Understanding Swedish Consumers’ Purchase Intentions for Green Packaged Short-Shelf-Life Food Products

*An Expanding to the Theory of Planned Behavior*

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Abstract

Background
The climate change problem causes the importance of sustainable development. Food wastage especially short-shelf-life food product and the main focus on the consumer purchase intention towards the short-shelf-life food products in green packaging.

Purpose
This thesis aims to explore the factors that influence Swedish consumers' purchase intention for green packaged short shelf-life food products, and to extend the theory of planned behavior (TPB) by incorporating new or under-researched factors into the model.

Methodology
The quantitative survey conducted in the Sweden and collects the data to finding research questions.

Results
The theory of planned behavior is applied to explain Swedish consumers' willingness to purchase green food products with a short shelf life in green packaging, and its explanatory power is further enhanced by the addition of two variables: environmental concerns and past green purchasing experience. Surprisingly, past green purchase experiences do not directly influence green purchase intentions but only indirectly through attitudes.

Keywords
Green Purchase Intention, Environmental Concern, Past Green Experience, Expanding Theory of Planned Behavior
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List of Abbreviations

AT | Attitude
EC | Environmental Concern
GPB | Green Purchase Behavior
GPI | Green Purchase Intention
PBC | Perceptual Behavioral Control
PGPE | Past Green Purchase Experience
SN | Subjective Norms
TPB | Theory of Planned Behavior
TRA | Theory of Reasoned Action
1. Introduction

1.1 Background

The climate change crisis has become a global challenge of the time, with environmental degradation and resource depletion being increasingly pressing issues (United Nations, 2021). And, food waste has a significant impact on the environment (Devin and Richards 2018). According to the United Nations (2022), around 17 percent of world food waste happened in harvesting and retail markets. Approximately 1.3 billion tons of food was wasted which is considered one third of world food produced for human consumption (FAO, 2021). It has a significant impact on greenhouse gas emissions. Food waste management has become an important factor for sustainable development. The food industry plays an important role in reducing food waste by creating sustainable food systems to meet the demand (Searchinger et al., 2009). Therefore, it is important to understand the major cause of food waste. According to the Food and Agriculture Organization (FAO 2021), around 14 percent of the world’s food waste happens before consumption, commonly in the retail and at consumer levels every year. One of the major reasons behind food waste lies in its perishability and shorter shelf life (Song, 2019). The shelf life is the length of time that a commodity may be stored without becoming unfit for use, consumption, or sale. Short shelf-life food products refer to food products that have a shorter lifetime than other food products due to their perishable nature (ibid). Short-shelf-life food products include four main categories, namely vegetables, fruits, dairy, and prepared foods. Some examples of short-shelf-life food products are fresh berries, leafy greens, bread, and dairy products such as milk, yogurt, and cheese that have a limited lifespan and need to be consumed or used within a short period. Unconsumed food that goes beyond expiration date becomes waste (Kummu et al., 2012). To prevent the loss of food, modern food industry puts effort in improving food safety and quality with the help of packaging, (Heller et al., 2019).

Although food packaging is often found to have negative impacts on the environment (Brennan, 2021), the general perception in a consumer's mind regarding packaging is to dispose or recycle it after use (ibid). Thus, packaging helps reduce food waste by preventing food from spoilage (Lockrey et al., 2019). Moreover, it helps to store food items and provide food information by labels, such as date, ingredients, and ways to handle/store properly. Therefore, packaging plays a vital role in short-shelf-life food products, as it protects, preserves, and makes products easier to transport and store (Wikström et al., 2019). However, the extensive use of packaging generates an immense amount of waste and poses a severe threat to the environment (State of the Environment Report (SBN, 2019).

Many terminologies rise up in the journey towards sustainability such as green products, green packaging, green marketing, green consumer, and many more. Green packaging offers a solution to food waste by minimizing its environmental impact throughout its entire life cycle (United Nations, 2022). This type of packaging is typically made from biodegradable, recyclable, and compostable materials, reducing waste through sustainable design and production processes (Bhargava et al., 2020). Therefore, green packaging or short-shelf-life food products attracts the industry's attention, and the growing competition, demand, and
selectiveness create a new opportunity. Nonetheless, the advancement of green packaging faces promotional difficulties. This is caused by traditional packaging methods (Yang and Thøgersen, 2022) and consumer purchase intention towards food products in green or non-green packaging. Companies push themselves to develop a green strategy to reach the level where they can gain fruitful results from the growing market segment (Lartey et al., 2020).

1.2 Research Problem

To address the challenges related to sustainable development, it is important to consider the contribution by all stakeholders (Nam and Hwang 2019). The success will be achieved by a combined effort from all stakeholders (ibid). It is not enough for companies to drive consumer attention towards the green packaging of short-shelf-life food products. Ultimately, it is the choice of consumers that will determine the main products' popularity in the market (Tsai et al., 2020). We reviewed the aspects which influence the purchase intention, and assume that past green purchase experience and environmental concern contribute to those aspects.

The research on green purchase intention is still emerging. Existing research is primarily based on broad product types, with less research on explicit product types and even less research on specific regions (Zhao et al., 2023). Thus, the key research direction for this paper is to understand the consumer purchase intention of products in green packaging by extending the theory of planned behavior (TPB). Furthermore, it intends to bridge the research gap, by reviewing the key factors influencing green purchase intentions. Those key factors are categorized into four perspectives in order to give readers a clearer concept: government policy, society and media, business and product, and consumer. The results of previous studies on how these factors influence consumers' willingness to make green purchases of different types and green products are reviewed. On one hand, it is found that research on consumers' willingness to purchase general products with green packaging is limited, as the existing literature on green packaging is often limited to green products, such as organically grown food with green packaging. On the other hand, it is seldom mentioned about the influence of past purchasing behavior and relatively little research on the impact of environmental concerns. Ultimately, environmental concerns and past green purchasing experiences are the two factors that have been relatively less studied. Therefore, this study selected short-shelf-life food products in green packaging as the subject of the study and innovatively extended TPB using environmental concerns and past green purchasing experiences. It is expected that the research results will fill the research gap.

Furthermore, the popularity of green packaging faces a challenge on lack of consumer effort, which refers to the inconsistency between consumers' attitudes toward green products (Thøgersen, 2023). To maximize the use of green packaging and promote more sustainable short-shelf-life food products, it is essential to understand the factors that influence consumers' purchase intentions for products in green packaging (Arli et al., 2018). However, despite an increase in awareness about the importance of sustainability, and consumers may express support for eco-friendly products, their purchasing intentions are often influenced by many factors (ibid). This study will focus on understanding consumers' purchase intention toward green packaging which is becoming increasingly popular.
1.3 Research Purpose and Research Question

The purpose of this study is to explore the factors that influence the Swedish consumer purchase intention for green packaged short-shelf-life food products, and to extend the theory of planned behavior (TPB) by combining new or under-researched factors into the model. To fulfill that purpose accordingly, it is important to select relevant region. And the intent to choose Sweden as a region for this study is due to its worldwide reputation in the sustainability development. Furthermore, in centuries like Sweden, there is more focus on reducing and managing the negative impact of packaging waste (Somlai et al., 2023). Packaging is a part of daily life, and it’s intriguing to know how the relationship is between a consumer’s usage on packaging and his/her efforts to protect the environment.

It serves as an ideal representative position to evaluate the consumer purchase intention in the most advanced countries in this field. With the help of (TPB) from the previously presented research, authors try to add novelty in this area of research. Additionally, food packaging accounts for a significant portion of total packaging waste (Brennan et al., 2021). To understand the new perspective which is hardly studies before in the Sweden regarding short-shelf-life food product, this study aims to bridge that research gap. Further, it focuses on Swedish consumers and their purchase intentions towards short-shelf-life food products in green packaging to gain knowledge and information needed on Swedish consumers' Purchase Intentions for short-shelf-life food products, and the environmental concern which affects their purchase intentions towards short-shelf-life food products in green packaging with the help of expanded theory of planned behavior (TPB). The research aims also to understand the consumer purchase intention through their attitude, subject norms, and perceived behavior control by studying their perception, level of knowledge, interest, and motivation towards green packaging. To achieve the desired outcome, this study considers the following research questions.

RQ1. What is the link between past green purchase experience and Swedish consumers' purchase intentions for green packaged short-shelf-life food products?

RQ2. What is the link between environmental concern and Swedish consumers' purchase intentions for green packaged short-shelf-life food products?

RQ3. Whether the impact of prior green satisfaction and environmental concern on Swedish consumers' purchase intentions for green packaged short-shelf-life food products mediates through their attitude, subject norms, and perceived behavior control.
1.4 Thesis Outline

- Introduction
  - In the first chapter the research background and the purpose of the research are introduced. Following by the research purpose and research question which gives the reader an overview about the thesis.

- Literature Review
  - Chapter two will give an in-depth overview of literature review about the previous theory and concepts used in this study. And the explanation of research hypotheses and theoretical model which used in this study. Further, in detail explained the correlation between TPB and consumer purchase behavior towards the short-shelf-life food products.

- Methodology
  - Chapter four will provide the details of the complete research process from the research strategy to data analysis. It also explains the research approach and discusses the process of data collection.

- Analysis
  - Chapter five will provide the details of findings calculated, further it presented the results with the use of the models and frameworks.

- Discussion
  - Chapter six will discuss the outcomes of the studies and explain the results and findings of the research. Further, the recommendations for government and companies are presented in the end of this chapter.

- Conclusion
  - Finally concluded the research by providing limitations and future research.
2. Theoretical Framework

2.1 Green Product

Green products typically include various reusable, recyclable, biodegradable, and environmentally friendly packaged items. They are manufactured using advanced and superior techniques to minimize pollution, hazards, and energy consumption, and making them eco-friendly and meeting environmental protection requirements (Liobikiénë et al., 2016). Energy-saving home appliances such as refrigerators and dishwashers, new energy vehicles, and organic food such as organic milk are some of the green products that people often encounter in their daily lives.

This study focuses on green packaged short-shelf-life food products. Although the concept of short-shelf-life food products covers numerous items and not all of them necessarily meet the definition of green products, when combined with green packaging, they can be considered as a whole to be green products.

2.1.1 Green Packaging and Sustainable Packaging

According to Singh and Pandey (2018), green packaging has been defined as packaging that uses renewable, biodegradable, recyclable, or low-pollution materials as much as possible in the selection and design of packaging materials, to avoid destroying the natural environment and wasting limited earth resources. In contrast, Boz et al. (2020) defines sustainable packaging as a type of packaging that can minimize environmental impact during its entire life cycle, while meeting the needs of consumers and businesses. There are connections and differences between green packaging and sustainable packaging. The connection is that both emphasize green characteristics such as recycling, degradation, non-toxic and harmless. However, the difference is that sustainable packaging is a broader concept, with considerations over other aspects, such as social, economic, and functional.

