiwan are to buy products with shopping bags as gifts, shopping places as gifts, and lifestyle department stores to buy. If they buy shopping bags, they tend to go to Daiso Life Department Store, Xiaobei Department Store, Poya Life Department Store (Figure 14). In particular, consumers in the 20 to 24 age group are most likely to get shopping bags with giveaways.

Initially promoting shopping bags to replace plastic bags under the trend, the manufacturers proposed shopping bags as gifts sales. In addition to encouraging consumers to make good use of shopping bags, but also can help marketing products, like paper bag marketing strategy to promote the brand. Therefore, consumers are also used to purchasing goods attached to the shopping bags and obtaining the way of shopping bags. Because the accompanying shopping bags are often low quality, manufacturers develop better quality and design sense of shopping bags. To attract consumers to buy more durable and good-looking shopping bags.

The result shows that consumers mostly go to the lifestyle department store to buy shopping bags. Those shopping malls can be set up on the shopping bag recycling box, like bottle recycling and battery recycling, to avoid excessive stocking in the house and not often use shopping bags. However, we know that battery recycling can be effective because the battery toxic substances, easy for consumers to feel for environmental damage, are more willing to carry out independent recycling. Still, compared with shopping bag hoarding, bad discard disposal is not such a strong sense of crisis, ta. Take initiative to recycle shopping bags mechanism, hoping to rely on the habit of the formation.

Changes in people's behavior not only involve social factors and emotions, but more importantly, changes in habits (Triandis, 1977), only automatic spontaneous forces that reduce many obstacles and burdens (Jackson, 2005), and suggest two factors to encourage consumers to break old habits: repetition and reinforcement Jackson, 2005, Bhamra et al., 2011) This part of the use of shopping bags behavior patterns, this paper believes that from the beginning to obtain shopping bags when the establishment of new habits, so that consumers repeatedly know the use and disposal of shopping bags, to avoid becoming the following category of garbage, manufacturers assume corporate social responsibility, through marketing can also do environmental protection, gift shopping bags at the same time can also arrange the strategy of recycling shopping bags.

2. The primary motivation for consumers to carry shopping bags is to carry the goods

This study learned that consumers are willing to carry shopping bags. The most important motivation is still to product functional orientation. Think that carrying the goods can trigger consumers to take the initiative to bring the bags, followed by environmental protection to reduce plastic bags.

Another external reason is that you must carry your own because shopping bags are not available at the place of purchase. From this, we can see those consumers regard shopping bags as a functional product, pay more attention to the advantages and disadvantages of loading functions, and ignore how they should use shopping bags to achieve environmental benefits. From then on, we can see that consumers began to expand the definition of shopping bags, especially in the interview process. The most common feedback is that can load items can become shopping bags, for some student consumers think that canvas bags and school bags can be shopping bags as long as they can load things.

We believe that the ability to reuse their self bags has reduced plastic bags. But it is more noteworthy than consumers who accumulate shopping bags at home for the use and disposal of shopping bags, whether they can really recognize the actual use of shopping bags and achieve environmental benefits, not just consider loading functionality.

3. Shopping malls for everyday items are the most frequent places to bring shopping bags

For consumers surveyed by this study, the purchase place is Mart, life department store, Hypermarket is the most frequent. Since it is the most frequent shopping place for consumers, it may be possible to gradually establish a pattern of shopping bag recycling from the shopping mall's service experience design process. Taiwan's current convenience stores implement a self-carrying environmental cup preferential scheme to encourage consumers to carry their cups TWD 2 to 3 dollars.

In addition, the emergence of the rental mechanism of emerging business models, there are also rental mechanism products, such as transportation leasing, luggage rental, brand-name fashion package leasing, and other products business models. Recently the PX Mart launched a shopping bag rental model, currently in Taipei and New Taipei city trial operation.

4. The three most usually not used shopping bag sizes

This result of the study was the most likely to be hoarded in sizes of unused shopping bags: 1. Wide type with big capacity (L45 x W80 cm), 4. Long type with big capacity (L50 x W30 cm), 6 Long type with small capacity (L20 x W15 cm).

The most commonly used size is "2. Wide type with medium capacity (L30 x W40 cm)", "3. Wide type with small capacity (L16 x W20 cm)" and "5. Long type with medium capacity (L30 x W18 cm)"

Basically, Taiwanese consumers prefer a wide version of the shopping bag design, from carrying, loading items are very convenient. Long design acceptance is limited. In addition, manufacturers, to introduce a limited number of particular size shopping bag designs to attract consumers, often become the easiest for consumers to hoard shopping bags at home. The market has designed many collections, folding, etc., to provide consumers with the convenience of carrying and using. However, it still causes trouble, and it is possible because of different sizes in the classification of difficulties encountered in the collection.

5. Significant changes in environmental protection are the reason for the continued use

Based on the motivations that mean to carry in point II of this section, this fifth point is about the reason for continued use, which has different meanings. The most important thing about the continued use of shopping bags is the behavior that makes consumers more willing to invest in environmental protection by actually feeling the changes in the environment (Fig. 30).

5-1 Theoretical Implications

Corresponding to Lilley's proposed Strategies for designing sustainable behavior three decision-making power, the current Taiwan shopping bag design is between the consumer and product decision-making power. The status is more in line with Behavior Steering, encouraging consumers to follow the conventions and constraints following the design of the way. Consumers are still consciously using shopping bags under government policies or shopping mall rules. It also relies on existing shopping bag designs to persuade

consumers to change people's minds or behaviors. But there are few reminders feedback design induces the use of shopping bags.

