

Chinese Consumers' Perceptions, Attitude, and Purchase Intention of Organic Products

by

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Dedication

Two and a half years have passed in the blink of an eye, and as I approach graduation, I wish to express my sincere gratitude to those who have provided unwavering support throughout this journey.

First and foremost, I would like to extend my deepest appreciation to my supervisors. I am profoundly grateful to Dr. Hartt, who accepted me into this program and offered me this invaluable opportunity to complete my studies at Dalhousie University. Thank you for warmly introducing me to Canadian culture and for generously sharing your wisdom beyond academics. My sincere thanks also go to Dr. Lu, whose patient guidance significantly enriched my research skills and greatly contributed to my study. Dr. Lu's selfless mentorship not only advanced my professional knowledge but also instilled in me a persevering and diligent research spirit.

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Abstract

With increasing income and living standards, Chinese consumers have shifted their purchasing habits, moving from merely satisfying basic needs to emphasizing dietary balance, food safety, and sustainability. This presents opportunities for safe and eco-friendly organic agriculture. However, China's organic food market share remains relatively low. To fully realize the economic, social, and environmental benefits that organic agriculture can offer in China, it is essential to gain a thorough understanding of consumers' psychological mechanisms.

Focusing on urban China, this study aims to describe consumers' organic food purchasing behaviours and preferences, identify important demographic and psychological variables that influence their purchasing intentions, and examine the psychological mechanisms through which psychosocial factors influence purchase behaviour.

Over 1,500 participants residing in Beijing, Shanghai, and Chongqing participated in an online survey and reported their demographic information, perceptions, attitudes, and beliefs regarding organic food, as well as organic food purchase behaviours and preferences. The data were analyzed in linear regressions, MANOVAs, neural networks, and structural equation modelling (SEM).

The results indicate that fruits and vegetables are the most commonly purchased organic food by Chinese consumers. Based on neural network analyses, consumers' perceptions of organic food's nutritional content are the most important factors in predicting their purchase intentions, while the perceptions of affordability most strongly predict purchase behaviour. The SEM reveals a behavioural model in which participants' favourable perceptions of organic food attributes are positively associated with their attitudes toward hedonic, utilitarian, and ethical benefits. As the attitudes towards hedonic and utilitarian benefits are positively associated with purchase intention, the attitudes towards ethical benefits do not directly impact purchase intention. A positive attitude to ethical benefits is associated with increased attitudes toward hedonic and utilitarian benefits, thereby indirectly affecting purchase intention.

This study provides valuable practical, methodological, and theoretical insights into the organic food market in China, benefiting organic product producers, organic policymakers, and consumers. The results highlight that utilitarian and hedonic values are the key drivers for organic food purchasing in China, while there is a potential mechanism through which ethical values can be leveraged to promote sustainable food products.

Chapter 1. Introduction

China is a major developing country, and its modernization process, particularly in the agricultural sector, has significantly advanced socio-economic development. Agricultural mechanization, chemical pesticides, and synthetic fertilizers have greatly increased productivity, lowered food costs, and increased the availability of agricultural products (X. Liu & Li, 2023). This has improved the living standards for Chinese people, while the rapid progress of agricultural modernization is also accompanied by environmental challenges and food safety concerns (Qin et al., 2021). While large-scale, industrialized farming practices have resulted in higher yields, they have also exacerbated issues such as soil degradation, water pollution, and biodiversity loss (Roy et al., 2024). Furthermore, the excessive use of chemical fertilizers and pesticides has raised widespread concerns about food safety (Q. Li et al., 2021).

Developing organic agriculture can mitigate the health and environmental risks of conventional industrialized agricultural development by protecting the environment and ensuring food safety (Reganold & Wachter, 2016; Seufert & Ramankutty, 2017). By limiting the use of synthetic fertilizers and pesticides, organic farming improves soil structure and fertility through natural processes (Esmacilian et al., 2022). Additionally, as the area devoted to organic farming expands, a noticeable reduction in greenhouse gas emissions can be expected (Squalli & Adamkiewicz, 2018). Organic agriculture also promotes biodiversity by fostering a more balanced ecosystem that supports a wider variety of plant and animal species (Zander et al., 2013). In terms of food safety, the

reduced chemical residues and genetically modified organisms in organic produce provide consumers with more natural food options, which could reduce food safety risks (Hilbeck & Otto, 2015; Seufert et al., 2012).

China has experienced a significant transformation from a time of product scarcity to one of considerable abundance (Song et al., 2019). In the past, when food supplies were limited, the primary concern for most consumers was simply to satisfy hunger and ensure basic nutritional needs were met (X. Zhou, 2012). In the past two decades, China has undergone a significant transformation from a low-income society to one featuring a rapidly expanding middle-class (Meng et al., 2023). As China's economy grew and living standards improved, this demand evolved towards eating well, with a greater focus on the quality and taste of food (Zipser et al., 2023). In recent years, a series of food safety scandals have sparked growing concerns among Chinese consumers regarding the safety of their food (R. Liu et al., 2020). This shift is driving increased consumer demand for higher food quality and sustainability.

Chinese consumers are increasingly conscious of food safety and environmental protection, which should lead to a notable increase in the demand for organic products (Zheng et al., 2023). However, as China's per capita GDP has surpassed the global average (The World Bank, 2023), its per capita purchase of organic foods remains below the world average (The State Administration for Market Regulation & China Agriculture University, 2022). With a large population, China provides huge potential for the organic industry and its ecological benefits. Therefore, it is important to understand Chinese consumers' perceptions, attitudes, and behaviour in the organic food sector. Moreover, there are many developing countries that are now experiencing similar developmental

trajectories (Capella et al., 2023; Rosas-Sánchez et al., 2022), environmental challenges, and food safety issues as China has experienced in the past decades. A deeper understanding of consumers' behaviour in a transitional society is important for global sustainable development.

This chapter begins with a brief introduction to the role of organic food production in maintaining ecological balance and ensuring food safety. It also outlines the global development of the organic agriculture industry and the organic food production and purchasing market in China. Finally, the chapter articulates the research objectives of this study.

1.1. Organic Farming and Products

Organic farming produces food in a system that aims to reduce the potential environmental impacts and protect long-term sustainability by maintaining ecological balance (IFOAM Organics International, 2008). Organic agriculture is defined as "*Organic Agriculture is a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects*" (IFOAM Organics International, 2008).

Organic farming can potentially promote healthy soil fertility (Esmailian et al., 2022). By enhancing soil health, organic agricultural practices contribute to more sustainable and resilient farming systems. Additionally, organic farming can improve air quality and reduce greenhouse gas emissions (Squalli & Adamkiewicz, 2018). This indicates that even modest expansions in organic farming can have measurable environmental benefits.

The development of organic agriculture can promote biodiversity. Organic agriculture promotes biodiversity by fostering a more balanced ecosystem that supports a wider variety of plant and animal species (Zander et al., 2013). Promoting biodiversity on agricultural land is essential for maintaining ecological balance and supporting ecosystem services that benefit both agriculture and the wider environment. Notably, developing organic agriculture can create environments favourable to pollinators and natural enemies of pests. This demonstrates that organic agriculture can control pest populations, enhance crop pollination efficiency, and thereby promote sustainable agricultural development (Crowder et al., 2010; Holzschuh et al., 2008).

Organic agriculture is one of the solutions to food safety problems and may promote human health (Seufert et al., 2012). By minimizing the use of synthetic pesticides, organic farming reduces health risk issues associated with pesticide exposure. Consumers can minimize pesticide exposure by adopting organic diets (Forman et al., 2012), which makes organic foods a safer choice. This is particularly significant for vulnerable populations such as children (Curl et al., 2003; Mie et al., 2017) and pregnant women (Torjusen et al., 2014), who may be more susceptible to the adverse effects of pesticide residues. Moreover, the production of genetically modified (GM) crops may have negative effects on non-target organisms, such as beneficial insects, soil microorganisms, and aquatic species, potentially leading to unforeseen ecological risks (Hilbeck & Otto, 2015). Organic agriculture prohibits the use of GM seeds and feed, thereby substantially mitigating the potential risks associated with GM foods.

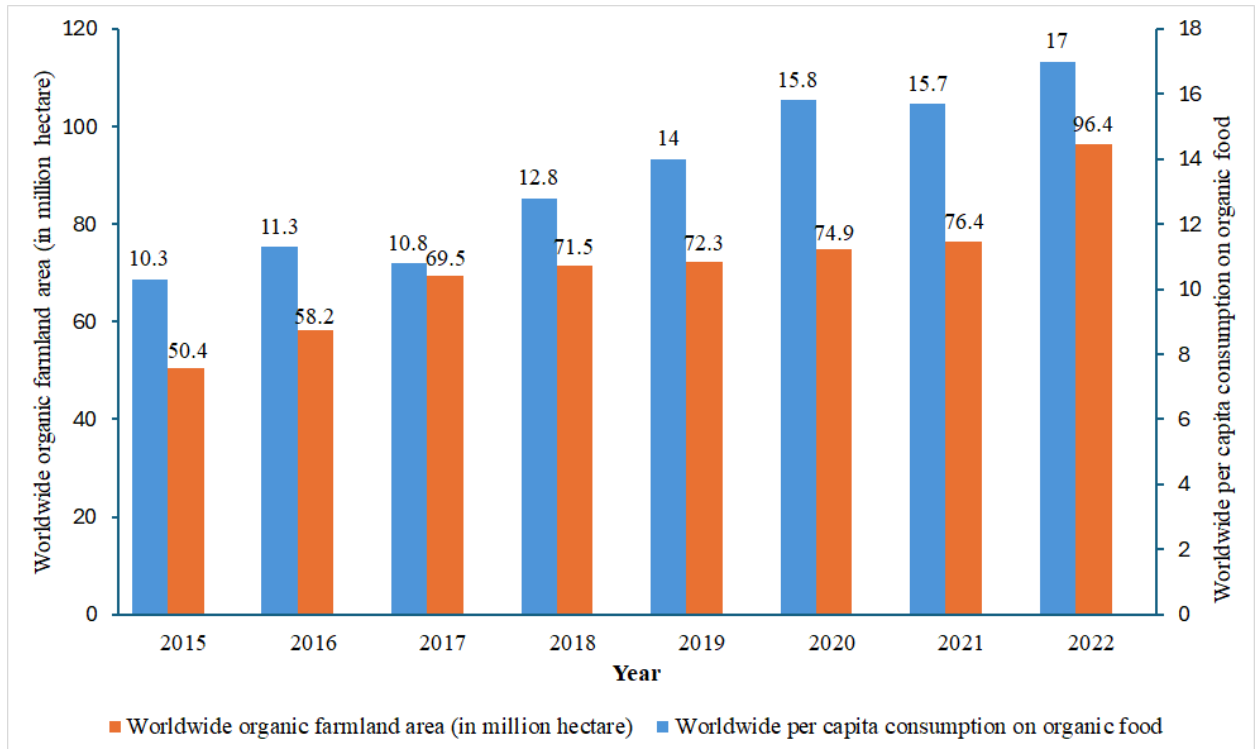
Moreover, organic foods can provide humans with more nutrients, potentially reducing the risk of certain diseases, including cancers (Crinnion, 2010). The higher

nutrient content in organic produce may contribute to better overall health outcomes.

Therefore, the adoption of organic diets not only addresses food safety concerns but also supports human health.

As consumers start to appreciate the health benefits and reduced environmental impact (Massey et al., 2018), the organic industry has witnessed rapid growth worldwide in recent decades (See Figure 1.1.-1). In 2022, international organic food and beverage sales reached 127.5 billion Euros (about 138.3 USD), an increase of 167.9% since 2012 (H. Willer et al., 2023). In 2022, the global per capita purchase of organic products reached €17.0 (about 18.4 USD) (H. Willer et al., 2023), an increase from the €10.3 reported in 2015 (about 11.2 USD) (E. H. Willer & Lernoud, 2017). The land used for organic farming has also grown substantially in the past two decades. In 1999, eleven million hectares of land were used for organic agriculture, representing only 0.3% of the land used for agricultural production. As of 2019, organic agriculture reached 72.3 million hectares, taking 1.5% of all farmland (H. Willer et al., 2021). In recent years, the global acreage dedicated to organic agricultural production has continued to expand. At the end of 2022, the land area dedicated to organic practices stood at 96.4 million hectares, constituting 2.0% of the total farmland (IFOAM Organics International, 2023).

Figure 1.1.-1: Worldwide Organic Agriculture Development 2015-2021



Note: The figure was reproduced from FiBL data (International federation of organic agriculture movements & Forschungsinstitut für biologischen Landbau, 2018; E. H. Willer et al., 2020; E. H. Willer & Lernoud, 2017, 2019; H. Willer et al., 2023; H. Willer & Trávní, 2021, 2022).

1.2. Organic Food Market in China

In 1994, with the approval of the State Environmental Protection Administration, the Organic Food Development Center (OFDC) was officially established. This marked the beginning of organic agriculture development in China. In early 2003, OFDC received international accreditation from the International Federation of Organic Agriculture Movements (IFOAM), becoming the first Chinese organic certification body to gain both domestic and international recognition. (Ministry of Ecological and Environment of the People’s Republic of China, 2004). Since the 1990s, China has implemented a tiered certification system for agricultural products overseen by the

Ministry of Agriculture and Rural Affairs. This system categorizes agri-food products into three levels: pollution-free, green, and organic. Pollution-free products adhere to basic environmental and quality standards, while green food products meet stricter requirements for production processes and environmental impact. Organic food represents the highest tier and is subject to the most stringent regulations, emphasizing organic production methods and minimal use of synthetic chemicals (Ministry of Agriculture of the People's Republic of China, 2004).