This study will delve into factors that have not been thoroughly researched for green packaging and analyze how they affect Swedish consumers’ green purchase intention. The definition of green packaging in this study follows Singh and Pandey (2018) considering green packaging requires less implementation conditions and is easier to adopt and promote. It is also a more feasible research object at this stage.

2.1.2 Green Packaging-Related Research

In studies related to packaging and purchase intention, packaging can be analyzed from two perspectives. One is as an influencing factor of purchase intention, i.e., the study of how packaging and other factors such as product function, quality, price, brand, etc. work together to influence consumers' purchase intention; the other is as an object of purchase intention, i.e., factors such as environmental concerns and environmental knowledge work together to influence consumers' purchase intention towards packaging. Therefore, its related research is naturally divided into two types: one is to consider green packaging itself as a factor affecting purchase intention and emphasize the influence of packaging attributes on purchase intention; the other is to consider green packaging as the object of purchase intention and emphasize the
influence of other factors on green packaging purchase intention.

In the former case, Rokka (2008) studied the effect of whether functional beverage packaging can be recycled on consumers' choices. The conclusion showed that when consumers choose functional drinks, they focus on the environmental attributes of the packaging. Koenig-lewis (2014) studied green packaging using bottles containing 15% plant materials. The results showed that consumers' emotions did affect their purchase intention of green packaging. When the subjects' emotions were positive, their corresponding purchase intention was higher. On the contrary, when consumers were unfamiliar with this packaging, they might feel nervous, which reduced their purchase intention on that particular product.

Instead of considering green packaging as one of the factors, the article follows the second approach, which is to investigate other factors that affect the purchasing intention of green packaging (for short-shelf-life food products). This is due to our expectation that the results of the study can be used to make recommendations for improving the market share of green packaging, rather than simply examining the mechanisms that influence green purchase intention.

2.2 Green Purchase Intention (GPI)

2.2.1 Definition of Green Purchase Intention (GPI)

From a psychological perspective, scholars including Fishbein and Ajzen (1975) have pointed out that the term "intention" actually refers to an individual's psychological expression, which ultimately affects their behavior. Purchase intention is a concept that stems from intention, which describes a consumer’s likelihood to buy something. Consumers' purchase intentions for green products are naturally named green purchase intentions. We have followed Ajzen's (1985) definition of green purchase intention in this study. According to Ajzen (1985), purchase intention is a consumer's subjective inclination to purchase green products in their daily lives, as well as their willingness to make efforts for it. Researchers such as Dodds et al. (1991) have suggested that if a consumer has a strong psychological identification with green products and a positive attitude towards them, their green product purchase intention is likely to be high. In green consumption, consumers’ purchase intention is a major contributing force that influences consumers' decisions to make a purchase or not.

Green purchase intention is an important building block in green marketing and consumer behavior, which can also help researchers to explore the underlying mechanisms and processes that drive consumers' green consumption behavior and thus make targeted recommendations. Therefore, this study hopes to contribute to the further promotion of green packaging for short-shelf-life food products by conducting an in-depth analysis of Swedish consumers' green purchase intentions towards green packaging for short-shelf-life food products.

2.2.2 The Relationship between GPI and GPB

The behavior of consumers with green purchasing intentions who actually buy these green products in their daily lives is often referred to as green purchase behavior (GPB), which is
the ultimate aim of the study of green purchasing intentions. Compared with ordinary consumption behavior, consumers who engage in green consumption behavior pay attention not only to the use value of the product itself but also to the green value of the product. They require the product to have green, healthy, and environmentally friendly characteristics (Gonçalves et al., 2016).

In terms of the relationship between GPI and GPB, most scholars agree and confirm that green purchase intention is a key indicator to explain and predict green purchase behavior. This article intends to explain and verify the influencing factors and mechanism of Swedish consumers' green purchase intention of green packaged short-shelf-life food products through empirical analysis, and thus infer their green purchase behavior, to provide suggestions for promoting green consumption.

2.3 Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB)

2.3.1 Theory of Reasoned Action (TRA)

Fishbein and Ajzen (1975) proposed the Theory of Reasoned Action (TRA), which is premised on the assumption that individual behavior is consistent with their behavioral intentions. In turn, behavioral intention is predicted by two different perspectives of antecedents, attitudes, and subjective norms. Among those, an attitude refers to an individual's relatively stable preference or stance towards something or an object, which is a summative evaluation and opinion of an individual after he or she has a certain degree of knowledge about it (Ajzen, 1991). Subjective norms, on the other hand, are the social pressures that individuals perceive from the external environment regarding the performance of a particular behavior (Ajzen, 1991). The theory has been able to explain to some extent the factors influencing behavior and behavioral intentions. However, this theory is based on the premise that people are rational and make optimal choices considering various factors and that their will can directly control the occurrence of behavior regardless of other conditions. Therefore it has some limitations when applied to real consumers. This theoretical model is shown in the figure below.

![Fig I- Theory of Reasoned Action](image)

2.3.2 Theory of Planned Behavior (TPB)

The theory of planned behavior (TPB) is a classical behavioral prediction theory that is widely used to explain and predict consumers' purchase intentions and behavior. It was
developed based on the Theory of Reasoned Action (TRA), which has its limitations since its premises are difficult to realize in real life: people are not completely rational, and individual behavior can be constrained by personal capabilities or external conditions. Therefore, Arjan added a new variable named perceived behavioral control to the theory to form a new theory of planned behavior. Perceived behavioral control refers to whether an individual perceives a behavior to be under his or her control before performing it, whether he or she finds it easy or difficult to perform the behavior, and also as a judgment of his or her ability (Ajzen, 1991). Simply put, it refers to the individual's feelings about whether or not he or she can perform a behavior successfully. When individuals believe they can succeed, their behavioral intentions are enhanced. Thus, behavioral intentions are influenced by attitudes, subjective norms, and perceived behaviors. Intentions and perceived behavioral control then further influence individual behavior.

The new theory is more complete than its predecessor, taking into account attitudes, subjective norms, and perceived behavioral control. It also explores individual behavioral intentions in a comprehensive and in-depth manner, thus better explaining and predicting individual behavior. As one of the classic theories that explore individual behavior from a psychological perspective, TPB has been proven to successfully predict individual behavior and is an important theoretical model widely used in academic research on behavior. It can be said that research on expanding the TPB model has never stopped. At the same time, Ajzen (1991) also stated that the theoretical model is not a "closed loop" and still needs to be tested and improved under different circumstances. The basic TPB model is shown in the figure below.

![Fig II- Theory of Planned Behavior](image)

Green purchase behavior, as a rational consumption behavior, involves consumers thinking rationally about whether it is beneficial to environmental protection when purchasing and using products. Different consumers also plan their purchasing behavior based on their different abilities, so TPB can effectively explain consumers' willingness to purchase green products. For example, Han (2015) integrated the Norm Activation Model and TPB into a theoretical framework, which verified that TPB has a significant impact on travelers' willingness to stay in green accommodations. TPB is one of the most extensively used theories in previous research on green purchase intentions (Pathak et al., 2022). The series of studies on green purchasing based on this theory can be roughly divided into two categories. The first category involves verifying the effectiveness of the theory in studying consumers' willingness or behavior toward green purchasing. For example, Rezai et al. (2012) found that all three core factors of TPB can positively contribute to consumers' willingness to purchase green foods with health and safety attributes, while Pakpour et al. (2021) also reported their
strong predictive effect on behavioral intentions when studying adolescents' green purchase behavior. The second category involves extending the theoretical model by seeking new explanatory variables and constructing new extended models based on TPB. For example, Sharma and Foropon (2019) introduced product attributes and environmental concerns into TPB, removing the controversial subjective norms and perceived behavioral control and attempting to replace them with environmental knowledge and perceived validity, and expanded purchasing behavior into three modes: unconditional purchasing, conditional purchasing, and accidental purchasing, in order to study consumers' green purchase behavior. Ruangkanjanases et al. (2020) applied the extension of TPB to explore the antecedent effects that influence consumers' willingness to purchase green products and found that voluntary participation in the green movement is far more influential than mandatory social pressure.

This study is a combination of two types of research, seeking both to test the explanatory power of TPB on Swedish consumers' purchase intentions for green packaged short-shelf-life food products and to expand TPB to facilitate its application in this field.

2.4 Green Product

The following will review the findings of past research in related fields on the relationship between the three core concepts of TPB, attitudes, subjective norms, and perceived behavioral control, and the added factor, environmental concerns, past green purchase experiences, and green purchase intentions. On this basis, the hypothesis of this paper will be presented, from which a testable theoretical framework will be constructed.

2.4.1 Attitude (AT)

Various marketing fields have examined attitude as an important variable for analyzing individual consumer behavior. It is one of the three essential variables of TPB and involves an individual's positive or negative appraisal of a specific object (Ajzen, 1991). Ajzen (1985) stated that a person who has a favorable attitude towards a certain behavior is more inclined to adopt it. Positive (negative) attitudes can positively (negatively) influence an individual's behavioral intention (Arli et al., 2018). For example, if someone believes that exercising is beneficial for their health and has a favorable attitude towards it, they will be more inclined to go to the gym to stay healthy. Conversely, if someone has a negative attitude towards exercise, their behavioral intention will be weaker. Green purchase intention, as a type of individual behavioral intention, also applies to this theory. Many studies verify the notion that positive attitudes have a positive influence on green purchase intention across different cultures and product categories (Wang et al., 2016). As Paul et al. (2016) suggested, consumers with a positive attitude towards green products recognize the important role these products perform for individuals and the environment, which accordingly boosts their purchase intention and causes green purchase behavior. Based on this, our hypothesis is as follows.

H1: Positive attitude will positively influence Swedish consumers' purchase intention for short-shelf-life food products in green packaging.
2.4.2 Subjective Norms (SN)

Subjective norms describe how consumers sense the social pressure to conduct a certain kind of behavior. In simpler terms, it represents the likelihood of individuals adopting behaviors that are considered normal or acceptable in their social group or society (Cialdini and Goldstein, 2004). For example, if a person's family and friends believe that exercising is important, it can positively influence their intention to go to the gym.

According to Niemiec et al. (2020), subjective norms consist of three types: descriptive norms, injunctive norms, and individual norms. However, Harrison's (1995) research found that individual norms have limitations in explaining certain moral behaviors. As a result, injunctive norms and descriptive norms are the two categories of subjective norms that researchers commonly use in academic research (Gimpel et al., 2021). On one hand, injunctive norms guide people to the correct behavior by informing them of what is right and wrong and the outcomes. People tend to follow this norm automatically. On the other hand, descriptive norms influence people to behave like other group members by showing them what most people do.