5-2 Theoretical Implications

This exploratory study discovers that the design of shopping bags needs to be reconsidered. The definition of shopping bags should not be limited to an additional independent bag. That should be more broadly defined, as long as consumers can carry the goods can be a shopping bag.

In addition, we have found that shopping bag design often combines with other scenarios, such as students can be used to load books, course supplies, and other functions, but can also be used to purchase daily items shopping bags.

Shopping bags are environmentally friendly products. Products, as the interface between consumers and consumption activities, can give immediate and direct responses to users' operations: how they are perceived, learned, and used. Designing a product means developing a user experience with the product, which also determines the compound impacts of this experience. A better understanding of what users do with and how they interact with products and the hidden factors behind the daily decision-making process should be gained to develop a valid critique of environmentally and socially significant consumption (Bhamra et al., 2011).

An excellent environmental protection product design, once over-manufactured, resulting in an oversupply of the state, may quickly become hoarding and not use idle things. The original shopping bags are to replace plastic bags. They expect to reuse to achieve environmental benefits truly.

Limited shopping bags and meeting consumer demand can be recycled or manufactured to form a circular economy chain. In addition, based on Table.1, the recommendations for a suitable shopping bag design strategy are as follows:

1. Eco-Information – design-oriented education

The visual design of the shopping bags hoarding amount in the house, such as using weight to show hoarding data, if combined with the recycling incentive mechanism, hoarding can be exchanged for points, reaching that can trade a fixed point for recycled shopping bags.

2. Eco-Choice – design-oriented empowerment

The shopping bag design needs to reveal more practical environmental information for adequate consumption and correct shopping bags selection. To suggest that shopping bags can bring environmental benefits and disadvantages or add value so that consumers know their choice of shopping bags will have to pay the environmental costs.

3. Eco-feedback – design-oriented links to environmentally or socially responsible action

Shopping bag design needs to reveal more practical environmental information for consumption effective and correct selection of shopping bags. Suggest that shopping bags bring environmental benefits and disadvantages or add value so that consumers know their choice of shopping bags will have to pay the environmental costs.

4. Eco-spur – design-oriented rewarding incentive and penalty

Establish a recycled shopping bag product service system, provide a cash reward mechanism and accumulate points to encourage consumers to continue to use shopping bags.

5. Eco-steer – design-oriented affordances and constraints

Manufacturers develop suitable sizes and materials, not only consider the ease of carrying and receiving but more important is to facilitate recycling service design and help continuously update the use of shopping bags for the old to reduce hoarding.

6. Eco-technical intervention – design-oriented technical intervention

Incorporated technology tracking, automatic collection function, and other technical applications, or sense the life of shopping bags to remind consumers of recycling and disposal.

7. Clever design

It can design with popular items, such as phone cases and shopping bags. Or combine products related to shopping behavior.

5-3 Limitations and Future Research

1. In this stud, our exploratory research will first compare the theory and results of the available data with the relevant literature and find out what may develop gaps in the future. And follow-up research will be adopted Persona, consumer's journal, the scenario, and other ways to carry out further in-depth study and investigation.
2. This study will include the official data of Taiwan's environmental protection policy (e.g., the policy on paying for shopping bags in Taipei and New Taipei City) to conduct data exploration and analysis.

   At the same time, compare the gaps in the policies of each country, Effectiveness, step by step to eliminate the culture, education, consumer habit, and so on for an in-depth exploration of the sustainable behavior as the green message communication of the influence and design strategy.
3. To find shopping bag users directly, take street questionnaires and visits do have certain limitations, really willing to stay to answer the study questions are not many, and can completely answer all relevant questions are few. The suggested that future research consider working with various stores or shopping centers to conduct research and research. That can get more information about consumer consumption, the use of shopping bags habits, understand the different situations of consumer behavior and shopping bags between the correlation, Further close to the fundamental consumer use behavior research.
4. For the part of the gender sample, we will add the number of males.

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永續行為設計之探索性研究：使用環保購物袋的經驗與意願

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摘要

各國政府意識到廢塑料處理已成為一個重大問題，因此逐漸開始開發綠色塑料。一般家庭普遍都有環保購物袋，但這些購物袋可能只用一兩次。消費者由於害怕浪費而不扔掉而產生了另一個問題。為了消費者提供便利的同時，塑料購物袋被過度使用以及回收處理不當，造成了嚴重的能源浪費和環境污染。因此從消費者的實際使用狀況來看，在提高購物袋環保設計的過程中，通過再利用來達到延長其生命週期的目標並非易事。本研究進行了一項探索性調查，以了解消費者對購物袋的體驗和習慣，並收集對於使用購物袋之看法和持續使用因素。研究結果：1.購物袋主要以贈品形式獲得。2.消費者使用購物袋的主要動機是提取物品。3.生活百貨日用品商場是最常需使用購物袋的場所。4.最常見的三個未使用的購物袋尺寸。促使消費者會持續使用的原因是為了環境保護。最後，我們按照七種設計策略對未來的購物袋設計提出建議。

關鍵詞: 永續行為設計、消費者體驗、環保購物袋、設計策略