China's organic agricultural standards are established by the National Certification and Accreditation Administration (CNCA), which also supervises the implementation of these standards by enterprises engaged in producing organic agricultural products (the logo of the certified organic foods is shown in Figure 1.2.-1). The CNCA does not directly certify organic products or producers. Instead, they delegate this authority to several accredited certification organizations. These organizations assess organic producers based on specific CNCA standards and regional regulations (Institute of Quality Standard and Testing Technology for Agro-Products of CAAS, 2013). For example, the China Organic Food Development Center is the oldest and largest one among those certification organizations and the only organic certifier in China accredited by IFOAM (Yin et al., 2010).

Figure 1.2.-1: Logo of Certified Chinese-Produced Organic Foods



In 2021, China issued 23,617 organic certificates under national norms. Of these, 15,581 certificates (66.0%) were for crops, 5,780 (24.5%) for processed goods, 884 (3.7%) for livestock and poultry, 685 (2.9%) for aquatic products, and 607 (2.6%) for wild collected products. Business-focused certificates were the fewest at 80 (0.3%). This indicates that most of China's organic offerings are primarily raw agricultural commodities, predominantly plant-derived, with processed organic products making up about a quarter (The State Administration for Market Regulation & China Agriculture University, 2022).

From 2020 to 2021, the leading regions for organic certification are spread across the country. Heilongjiang, located in Northeast China, is the largest organic-producing province due to its unique regional characteristics and agricultural offerings. Heilongjiang is the home to many organic production and distribution hubs. In Southwest and Western China, provinces like Yunnan, Guizhou, and Sichuan, with their distinctive topography, climate conditions, and abundant natural resources, organic production is

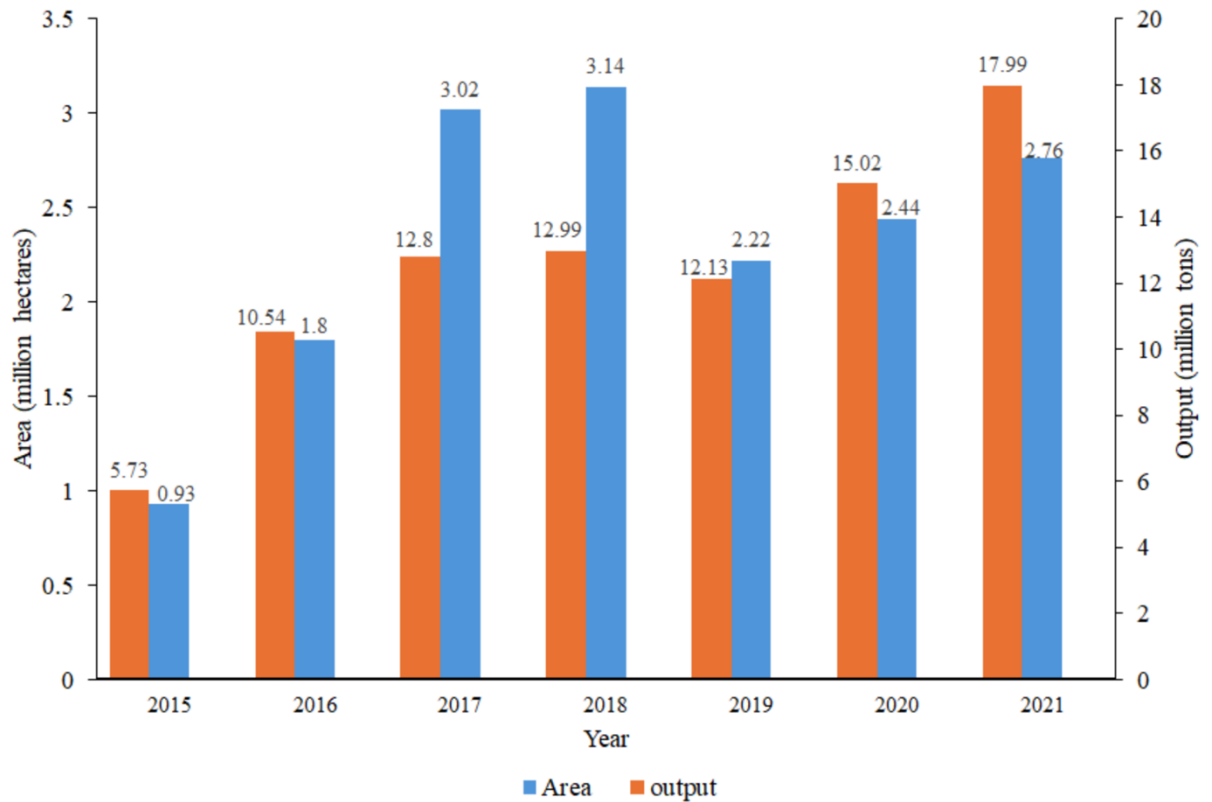
also growing rapidly (The State Administration for Market Regulation & China Agriculture University, 2022).

Consumer concerns regarding food safety in China have escalated due to several food safety incidents (Miroso et al., 2020). Meanwhile, more consumers prioritize health (Yin et al., 2010) and environmental considerations (Ahmed et al., 2021) when purchasing food. As a result, there is a growing demand for organic products. Sales of organic products in China have exhibited a remarkable increase in recent years, from about 63.1 billion CNY (about 9.8 billion USD) in 2017 to about 95.7 billion CNY (about 13.4 billion USD) in 2022 (The State Administration for Market Regulation & China Agriculture University, 2022; H. Willer & Trávní, 2022). The cultivated area for organic crops has displayed a consistent upward trajectory (See Figure 1.1-2). By 2022, the cultivation area had reached 2.9 million hectares, marking an increase of about 0.1 million hectares from 2021, equating to a growth rate of 3.6%. The production of organic crops increases with the growing organic cultivation area. In 2021, the output reached 17.989 million tons, indicating an increase of 2.967 million tons or a growth of 19.8% compared to 2020 (The State Administration for Market Regulation & China Agriculture University, 2022).

In light of the growing purchasing power of Chinese consumers, there is still great market potential for organic products in China (Sheng et al., 2009). China's per capita GDP surpassed the global average in 2021 (The World Bank, 2023), while China's per capita purchase of organic products is merely 8.7 euros (about 9.4 USD), less than half of the global per capita spending of 17.0 euros (approximately 18.4 USD) (The State Administration for Market Regulation & China Agriculture University, 2022). This

significant disparity suggests that the Chinese organic food market is underdeveloped relative to its economic capacity, highlighting an opportunity for growth in this sector.

Figure 1.2.-2: Trends in the Cultivated Area and Production Output of Organic Crops in China



Note: the figure was reproduced from (The State Administration for Market Regulation & China Agriculture University, 2022).

1.3. Research Objectives

In order for the organic farming industry and the consumers to fully harness the potential economic, social, and environmental benefits of organic agriculture in China, understanding consumers’ perceptions, attitudes, and purchase intentions toward organic food is indispensable. Examining these behavioural factors can provide valuable insights to all stakeholders interested in organic food production, benefitting them from both research and trade perspectives. Insights into consumer behaviour can inform strategies

to enhance market penetration and consumer engagement with organic products (Dimitri & Dettmann, 2012). This study aims to comprehensively understand Chinese consumers' organic food purchasing behaviour by identifying their preferred types of organic foods and purchasing locations, examining the demographic and psychological variables that most significantly influence their perceptions, attitudes, purchase intentions, and purchase behaviours, and comparing behavioural models to reveal the psychological mechanisms underlying these behaviours. This could potentially assist policymakers, marketers, and researchers in developing effective approaches to promote organic food purchase, thereby realizing the market potential in China. Specifically, the study has three research objectives:

Objective 1. Describe consumers' perception, attitudes and purchase intention regarding organic food and purchase behaviours. This study aims to depict Chinese consumers' perceptions of organic food product attributes, attitudes toward benefits, and purchase intentions, explore consumers' perceived accessibility of organic products, as well as identify the types of organic foods most commonly purchased by Chinese consumers and their most frequent purchasing locations.

Objective 2. Explore, examine, and assess some of the psychosocial predictors of organic food purchase. The second objective of this study is to identify the demographic and psychological variables that most significantly influence perceptions, attitudes, purchasing intentions and purchase behaviour.

Objective 3. Compare behavioural models that may explain Chinese consumers' purchase intention and behaviour for organic products. This study will examine the psychological mechanisms through which the perception of attributes, attitudes,

subjective norms, perceived behavioural control (including accessibility and information provision), and purchase intention influence purchase behaviour.

The results of this research can provide information to organic producers to support their decisions across a range of critical areas. These areas include the choice of crop varieties that are more appealing to consumers, thereby aligning production with market demand. In terms of marketing communication, the findings can help in crafting messages that resonate with consumers' values and concerns about health, environment, and food safety. Regarding pricing strategies, producers can utilize the insights to set prices that reflect the perceived value of organic products while remaining competitive within the market. Market access options can also be optimized by identifying the most effective distribution channels and retail partnerships that align with consumer shopping habits.

Furthermore, this research may also help organic standard-setting organizations understand consumers' awareness, perception, and knowledge regarding organic production standards. Such understanding is crucial for these organizations to assess the effectiveness of current standards and certification processes from the consumer's perspective. By identifying any gaps in awareness or misconceptions about organic standards, these organizations can refine their educational outreach and certification labels to be more informative and trustworthy.

1.4. Summary of Thesis Chapters

This thesis presents a study investigating consumers' demand for organic products in the Chinese market. This thesis is organized into five chapters; this chapter introduces

the research and practice background. The next chapters include a literature review, method, results, and discussion of the study.

In Chapter 2, the literature review is based on the Theory of Planned Behaviour (TPB) and the Stimulus-Organism-Response (SOR) model in analyzing the psychological and social factors that shape consumer behaviour toward organic food. It explores the influence of attitudes, subjective norms, and perceived behavioural control, alongside the consumers' perception of the attributes of organic foods, on consumer decisions. The chapter also identifies gaps in the existing research, particularly within the context of China, establishing the need for this study to address these gaps.

The method chapter describes the research design and data collection process, which involved an online survey of consumers from major cities in China. The chapter introduces the conceptual model of this study that integrates both TPB and SOR frameworks, exploring how various attributes of organic food, such as naturalness, freshness, and affordability, affect consumer attitudes and intentions. The chapter also briefly introduced the general approach to data analysis.

The results chapter starts by validating the research instruments and presents the study's results in the order of research objectives. The discussion chapter summarises the key findings and their theoretical and practical implications. It also reflects on the study's limitations and proposes directions for future research. The conclusion of this chapter offers insights that could contribute to the growth of China's organic food market while identifying opportunities for further expansion.

Chapter 2. Literature review

The growing global concern for environmental sustainability and health consciousness has led to an increased consumer interest in organic products. Understanding the psychosocial factors that influence consumer behaviour towards organic products is crucial for businesses, policymakers, and researchers. This literature review is based on two commonly utilized theoretical frameworks in organic food purchase research: the Theory of Planned Behaviour (TPB) (Ajzen, 1991) and the Stimulus-Organism-Response (SOR) (Mehrabian & Russell, 1974) model. Following the theoretical framework, the review presents studies regarding consumers' beliefs, intentions, and actions in the context of organic purchase. The TPB suggests that an individual's behaviour is primarily shaped by one's behavioural intention, and the intention is influenced by three psychological factors, namely, attitudes towards the behaviour, subjective norms, and perceived behavioural control (Ajzen, 1991). In organic purchase, positive attitudes, social norms, and perceived ease of purchase have been shown to significantly affect purchase intentions (Kouy et al., 2016; Liang et al., 2023; Othman & Rahman, 2014). However, the TPB has been critiqued for emphasizing deliberative processes while overlooking affective and reflective processes (Conner & Armitage, 1998). To address these limitations, this review also includes the SOR model, which emphasizes that behaviour is an individual's response to environmental stimuli (Zhai et al., 2022). Attributes of organic products, such as ecological welfare, animal welfare, nutritional value, freshness, naturalness, and sensory appeal, served as stimuli

that trigger consumers' cognitive and emotional responses. These responses encompass the beliefs regarding the ethical, hedonic, and utilitarian benefits of organic food, shaping consumers' attitudes and ultimately influencing their purchasing intention. By integrating the TPB and SOR models, this review provides a comprehensive overview of the psychosocial factors and product characteristics that shape consumer preference of organic food products.

2.1. Theory of Planned Behaviour

Theory of Planned Behaviour (TPB) is a commonly used theoretical framework in organic purchase research to investigate consumers' beliefs, intentions, and behaviour (Ahmed et al., 2021; Jiang & Wu, 2022). The TPB posits that an individual's behaviour is determined by their behavioural intention, which is influenced by three critical components: attitudes toward the behaviour (behavioural beliefs), subjective norms (normative beliefs), and perceived behavioural control (control beliefs) (Ajzen, 1991). The beliefs necessary to participate in a particular action shape attitudes toward the behaviour. They represent an individual's positive or negative judgements or emotions related to carrying out a specific act. Essentially, if individuals believe that performing a particular behaviour will lead to predominantly positive outcomes, they will develop a positive attitude towards it (Sentosa & Mat, 2012). This positive attitude increases the likelihood that the individual will intend to engage in the behaviour, thereby influencing actual behaviour. Subjective norms refer to the social pressures and perceived expectations from important individuals or groups that can influence a person's intention to perform a behaviour (Rhodes & Courneya, 2003). These norms encompass the individual's perception of whether people who are significant to them, such as family

members, friends, or colleagues, approve or disapprove of the behaviour. If an individual perceives that these significant others expect them to perform the behaviour, they are more likely to form the intention to do so, aligning their actions with the anticipated approval of their social circle (Nawawi et al., 2018). Perceived behavioural control pertains to people's beliefs about how easy or difficult it is to perform a specific behaviour (Trafimow et al., 2002). This concept reflects the individual's assessment of the factors that may facilitate or hinder the performance of the behaviour, such as resources, opportunities, and skills. If an individual believes they have the necessary capabilities and resources to perform the behaviour successfully, they are more likely to develop a stronger intention to carry it out. Conversely, if they perceive significant obstacles or limitations, their intention may weaken, reducing the likelihood of the behaviour being performed (Hagger & Hamilton, 2024).