Therefore, two perspectives can be used to study subjective norms and green purchasing intention. In the field of green products, injunctive norms are manifested as environmental pollution problems become increasingly serious, and consumers are influenced by public opinion pressure and peer evaluation, leading to subjective norms that can increase the intention to buy green products. When consumers notice that green products are popular in the group, they experience descriptive norms. This triggers their subconscious interest in green products and their purchase intentions under the guidance of group behavior. Thus, our hypothesis is as follows:

H2: Subjective norms will positively influence Swedish consumers' purchase intention for short-shelf-life food products in green packaging.

2.4.3 Perceptual Behavioral Control (PBC)

TPB has a new concept called perceived behavioral control. It also sets itself apart from the theory of reasoned action. The increase of this variable mainly considers that the occurrence of actual behavior is not solely dependent on the control of willpower, but is also constrained by ability and conditions. Before individuals take action, they need to consider three factors: Can I do it? Do I want to do it? Do others want me to do it? So, how an individual perceives the factors that sway their behavior decision before they perform it is perceived behavioral control. It will be stronger when people believe they can do a certain behavior. Many studies examine how green purchasing intentions are affected by perceived behavioral control. For example, Wang et al., (2018) argue that consumers' PBC and GPI will be stronger when they have enough available resources and opportunities to buy and perceive few obstacles in the buying process. Chen (2007) used consumers in Taiwan as research subjects and found that perceived behavioral control positively impacts consumers' intention to purchase organic food. Based on the above, our hypothesis is as follows.
H3: Perceived behavioral control will positively influence Swedish consumers' purchase intention for short-shelf-life food products in green packaging.

2.4.4 Environmental Concern (EC)

The definition of the term environmental concern has been refined by many scholars, ranging from intense attitudes towards ecological protection (Crosby et al., 1981), to the degree of perceived severity of environmental issues and the degree of desire to try to find solutions to these environmental issues (Dunlap and Jones, 2002; Akehurst et al., 2012; and Schuitema et al., 2013) to the extent to which individuals are actually involved in environmental affairs (Goh and Balaji, 2016). Instead, this study adopts the following definition of Environmental Concern: individuals' concern about environmental issues and their resonance with the need to protect the environment.

Consumers' environmental concerns are often mentioned in studies related to green consumption. Many scholars have found that it has a extensively positive impact on consumers' intentions to acquire green products in a broad range of contexts. For example, Bang et al. (2000) claims that consumers with above-average concern for environmental problems having greater likelihood of using renewable resources, even if the prices are higher. Mostafa (2007) finds that environmental concerns positively impact consumers' green product purchase intentions. Using an extended TPB model, Chen and Tung (2014) examine how one’s environmental concern influences his/her intention to choose to experience a green hotel with TPB variables mediating this relationship; Koenig-Lewis et al. (2014) studied Norwegian consumers' purchase intentions for bottles containing 15% plant material and found that environmental concerns significantly increased consumers' purchase intentions; Sang and Bekhet's (2015) study pointed out that environmental concerns can significantly influence individuals' purchase intentions for green cars; Yadav and Pathak (2016), while investigating green purchases of Indian youth intention, similarly found environmental concerns as an antecedent variable influencing consumer attitudes and concluded that environmental concerns influenced consumers' green product purchase intention through attitudes. So, it is assumed that Consumers with relatively high levels of environmental concern are more inclined to make purchases of green products. Based on this, the following hypotheses were developed:

H4: Environmental concerns will positively influence Swedish consumers' purchase intention for short-shelf-life food products in green packaging.

However, in the past related literature, environmental concerns are usually not only directly associated with green purchase intentions but also indirectly influenced through other mediating variables (Heilbroner et al., 1980). For example, Sun et al. (2019) highlights the important mediating effect of environmental knowledge, arguing that the impact of environmental concerns on green consumption must be transmitted through environmental knowledge and cannot be influenced directly; Bamberg (2003) stated that environmental concern influences individuals' behavioral intentions through three core factors of TPB. That is, environmental concern can be not only a direct factor of pro-environmental behavioral intentions but also indirect factor acting through other factors. Therefore, we propose the following hypothesis:
H5: Environmental concerns will positively influence Swedish consumers' attitudes towards short-shelf-life food products in green packaging.

H6: Environmental concerns will positively influence Swedish consumers' subjective norms towards short-shelf-life food products in green packaging.

H7: Environmental concern positively influences Swedish consumers' perceived behavioral control of short-shelf-life food products in green packaging.

2.4.5 Past Green Purchase Experience (PGPE)

Most of the past studies have shown that past behavioral experience has a noticeable impact on behavioral intention. Conner and Armitage (1998) confirmed the view that past behavioral experience had a direct relationship with behavioral intention and behavior through meta-analysis. Knussen et al. (2004) found that past behavioral experience was very significant with intention for people who did not have recycling perception habits in their study on residents' environmental garbage dumping.

Therefore, many researchers believe that understanding/adding? consumers' past behavior can better predict their behavioral intentions (Conner and Armitage, 1998). Fishbein and Ajzen (1975) pointed out that consumers would collect information based on past experience or external information, and generate purchase behavior after evaluation and consideration. The strength of purchase intention determines the probability of consumers buying those products. Holbrook et al. (1982) argued that consumers' purchase intention is evoked by the pleasant memories that consumers associate with the unique experience of a company's product. However, according to Peattie and Collins (2009) and Lee et al. (2018), most studies on green purchase intention have not addressed the influence of previous actual purchase experience on future purchase intention. Nevertheless, in fields other than green products, many empirical studies have found that past purchase experiences can to a large extend affect consumers' attitudes and purchase intentions. Mohmed et al. (2013) found a strong correlation between past purchase experience and consumers' online purchase intention. Krishnakumar (2018) studied clothing and found that past purchase experience partially mediates future purchase intention. These research findings indicate that in addition to the immediate experience of green products at the time of purchase, past experience with green products can also have an impact on consumers' purchase intention. We believe that experience can influence consumers' attitudes towards green product purchase intention, thereby affecting their green purchase intention. Therefore, the following hypotheses were developed:

H8: Past green purchasing experience positively influences Swedish consumers' purchase intention for short-shelf-life food products in green packaging.


It is worth noting that in this study, past green purchase experience does not only refer to the purchase experience of short-shelf-life food products with green packaging but rather refers to the purchase experience of all green products in the past.
Combining the above hypotheses, we constructed the following theoretical model as shown in Fig 3.

![Theoretical Model](image)

*Fig III- Theoretical Model*
3. Methodology

The methodology chapter explains the choices and tools that have been used for this study from collecting data to analysis. The first part of this section expresses the strategy and approach of the study which fulfills the research purpose. And the second part explained how the study was designed to get the examine research problem in a sufficiently detailed way. Thirdly, it is described in detail how the data was collected for the study to understand how the final sample was gathered for this research. The next part explained the tools and software which are used to get the result from collected data. Finally, the end of the section explained the constructions that will be for the hypotheses test.

To make it easy for the reader, the following figure provides the overview and procedures of methodology which gives an overview of the entire section step by step. First, the research strategy and approach were explained, followed by the research design, data collection method, data collection process, and data analysis. Finally, at the end of this chapter, the ethical considerations section is also explained.

![Methodology Diagram]

3.1 Research Strategy and Approach

The research approach provided information about the relationship between theory and data to reach the ending result of the thesis (Saunders et al, 2009). Further mentioned the difference between the deductive approach and the inductive approach, where in deductive approach using the available theories which already exist to develop different hypotheses and test reality (ibid). On the other hand, the inductive approach refers to collecting new data for
further analysis and then proposing a new theory development (Malhotra et al., 2017). This study is based on the deductive approach to explore new empirical data and contributes to previous theories namely the planned behavior theory (PBT) relevant to the consumer purchase intention toward green packaging. Finally, the adjusted framework is done to relate the context of information for this thesis.

3.2 Research Design

This section will explain the chosen research design for this thesis. The exploratory research design was selected for this thesis to explore the general phenomenon with the new information added to the research problem (Saunders et al, 2009). That research design allows the researcher to be more flexible and adaptable in the process of conducting new research (ibid). It is important to consider that conducting the study in an immature research area where new empirical data can require a change of direction (ibid). To be on track this research design also required proper attention which led toward the research direction which was not affected by flexibility (ibid). The study will use quantitative analysis methods with the help of new data collected within a limited timeframe. Further, hypotheses and models were created concerning previous studies, and design a questionnaire based on them.

3.3 Data Collection Method

This section will explain the method, process, and platforms used to collect the data for this study. Further, it elaborates on which tools were used and the challenges that occur in the process of collecting data.

The quantitative data was collected by the structured and designed survey. For the data collection of this study focused on a targeted region which was Sweden. To reach out to the Swedish targeted audience the survey was in two languages first is in English and second Swedish, both languages were written on the same link of the survey provided to all participants. That creates transparency to get quality data by getting responses from local Swedish consumers who have firsthand experience of buying short-shelf-life food products in green packaging.

The process of collecting data requires time and resources due to limited availability; the authors used an efficient and effective way to collect data within a limited period. Mainly two methods were used to collect data for this study. Firstly, all sorts of social media platforms were used to get more response in which Facebook, Instagram, and telegram was the main source of survey distribution. Secondly, by person to the person filling out the survey, this method is used to collect data by providing the electronic device with the survey or barcode which directly opens the survey on their devices to the respondents. To get a response in the second method data collector provides information on the research topic and what are the purposes of the research to respondents before starting the survey. By this method, the quality of data was maintained and if there is any confusion regarding questions or overall research survey was cleared on the spot.
3.3.1 Survey Questionnaire

The questionnaire builds on the Google form which helps respondents to fill survey on their comfortable time and place. The contact details of both authors provided on the survey allow the respondent to contact them if there are any concerns, confusion, or comments regarding the survey questions.

The purpose of data collecting handling and data privacy protection was also mentioned in the survey. Those efforts were made to gain the confidence of participants that the data was only used for academic purposes and not to relive personal identification.

The survey was divided into six categories of questions which help to analyze data according to the research problem. The survey questionnaire is preferable to add demographic questions to the survey (Story, 2019). It is also important to maintain the validity and reliability of survey questionnaires by maintaining transparency and credibility for participants (ibid). Further the measurement of attitude, subjective norms, environmental concern, perceived behavioral control, and willingness to purchase the products in green packaging. This helps to know the respondent’s purchase intention of products or services (Paul et al., 2016). It measures with the help of a rating scale by providing 1-5 rating options that allow the respondent to express their answers (Story, 2019).

1. The first part was based on a demographic question. This allows the researcher to know the age, gender, location, occupation, monthly budget, and the respondent’s level of education.

2. The second part is dedicated to measuring the attitude towards short-shelf-life food products in green packaging.

3. Subjective norms, to understand the social pressure on respondents to perceive to buy short-shelf-life food products in green packaging.

4. Perceived behavioral control, to understand the respondent’s level of control perceived over the purchase of short-shelf-life food products in green packaging.

5. To understand the respondent's environmental concerns this ultimately shows how they will react toward environment-friendly food products or packaging.

6. Prior green satisfaction, to understand the respondent's level of satisfaction with their previous green purchases.

7. Purchase intention to understand the willingness of respondents towards buying a short-shelf-life food product in green packaging.
3.4 Data Analysis

This section will explain how the authors analyze the quantitative data for the results. The tool which was used to analyze the collected survey data was SmartPLS software which helps to check the hypotheses developed for this study. The result will indicate whether the hypotheses support the research aim or not and also provide the connection information whether it’s positive or negative. The process of analysis was done in steps. The first step was to categorize the collected survey questions into groups, which are based on hypotheses. The second step was to code these questions into a .csv file. Then it transports to the SmartPLS software to start the process of analyses. Then the questions were organized in the software in the relevant patterns to the hypothesis for analysis. Then the model was built, and simulation was started for calculating the PLS algorithm which does multiple tests on data providing the calculated results.

Further, PLS-SEM is used which is a variance-based method that combines principal component analysis and multiple regression in an iterative estimation process. It allows for the processing and interpretation of the data we collected through the questionnaire through the model we specified, thus helping us to analyze and predict the relationships between the complex latent variables. And this is the core of the study, which is why it was used in this study. Moreover, PLS-SEM can accommodate small to medium sample sizes, non-normal data, and formative measurement models. The study ultimately collected a qualified sample of 294, meeting the general requirement for sample size in empirical studies, which requires a minimum requirement of greater than 10 times the maximum number of structural paths to the latent variable in the model.

3.5 Ethical Considerations

This ethical section explained the ethical procedure allied with collecting quantitative data. In the introduction of the survey questionnaire, it was mentioned that the aim of this data collection is for academic purposes and to inform all participants about confidentiality to make sure that all participants will remain anonymous. Furthermore, we did not collect any personal identification such as name, email, or personal number from any participants. Lastly, to assure all participants in the information section of the survey by mentioning that their answers would not be used for any commercial use in the future.

3.6 Limitations on Data Collection

Due to limited time and resources the authors of this research collected the response from 294 participants. And the targeted area was Sweden to conduct the survey, it was also a communication gap as both authors does not speak Swedish which required them to explain before they are willing to a limited number of targeted audiences or the survey was filled. The survey was in two languages English and Swedish.

3.7 Quality of Data

To maintain the genuineness of this study and gain the readers' confidence, it is important to state the quality of research which refers to the trustworthiness of quantitative research.
According to (Saunders et al., 2009), to build the research trustworthiness of the research some measures are important to consider. The most relevant measures for this research include credibility, transferability, dependability, and conformability.

3.7.1 Credibility

The Credibility is an essential principle of the findings that indicate whether the data is relevant to what is intended to find (Saunders et al., 2009). In this research, the author tries to be taken the measure to ensure the established theory match the results.

3.7.2 Transferability

Transferability refers to the extent or transfer of the research results to other contexts or in other contexts (Lincoln and Guba, 1985). In this study, authors ensure the transferability by providing detailed information about the selection process of survey participants, and region. Further, it elaborates in detail which provided good help in processing transferability.

3.7.3 Survey Questionnaire

Dependability refers to the reliability of the research in other words over time stability of finding continued and the ability to repeat the research and gather similar results (Shenton, 2004).

In this research paper, the process of data collection and targeted region, group, and specific area of research were explained in detail in the methodology chapter. Further appendix chapter also provided the survey questionnaire to give an overview of the survey which helps the future researcher to conduct similar research in that area.

3.7.4 Survey Questionnaire

Conformability refers to the objectivity of research which means that no biases or influence from the author related to the preconception or individual understanding of the research topic (Shenton, 2004). To maintain the conformability of this quantitative research authors, make sure that they respectively and relied on the particular sources of literature to conduct the research.
4. Analysis

After conducting literature reviews and theoretical analyses, this chapter collected research data by distributing surveys. The collected data was analyzed using SmartPLS4 to perform descriptive statistical analysis, reliability and validity analysis, and structural equation modeling analysis. This was done to empirically validate the theoretical model of the research.

4.1 Data

After multiple adjustments, the final questionnaire consisted of 18 items in the form of a Likert 5-point scale. A total of 327 questionnaires were collected, but after removing survey respondents who completed the questionnaire in less than two minutes or provided identical responses for all items, only 294 valid questionnaires were retained.

Due to limited resources, the survey samples were mainly distributed in two regions, Linkoping and Stockholm, and the geographical distribution of the survey samples was not very balanced. However, the focus of this research is on the application of expanding plans behavior to the green purchase intention field, and the regional differences of the research samples are not the main point of this study. Furthermore, compared with developing countries, the green product market in Sweden started earlier and is relatively mature in all aspects. Therefore, there is not much difference in the actual situation of the green product market in different regions in daily life. As a result, the survey data collected in this study was deemed sufficient for subsequent research.

4.2 Descriptive Statistical Analysis

The first part of Table-I shows the descriptive statistics of the overall sample's gender distribution. Male respondents accounted for 41.4%, female respondents for 57.1%, and 1.3% did not reveal their gender. The higher proportion of female respondents is in line with earlier studies indicating that women have a higher tendency to purchase more eco-friendly products than men. The higher tendency to purchase makes them more inclined to complete relevant surveys to express themselves.

Age distribution of the overall sample shows: consumers aged 18 to 25 years old represented the largest proportion at 68.3%, followed by consumers aged 26 to 35 years old, representing 22.1% of the sample. Consumers aged 36 to 45 years old, 46 to 55 years old, and over 55 years old represented 8.5%, 0.6%, and 0.3% of the sample, respectively. It can be observed that younger people pay more attention to environmentally friendly purchases.

Regarding the occupational distribution of the sample, students and employees represented the largest proportion. The education levels of the sample were divided into five categories: below high school, high school or equivalent, undergraduate, master's, and doctoral or above. The proportion of consumers with an education level below high school was 3.4%, while the proportion of consumers with a high school or equivalent education level was 56.4%. Consumers with a college degree or higher education represented 32.6% of the sample, while those with a graduate degree represented 6.8% and those with a doctoral degree represented...
0.6%. Higher-educated consumers showed a more positive intention to purchase Eco-friendly products.

In terms of monthly shopping budgets, the proportion of samples with a budget of less than 5000 SEK was the largest at 79.9%. Consumers with higher monthly shopping budgets also showed a more positive intention to purchase environmentally friendly products. This is consistent with some scholars' views that environmentally friendly products are often priced higher than ordinary products, which require consumers to have higher purchasing power and more generous spending habits.

### Table I Descriptive statistics results

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>Item</th>
<th>Frequency</th>
<th>Percentage (%)</th>
<th>PI mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
<td>168</td>
<td>57.1</td>
<td>3.719</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>122</td>
<td>41.4</td>
<td>3.716</td>
</tr>
<tr>
<td></td>
<td>Secret</td>
<td>4</td>
<td>1.3</td>
<td>3.754</td>
</tr>
<tr>
<td>Age</td>
<td>18-25</td>
<td>201</td>
<td>68.3</td>
<td>3.693</td>
</tr>
<tr>
<td></td>
<td>25-35</td>
<td>65</td>
<td>22.1</td>
<td>3.718</td>
</tr>
<tr>
<td></td>
<td>35-45</td>
<td>25</td>
<td>8.5</td>
<td>3.729</td>
</tr>
<tr>
<td></td>
<td>45-55</td>
<td>2</td>
<td>0.6</td>
<td>3.500</td>
</tr>
<tr>
<td></td>
<td>56+</td>
<td>1</td>
<td>0.3</td>
<td>3.000</td>
</tr>
<tr>
<td>Occupation</td>
<td>Student</td>
<td>229</td>
<td>77.8</td>
<td>3.719</td>
</tr>
<tr>
<td></td>
<td>Employee</td>
<td>51</td>
<td>17.3</td>
<td>3.713</td>
</tr>
<tr>
<td></td>
<td>Business</td>
<td>11</td>
<td>3.7</td>
<td>3.711</td>
</tr>
<tr>
<td></td>
<td>Job-seeker</td>
<td>3</td>
<td>1</td>
<td>3.704</td>
</tr>
<tr>
<td>Education</td>
<td>Less than high school</td>
<td>10</td>
<td>3.4</td>
<td>3.714</td>
</tr>
<tr>
<td></td>
<td>High School or equivalent</td>
<td>166</td>
<td>56.4</td>
<td>3.716</td>
</tr>
<tr>
<td></td>
<td>Bachelor's degree</td>
<td>96</td>
<td>32.6</td>
<td>3.721</td>
</tr>
<tr>
<td></td>
<td>Master's degree</td>
<td>20</td>
<td>6.8</td>
<td>3.723</td>
</tr>
<tr>
<td></td>
<td>PhD degree or above</td>
<td>2</td>
<td>0.6</td>
<td>3.727</td>
</tr>
<tr>
<td>Budget</td>
<td>Up to 5000 SEK</td>
<td>235</td>
<td>79.9</td>
<td>3.716</td>
</tr>
<tr>
<td></td>
<td>5000-10000 SEK</td>
<td>38</td>
<td>12.9</td>
<td>3.718</td>
</tr>
<tr>
<td></td>
<td>10000-15000 SEK</td>
<td>21</td>
<td>7.1</td>
<td>3.721</td>
</tr>
</tbody>
</table>
4.3 Reliability and Validity Analysis

4.3.1 Reliability Analysis

Reliability measures the degree of reproducibility of measurement results and can be directly measured by conducting a test of repeatability on the research data (DeVellis and Thorpe, 2021). The higher the level of reliability, the smaller the difference between the results of multiple measurements, and vice versa. It can be said that good reliability is the prerequisite and basis for research data to have high validity. The specific indicators for reliability analysis in empirical tests usually include tests of stability, equivalence, and internal consistency. Stability measures the quality of the scale used by the researcher. If the same scale is used to measure the same research content at different times and the results are consistent, it indicates that the scale used in the study has good stability. Equivalence examines the degree of difference in measurement results obtained by different survey objects under the same scale measurement. In actual research, researchers need to judge whether there are differences between survey objects according to their research purposes and needs. Higher equivalence is not always better. Internal consistency is an important indicator of the reliability level of the scale. Generally, it refers to using the same scale to measure survey objects with similar or similar levels. If the measurement results obtained by different survey objects are roughly the same, it indicates that the internal consistency level of the scale is high. The measurement of the internal consistency level of the scale is a key indicator for conducting reliability analysis, so researchers need to ensure that the research scale they use has a high level of internal consistency. To measure the internal consistency level of the questionnaire in reliability analysis, scholars generally use Cronbach's alpha coefficient value. The higher the alpha value, the higher the internal consistency and reliability level of the scale. The common judgment criteria are: alpha > 0.7 indicates high reliability and is ideal; 0.5 < alpha < 0.7 is acceptable; alpha < 0.5 indicates low reliability and is unacceptable. Table-II shows that Cronbach's alpha values for the scales of attitude, subjective norm, perceived behavioral control, environmental concern, past green purchasing experience, and purchase intention are all above 0.7. This means that the measurement scales used in the study have good reliability and high credibility of the measurement results.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cronbach's alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>0.859</td>
</tr>
<tr>
<td>subjective norms</td>
<td>0.919</td>
</tr>
<tr>
<td>perceived behavior control</td>
<td>0.784</td>
</tr>
<tr>
<td>environmental concern</td>
<td>0.777</td>
</tr>
<tr>
<td>past green purchase experience</td>
<td>0.911</td>
</tr>
<tr>
<td>purchase intention</td>
<td>0.851</td>
</tr>
</tbody>
</table>

*Table-II Results of the reliability analysis of each potential variable*
4.3.2 Validity Analysis

Validity is the extent to which a measurement tool can measure the concept it aims to measure accurately (Heale and Twycross, 2015). It mainly consists of content validity, convergent validity, and discriminant validity. To ensure the validity of the results we need to conduct a validity analysis of the data as follows.