The Theory of Planned Behaviour (TPB) can be effectively used to analyze consumers' purchase intentions for organic products by accommodating various psychosocial factors within a comprehensive behavioural model (Loera et al., 2022). This theory has been found applicable to organic purchase across various cultural contexts, demonstrating its versatility and relevance in different societal settings (Yadav & Pathak, 2016). Research has consistently shown that attitude significantly predicts organic product purchase intention, highlighting the crucial role of individual perceptions and evaluations in the decision-making process (Kapogianni, 2015). Specifically, consumers who hold a positive attitude towards organic foods, such as believing that organic food tends to be healthier, are more likely to purchase them, underscoring the impact of favourable beliefs on consumer behaviour (Kouy et al., 2016).

In the context of organic food purchase, the influences of subjective norms and perceived behavioural control are also well-documented, indicating that factors beyond individual attitudes contribute to purchasing decisions (Kunkrom, 2022). Subjective norms can significantly impact consumers' intentions based on the opinions of their reference groups regarding the safety and benefits of organic products (Othman & Rahman, 2014), which means that social pressures and expectations from important individuals or groups, such as family, friends, or peers, can shape a person's intention to buy organic products, as they may seek approval or avoid disapproval from these significant others.

Perceived behavioural control often refers to consumers' confidence in their ability to purchase organic products, reflecting their perceptions of how easy or difficult it is to perform the behaviour (Trafimow et al., 2002). Consumers' perceived behavioural control often can be undermined by the lack of transparency of the information (Aitken et al., 2020) and limited accessibility of organic food products (Doan, 2021). The lack of transparent information may lead to uncertainty or mistrust about the authenticity and benefits of organic products, reducing consumers' confidence in making informed purchasing decisions (Liang et al., 2023). Similarly, limited accessibility, such as fewer retail outlets offering organic options or higher prices, can pose practical barriers, making it more challenging for consumers to act on their intentions to buy organic foods (Baş et al., 2024).

By integrating attitude, subjective norms, and perceived behavioural control, the TPB offers a comprehensive framework to understand and predict consumers' purchase intentions for organic products. It emphasizes that not only do individual positive

attitudes towards organic foods drive purchase intentions, but social influences and perceived ease of purchase also play significant roles. Understanding these factors is essential for stakeholders aiming to promote organic purchase, as interventions can enhance positive attitudes, leverage social norms, and improve perceived behavioural control by increasing information transparency and product accessibility.

The Theory of Planned Behaviour (TPB) model assumes that consumers are rational actors who emphasize cognitive processes in their decision-making (Ajzen, 1991). This model posits that individuals systematically evaluate the information available to them and make logical choices based on this rational assessment. However, some research argues that the TPB model overlooks affective factors that predict behaviour, suggesting that emotions and feelings also play a significant role in influencing consumer actions (Conner & Armitage, 1998). These critics point out that by focusing primarily on cognitive aspects, the TPB may not fully capture the complexity of human behaviour, particularly the emotional and reflective processes that can impact decision-making.

2.2. Stimuli-Organism-Response Model

To address the limitations of TPB, several studies employed the Stimulus-Organism-Response (SOR) model (Mehrabian & Russell, 1974) to investigate how consumers' perception of organic products influences purchase intentions (Lee & Yun, 2015; Massey et al., 2018). The SOR model emphasizes the interactions between the environment and individuals' behaviours, highlighting that the environmental cues trigger changes in individuals' internal states, thereby influencing their behaviours (Zhai et al., 2022). This model suggests that external environmental stimuli can evoke internal

psychological responses, which lead to observable behavioural outcomes. In this model, Stimulus (S) refers to the external information individuals receive from their environment, such as visual, auditory, and tactile cues. These stimuli encompass any environmental factors that can capture an individual's attention and provide information that influences their perceptions. Organism (O) refers to the individual's psychological state as a reaction to the stimulus, reflecting emotional and cognitive assessment. This stage involves the internal processing of the stimuli, where the individual interprets and evaluates the information, leading to certain emotions and thoughts. Response (R) entails the behavioural reactions to the organism as an individual responds to their cognitive assessment and emotional status. This final component represents the actual behaviour exhibited, such as the decision to purchase or not purchase a product, based on the internal evaluations. By utilizing the SOR model, researchers aim to capture a more holistic understanding of consumer behaviour that includes both cognitive and affective components. This approach acknowledges that environmental factors can evoke emotional responses, which, alongside cognitive evaluations, contribute to the decision-making process. In the context of organic product purchase, the SOR model allows for a deeper exploration of how consumers' perceptions and feelings about organic products, prompted by external stimuli, influence their purchase intentions. This model thus provides a valuable framework for examining the complex interplay between environmental cues, internal psychological states, and behavioural outcomes in consumer decision-making.

Previous studies (Lee & Yun, 2015; Massey et al., 2018) specified the attributes of organic products as the external stimuli influencing consumers' purchasing decisions.

These attributes act as crucial factors that shape consumers' perceptions and beliefs about organic foods. Consumers' perception of organic foods can be reflected in their beliefs regarding the attributes of the products. Compared to conventional agri-food products, organic foods are perceived to be superior in some attributes, such as sustainability, healthiness, animal welfare, freshness, food safety, and taste (IFOAM Organics International, 2021; Wee et al., 2014; Lawrence & Jeanne, 2023; Rodale, 2011; Yin et al., 2010). This perceived superiority in multiple dimensions contributes to a favourable evaluation of organic products by consumers. Cue utilization theory posits that consumers rely on attributes of a product, which might be inherent or external, to assess its quality (Fejes & Wilson, 2013). In food purchase, attributes are often deemed as stimuli that influence assessment and trigger purchase behaviour (Lee & Yun, 2015). The attributes serve as cues that consumers use to infer the overall quality and benefits of the product, affecting their decision-making process.

By understanding the specific attributes that consumers associate with organic foods, researchers and marketers can better describe how these stimuli impact consumers' cognitive and emotional responses. The emphasis on attributes like ecological welfare and animal welfare reflects consumers' growing concern for ethical and environmental issues, which in turn influences their purchasing decisions (Thøgersen & Zhou, 2012; Wee et al., 2014). Similarly, attributes such as naturalness, nutritional content, freshness, and sensory appeal address consumers' desires for products that meet their expectations for quality and sensory satisfaction. The identification of these attributes as key stimuli underscores the importance of product characteristics in shaping consumer behaviour toward organic foods (Mohamed et al., 2012; Molinillo et al., 2020;

Najib et al., 2022; Yin et al., 2010). By focusing on these attributes, stakeholders can develop strategies that highlight the perceived benefits of organic products, thereby enhancing consumers' positive perceptions and willingness to purchase. This approach aligns with the principles of the SOR model, where external stimuli elicit internal evaluations that lead to behavioural responses (Mehrabian & Russell, 1974).

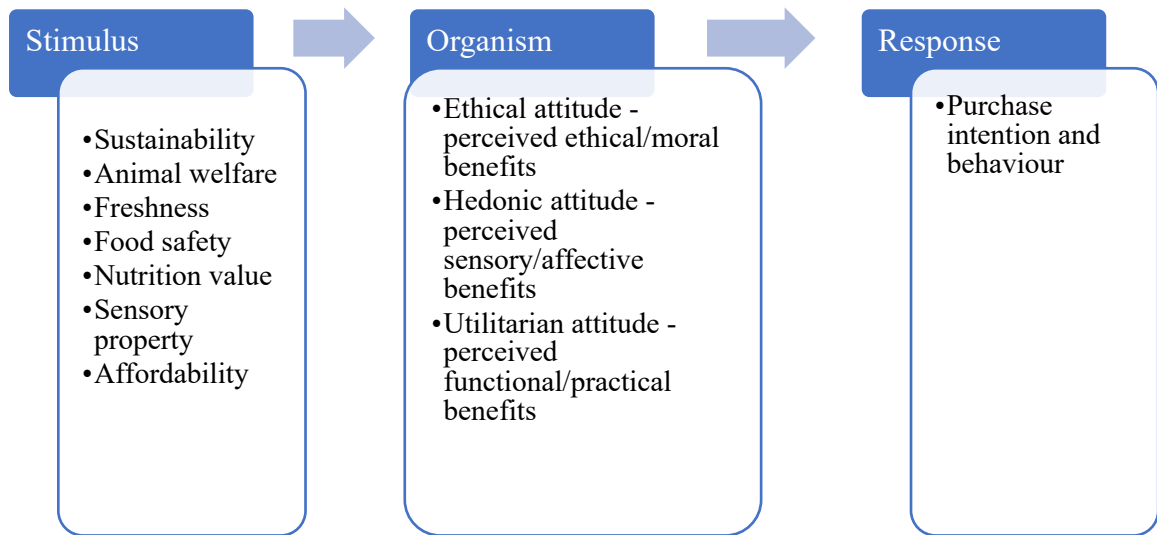
The attributes of the organic products (Stimuli) may trigger consumers' cognitive and emotional assessment of organic products (Organisms). Literature on organic food purchase (Lee & Yun, 2015; Massey et al., 2018) operationalizes the Organism as the attitude toward organic food. These attitudes represent the cognitive and emotional/affective assessment of organic food's utilitarian and hedonic benefits. Hedonic benefits elicit emotional responses, mainly influenced by the product's aesthetics, flavour, symbolic significance, and sensory properties (Lim & Ang, 2008). For instance, the pleasure derived from the taste of organic food, the visual appeal of its presentation, and the sensory satisfaction it provides contribute to its hedonic value. These factors can enhance the emotional connection consumers feel towards organic products, making them more inclined to develop positive attitudes based on enjoyment and sensory gratification. Utilitarian benefits are related to products' functional, instrumental, and practical performance concerning how well they fulfil the user's pragmatic needs (Chitturi et al., 2008). This includes considerations such as the nutritional content, naturalness, and affordability of organic food. Consumers assess these practical attributes cognitively, evaluating how the organic products serve their functional purposes and contribute to their well-being.

By encompassing both hedonic and utilitarian benefits, the attitudes toward organic food reflect a comprehensive assessment that includes emotional and cognitive dimensions. The stimuli provided by the attributes of organic products prompt consumers to evaluate these benefits, influencing their overall attitudes and, potentially, their purchase intentions. Understanding this process is crucial in the context of organic purchase, as it highlights how product attributes can affect consumer behaviour through both emotional and practical evaluations.

Moving beyond the dichotomy of hedonic and utilitarian attitudes, some literature suggests that Organism has five elements: cognition, affect, emotion, value, and consciousness (Fiore & Kim, 2007). This expanded view recognizes that consumers' responses are not limited to just pleasure-seeking or practical utility but also involve deeper psychological and moral dimensions. Specifically, certain attributes of organic products, such as sustainability and animal welfare, can bring ethical benefits that environment-conscious consumers seek in their purchase. These attributes engage consumers' values and consciousness, prompting an ethical assessment of organic foods that goes beyond mere functional or sensory evaluation. Thus, ethical assessment (values and consciousness) of organic food may influence consumers' attitudes to organic products. This ethical assessment becomes an integral part of the internal processing that shapes consumer behaviour. By acknowledging the role of ethical attitudes, this study argues that the ethical dimension is another crucial component of the Organism in the SOR model, in addition to the hedonic (affective pleasure) and utilitarian (practical utility) attitudes. Incorporating ethical attitudes into the model allows for a more comprehensive understanding of how consumers process stimuli from organic product

attributes, ultimately influencing their purchase intentions and behaviours (See Figure 2.1.-1).

Figure 2.1.-1: Framework of the SOR Model



2.3. The Stimuli: Organic Product Attributes

Some literature views product attributes as external stimuli that may trigger consumers' cognitive, affective, or moral responses. This section utilizes this framework and summarizes consumers' perceptions of some important organic food attributes.

2.3.1. Ecological Welfare

Ecological welfare is a significant factor motivating consumers to purchase organic products. Many consumers purchase organic products because they believe organic agriculture can protect the environment (Mohd Suki et al., 2021). This belief is grounded in the perception that organic farming practices are more environmentally friendly compared to conventional methods. An increasing number of consumers are becoming more mindful of the impact of their purchase behaviour on the natural environment.

Therefore, Sustainability-related attributes of products drive more consumers towards organic options (Basha et al., 2015; Patel et al., 2021). This shift reflects a growing awareness and concern for environmental issues, leading individuals to make purchasing decisions that align with their ecological values.

In Europe, consumers tend to purchase organic products because of their environmental protection attributes. Organic farming is considered a more sustainable agricultural practice that protects soil, water sources, and ecosystems (Cerjak et al., 2010; de Magistris & Gracia, 2008). This preference indicates that European consumers are motivated by the desire to support farming practices that have a lower negative impact on the environment.

A previous study has shown that Chinese consumers are inclined to purchase organic products due to their environmentally friendly nature and lower environmental impact (Thøgersen & Zhou, 2012). This finding suggests that concern for ecological welfare is not limited to Western contexts but is also present in Asian markets. Chinese consumers recognize the benefits of organic agriculture in terms of environmental protection, leading them to favour organic products over conventional ones.

2.3.2. Animal Welfare

Animal welfare includes the animal's physical and mental states and the extent to which its nature is satisfied (Hewson, 2003). This concept encompasses not only the health and well-being of the animal but also the ability of the animal to exhibit natural behaviours and live in conditions that meet its intrinsic needs. Consumers are increasingly paying attention to whether the production of animal products protects animal rights and interests (Clark et al., 2017). This heightened attention reflects a

growing consumer demand for transparency and ethical standards in animal husbandry practices.