**Content Validity**
Content validity refers to the degree of correspondence between the content measured in the research and the concept to be measured. Content validity determines the rationality and truthfulness of the relationship between the research variables based on previous research results and experiences. The higher the internal validity, the more reasonable the preset variables are, and the less uncertainty there is in the relationship between variables. The measurement scales used in this study are mature scales that have been tested and validated by previous scholars, ensuring a high level of content validity. The attitude, subjective norm, perceived behavioral control, and environmental concern scales were adapted from Paul et al. (2016). The past green purchase experience was adapted from studies by Sun et al. (2012) and Zhou et al. (2012). The purchase intention scale was adapted from the study by Kim et al. (2013). These scales are all classic scales that have been adapted and cited multiple times internationally and have good reliability and validity. Based on suggestions, they have undergone multiple optimizations and modifications, and have been finally formed into a questionnaire. Therefore, the survey questionnaire of this study has good content validity.

**Convergent Validity**
Convergent validity is the extent to which different measurement methods produce consistent results when measuring the same concept. The higher the convergent validity, the more the latent variables aggregate with the observed variables. In quantitative research, factor loading, composite reliability (CR), and average variance extracted (AVE) are the most common metrics used to measure convergent validity. Good convergent validity requires factor loadings > 0.60, CR > 0.80, and AVE > 0.50.

Using SmartPLS, we analyzed the data's convergent validity. Table-III presents the results. All items met the criteria of factor loadings above 0.6 and p-values below 0.001, indicating good explanatory power. All constructs showed good internal consistency, reliability, and convergent validity with composite reliability above 0.80 and average variance extracted above 0.50.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Item</th>
<th>Factor loading</th>
<th>p value</th>
<th>Composite reliability</th>
<th>Average variance extracted (AVE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>AT1</td>
<td>0.899</td>
<td>0.000</td>
<td>0.913</td>
<td>0.778</td>
</tr>
<tr>
<td></td>
<td>AT2</td>
<td>0.844</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AT3</td>
<td>0.902</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective norms</td>
<td>SN1</td>
<td>0.925</td>
<td>0.000</td>
<td>0.948</td>
<td>0.860</td>
</tr>
</tbody>
</table>
Discriminant Validity
We tested the discriminant validity of the latent variables using two methods: cross-loadings and the Fornell-Larcker criterion. Cross-loadings compare each item's contribution to its latent variable, requiring that it is higher than its contributions to other variables. The Fornell-Larcker criterion uses the square root of the AVE as a standard. According to Fornell and Larcker, the correlation coefficient between each pair of dimensions should be lower than the square root of the AVE. Table-IV shows that the bold parts are the loadings of each item on its latent variable, and they are higher than all other loadings, indicating that the cross-loadings meet the requirements. The Fornell-Larcker criterion analysis results are shown in Table.V. The bold diagonal values are the square roots of the AVE, and the lower triangular area shows the correlation coefficients between variables. The table shows that the square roots of the AVE for attitude, environmental concern, past green purchasing experience, perceived behavioral control, purchase intention, and subjective norm are 0.882, 0.831, 0.921, 0.834, 0.878, and 0.927, respectively, and they are higher than the correlation coefficients between variables. Thus, the questionnaire has good discriminant validity.
<table>
<thead>
<tr>
<th></th>
<th>AT</th>
<th>EC</th>
<th>PGPE</th>
<th>PBC</th>
<th>PI</th>
<th>SN</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBC1</td>
<td>0.363</td>
<td>0.450</td>
<td>0.857</td>
<td>0.212</td>
<td>0.449</td>
<td>0.482</td>
</tr>
<tr>
<td>PBC2</td>
<td>0.301</td>
<td>0.456</td>
<td>0.879</td>
<td>0.217</td>
<td>0.413</td>
<td>0.523</td>
</tr>
<tr>
<td>PBC3</td>
<td>0.115</td>
<td>0.320</td>
<td>0.759</td>
<td>0.117</td>
<td>0.303</td>
<td>0.328</td>
</tr>
<tr>
<td>EC1</td>
<td>0.261</td>
<td>0.285</td>
<td>0.248</td>
<td>0.810</td>
<td>0.304</td>
<td>0.400</td>
</tr>
<tr>
<td>EC2</td>
<td>0.307</td>
<td>0.126</td>
<td>0.159</td>
<td>0.844</td>
<td>0.216</td>
<td>0.329</td>
</tr>
<tr>
<td>EC3</td>
<td>0.333</td>
<td>0.114</td>
<td>0.146</td>
<td>0.838</td>
<td>0.338</td>
<td>0.317</td>
</tr>
<tr>
<td>PGPE1</td>
<td>0.321</td>
<td>0.265</td>
<td>0.443</td>
<td>0.359</td>
<td>0.917</td>
<td>0.430</td>
</tr>
<tr>
<td>PGPE2</td>
<td>0.332</td>
<td>0.268</td>
<td>0.452</td>
<td>0.262</td>
<td>0.927</td>
<td>0.395</td>
</tr>
<tr>
<td>PGPE3</td>
<td>0.318</td>
<td>0.270</td>
<td>0.416</td>
<td>0.333</td>
<td>0.920</td>
<td>0.439</td>
</tr>
<tr>
<td>PI1</td>
<td>0.438</td>
<td>0.408</td>
<td>0.442</td>
<td>0.360</td>
<td>0.407</td>
<td>0.890</td>
</tr>
<tr>
<td>PI2</td>
<td>0.474</td>
<td>0.339</td>
<td>0.448</td>
<td>0.375</td>
<td>0.413</td>
<td>0.891</td>
</tr>
<tr>
<td>PI3</td>
<td>0.400</td>
<td>0.466</td>
<td>0.545</td>
<td>0.382</td>
<td>0.385</td>
<td>0.852</td>
</tr>
</tbody>
</table>

*Table-IV Discriminant validity - cross-loading*

<table>
<thead>
<tr>
<th></th>
<th>AT</th>
<th>EC</th>
<th>PGPE</th>
<th>PBC</th>
<th>PI</th>
<th>SN</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT</td>
<td>0.882</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EC</td>
<td>0.359</td>
<td>0.831</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PGPE</td>
<td>0.351</td>
<td>0.346</td>
<td>0.921</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>0.331</td>
<td>0.227</td>
<td>0.474</td>
<td>0.834</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI</td>
<td>0.498</td>
<td>0.425</td>
<td>0.458</td>
<td>0.547</td>
<td>0.878</td>
<td></td>
</tr>
<tr>
<td>SN</td>
<td>0.347</td>
<td>0.22</td>
<td>0.29</td>
<td>0.5</td>
<td>0.463</td>
<td>0.927</td>
</tr>
</tbody>
</table>

*Table-V Discriminant validity - Fornell-Larcker criterion*

### 4.4 Structural Model Test

#### 4.4.1 Coefficient of Determination

The coefficient of determination, or R2, measures how well a latent variable is explained by its observed variables and evaluates the structural model's explanatory power (Nagelkerke, 1991). The value of R2 is positively correlated with the internal fit of the partial least squares path model, and it ranges from 0 to 1. A higher R2 value indicates a better fit. Chin (1998) suggested three critical values for R2: 0.19, 0.33, and 0.67. R2 values greater than or equal to 0.67 show strong explanatory power of the independent variables on the dependent variable. R2 values between 0.33 and 0.67 show moderate explanatory power. R2 values between 0.19 and 0.33 show weak explanatory power.

We tested the coefficient of determination for the purchase intention of Swedish consumers for short-shelf-life food products with green packaging using SmartPLS4. Table-VI shows the results. The coefficient of determination for TPB's three main factors on purchase intention is 0.488, showing a moderate explanatory power. Thus, TPB's three main factors
can explain the purchase intention of Swedish consumers for short-shelf-life food products with green packaging.

<table>
<thead>
<tr>
<th></th>
<th>R-square</th>
<th>R-square adjusted</th>
</tr>
</thead>
<tbody>
<tr>
<td>purchase intention</td>
<td>0.488</td>
<td>0.479</td>
</tr>
</tbody>
</table>

Table VI R2

4.4.2 Model Fit Analysis-SRMR

The model fit will be evaluated using the standardized root mean square residual (SRMR). SRMR measures the average difference between the observed and expected correlation matrices and is an absolute fit index. Hu and Bentler (1998) suggested that SRMR<0.1 is acceptable, and a stricter criterion is SRMR<0.08. SmartPLS provides two types of SRMR values: saturated model and estimated model. The saturated model refers to the model where all latent variables are correlated, while the estimated model refers to the model constructed according to theoretical assumptions. We will compare the SRMR values of the two models to judge whether our estimated model has a good fit.

Table VII shows the SRMR values of the two models. We can see that the SRMR value of the saturated model is 0.065, while that of the estimated model is 0.078. The difference between them is small, indicating that our estimated model does not deviate too much from the observed data. At the same time, both models have SRMR values lower than the strict criterion of 0.08, indicating that our estimated model has a good fit.

<table>
<thead>
<tr>
<th></th>
<th>Saturated model</th>
<th>Estimated model</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRMR</td>
<td>0.065</td>
<td>0.078</td>
</tr>
</tbody>
</table>

Table VII SRMR

4.4.3 Path Coefficient Analysis

We used SmartPLS4 to obtain the path coefficients of each path using the PLS algorithm and tested their significance using bootstrapping with a subsample size of 5000. The significance of the path coefficients is determined by t-statistics and p-values. A path coefficient is significant, and a hypothesis is supported if the absolute value of the t-statistic is above 1.96 and the p-value is below 0.05.

As shown in Table VII, the study model comprises nine paths. The path coefficient of the AT -> PI is 0.233, with a t-statistic of 4.075 and a p-value of 0.000, which is less than 0.01. This indicates that Swedish consumers' attitude significantly and positively influences their purchase intention of short-shelf-life food products with green packaging, and H1 is supported. The path coefficient of AN -> PI is 0.159, with a t-statistic of 2.918 and a p-value of 0.004, which is less than 0.01. This shows that Swedish consumers' subjective norm significantly and positively influences their purchase intention of short-shelf-life food products with green packaging, and H2 is supported. The path coefficient of PBC -> PI is 0.286, with a t-statistic of 5.580 and a p-value of 0.000, which is less than 0.01. This indicates that Swedish consumers' perceived behavioral control significantly and positively influences
their purchase intention of short-shelf-life food products with green packaging, and H3 is supported. The path coefficient of EC -> PI is 0.198, with a t-statistic of 3.961 and a p-value of 0.000, which is less than 0.01. This indicates that Swedish consumers' environmental concern significantly and positively influences their purchase intention of short-shelf-life food products with green packaging, and H4 is supported. The path coefficient of EC->AT is 0.270, with a t-statistic of 4.115 and a P-value of 0.000, which is less than 0.01. This indicates that Swedish consumers' environmental concern can significantly and positively influence their attitude towards short-shelf-life food products with green packaging, and H5 is supported. The path coefficient of EC->SN is 0.220, with a t-statistic of 3.689 and a P-value of 0.000, which is less than 0.01. This suggests that Swedish consumers' environmental concern can significantly and positively affect their subjective norm towards short-shelf-life food products with green packaging, and H6 is supported. The path coefficient of EN->PBC is 0.227, with a t-statistic of 3.407 and a P-value of 0.001, which is less than 0.01. This indicates that Swedish consumers' environmental concern can significantly and positively influence their perceived behavioral control towards short-shelf-life food products with green packaging, and H7 is supported. The path coefficient of PGPE->PI is 0.126, with a t-statistic of 1.724 and a P-value of 0.085, which is greater than 0.05. This indicates that the influence of Swedish consumers' past green purchase experiences on their purchase intention towards short-shelf-life food products with green packaging is not significant, and H8 is not supported. The path coefficient of PGPE->AT is 0.258, with a t-statistic of 4.262 and a P-value of 0.000, which is less than 0.01. This suggests that Swedish consumers' past green purchase experiences can significantly and positively affect their attitude towards short-shelf-life food products with green packaging, and H9 is supported. In summary, except for H8, all hypotheses are supported.

In terms of the size of standardized path coefficients, among the four factors that affect "purchase intention", perceived behavioral control has the greatest influence, followed by attitude, and finally, environmental concern and subjective norm. Among the two factors that affect "attitude", environmental concern has a slightly greater impact on attitude than past green purchasing experiences.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path</th>
<th>Path coefficients</th>
<th>T statistics</th>
<th>P values</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>AT -&gt; GPI</td>
<td>0.233</td>
<td>4.075</td>
<td>0.000</td>
<td>significant</td>
</tr>
<tr>
<td>H2</td>
<td>AN -&gt; GPI</td>
<td>0.159</td>
<td>2.918</td>
<td>0.004</td>
<td>significant</td>
</tr>
<tr>
<td>H3</td>
<td>PBC -&gt; GPI</td>
<td>0.286</td>
<td>5.580</td>
<td>0.000</td>
<td>significant</td>
</tr>
<tr>
<td>H4</td>
<td>EC -&gt; GPI</td>
<td>0.198</td>
<td>3.961</td>
<td>0.000</td>
<td>significant</td>
</tr>
<tr>
<td>H5</td>
<td>EC -&gt; AT</td>
<td>0.270</td>
<td>4.115</td>
<td>0.000</td>
<td>significant</td>
</tr>
<tr>
<td>H6</td>
<td>EC -&gt; SN</td>
<td>0.220</td>
<td>3.689</td>
<td>0.000</td>
<td>significant</td>
</tr>
<tr>
<td>H7</td>
<td>EC -&gt; PBC</td>
<td>0.227</td>
<td>3.407</td>
<td>0.001</td>
<td>significant</td>
</tr>
<tr>
<td>H8</td>
<td>PGPE -&gt; GPI</td>
<td>0.126</td>
<td>1.724</td>
<td>0.085</td>
<td>insignificant</td>
</tr>
<tr>
<td>H9</td>
<td>PGPE -&gt; AT</td>
<td>0.258</td>
<td>4.262</td>
<td>0.000</td>
<td>significant</td>
</tr>
</tbody>
</table>

*Table-VIII path coefficients and significance results*
5. Discussion

5.1 Discussion of Data Analysis Result

This subsection presents a discussion of the results of the data analysis concerning this study's RQ and theoretical framework. The main goal of this research is to explore the forces that influence Swedish consumers' purchase intention for short-shelf-life food products in green packaging and to expand TPB by incorporating new or under-researched factors into the model. Following a literature review, nine hypotheses are proposed in this study to test the relationship between different factors and purchase intentions. The data analysis showed that eight hypotheses were supported by the data, while one hypothesis was not supported. The following paragraphs will explain the findings and implications of each hypothesis.

The first three hypotheses, H1, H2, and H3, are based on TPB (Ajzen, 1991), the core expression of which is that an individual's behavior is controlled by his or her behavioral intention and perceived behavioral control, where the behavioral intention is influenced by the individual's attitude towards the behavior, the subjective norm for performing the behavior and perceived behavioral control. This study measured attitude as consumers' evaluation of green packaging short-shelf-life food products. Similarly, subjective norms are measured as the social pressure felt by consumers to perform the act of purchasing such products. Again, perceived behavioral control is measured as the consumer's perception of the feasibility and difficulty of purchasing the product. Finally, green purchase intention was measured as the likelihood of the consumer purchasing the green product. The data analysis showed that all three TPB core factors were able to significantly and positively influence potential consumers' green purchase intentions, meaning that consumers with a more favorable attitude, higher perceived social pressure, and greater perceived ability to buy green packaging short-shelf-life food products were more likely to buy them. These findings are consistent with many previous studies in the literature review chapter (e.g., Wang et al., 2016; Paul et al., 2016), and confirmed the applicability and validity of TPB in explaining and predicting Swedish consumers' purchase intention for green packaging short-shelf-life food products.

The significant role of attitudes is to be expected, as the vast majority of past research findings support a direct relationship between it and green purchase intentions (Zhuang et al., 2021). After analyzing the data, we infer that, on the one hand, attitudes, as mediators between multiple external factors and green purchase intentions, are reinforced by a variety of external factors. Specifically, environmental concerns as well as past green purchasing experiences are translated into attitudes, which in turn strengthen the influence of attitudes. On the other hand, attitudes themselves significantly influence intentions and behavior, as they are an evaluation of behavior, and excluding objective conditions, attitudes are the subjective psychological factor that most significantly influences behavioral intentions. Specifically, Swedish consumers who have a positive attitude towards a short-shelf-life food product in green packaging have a positive perception of it and are more likely to choose to buy it, given the same conditions.

Although in this study, the three core factors of TPB all had a significant influence on purchase intention; the influence of subjective norm was relatively weaker than the other two.
Considering previous studies on green purchase intention, scholars did not reach a consensus on the influence of subjective norms, such as Ruangkanjanases et al. (2020) who found that subjective norms did not have a significant influence on green purchase intention among Taiwanese young people, while it did have a significant influence among Japanese young people, it is uncertain whether the conclusion that subjective norm has a positive influence on Swedish consumers’ green packaging of short-shelf-life food products can be generalized to a wider scope, and more research is needed.

In the analysis of the data in this paper, it was found that perceived behavioral control was the most influential, while attitudes were more important than subjective norms in influencing green purchase intentions, which may stem from the moderating effect of perceived behavioral control. La Barbera and Ajzen (2020) suggested that when analyzing the effect of TPB variables on purchase intentions, strong perceived behavioral control enhances the relevance of attitudes importance while weakening the relevance of subjective norms. We speculate that the logic behind this is that Swedish consumers' control over the relatively low-cost purchase of green packaged short-shelf-life food products is sufficiently strong that their intentions are shaped more by their attitudes than by peer pressure (Castanier et al., 2013).

The next four hypotheses H4, H5, H6, and H7 were based on the extension of TPB by adding environmental concern as a new factor that may influence consumers' green purchase intention. In this research, Environmental concern was measured as consumers' cognition and feeling about environmental issues and problems. Data analysis revealed that environmental concern had a direct positive effect on potential consumers' green purchase intention, i.e. consumers who possessed a higher level of concern about environmental issues were more likely to purchase short-shelf-life food products in green packaging to reduce their environmental impact. This finding is likewise consistent with the findings of several studies mentioned in previous literature reviews (e.g., Koenig-Lewis et al. 2014; Sang and Bekhet 2015; and developed centuries like Pathak 2016), demonstrating that environmental concerns are an important factor in consumers' green purchase intentions, a logical extension of TPB in the green domain. Moreover, the data analysis also showed that environmental concern had an indirect positive influence on purchase intention through the mediators of attitude, subjective norm, and perceived behavioral control. This means that consumers who are concerned about environmental issues have more positive attitudes towards green packaging for short-shelf-life foods than those who are less concerned about environmental issues, are more sensitive to calls from society for green consumption, are more likely to ask for these green products themselves and have less perceived difficulty in purchasing them, thus increasing purchase intentions. These findings were also consistent with some previous studies (e.g., Bamberg, 2003; Paul et al., 2016), and indicated that environmental concern was not only a direct factor but also an indirect factor of green purchase intention. These findings also confirmed that environmental concern as an extension factor of TPB in the green consumer behavior field was reasonable and meaningful.

Environmental concern is a relatively popular choice as an extension of TPB in the green sector, but it is also troubling to know how to measure it accurately. Previous research does not have a relatively stable measure of environmental concern, which we believe is likely to be one of the key reasons why the effect of environmental concern on green purchase
intentions is not fully recognized (Qomariah and Prabawani, 2020). Therefore, more research is needed to test whether environmental concerns can be identified as an extension of the TPB factor and to determine the most reasonable measure.