The production process of organic animal products is often considered to protect animal welfare (Miller, 2005). This is because organic farming often adheres to stricter animal welfare standards compared to conventional farming methods. Such standards may include providing animals with access to outdoor spaces, ensuring they have sufficient room to move freely, and feeding them diets that are free from synthetic additives (Phillips & Heins, 2022). These practices align with the consumers' desire for products that are produced in a manner that respects the animals' well-being.

Research has documented that animal welfare drives consumers' purchase intention on livestock products (Bradford et al., 2022). This indicates that concerns about how animals are treated have a significant impact on purchasing decisions, with consumers more likely to buy products that they believe are produced ethically. Protecting animal rights is one of the attributes that consumers consider when purchasing organic products (Wee et al., 2014). This means that the ethical treatment of animals is not just a peripheral concern but a central factor influencing consumer behaviour in the organic market.

2.3.3. Nutrition Value

The health motives of organic foods drive consumers' choice of them, which is influenced by the nutrition and health claims of organic foods (Aschemann-Witzel et al., 2013). Many consumers buy organic foods because they believe they have extra nutritional value, so they are better for their health (Sivathanu, 2015). This belief in the

superior nutritional content of organic foods contributes to their appeal among health-conscious individuals.

Research has shown that health consciousness is one of the essential factors associated with organic food purchase (D. T. Nguyen & Truong, 2021). Consumers who are more aware of and concerned about their health are more inclined to choose organic foods, viewing them as a means to enhance their well-being (Yang et al., 2023). This association between health consciousness and organic food purchase underscores the importance of perceived health benefits in influencing purchasing behaviour.

The nutritional attributes of organic food are one of the primary motivators for Egyptian consumers to buy organic products (Mohamed et al., 2012). This indicates that the perceived health advantages of organic foods are a significant factor not only in western countries but also in other cultural contexts. The emphasis on nutritional value as a motivating factor suggests that consumers across different regions value the potential health benefits that organic foods offer.

2.3.4. Freshness

Freshness refers to the state of the crop, indicating that it has been recently harvested and processed and is in a condition that is suitable for purchase (Jaeger et al., 2023). This implies that the produce retains its optimal qualities, such as texture, flavour, and nutritional value, which are at their peak immediately after harvest. Organic food is perceived to be fresher than conventional food, as it cannot be treated with synthetic preservatives or additives (Lawrence & Jeanne, 2023). The absence of these chemicals necessitates that organic produce be consumed within a shorter timeframe, thereby enhancing the perception of its freshness among consumers. It has been documented that

freshness is the primary factor for consumers to purchase organic vegetables, as fresher vegetables are perceived to have a more enjoyable taste (Andari et al., 2016). The superior taste associated with fresh organic produce contributes to higher consumer satisfaction and preference. The freshness attribute of organic products is positively correlated with consumers' willingness to purchase organic products (Najib et al., 2022). This positive correlation suggests that the more consumers perceive organic products as fresh, the more likely they are to purchase them, highlighting freshness as a critical determinant in consumer purchasing decisions within the organic food market.

2.3.5. Naturalness

Organic plant-based raw materials typically exhibit reduced levels of pesticides, nitrates, and toxic metals, alongside higher concentrations of vitamin C and polyphenols (Gibowski, 2020). This reduction in chemical exposure is a significant factor for consumers who are concerned about the long-term health implications of consuming conventionally grown foods. Consequently, consumers may purchase organic food due to its safety properties.

A study conducted in Spain suggests that consumers trust the safety attribute of organic food and believe organic food is more beneficial to human health than conventional food because it effectively avoids pesticide residues (Rodríguez-Bermúdez et al., 2020). This trust indicates that consumers perceive organic products as a healthier alternative, reinforcing their purchasing decisions based on safety considerations. The belief that organic food is free from harmful residues enhances its appeal among health-conscious consumers prioritizing food safety (Eyinade et al., 2021).

Similarly, a study in China indicates that Chinese consumers are willing to purchase organic food for its safety attributes and better quality (Yin et al., 2010). The emphasis on safety attributes reflects a concern among Chinese consumers about food contamination and the desire for higher-quality food options. The perception that organic foods offer better quality, alongside their safety benefits, motivates consumers to choose organic over conventional products (Aydogdu & Kaya, 2020). This suggests that the safety attributes of organic food are a significant factor influencing consumer behaviour across different cultural contexts.

2.3.6. Sensory Appeal

When consumers believe that organic food offers a superior taste compared to conventional options, they may be more inclined to choose organic products, even if they are priced higher. A study has revealed that Chinese consumers perceive organic food to have a superior taste to conventional food (Yin et al., 2010). This perception positively influences their purchasing decisions, as taste is a critical factor in food selection and overall satisfaction.

Similarly, consumers in Spain and Brazil also associate organic food with better taste, influencing their willingness to purchase organic products (Molinillo et al., 2020). The association of superior taste with organic foods in these countries suggests that sensory appeal is a significant factor driving the demand for organic products in diverse cultural contexts. Consumers' belief that organic foods taste better enhances their preference for these products over conventional alternatives.

Furthermore, consumers in India are also satisfied with the taste of organic food, which makes them more willing to consume it (Paul & Rana, 2012). The satisfaction

derived from the taste experience reinforces their intention to purchase organic products. This indicates that the sensory attributes of organic food play a crucial role in consumer acceptance and repeated purchase in the Indian market.

2.4. The Organism: Attitudes and Perceived Benefits

In the SOR model, the Organism reflects the consumer's cognitive, affective, and moral judgments of a product (Fiore & Kim, 2007). This means that when consumers encounter a product, they internally process the stimuli through their thoughts (cognition), feelings (affect), and ethical considerations (moral judgments). These internal judgments are critical as they jointly form the consumers' overall attitudes toward the product. Such attitudes are not formed in isolation but are closely related to the perceived benefits that the product offers (Al-Debei et al., 2015; Bredahl, 2001). In other words, the way consumers think and feel about a product, as well as their moral evaluations of it, influence how they perceive its advantages and disadvantages.

Therefore, consumers' attitudes toward organic products can be reflected in the perceived utilitarian, hedonic, and ethical benefits. The utilitarian benefits pertain to the practical and functional advantages of the product, such as its effectiveness and efficiency in fulfilling specific needs. The hedonic benefits relate to the sensory pleasure and emotional satisfaction derived from the product, including aspects like taste, aroma, and overall enjoyment. The ethical benefits involve the moral values and principles associated with the product, such as environmental friendliness, animal welfare, and social responsibility.

By integrating these cognitive, affective, and moral judgments, the Organism component encapsulates the multifaceted nature of consumer attitudes within the SOR

model. This view highlights how consumers' internal evaluations of utilitarian, hedonic, and ethical benefits are pivotal in shaping their responses to organic products. It underscores the importance of considering all three dimensions when analyzing consumer behaviour, as each contributes significantly to forming attitudes and, consequently, to purchasing decisions.

2.4.1. Ethical Benefits

Ethical benefits play a significant role in influencing consumer behaviour towards organic products. Moral principles guide individuals' behaviour as they obtain, use, and dispose of goods and services (Szmigin & Carrigan, 2005). These moral principles are deeply embedded in consumers' decision-making processes, affecting how they perceive and interact with products. The ethical benefits are associated with the moral standards reflected in the design and production processes of the products (Crane, 2001). This means that when products are created with consideration for ethical practices, such as environmental stewardship, social responsibility, and fair labour, they carry ethical benefits that appeal to consumers who value these principles.

The demand for organic food is often driven by moral benefits, as many consumers believe organic food is ethical (Rana & Paul, 2017). This belief stems from the perception that organic farming practices are more aligned with ethical standards compared to conventional methods. Consumers generally hold a positive attitude toward organic food as it provides a potential solution to environmental, social, and ethical issues (Dias et al., 2015; Zander & Hamm, 2012). For those who are concerned about such issues, these ethical benefits significantly affect their purchasing decisions (Honkanen et

al., 2006). The alignment of organic products with their moral values enhances the attractiveness of these products.

Furthermore, as organic regulations now include more ethical standards beyond ecology, such as fair working conditions, family farms, and animal welfare (Dias et al., 2015), consumers are willing to pay higher prices for organic products with additional ethical benefits (Zander & Hamm, 2010). The expansion of organic standards to encompass broader ethical considerations increases the perceived value of organic products for ethically conscious consumers. This willingness to pay a premium reflects the importance consumers place on supporting products that not only meet their personal needs but also contribute positively to societal and environmental well-being (C. Nguyen et al., 2020). The ethical benefits thus serve as a powerful motivator in the consumer decision-making process regarding organic food purchases.

2.4.2. Hedonic Benefits

Hedonic benefits encompass the pleasure, positive feelings, and enjoyment generated from the purchase experience (Kim et al., 2023). These benefits are significant because they relate directly to the sensory and emotional satisfaction that consumers derive from a product. The hedonic benefits of a product are a significant factor in forming attitudes and driving purchasing behaviours (Ghazali et al., 2017). When consumers experience enjoyment and positive emotions from a product, they are more likely to develop favourable attitudes towards it, which in turn influences their intention to purchase.

In the context of organic products, the hedonic benefits appeal to consumers through sensory aspects associated with enjoyment, excitement, and pleasure (Vergura et

al., 2020). These sensory aspects include attributes such as the freshness, appearance, and taste of the food. As sensory experience can offer effective value (Anisimova, 2016), hedonic benefits are typically associated with the freshness, appearance, and taste of the food (Loebnitz & Grunert, 2018; Spendrup et al., 2016). For instance, the superior taste and visual appeal of organic foods enhance the sensory enjoyment of consumers, making them more inclined to purchase these products.

Furthermore, consumers' feelings that they are doing a good thing for the environment and their health are also tied to hedonic values (Sultan et al., 2021). This means that the emotional satisfaction derived from making choices that are perceived as environmentally friendly and health-conscious contributes to the overall pleasure of the purchase experience. These positive feelings enhance the hedonic benefits of organic products, reinforcing consumers' positive attitudes and influencing their purchasing behaviour.

By combining sensory pleasure with emotional satisfaction related to ethical and health considerations, the hedonic benefits of organic products play a crucial role in shaping consumer attitudes and driving purchasing decisions. Understanding these benefits is important because they highlight how the enjoyment and positive feelings associated with organic products can influence consumers to choose them over conventional alternatives (Vergura et al., 2020). The emphasis on hedonic benefits underscores the significance of sensory and emotional experiences in consumer behaviour towards organic foods.

2.4.3. Utilitarian Benefits

Utilitarian benefits refer to functional and instrumental value (Haddadi et al., 2016). These benefits are closely related to efficiency, task accomplishment, and the economic aspects of products and services, encompassing how effectively a product performs its intended function and assists in fulfilling specific tasks (J. Kim et al., 2023). In the context of food purchase, the utilitarian value is typically associated with attributes such as food safety and nutrition, ensuring that the food is safe to eat and provides the necessary nutrients for health (Pérez-Villarreal et al., 2020). Other important attributes include quality, which may involve considerations of freshness and purity, and convenience, relating to the ease of preparation and purchase (Yan et al., 2022).

When consumers purchase food for its utilitarian benefits, they tend to prioritize the nutritional attributes of the food, seeking options that offer health benefits and meet dietary needs (Loebnitz & Grunert, 2018). They also place significant importance on value for money, evaluating whether the benefits provided by the product justify its cost (Lee & Yun, 2015). In the case of organic products, consumers often associate their health with utilitarian benefits, perceiving them as healthier alternatives that contribute positively to their well-being (Fotopoulos et al., 2003; Sadiq et al., 2021).

However, a high price is often associated with negative utilitarian value because it can diminish the product's cost-effectiveness from the consumer's perspective (Chang & Wildt, 1994). The higher cost of organic products is one of the barriers to organic purchase, as it may deter consumers who are sensitive to price and are seeking value for money (Rödiger & Hamm, 2015). This financial consideration can outweigh the

perceived utilitarian benefits, leading consumers to opt for less expensive alternatives despite recognizing the potential advantages of organic foods.

By understanding how utilitarian benefits influence consumer purchasing behaviour, particularly in relation to organic products, it becomes evident that both the functional attributes of the food and its economic aspects play critical roles. Consumers weigh the practical benefits against the cost, and while the healthiness and quality of organic foods add to their utilitarian value, the higher price can negatively impact their purchasing decisions (Hansmann et al., 2020). Recognizing this balance is essential for stakeholders aiming to promote organic purchase by addressing price barriers and emphasizing the functional benefits that justify the cost.

2.5. The Conceptual Model

To comprehensively understand the psychological mechanisms influencing Chinese consumers' purchase intentions and behaviours toward organic products, this study integrates the Theory of Planned Behaviour (TPB) and the Stimulus-Organism-Response (SOR) model into a unified conceptual framework (see Figure 2.5.). The TPB component posits that purchase intention is directly influenced by attitudes toward organic food, subjective norms, and perceived behavioural control (encompasses accessibility and information provision). In line with the TPB, this study anticipates that these factors will positively correlate with purchase intention, which in turn is expected to affect actual purchase behaviour positively. This aligns with our objectives to examine how these psychological factors influence consumers' intentions and actions regarding organic products.

H1. Purchase intention is positively associated with organic food purchasing behaviour.

H2.a) The attitude toward utilitarian benefits is positively associated with the purchase intention.

H2.b) The attitude toward hedonic benefits is positively associated with the purchase intention.

H2.c) The attitude toward ethical benefits is positively associated with the purchase intention.

H3. Subject norm regarding organic food is positively associated with the purchase intention.

H4. Perceived behavioural control is positively associated with purchase intention.

This study extends the TPB by incorporating the SOR model to further examine consumers' overall attitudes toward organic food. It aims to provide a detailed explanation of how consumers' perceptions of organic product attributes (Stimuli) influence their attitude to the benefits (Organism), which then affect their behavioural intentions (Response). Specifically, this study expects that perceptions of sensory properties and freshness will be positively associated with attitudes toward hedonic benefits, as these attributes enhance sensory enjoyment and pleasure.