The last two hypotheses H8 and H9 were based on our new extension to TPB by adding past green purchase experience as another new factor that may influence consumers' green purchase intention. The past green purchase experience was measured as the consumer's past experience of purchasing all types of green products. The data analysis showed that past green purchase experiences did not have a direct positive influence on purchase intention, meaning that consumers who had bought and experienced more green products in the past were not necessarily more likely to buy green packaged short-shelf-life food products. This finding was contrary to the hypothesis and some previous studies (e.g., Mohmed et al., 2013; Krishnakumar, 2018), and suggested that the influence related to past experiences with green purchases may have different impacts on purchase intention for different products and fields. One possible explanation for this finding was that Swedish consumers had high awareness and acceptance of green products, and they evaluated different green products independently rather than relying on their past experience. Therefore, their past good experience of buying other green products did not directly and significantly influence their purchase intention for new green products. However, the data analysis also showed that past green purchase experiences had an indirect positive influence on purchase intention through the mediator of attitude. This implies that consumers who have purchased more green products in the past and have had a good purchasing experience will have a more positive attitude towards short-shelf-life food products in green packaging, even if they are not the same product, and will be more willing to try green products, thus increasing their green purchase intention. This finding is in line with previous studies mentioned in the literature review section (e.g., Mohmed et al., 2013; Krishnakumar, 2018), implying that consumers' past experiences with green products influenced their attitudes toward new green products and thus their purchase intentions. In conclusion, past green purchase experiences do not directly influence green purchase intentions but have an indirect effect through attitudes. This finding also demonstrates the important role of consumers' past experiences in shaping and changing consumers' attitudes.

Previous studies on green purchase intention usually emphasized past experience with the same product when involving past experience, and therefore their conclusions were generally only applicable to one or a category of products. But this paper chose to study consumers’ past experience with all green products as the research object, and thus the newly expanded model and conclusions have more universality and can be tried to extend to other types of green products.

Although TPB is a good predictor of individual behavior, it is a very basic theory and its application to different domains is such that, to improve its accuracy, it is necessary to try to make specific refinements by adding various new variables, thus enhancing its predictive and explanatory power for specific behaviors and intentions. This study empirically tests nine hypotheses and attempts to add environmental concerns and past green purchase experiences to enhance the explanatory power of TPB in the area of green consumption, as an extension of TPB.
In summary, this section discussed the data analysis results of the research questions and the theoretical framework of this study. The main findings were that TPB was a valid and useful theory to explain and predict Swedish consumers' purchase intention for green packaging short-shelf-life food products; the environmental concern was a significant direct and indirect factor of green purchase intention; past green purchase experience was not a significant direct factor but a significant indirect factor of green purchase intention through attitude; environmental concern influenced attitude, subjective norm, and perceived behavioral control positively; past green purchase experience influenced attitude positively. Together, these findings validate the feasibility of including environmental concerns and past green purchase experiences as new influencing factors in the TPB model when studying green purchase intentions to better explain consumers' green purchase intentions.

5.2 Recommendations

This section will provide a recommendation for the government and companies based on the findings in this research. Further it explains the steps and actions government and companies should take in order to make effective impact on consumer purchase intention towards the green packaging of short-shelf-life food products.

5.2.1 Recommendations for Government

Firstly, publicity and awareness campaigns towards the environment. The results concluded that the Swedish consumers have concerns with regards to the environmental issues related to the package waste from green packaged short-shelf-life food products. We now know that Swedish consumers’ concern and perception for environmental issues ultimately affects their purchase intention. The role of the government is significant in making this into a positive scenario where they can strengthen publicity and education related to environmental protection, attitude improvement, and social pressure reinforcement. It can be achieved by actively working on public awareness campaigns and education programs to promote green packaging for short-shelf-life food products. Further, government should strategies the effective ways of communication to improve the public awareness of environmental protection measures in order to gain public enthusiasm and support. These awareness campaigns help to change the behavior of the general public towards reducing the negative impact of non-green packaging on the environment.

Secondly, strengthen laws related to environmental protection that help to enhance the use of green packaging. Consumers who are more concerned about environmental issues are more likely to use green packaging which ultimately reduces the negative impact of waste on the environment. Therefore, the government should introduce policies which promote the purchase of short-shelf-life food products in green packaging.

Thirdly, government may implement taxes on short-shelf-life food products in non-green packaging which ultimately converts consumer purchases intention towards green packaged products. This concept is not new in Sweden as the government already has laws for the different pricing on plastic and paper carrier bags in supermarkets and groceries stores. Those plastic bags are usually twice as expensive as paper bags due to taxes on the former and subsidies on the latter. This promotes and serves the purpose of environmental protection.
Similar measures for green packaging were also recommended by us authors after the findings of this research paper.

5.2.2 Recommendations for Companies

The recommendations for companies are especially towards the region where this study was conducted.

Firstly, as the Swedish consumers has concern over the environmental issue related to the package waste from those green packed short-shelf-life food products, it is recommended for the companies to promote the idea of green packaging and gain the public support by campaigns. That will help the companies build a positive image amongst the consumers who already have environmental awareness and grow their company revenue. Consumers in Sweden have a relatively high level of acceptance and awareness for sustainable products and therefore, it will be not a significant challenge for companies to introduce the green packaging for short-shelf-life food products.

Secondly, it is recommended for the companies to focus on green marketing in order to appeal to the consumer purchase intention towards the green packaged short-shelf-life food products. The aim of green marketing is to introduce the company’s environmental-friendliness and sustainable practices for business operations and products to the public. This will ultimately improve the credibility and visibility of the company from a consumer’s perspective, and furthermore, it will differentiate them from competitors in the market. Promote green packaging by emphasizing on the importance and benefits of use attracts customers and helps build positive perception in consumers’ mind, or their attitude. This helps the companies to change the consumers’ attitudes towards the use of green packaging. Positive attitude towards green packaging triggers the sense of contributing to protecting the planet which then increases people’s purchase intention and drives green purchasing behavior.

Thirdly, it is recommended that companies may target consumers who have not had the experience of green purchase in the past by introducing the benefits of green packaging from an environmental protection perspective. That will allow more people to experience the products in green packaging. Furthermore, if those consumers are enabled to experience using green products at low cost they will have enhanced attitudes, which indirectly increase their purchase intentions.

Fourthly, it is recommended to organize promotional campaigns to distribute free samples of short-shelf-life food products in green packaging. In this way, new consumers will be attracted to come and experience and eventually get used to the product and green packaging. After completing those promotion campaigns of free products sample, it is recommended to give discounts on the green packaged short-shelf-life food products. This will not only enhance consumers’ purchase intention by experiencing the same product repetitively, but also continuously attract the attention of new consumers.

Finally, it is recommended to increase the accessibility of green packaged short-shelf-life food products. For example, if one store has 5 non-green packaged products on the shelf, then the store needs to provide at least 2 green packaged products so that the consumers will have more options to choose from. As this research found, the problem related to accessibility lies in that most of those products are not in green package. Therefore, it is recommended to make sure that the consumers do not have to put extra effort to access the products in green packaging.
6. Conclusion

6.1 Research Conclusions

How to different factors affecting the intention of Swedish consumers to purchase green packaged food products having a short-shelf-life? This paper investigates this question using TPB. Environmental concerns and past green purchase experience are the two factors that we tried to extend TPB and influence green purchase intentions. Through this model we explored Swedish consumers' intention to buy green packaged food products with short-shelf-life. This paper targeted general Swedish consumers, used questionnaire survey method to collect data, and employed empirical research method to test the hypotheses. The following are the main conclusions of this paper.

The descriptive statistics results show that, 1) gender-wise, female consumers tend to have slightly stronger purchase intention than male consumers; 2) age-wise, consumers aged 35-45 have the highest purchase intention; 3) education-wise, consumers with doctoral degree have the strongest purchase intention, demonstrating the positive outcome of education on green purchase intention; 4) occupation-wise, students have better purchase intention, followed by employees; 5) budget-wise, consumers with higher monthly budget have higher purchase intention.

The structural equation model results revealed that: Swedish consumers' green purchase intention for green packaged food products with short-shelf-life can be directly enhanced by consumer attitude, subjective norm, and perceived behavioral control, which proves the correctness of the chosen theoretical model. Perceived behavioral control is the strongest factor in enhancing purchase intention, followed by attitude; and the effect of subjective norms is weaker than the former two. Indirectly, consumer environmental concern can increase Swedish consumers' green purchase intention for green packaged food products with short-shelf-life through attitude, subjective norm, and perceived behavioral control as mediators. Moreover, past green purchase experience can indirectly increase Swedish consumers' green purchase intention of green packaged food products with short-shelf-life through attitude as a mediator. With attitude as a mediating variable, the indirect effect of environmental concern on purchase intention is larger than that of past green purchase experience. Based on the findings, relevant measures and suggestions are proposed.

6.2 Innovation and Academic Contribution

Previous studies on green purchase intention related to green packaging mostly focused on the attributes of green packaging as influencing factors of purchase intention and overlooked other factors that could have affected the purchase intention of green packaging itself. They also mainly studied the green packaging of green products, and seldom examined the influencing factors of purchase intention of green packaging for general products. This study integrated TPB and innovatively explored the factors that affect Swedish consumers' green purchase intention of green packaged food products with short-shelf-life.

This study adopted the consumer's perspective and extends TPB. It added environmental
concern and past green purchase experience as new variables that can affect purchase intention directly or indirectly through attitude, subjective norm, and perceived behavioral control. And from the attitude perspective, it investigated two variables that indirectly affected purchase intention through attitude as a mediator. Then it built a model and tested its hypotheses and model through data analysis. It confirms that TPB can effectively predict consumers' green purchase intention and behavior of green packaging for short-shelf-life food products and verifies the role of environmental concern and past green purchase experience as new variables in the model. This provided strong evidence and support for the application of planned behavior theory in food marketing, green packaging marketing and environmental management fields, and enriches the research on green purchase intention of green packaging for general products.

In addition, this study also provided relevant suggestions for Swedish food enterprises and government departments in the discussion part to promote Swedish consumers' acceptance and use of green packaging.

6.3 Limitations and Future Research

This study has certain limitations which are mentioned in this section with suggestions provided for future research. Firstly, the sample data is collected from limited number of Swedish cities which may not represent the entire population of Sweden. Secondly the study also has limitations in terms of sampling bias. Due to limited time and resources, authors of this study decided to go for convenience sampling technique, by using which, this study was not able to provide equal rate in many data groups such as gender, age, and occupation groups. Accordingly, a major part of the result is influenced by the opinion of one group. In addition, as this research is conducted by students, many respondents are students themselves as well, which in this case, can also be considered as a limitation.

The subject of this research is targeted on just a few aspects for green packaged short-shelf-life food products. But there are large research gaps around the green packaging itself which are not covered by authors of this research. Therefore, it is suggested for future researchers to focus on other factors which may contribute to the research topic.