Perceptions of ecological welfare and animal welfare are anticipated to be positively correlated with attitudes toward ethical benefits, reflecting consumers' moral evaluations of organic farming practices. Additionally, perceptions of naturalness, nutritional content, and affordability are expected to positively influence attitudes toward utilitarian benefits, emphasizing the practical and functional advantages of organic products. These differentiated attitudes, including hedonic, ethical, and utilitarian, along with subjective norms and perceived behavioural control, are hypothesized to affect

purchase intention positively. Ultimately, purchase intention is expected to be positively correlated with purchase behaviour.

H5.a) The perception of organic food's naturalness is positively associated with the attitude toward utilitarian benefits.

H5.b) The perception of the nutritional value is positively associated with the attitude toward the utilitarian benefits.

H5.c) The perception of affordability is positively associated with the attitude toward utilitarian benefits.

H6.a) The perception of freshness is positively associated with the attitude toward hedonic benefits.

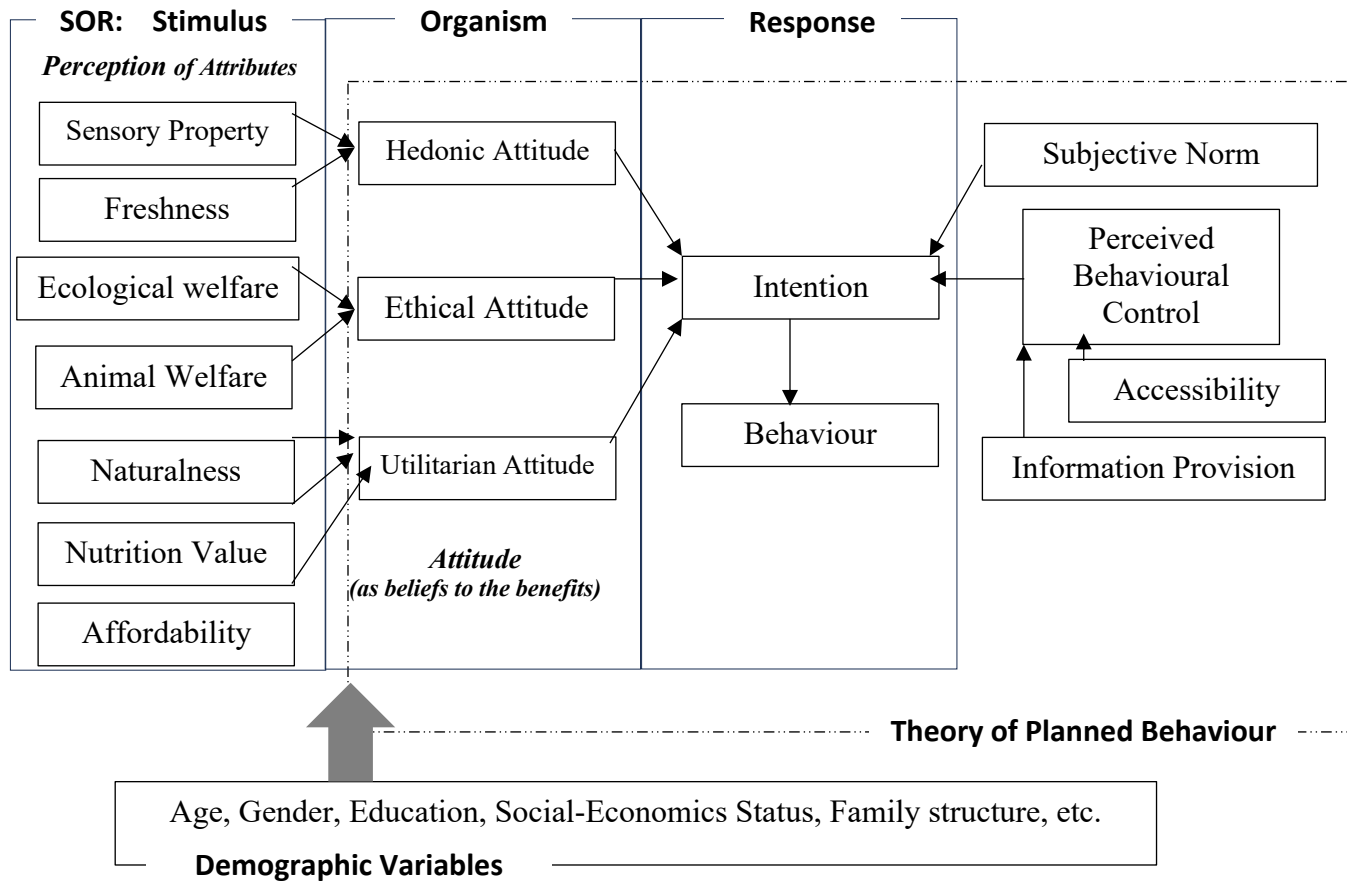
H6.b) The perception of sensory appeal is positively associated with the attitude toward hedonic benefits.

H7.a) The perception of animal welfare is positively associated with the attitude toward ethical benefits.

H7.b) The perception of the ecological value is positively associated with the attitude toward ethical benefits.

This integrated model allows this study to examine how the perception of specific organic product attributes influences various attitudinal dimensions and how these, along with social and control factors, drive consumers' intentions and actual purchasing behaviours, thereby fulfilling the research objective.

Figure 2.5. The Conceptual Model for the Empirical Analyses.



Note: The attributes listed in this figure are not an exhaustive list of organic food attributes. Organic foods also possess many other attributes, like farmers' safety and non-GMO.

Chapter 3. Methods

3.1. Research Instruments

Primary data for this study was obtained from an online survey coordinated by Wenjuanxing (wjx.cn), one of China's largest online survey platforms. The study participants were recruited through a sampling service provided by Wenjuanxing. This online recruitment platform offered quick and reliable access to a representative sample with specific inclusion criteria for this study. Wenjuanxing, a widely used questionnaire collection platform in China, is frequently employed by academic researchers for data gathering. Numerous published studies conducted in China have utilized Wenjuanxing to collect data (Peng et al., 2022; Su et al., 2024; F. Zhou, 2022). In this research, participants were randomly selected from a representative consumer panel managed by Wenjuanxing. The study required that participants must currently live in urban and suburban areas of Beijing, Shanghai, and Chongqing and be the primary grocery shoppers for their households. The first part of the survey included a consent form outlining the purpose of the study, procedure, and potential risks. In the following part, a five-section questionnaire is presented to the participants.

The questionnaire in this study comprised 63 questions, and respondents took an average of 9.7 minutes to complete it. The full questionnaire is attached in Appendix I. The questions in the survey are mostly adapted from previous literature (Hamzaoui Essoussi & Zahaf, 2009; Lee & Yun, 2015; McEachern & McClean, 2002; Roitner-Schobesberger et al., 2008; Tarkiainen & Sundqvist, 2005; Vijayan, 2015; Wee et al.,

2014; Yadav & Pathak, 2016), all of which are written in English. The original questions were translated into simplified Chinese by the author and an expert in the field who is also fluent in Mandarin Chinese. The Chinese version of the questionnaire was then translated back to English by another Chinese-speaking researcher in the field. A comparison between the translated and original versions of the questionnaire indicated that the Chinese version of the questionnaire was accurate.

The questionnaire primarily uses a 5-point Likert scale (from "Strongly Disagree" to "Strongly Agree" or from "Never" to "Very often") and a 5-level semantic differential scale to measure respondents' perceptions, attitudes, and behaviours. There is an option of "prefer not to say" for each question, so the participants can skip any questions they would not answer. The survey questionnaire consists of two sections: the first section includes demographic questions. The second section covers questions regarding respondents' perceptions of organic food attributes, attitudes toward the benefits of organic food, subjective norms, perceived behavioural control, purchase intentions, and purchase behaviour.

3.1.1. Perception of Attributes

There is a series of questions that asks the participants to indicate their perception of organic food attributes in ecological welfare, animal welfare, sensory property, freshness, naturalness, nutrition value, and affordability. A 5-point Likert scale (from "Strongly Disagree" to "Strongly Agree") was used. All the attributes were measured in multiple-item scales and based on prior literature (Lee & Yun, 2015; Roitner-Schobesberger et al., 2008; Wee et al., 2014). The attribute "animal welfare" includes two items, "freshness" comprises one item, "naturalness" encompasses three items,

"nutritional content" includes two items, "ecological welfare" consists of two items, "sensory appeal" has three items, and "price" includes two items.

3.1.2. Attitudes toward Benefits

To measure the hedonic, utilitarian, and ethical attitudes as reflected in the perceived benefits of organic food (Organism in SOR), survey questions are adapted from prior studies: hedonic attitudes & utilitarian attitudes (Lee & Yun, 2015) and ethical attitudes (McEachern & McClean, 2002). In this section, a 5-point semantic differential scale was used to test their attitudes toward the certain benefits of organic foods. Items of utilitarian attitudes include “ineffective–effective,” “not functional–functional,” and “unnecessary–necessary;” items of hedonic attitudes include “not fun–fun,” “dull–exciting,” “not delightful–delightful;” and items of ethical attitudes include “unethical–ethical,” “irresponsible-responsible,” “immoral-moral.”

Previous research has mainly focused on consumer attitudes towards the utilitarian and hedonic benefits of organic food. This study not only examines consumer attitudes toward these utilitarian and hedonic benefits but also explores their attitudes toward the ethical benefits of organic food. The questions in this study's questionnaire that assess consumer attitudes towards the ethical benefits of organic food are adapted from a study (McEachern & McClean, 2002), which investigated the factors driving consumers to purchase organic products, with an emphasis on the influence of ethical considerations. Their research delved into how consumers perceive the ethicality of their purchasing decisions, including aspects such as animal welfare, environmental sustainability, and overall moral responsibility. In this study's questionnaire, opposing adjectives such as "unethical–ethical," "irresponsible–responsible," and "immoral–moral" are used, allowing

respondents to rate their ethical perceptions of organic food purchases on an interval. This adaptation maintains consistency with the theoretical foundations and methodologies of the original study.

3.1.3. Subjective Norm and Perceived Behavioural Control

The questionnaire also covers the subjective norms involving the perceived social pressure to perform or not perform the behaviour, and perceived behavioural control reflects the perceived ease or difficulty of performing the behaviour based on past experiences and anticipated obstacles. In this study, those survey questions are adapted from (Lu et al., 2022; Vijayan, 2015). A 5-point Likert scale (from "Strongly Disagree" to "Strongly Agree") was used in this section. The "subjective norm" section includes three items designed to assess the influence of people around the consumers on their purchasing decisions regarding organic food. The "perceived behavioural control" section encompasses two aspects: product accessibility and information provision. The accessibility component contains four items that evaluate the extent to which consumers can conveniently access organic foods, while the information provision component includes two items that measure the consumers' perceived accuracy and accessibility of the information about organic foods.

3.1.4. Purchase Intention and Purchase Behaviour

The measurements of participants' purchase intention and behaviour toward organic food purchase (Response in SOR) are adapted from prior literature (Hamzaoui Essoussi & Zahaf, 2009; Lee & Yun, 2015; Tarkiainen & Sundqvist, 2005). The participants' purchase intention was assessed through a 5-point Likert scale (from "Strongly Disagree" to "Strongly Agree"). Purchase behaviour was measured in two

parts: One part assessed the frequency with which consumers purchase organic foods in various categories, such as "fruits & vegetables," "meat & fish," "cereal & grains," and "processed foods," as well as their overall frequency of purchasing organic foods.

Another part evaluated how often consumers purchase organic foods from different types of retail locations, including "supermarkets," "organic food stores," "health stores," and "farmers' markets." The respondents' purchase behaviour was tested through a 5-point Likert scale (from "Never" to "Very often").

3.2. Sampling Cities

This study aims to collect a representative sample of Chinese consumers to analyze their organic food purchase behaviour. The sampling, however, focused on three major cities in China: Beijing, Shanghai, and Chongqing. The target population was adult consumers in these metropolitan areas. The three cities are the most populated in their region: Beijing has 21.84 million residents, Shanghai has 24.75 million, and Chongqing has 32.13 million (National Bureau of Statistics of China, 2023). Therefore, the sampling cities cover over 78 million population, and Beijing, Shanghai, and Chongqing hold the highest per capita GDP in northern, southern, and western China (Statista, 2023).

The focus on the three cities is mainly a practical choice. The sampling of Chinese consumer research often faces practical challenges, as China has diverse regions with varying economic and social development (Chen et al., 2023). To enhance the representativeness of the sample, a stratified sampling technique is ideal to cover multiple regions with a substantial sample size for each area. However, recruiting participants from numerous regions usually requires a significant increase in the total sample size.

Therefore, this study selectively concentrated on the three cities that have large populations, are relatively more developed, and exemplify their regions.

The reason for this study focusing on the largest and the most developed cities is that large metropolitan areas are often the leaders of national consumer trends, leading future trends in less developed areas. These more developed cities tend to lead the way in sectors such as luxury consumer goods, leisure, and services, influencing purchase patterns nationwide (Nandy & Biswas, 2023). A study on China's emerging consumer market reveals that regional central cities with higher income and more advanced infrastructures tend to adopt modernized purchase patterns faster than other areas in their region. These cities frequently evolve into international centres, thereby influencing regional and national purchase (Zhang & Zhang, 2023).