1) Authors of this research focused only on environmental concerns and past purchase experience. However, there are many other factors which can contribute to this research topic, such as Media exposure, environmental knowledge, and environmental guilt.

2) In this research, the number of respondent is no more than 300 in one particular region of Sweden. Future research can be enhanced by having more samples and targeting more regions.

3) This study is only based on the planned behavior theory (TPB) due to limited time and resources. Future researchers can conduct research in this area by using different theories.

4) This study assumes that purchase intention stands for the consumer behavior. But due to the green gap (the gap between green purchasing intentions and green purchasing behavior) it may not be 100 percent accurate. so it is Future researchers can consider the green gap as well.
Reference List


students. 5th ed. New York: Prentice Hall.


Appendix:

Survey Questionnaire

Survey

We are students at Linköping University and writing a thesis paper on the Swedish Consumers’ Purchase Intentions for short-shelf-life food products in green packaging. Therefore, conducting the survey to collect data on what thoughts and opinions consumers have on this subject.

All participants will remain anonymous, and the data will be used only for academic purposes and all the answers will remain confidential.

We would very appreciate your honest and thoughtful responses to the following questions.

If you have any questions or concerns, please contact Ali Ahsan (alita154@student.liu.se) and Siyu Huang (siyu784@student.liu.se)

In Swedish

Vi är studenter vid Linköpings universitet och skriver ett examensarbete om de svenska konsumenternas köpintentioner för korthållbara livsmedel i grön förpackning. Vi genomför därför undersökningen för att samla in data om vilka tankar och åsikter konsumenter har om detta ämne.

 Alla deltagare kommer att förbli anonyma, och uppgifterna kommer endast att användas för akademiska ändamål och alla svar kommer att förbli konfidentiella.

Om du har några frågor eller funderingar, vänligen kontakta Ali Ahsan (alita154@student.liu.se) och Siyu Huang (siyu784@student.liu.se)

Vi skulle uppskatta dina ärliga och omtänksamma svar på följande frågor.

Note

Before we begin, we would like to provide you with some brief information on key terms used in this survey.
Note

Before we begin, we would like to provide you with some brief information on key terms used in this survey.

- **Green packaging** refers to packaging that is *environmentally friendly, recyclable, and sustainable*. An example of green packaging is biodegradable packaging made from plant-based materials.
- **Shelf life** is the length of time that a commodity may be stored without becoming unfit for use, consumption, or sale. **Short shelf-life food products** refer to food products that have a shorter lifespan than other food products due to their perishable nature. Short-shelf-life foods products include four main categories, namely *vegetables, fruits, dairy and prepared foods*. Some examples of short shelf-life food products are *fresh berries, leafy greens, bread and dairy products like milk, yogurt and cheese* that have a limited lifespan and need to be consumed or used within a short period of time.

Notera

Innan vi börjar vill vi ge dig lite kort information om nyckeltermen som används i den här undersökningen.

- **Gröna förpackningar** avser förpackningar som är miljövänliga, återvinningsbara och hållbara. Ett exempel på gröna förpackningar är biologiskt nedbrytbare förpackningar gjorda av växtbaserade material.
- **Hållbarhet** är den tid som en vara kan lagras utan att bli olämplig för användning, konsumtion eller försäljning. Livsmedelsprodukter med kort hållbarhet avser livsmedel som har en kortare livslängd än andra livsmedel på grund av sin lättfördärvliga natur. Livsmedelsprodukter med kort hållbarhet inkluderar fyra huvudkategorier, nämligen grönsaker, frukt, mejeriprodukter och färdigmat. Några exempel på livsmedelsprodukter med kort hållbarhet är färöar, bladhäll, bröd och mejeriprodukter som mjölk, yoghurt och ost som har en begränsad livslängd och måste konsumeras eller användas inom en kort tidspark.
Green packaged vegetables (short shelf life food products)
Gröna förpackade grönsaker (livsmedelprodukter med kort hållbarhet)

Green packaged dairy products (short shelf life food products)
Gröna förpackade mejeriprodukter (livsmedelprodukter med kort hållbarhet)

Green packaged prepared foods (short shelf life food products)
Gröna förpackade beredda livsmedel (livsmedelprodukter med kort hållbarhet)
What is your age?
Hur gammal är du?

- 18-25
- 26-35
- 36-45
- 46-55
- 56+

What is your gender?
Vad är ditt kön?

- Male
- Female
- Does not want to disclose

What is your highest level of education completed?
Vilken är din högsta utbildningsnivå?

- Less than high school diploma
- High school diploma or equivalent
- Bachelor’s degree
- Master’s degree
- PhD degree
What is your current occupation?
Vad är din nuvarande sysselsättning?

- Student
- Employee
- Business
- Pensioner
- Job Seeker
- Other...

Do you live in Sweden? If yes, in which city?
Bör du i Sverige? Om ja, i vilken stad?

Short answer text
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Do you live in Sweden? If yes, in which city?
Bor du i Sverige? Om ja, i vilken stad?

Your answer

What is your monthly budget for groceries?
Vad är din månadsbudget för matvaror?

- [ ] Up to 5000 SEK
- [ ] 5,000-10,000 SEK
- [ ] 10,000-15,000 SEK
- [ ] 15,000-20,000 SEK
- [ ] 20,000+ SEK

Have you ever purchased short-shelf life food products in green packaging? *
Har du någonsin köpt livsmedel med kort hållbarhet i gröna förpackningar?

- [ ] Yes
- [ ] No
- [ ] Maybe
Survey questions
Please answer all the following questions with 1 to 5.
Vänligen svara på alla följande frågor med 1 till 5.
1 = Strongly Disagree, Håller absolut inte med,
2 = Disagree, Håller inte med
3 = Neutral
4 = Agree, Håller med
5 = Strongly Agree, Håller helt med.

Attitude
Your attitude towards short shelf-life food products in green packaging.
Din inställning till livsmedelsprodukter med kort hållbarhet i gröna förpackningar.

I like the idea of purchasing short-shelf life food products in green packaging.
Jag gillar tanken på att köpa livsmedelsprodukter med kort hållbarhet i gröna förpackningar.

1 2 3 4 5
Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

Purchasing short-shelf life food products in green packaging is a good idea.
Att köpa livsmedel med kort hållbarhet i gröna förpackningar är en bra idé.

1 2 3 4 5
Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree
I have a favorable attitude toward purchasing short-shelf life food products in green packaging.
Jag har en positiv inställning till att köpa livsmedel med kort hållbarhet i gröna förpackningar.

1 2 3 4 5
Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

**Subjective norm**
The social pressure you perceive to buy short-shelf-life food products in green packaging.
Det sociala trycket du upplever att köpa korthållbara livsmedelsprodukter i gröna förpackningar.

Most people who are important to me think I should purchase short-shelf-life food products in green packaging.
De flesta som är viktiga för mig tycker att jag borde köpa livsmedelsprodukter med kort hållbarhet i gröna förpackningar.

1 2 3 4 5
Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

Most people who are important to me would want me to purchase short-shelf life food products in green packaging.
De flesta som är viktiga för mig skulle vilja att jag köper livsmedelsprodukter med kort hållbarhet i gröna förpackningar.

1 2 3 4 5
Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

People whose opinions I value would prefer that I purchase short-shelf life food products in green packaging.
Människor vars åsikter jag värdesätter skulle föredra att jag köper livsmedelsprodukter med kort hållbarhet i gröna förpackningar.

1 2 3 4 5
Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree
Perceived behavioral control
The level of control you perceive over the purchase of short-shelf-life food products in green packaging.
Nivån av kontroll du uppfattar över inköp av kortåldbara livsmedelsprodukter i gröna förpackningar.

I believe I am able to purchase short-shelf-life food products in green packaging due to many reasons.
Jag tror att jag kan köpa livsmedelsprodukter med kort hållbarhet i gröna förpackningar på grund av många anledningar.

1  2  3  4  5
Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

I have resources, time and willingness to purchase short-shelf life food products in green packaging.
Jag har resurser, tid och vilja att köpa livsmedelsprodukter med kort hållbarhet i gröna förpackningar.

1  2  3  4  5
Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree
Short-shelf life food products in green packaging is generally available in the shops where I usually do my shopping.
Livsmedel med kort hållbarhet i gröna förpackningar finns generellt i de butiker där jag brukar handla.

1 2 3 4 5

Strongly Disagree  ○  ○  ○  ○  ○  Strongly Agree

Environmental concern

I am very concerned about the environment.
Jag är väldigt mån om miljön.

1 2 3 4 5

Strongly Disagree  ○  ○  ○  ○  ○  Strongly Agree

Major social changes are necessary to protect the natural environment.
Stora sociala förändringar är nödvändiga för att skydda den naturliga miljön.

1 2 3 4 5

Strongly Disagree  ○  ○  ○  ○  ○  Strongly Agree
Anti-pollution laws should be enforced more strongly.
Lagar mot föroreningar bör efterlevas hårdare.

1 2 3 4 5
Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

Prior green satisfaction
Tidigare grön tillfredsställelse
Your level of satisfaction with your previous green purchases.
Din nivå av tillfredsställelse med dina tidigare gröna inköp.

I am satisfied with my prior green purchase experience.
Jag är nöjd med mina tidigare gröna köpplevelse.

1 2 3 4 5
Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

I am pleased with my prior green purchase experience.
Jag är nöjd med mina tidigare gröna köpplevelse.

1 2 3 4 5
Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree
I am contented with my prior green purchase experience.

Jag är nöjd med mina tidigare gröna köpplevelse.

1  2  3  4  5

Strongly Disagree  ○ ○ ○ ○ ○ Strongly Agree

Purchase intention

Köpavsikt

Your willingness to buy short shelf-life food products in green packaging.

Din vilja att köpa livsmedelsprodukter med kort hållbarhet i gröna förpackningar.

I will purchase short-shelf-life food products in green packaging for personal use.

Jag kommer att köpa livsmedelsprodukter med kort hållbarhet i gröna förpackningar för personligt bruk.

1  2  3  4  5

Strongly Disagree  ○ ○ ○ ○ ○ Strongly Agree

I am willing to purchase short-shelf-life food products in green packaging for personal use.

Jag är villig att köpa livsmedelsprodukter med kort hållbarhet i gröna förpackningar för personligt bruk.
I am willing to purchase short-shelf-life food products in green packaging for personal use.

Jag är villig att köpa livsmedelsprodukter med kort hållbarhet i gröna förpackningar för personligt bruk.

1 2 3 4 5
Strongly Disagree □ □ □ □ □ Strongly Agree

I will make an effort to purchase short-shelf life food products in green packaging. Jag ska anstränga mig för att köpa livsmedelsprodukter med kort hållbarhet i gröna förpackningar.

1 2 3 4 5
Strongly Disagree □ □ □ □ □ Strongly Agree

Tack så mycket

Thank you