3.3. Demographic Characteristics of the Participants

Given the complexity of the behavioural models and the number of variables, the study recruited about 500 participants per city (1533 total) to fill out an online questionnaire hosted on Wenjuanxing. The sample size of 1,533 participants in this study is adequate for conducting analyses involving structural equation modelling (SEM), which is the most complicated model used in this study. Prior research has suggested that a minimum of 460 samples is required in order for an SEM to test a set of paths with a power of 0.8 (Wolf et al., 2013). Previous published studies using similar methodologies support this justification. For example, there was SEM-based research on consumer psychology related to organic food consumption using samples of 539 participants in China (Wang et al., 2024). Thus, the current study's sample size is sufficient to test the hypotheses. Among the 1,539 participants who completed the questionnaire, one

respondent indicated that they were not the primary shopper for their family. Therefore, the data for that participant was excluded from further analyses. In another question asking for the location of their residence, five participants indicated that they lived in rural areas. After removing those responses, further analyses were based on data from 1,533 participants. The survey was completed in March 2024. The questionnaire collected information regarding the demographic characteristics of the participants, including age, gender, education, household income, household size, and household structure.

Table 3.3.: The Demographic Characteristics of the Sample

		Frequency	% in sample	% in population
City of residence	Beijing	509		
	Shanghai	504		
	Chongqing	526		
Area of residence	Urban area	1340	87.4	84.8 ^b
	Suburb	193	12.6	15.2 ^b
Gender	Man	629	41	50.4 ^a
	Woman	904	59	49.6 ^a
Age	18-30	533	34.8	
	30-45	886	57.8	
	45-60	107	7.0	
	60 and above	7	0.4	
Education	middle school	8	0.7	70.1 ^b
	high school and college	140	9.1	
	Bachelor's degree	1149	75	23.6 ^b
	Master's degree	225	14.7	
	Phd degree	10	0.7	6.3 ^b
Household Income	80k CNY and below	66	4.3	
	80k-150k CNY	317	20.7	
	150k-300k CNY	624	40.7	
	300k-500k CNY	381	24.8	
	500k-1m CNY	125	8.2	
	1m CNY and above	20	1.3	

		Frequency	% in sample	% in population
Household size	1-2 people	198	12.9	48.8 ^a
	3 people	831	54.2	23.6 ^a
	4 people	319	20.8	
	5 people	144	9.4	27.6 ^a
	6 people and above	41	2.7	
Household structure	live alone	113	7.4	
	live with a spouse/partner but no child	149	9.7	
	live with a spouse/partner and child(ren)	1029	67.1	
	live with child(ren) as a single parent	14	0.9	
	live with parent(s) or grandparent(s)	198	12.9	
	other	30	2	
	Without Child(ren)	460	30.6	82.3 ^a
With Child(ren)	1043	69.4	17.7 ^a	

Note: “% in Population” refers to the demographic statistics of the population of the three cities. The superscript letter indicates the source of the data: a. (National Bureau of Statistics of China, 2023), b (Office of the Leading Group of the State Council for the Seventh National Population Census, 2020).

Table 3.3. lists a detailed demographic profile of the sample and compares it to the statistical data of Beijing, Shanghai, and Chongqing. The majority of respondents reside in urban areas, with only 12.6% living in suburban regions, which is close to the cities’ population statistics. Notably, the concept of "suburb" in China refers to a township-level administrative unit, typically surrounded by multiple villages and serving as the central hub for these villages. Chinese suburbs usually have concentrated commercial and service sectors, acting as the primary venues for village residents to access public services and engage in commercial activities (National Bureau of Statistics of China, 2008). The National Bureau of Statistics of China reports a gender ratio of approximately one-to-one. However, since the respondents in this study are primarily responsible for purchasing groceries for their families, a gender bias is present. According to a previous study, women predominantly manage household grocery purchases, accounting for about

60% of such cases (Hyzdu, 2020). This aligns with the proportion of female participants in this study, which is 59%. The age of respondents is concentrated between 30 and 45 years, accounting for 57.6% of the total. The median age of the populations in Beijing, Shanghai, and Chongqing ranges between 35 and 44 years (Office of the Leading Group of the State Council for the Seventh National Population Census, 2020), which is similar to the ages of the respondents in this study. Most respondents have attained an undergraduate or higher degree, with less than 10% of participants reporting lower than a university degree. However, according to the statistics, 70.1% of the population in Beijing, Shanghai, and Chongqing have the highest education level of high school or below. This indicates that the sample in our research is biased toward the well-educated population. Comparing the demographic data of the respondents in this study with the overall populations of Beijing, Shanghai, and Chongqing reveals that the participants are representative of high-income, well-educated, middle-class, and relatively large households.

3.4. Validating Measurements

Two confirmatory factor analyses (CFA) were conducted to test the internal consistency and validity of the measurements. Internal consistency refers to the degree of coherence among the items within a measurement instrument—that is, whether these items collectively measure the same underlying construct. Validity pertains to whether the measurement instrument accurately captures the concept or construct it is intended to assess. Validity reflects the effectiveness of the scale, ensuring that the data collected by the researcher genuinely represents the phenomenon under investigation. Cronbach's alpha coefficient is primarily used to evaluate internal consistency, while factor loadings

and Average Variance Extracted (AVE) are employed to assess validity. The measurements regarding the perception, attitude, and intention were categorized into two groups and submitted to two confirmatory factor analyses (CFA) based on the theoretical frameworks of the Stimulus-Organism-Response model and the Theory of Planned Behaviour model. Specifically, the measurements regarding the perception of organic food attributes and the attitudes to the benefits were submitted to the first CFA, which is based on the SOR model. The items related to overall attitude to organic food, subjective norm, perceived behavioural control, and purchase intention were submitted to the second CFA based on TPB. The results of these analyses are presented in Table 3.4.-1 and Table 3.4.-2.

The goodness-of-fit of the CFA models was acceptable ($CFI = 0.959$; $RMSEA = 0.043$ for the CFA based on SOR; $CFI = 0.910$, $RMSEA = 0.076$ for the one based on TPB). Although a standardized factor loading of at least 0.70 is often recommended, loadings above 0.50 can still be considered acceptable (Cheung et al., 2024). Therefore, the items with factor loadings lower than 0.50 were excluded from the final CFA and further analyses. The excluded items include “organic food contains natural ingredients” belonging to the measurement of naturalness attribute, “organic food is packaged in an environmentally friendly way” belonging to the ecological welfare attribute, “organic food looks nice” belonging to the sensory appeal attribute, “people whose opinions I value would prefer that I should not buy organic food (reversed)” belonging to the subjective norm, and “I did not have the resource and time to buy organic food (reversed)” belonging to perceived behaviour control. After excluding these items from the CFAs, the estimated factor loadings of the remaining items for their respective factors

are higher than 0.50. A Cronbach's alpha above 0.70 is commonly regarded as the benchmark for satisfactory reliability (Cheung et al., 2024), so in this study, all measurements' reliability (Cronbach's Alpha) was acceptable. The correlation of the items was tested for the factors with two items. All the correlations between the tested items are significant ($p < 0.01$). Although it is generally recommended that the average variance extracted (AVE) should exceed 0.50, AVE values above 0.30 are also acceptable (Cheung et al., 2024). In this study, all AVEs are greater than 0.3.

Table 3.4.-1: Confirmatory Factor Analysis Results, Based on the SOR Model

Factors and items	Factor loadings	AVE*	Cronbach's Alpha	Correlation
Animal welfare		0.44		0.43***
Organic farming treats animals humanely	0.62			
Organic farming always considers the animal well-being	0.70			
Freshness				
Organic food is fresher than the other products				
Nutritional content		0.36		0.36***
Organic food keeps me healthy	0.59			
Organic food is nutritious	0.61			
Naturalness		0.45		0.45***
Organic food contains no additives	0.65			
Organic food contains no artificial ingredients	0.69			
Ecological welfare				
Organic food has been produced in a way which has not shaken the balance of nature.				
Sensory appeal		0.59		0.59***
Organic food has a pleasant texture	0.74			
Organic food tastes good	0.80			
Affordability		0.54		0.48***
Organic food is expensive (reversed)	0.56			
The price of organic food is cheap	0.87			
Utilitarian attitudes		0.46	0.72	
Ineffective–effective	0.70			
Not helpful–helpful	0.67			
Unnecessary–necessary	0.67			
Hedonic attitudes		0.46	0.71	

Not fun–fun	0.56		
Dull–exciting	0.75		
Not delightful–delightful	0.70		
Ethical attitudes		0.62	0.83
Unethical – Ethical	0.75		
Irresponsible - Responsible	0.80		
Immoral -- Moral	0.81		

Note: n=1533

Goodness-of-fit: $\chi^2=473.431$, $df=124$, $p<0.001$, $CFI=0.959$, $RMSEA=0.043$

*AVE: Average Variance Extracted ** $p<0.05$, *** $p<0.01$.

The correlation of the items was tested for the factors with two items.

Table 3.4.-2: Confirmatory Factor Analysis results, Based on TPB Model

Factors and items	Factor loadings	AVE*	Cronbach's Alpha	Correlation
Attitudes		0.41	0.73	
Buying organic food is a good idea	0.63			
Buying organic food is a wise choice	0.67			
I like the idea of buying organic food	0.68			
Buying organic food would be pleasant	0.57			
Subjective norm		0.62		0.62***
Most people important to me, think that I should buy organic food	0.75			
Most people, important to me, would want me to purchase organic food	0.82			
Perceived behavioural control		0.38	0.74	
I am confident that if I want, I can buy organic food	0.57			
Organic food is always sufficiently available	0.61			
Organic vegetables are available in the market	0.59			
Organic foods are labeled with accurate information or the organic status of products	0.68			
There is a lack of information to indicate the source of organic production (reversed)	0.64			
Purchase intention		0.51	0.80	
I intend to buy organic bread in the near future	0.61			
If I had to do it again, I would buy organic food	0.74			
I try to buy organic food because it is the best choice for me	0.72			
I consider myself to be a loyal patron of organic food	0.77			

Note: n=1533.

Goodness-of-fit: $\chi^2=823.172$, $df=84$, $p<0.001$, $CFI=0.91$, $RMSEA=0.076$

AVE: Average Variance Extracted ** $p<0.05$, * $p<0.01$.*

The questionnaire included two questions to assess consumers' perceptions of the affordability of organic foods: one positively phrased (organic foods are affordable) and one negatively phrased (organic foods are expensive). Before conducting data analysis, the negatively phrased question (organic foods are expensive) was reversed to ensure consistency.

The correlation of the items was tested for the factors with two items.

3.5. Data Analysis

3.5.1. Variables Construction

For perceptions, attitudes, intentions, and behaviours measurements in this study, the Likert scales were encoded into numeric values according to the following scheme: 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree. For frequency measurements, the coding scheme is as follows: 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Very often. For semantic differential scales (e.g., Organic food is: Unethical 1-2-3-4-5 Ethical), a 5-point coding was employed, where the corresponding numeric value was assigned to the item according to a participant's selection. For a measurement with multiple items, the average of all relevant items was calculated as the numerical value of the measurement.

Following the common practice in social sciences and medical research, this study treated data from the Likert scales as continuous variables and applied parametric tests, such as MANOVA, regression, and structural equation modelling, for statistical analyses. Parametric tests can be applied to Likert scale data (Sullivan & Artino, 2013), and this approach is generally more flexible for analyses (Lumley et al., 2002) and provides unbiased estimations, even when key statistical assumptions, like normal data distribution, are violated (Norman, 2010). Although the normality tests on the key

variables of this study indicate that the data do not follow a normal distribution, histograms generally show a bell shape. Furthermore, it has been demonstrated that when the sample size is large (i.e., more than 10 observations per variable), the normality assumption for parametric tests has minimal impact on results (Schmidt & Finan, 2018). As noted by an influential paper (Norman, 2010): “Parametric statistics can be used with Likert data, with small sample sizes, with unequal variances, and with non-normal distributions, with no fear of coming to the wrong conclusion.” The Likert scales of this study are mainly adapted from previous literature, and these studies typically treated them as continuous variables in parametric tests (Hamzaoui Essoussi & Zahaf, 2009; Lee & Yun, 2015; McEachern & McClean, 2002; Roitner-Schobesberger et al., 2008; Tarkiainen & Sundqvist, 2005; Vijayan, 2015; Wee et al., 2014; Yadav & Pathak, 2016). In this study, during the conduct of MANOVA, Levene’s test of equality of error variance and Box’s test of equality of covariance matrix were performed, and the results indicated that the dependent variables meet the assumption of homoscedasticity.

For demographic variables, due to the limited number of respondents selecting certain options in some questions, to ensure a sufficient sample size for each option and facilitate data analysis, respondents selecting these options were merged into other groups. This study focused only on respondents living in urban and suburban areas, thus excluding those living in rural areas. There were only seven respondents aged 60 and above for the question about respondents' ages. Therefore, respondents aged 45-60 and those aged 60 and above were combined into one group labelled "45 years and above." For the question about educational attainment, only eight respondents had a middle school education. Hence, respondents with middle school, high school, and college

degrees were combined into one group, labelled as "high school & college and below." Only ten respondents had a doctoral degree, so respondents with doctoral and master's degrees were combined into one group, labelled "graduate degrees." Due to the diverse and difficult-to-classify nature of respondents' occupations, and since occupation was not significantly relevant to this study, it was excluded. For the question about household annual income, a very small number of respondents had an income below 80,000 CNY or above 1,000,000 CNY. Thus, respondents with household incomes below 80,000 CNY and those with incomes between 80,000 and 150,000 CNY were combined into one group, labelled as "household income below 150,000 CNY." Respondents with household incomes above 1,000,000 CNY and those with incomes between 500,000 and 1,000,000 CNY were combined into one group, labelled as "household income above 500,000 CNY." There were only a few respondents with household sizes of five or six or more members. Thus, respondents with household sizes of five or six or more members were combined with those having four members into one group, labelled as "household size of four or more members." Due to the complexity and diversity of respondents' family structures, respondents were divided into two groups based on whether they had children.

3.5.2. Descriptive Analysis and MANOVAs

To achieve Research Objective 1, which aims to describe the purchasing behaviour of Chinese consumers regarding organic food, this study used descriptive statistics to detail how often consumers buy each type of organic food and the frequency of purchases at various locations. Additionally, the research conducted correlation analyses to examine

the relationship between the frequency of purchasing different types of organic foods and the frequency of purchasing organic foods at different venues.

Research Objective 2 aims to identify important demographic and psychological variables that influence consumers' purchasing intentions. This study first utilized a one-way multivariate analysis of variance (MANOVAs) to investigate the differences in perceptions of organic food attributes, attitudes, purchase intentions, and purchase behaviours among consumers with different demographic characteristics. The dependent variables of these MANOVAs included the perceptions of organic foods, attitudes towards the benefits of organic foods, purchase intention on organic foods, frequency of buying various types of organic foods, and frequency of purchasing organic foods. Each MANOVA included one of the following factors: the respondents' locations, gender, age, education, household income, household size and household structure. Wilks' lambda and related F and p values are reported for each MANOVA. For each MANOVA, if the main effect is significant, a post-hoc comparison (Bonferroni adjusted) of group means was performed.

3.5.3. Neural Networks

Moreover, this research employed neural networks to explore, assess and examine the demographic and psychosocial predictors of purchase intention and purchase behaviour on organic food. Neural networks (NNs) are computational models inspired by the neural structures of the human brain (Dongare et al., 2012) and are commonly employed for tasks such as predictive analysis and classification (Schmidhuber, 2015). In the context of marketing, NNs play a pivotal role in predicting customer behaviour, identifying complex buyer segments, automating marketing efforts, personalizing

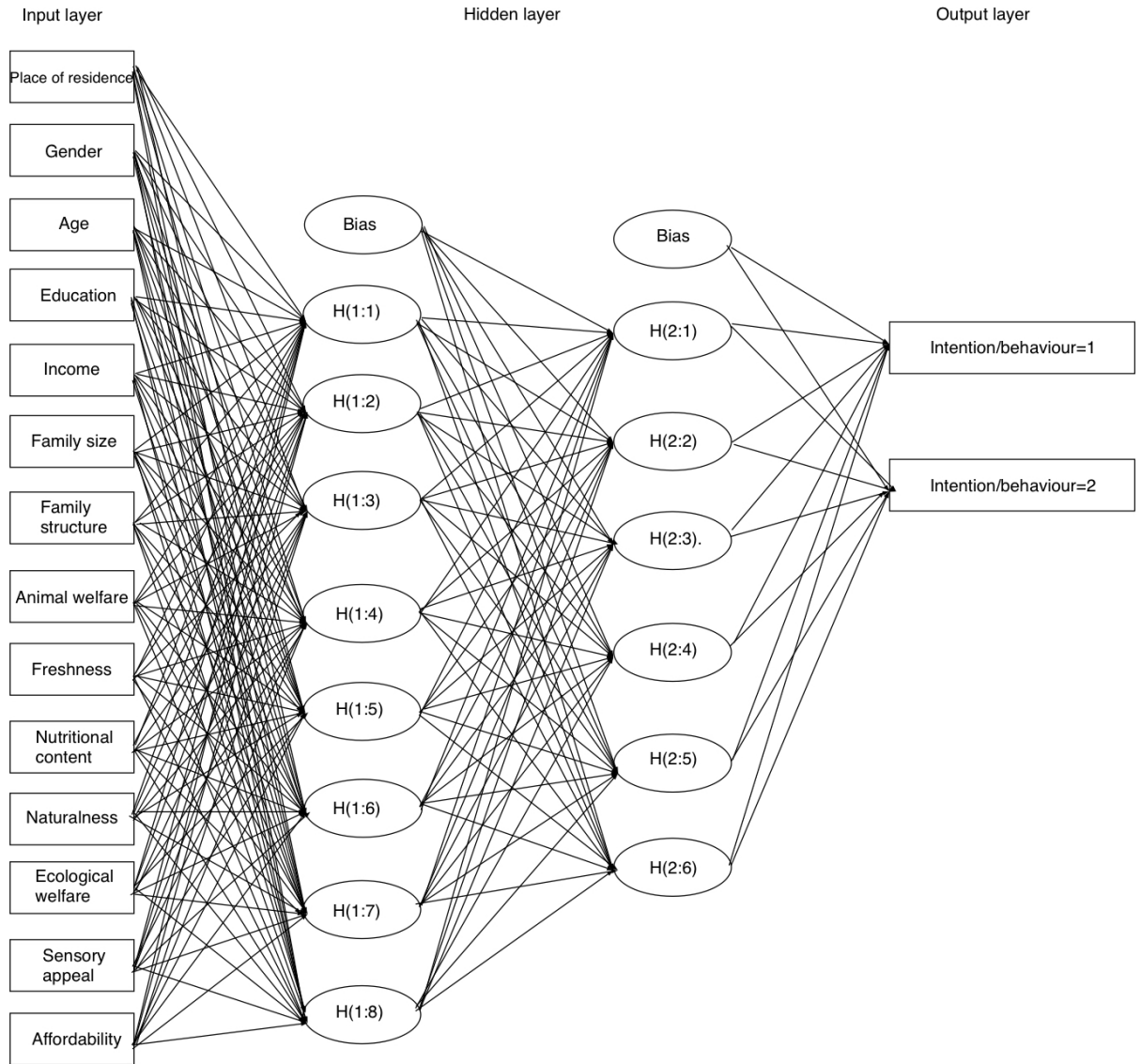
content, and forecasting sales trends, thereby enabling companies to optimize strategies, enhance customer engagement, and make data-driven decisions (Dastres & Soori, 2021).

In this study, the neural network models used demographic variables and consumers' perceptions of organic food attributes (psychological variables) as the input layer to predict whether a participant is a frequent organic food consumer (output layer: binary outcome Y/N). This study also used multiple hidden layers in NNs to form a deep-learning model, which is able to model complex patterns in large datasets (Sheikh et al., 2023). Figure 3.5.3. depicts the deep-learning model used in this study. The input layer represents each variable as a feature. The hidden layers consist of interconnected neurons, each linked by weighted connections that reflect the significance of the input variables. Each input from the previous layer was multiplied by a weight, which determines the strength of the connection between input and output. The relationship can be expressed as $Z = W_1X_1 + W_2X_2 + \dots + W_nX_n + b$. Where, Z is the weighted sum of inputs X (demographic and psychosocial factors), W represents the weights, and b is a bias term that adjusts the output. The weighted sum of the values of neurons in the last hidden layer feeds into the output layer through a SoftMax activation function to generate the final predictions.

The model compares the final predictions in the output layer against the actual outcomes to adjust parameters and assess performance. To determine the weights and other coefficients, a neural network first needs training based on data in a training set. During a training phase, the model iteratively adjusts its internal weights to minimize prediction errors. Following this, a testing phase evaluates the model's ability to generalize to new, unseen data by comparing its predictions to actual outcomes. In this

study, 70% of the data was allocated for training, while the remaining 30% was reserved for testing.

Figure 3.5.3.: Theoretical Framework of Neural Network: Demographic/Psychological Variables—Purchase Intention or Behaviour



Note: $H(x, y)$ refers to the y -th neuron in the x -th level of hidden layer.

The performance of a neural network in binary classification tasks (e.g. whether a participant is a frequent organic food purchaser: Y/N) is often evaluated using the Receiver Operating Characteristic (ROC) curve, which is a plot of the True Positive Rate

(TPR) against the False Positive Rate (FPR). The TPR (i.e., sensitivity) is the proportion of actual positive cases being correctly identified (correctly identifying a frequent purchaser). The FPR represents the proportion of negative cases incorrectly classified as positive (i.e., 1 - Specificity) (Sheikh et al., 2023) (See Table 4.4.-1). An ideal classifier achieves 100% sensitivity and 0% FPR. To quantify the classifier's overall performance, the Area Under the ROC Curve (AUC) is calculated to measure how well the model can distinguish the two classes. An AUC value above 0.5 indicates the performance of a model is better than random chance. AUC values between 0.7 and 0.8 are considered acceptable, between 0.8 and 0.9 are regarded as excellent, and above 0.9 are considered outstanding (Han, 2022).

This study employed six neural network models to investigate the determinants of purchase intention and purchase behaviour, aiming to assess the individual and combined effects of demographic and psychological variables on these outcomes. In each model, the input layer (features) is comprised of demographic variables, psychological variables, or a combination of both. Demographic variables, including place of residence, gender, and family structure, were treated as factors (categorical variables), and age, education, income, and family size were considered covariates (continuous variables). All psychological variables were treated as covariates.

In a series of analyses, the features in the input layer were used to predict whether a participant has a strong purchase intention. Participants were classified into two groups based on their average purchase intention scores. The respondents' intention to purchase organic food was assessed using a 3-item Likert scale rated from 1 to 5. Respondents with average scores below 4 were assigned to the “weak intention” group ($n = 684$,

44.4%), while those with scores of 4 and above were assigned to the “strong intention” group ($n = 849$, 55.2%). This transformation recodes the continuous purchase intention variable into a binary variable, aiming to balance the number of participants in each group and to improve classification accuracy and model efficiency (Klimo et al., 2021). Similarly, in another series of analyses, participants were categorized based on purchase frequency. Respondents who indicated their purchase frequency as “never,” “rarely,” or “sometimes” were classified as having “infrequent purchase” behaviour ($n = 641$, 41.7%). Those who reported purchasing “often” or “very often” were categorized as “frequent purchasers” ($n = 869$, 56.5%).

By systematically varying the independent variables across the six models, the study assessed the predictive power of these factors on purchase intention and purchase behaviour separately. Initially, demographic variables were employed as predictors. Subsequently, psychological variables were utilized, and finally, both demographic and psychological variables were incorporated. In this set of analyses, the general approach is to assess the importance of each feature and identify the most important feature as the most significant predictor of intention or behaviour. The importance of a feature in an NN model refers to the reduction in predictive accuracy that occurs when a specific feature is removed from the model. By quantifying importance, this study can assess the contribution of each feature to the overall predictive power of the model.

3.5.4. Linear Regressions

To fulfill research Objective 3, which aims to examine the psychological mechanisms through which psychosocial factors influence purchase behaviour, this study applied linear regression analyses to explore the linear relationships between the

perception of attributes and attitudes, attitudes, subjective norms, perceived behavioural control and purchase intentions, as well as purchase intentions and purchase behaviours.

This set of analyses aims to test the hypotheses based on the Stimulus-Organism-Response (SOR) model. This study first conducted three linear regressions, each of which included the attitudes toward the utilitarian, hedonic, or ethical benefits of organic food as the dependent variable. The dependent variables were constructed as continuous variables, as described in Section 4.4. In each model, participants' perceptions of organic food attributes were included as independent variables (Hypotheses related to Stimulus-Organism; H5.a, H5.b, H5.c, H6.a, H6.b, H7.a, and H7.b, see Section 2.5). The second set of analyses employed linear regressions that used the attitudes to hedonic, utilitarian, and ethical benefits to predict participants' purchase intention, which in turn predicts purchase behaviour (Hypotheses related to Organism-Responses; H1, H2.a, H2.b, and H2.c).

Based on the Theory of Planned Behaviour, a linear regression was employed to test the hypotheses (H2.a, H2.b, H2.c, H3, and H4) using the overall attitude towards organic foods, subjective norms, and perceived behavioural control as independent variables to predict purchase intention. The second group of linear regressions was performed using purchase intention as a predictor to predict the frequency of purchasing various types of organic foods (H1).

3.5.5. Structural Equation Model

To comprehensively test hypotheses, the research also used structural equation modelling (SEM) to examine the mechanisms by which perceptions of attributes, attitudes, subjective norms, perceived behavioural control (including accessibility and

information provision), and purchase intentions influence purchase behaviours. Specifically, the covariance-based structural equation modelling (CB-SEM) approach was selected, utilizing the AMOS software package. The parameter estimation method adopted was Maximum Likelihood Estimation (MLE), which is a widely used technique within CB-SEM frameworks.

The SEM was developed based on the proposed conceptual model and was used to test three sets of hypotheses: first, the SOR model was applied to examine how participants' perceptions of organic food attributes influence their attitudes towards the ethical, utilitarian, and hedonic benefits of organic foods (H5.a, H5.b, H5.c, H6.a, H6.b, H7.a, and H7.b). Second, the TPB was used to explore the influence of these attitudes (H2.a, H2.b, and H2.c), along with subjective norms (H3) and perceived behavioural control (H4; such as accessibility and information provision), on purchase intention. Lastly, the model assessed the impact of purchase intention on the frequency of purchasing various categories of organic foods (H1). Five separate structural equation models were constructed to examine different types of organic food purchasing behaviours. The main text of this thesis presents only the results of the model that explains overall organic food purchasing behaviour. Since the results for specific types of organic food purchases are similar to the overall behaviour, they are included in Appendix II. For the parts based on the SOR model, the exogenous variables included perceptions of organic food attributes, such as sensory appeal, ecological welfare, freshness, and affordability. These exogenous variables were specified as the predictors of the attitudes toward ethical, utilitarian, and hedonic benefits. For the parts based on the TPB, attitudes toward utilitarian, hedonic, and ethical benefits were used as exogenous

variables to predict purchase intention, which in turn predicts the frequency of overall organic food purchases.

Chapter 4. Results

4.1. Overall Organic Food Purchase Behaviour

This study first conducted a descriptive statistical analysis to describe the frequency of the participants' purchases of various types of organic foods and their frequency of purchasing organic foods from various retail locations. The results regarding the overall organic food purchasing behaviour (see Figure 4.1.-1) show that 57.6% of participants purchase organic foods with a frequency of "Often" or higher, indicating that the respondents in this study generally have a relatively high frequency of purchasing organic foods. Among the organic foods categories, the participants reported that they purchase organic fruits and vegetables most frequently, with 69.2% of respondents purchasing these with a frequency of "Often" or higher. In contrast, the frequency of purchasing organic processed foods is the lowest, with only 37.2% of respondents purchasing these with a frequency of "Often" or higher. The frequency of purchasing organic cereals and grains, as well as organic meat and fish, falls between the frequency of purchasing organic fruits and vegetables and organic processed foods.

Regarding the location of purchasing organic food, the results (see Figure 4.1.-2) indicate that, overall, respondents have a relatively high frequency of purchasing organic foods from the retail locations involved in this study, with nearly half of respondents purchasing organic foods from these locations at a frequency of "Often" or higher. Among these, supermarkets are the most frequent source, with 63.5% of respondents purchasing organic foods from supermarkets at a frequency of "Often" or higher. In

contrast, health stores are the least frequent source, with only 37.9% of respondents purchasing organic foods from health stores at a frequency of “Often” or higher. The frequency of purchasing organic foods from organic stores and farmer’s markets falls between the frequency of purchasing from supermarkets and health stores.

A further analysis is conducted to reveal the link between the preferred organic food category and purchasing location. This analysis first constructed a variable that measures, for each participant, the proportion of each organic food category relative to the total organic food purchased. The study used the purchasing frequency of each food category divided by the sum of the frequencies of all food categories to reflect this proportion.

$$r_i = \frac{f_i}{\sum f_i}$$

Where “*i*” represents the category of organic food being purchased, r_i is the preference ratio reflecting the purchasing frequency of each food category divided by the sum of the frequencies of all food categories (r_1 : preference ratio for organic vegetables and fruits, r_2 : preference ratio for organic meats and fish, r_3 : preference ratio for organic cereals and grains, r_4 : preference ratio for organic processed foods). f_i is the purchasing frequency of each food category, and $\sum f_i$ is the sum of the frequencies of all food categories.

Figure 4.1.-1: Frequency of Purchasing Different Types of Organic Foods

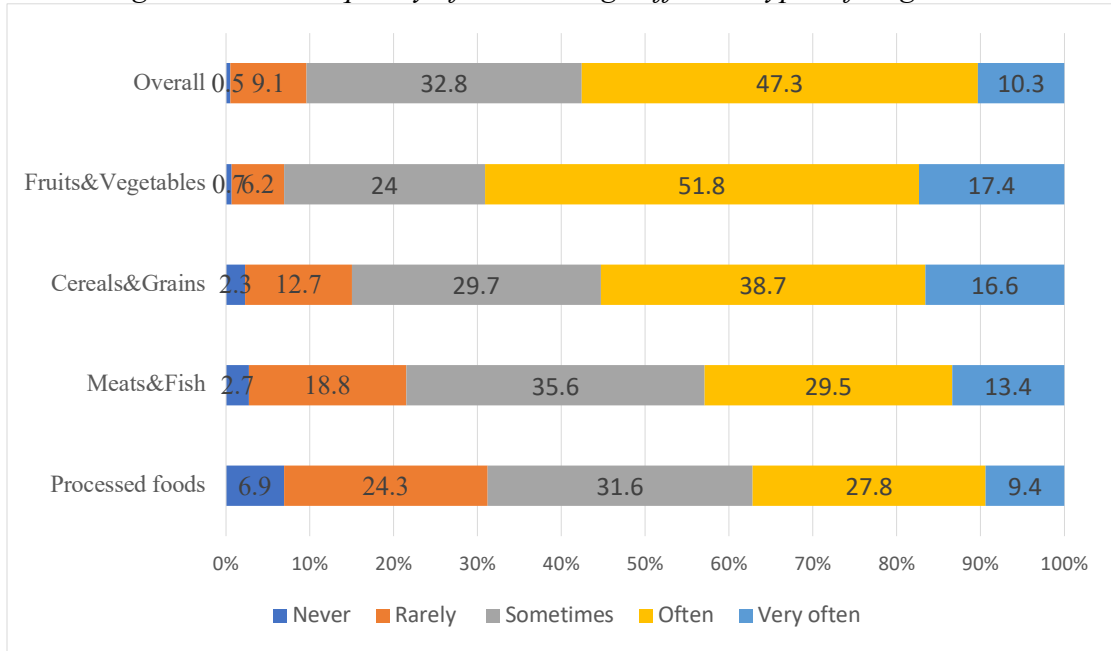
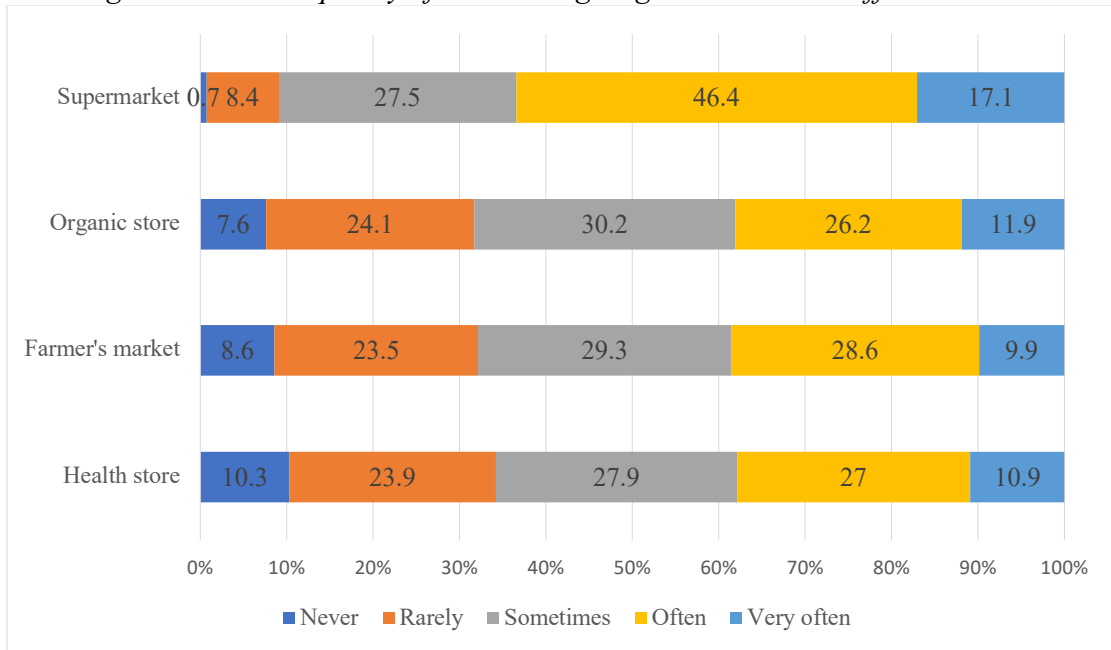


Figure 4.1.-2: Frequency of Purchasing Organic Foods in Different Locations



Similarly, another preference ratio was constructed, where “j” denotes the location of purchase, p_j , was created by dividing the frequency of purchasing organic foods from each location by the sum of the purchasing frequencies from all locations to reflect the

proportion of each location to the total number of organic food purchasing locations (p_a : preference ratio for supermarkets, p_b : organic food store, p_c : health store, p_d : farmers' store). l_j is the purchasing frequency of each location, and $\sum l_j$ is the sum of the purchasing frequencies from all locations.

$$p_j = \frac{l_j}{\sum l_j}$$

Table 4.1.-3 lists the correlation coefficients between r_i and p_j . The coefficients indicate how the participants' preference for a given type of store (i.e., supermarket, organic food store, health store, farmer's market) is correlated to their preference for a given category of organic food (fruits and vegetables, meats and fish, cereals and grains, and processed foods). The results indicate that as participants buy organic products more frequently at supermarkets, they tend to purchase organic fruits and vegetables more often ($r = 0.231, p < 0.001$), but they tend to buy organic fish and meat less frequently ($r = -0.174, p < 0.001$). Participants who purchase organic products more frequently at organic food stores purchase less organic fruits and vegetables ($r = -0.113, p < 0.001$). Conversely, a higher frequency of purchasing organic products at organic food stores is associated with a higher frequency of purchasing organic meats and fish ($r = 0.120, p < 0.001$). Participants who frequently purchase organic products at health stores tend to purchase processed organic food more often ($r = 0.073, p < 0.001$) and buy organic fruits and vegetables less often ($r = -0.158, p < 0.001$). Participants who often purchase organic products at farmer's markets tend to report a higher frequency of purchasing organic meats and fish ($r = 0.056, p = 0.028$).

Table 4.1.-3: The Correlation Between the Preference Ratio on the Various Types of Organic Foods and Preference Ratio in the Locations Where the Participants Purchase Organic Foods

	Fruits & Vegetables	Meats & Fish	Cereals & Grains	Processed foods
Supermarket	0.231 ^{***}	-0.174 ^{***}	-0.005	-0.036
Organic food store	-0.113 ^{***}	0.120 ^{***}	0.020	-0.027
Health store	-0.158 ^{***}	0.025	0.038	0.073 ^{***}
Farmers' market	-0.005	0.056 ^{**}	-0.046	-0.003

*Note: ** $p < 0.05$, *** $p < 0.01$*

Table 4.1.-3 highlights key correlations between organic food categories and purchasing locations. Supermarkets are linked with frequent purchases of fruits and vegetables but lower frequencies for meats and fish. Organic food stores favor meats and fish purchases, while health stores correlate positively with processed foods. Farmers' markets are associated with higher meat and fish purchases.

4.2. Differences in Demographic Groups

The objective of the following analyses is to explore the demographic differences in the perception, attitude, and behavioural intention of organic food. Several one-way MANOVAs were conducted. All the group means and test results are shown in Tables 4.2.1 - 4.2.7. Due to the large number of analyses and group mean comparisons, the following sections only provide a summary of the results describing a general pattern. All detailed results, including the F and p values for the main effect and the results of the group mean comparisons, are reported in the tables. The general pattern described hereafter in this section is based on the rankings in group means.

4.2.1. Location

One-way MANOVA found significant differences (Wilks' lambda: $F = 3.54$, $p < 0.001$) among participants from Beijing, Shanghai, and Chongqing (See Table 4.2.1.). The results in purchase intention revealed no significant difference among the cities, while the result in other dependent variables generally showed a pattern that Beijing participants reported higher purchase frequency for some food categories, the most favourable perception (nutritional content, ecological welfare, and affordability), and the most positive attitudes toward organic food. Shanghai participants reported lower purchase frequency for most food categories and less favourable perceptions, especially in terms of affordability. Chongqing participants, while reporting the highest overall purchasing frequency (although not significantly higher than Beijing), reported lower attitudes toward the hedonic, utilitarian, and ethical benefits of organic food than Beijing participants.

4.2.2. Gender

The results of the one-way MANOVA test (Wilks' lambda: $F = 2.31$, $p = 0.002$) revealed gender differences (see Table 4.2.2.). While no significant differences were found in overall organic food purchasing frequency between men participants and women participants, notable differences emerged in specific categories such as organic cereals, grains, and processed foods. In terms of perceptions, men participants reported more favourable affordability than women participants did. Compared to women, men participants also associated greater utilitarian benefits with organic products.

Table 4.2.1.: Mean (Standard Deviation) of Organic Food Perception, Attitudes, and Behaviour by Place of Residence

Factors and items	Beijing (509)	Shanghai (504)	Chongqing (520)	F (2, 1502)	P
Purchase frequencies					
Fruits and vegetables	3.77(0.82) ^{ab}	3.73(0.84) ^b	3.86(0.81) ^a	3.41	0.03
Cereal and grains	3.63(0.93) ^a	3.45(1.04) ^b	3.56(0.97) ^{ab}	4.25	0.01
Meats and fish	3.36(1.01) ^a	3.17(0.99) ^b	3.42(1.03) ^a	9.01	<0.001
Processed foods	3.16(1.08) ^a	3.11(1.11) ^{ab}	2.99(1.05) ^b	3.50	0.03
overall	3.57(0.80) ^{ab}	3.50(0.84) ^b	3.65(0.80) ^a	4.25	0.01
Perception to attributes					
Animal welfare	3.95(0.69)	3.93(0.69)	4.01(0.66)	2.06	0.13
Freshness	3.84(0.90)	3.81(0.91)	3.80(0.92)	0.29	0.75
Nutritional content	4.22(0.63) ^a	4.12(0.68) ^b	4.19(0.63) ^{ab}	3.56	0.03
Naturalness	3.67(0.90)	3.65(0.89)	3.54(0.92)	3.34	0.04
Ecological welfare	3.79(0.93) ^a	3.66(0.93) ^{ab}	3.60(1.01) ^b	5.28	0.01
Sensory appeal	3.79(0.86)	3.70(0.85)	3.78(0.87)	1.50	0.22
Affordability	2.18(0.97) ^a	1.95(0.87) ^b	2.10(0.84) ^a	8.20	<0.001
Attitudes to benefits					
Utilitarian attitudes	3.82(0.76) ^a	3.63(0.81) ^b	3.69(0.72) ^b	8.15	<0.001
Hedonic attitudes	3.65(0.79) ^a	3.49(0.78) ^b	3.44(0.74) ^b	10.58	<0.001
Ethical attitudes	4.03(0.84) ^a	3.91(0.89) ^{ab}	3.82(0.93) ^b	7.86	<0.001
General attitudes	4.03(0.61) ^a	3.94(0.67) ^b	3.98(0.59) ^{ab}	3.00	0.05
Purchase intention	3.86(0.74)	3.76(0.79)	3.83(0.70)	2.51	0.08

Note: Different letter superscripts indicate the post-hoc comparison of group means (Bonferroni adjusted) is significant (at 0.05). The same letter indicates the post-hoc comparison is not significant. All comparisons are made within rows.

The columns with F (degree of freedom 1, df2) and P indicate the test results of the main effects of MANOVA.

Table 4.2.2.: Mean (Standard Deviation) of Organic Food Perception, Attitudes, and Behaviour by Gender

Factors and items	Men (629)	Women (904)	F(1, 1508)	P
The category of organic foods				
Fruits and vegetables	3.80(0.80)	3.78(0.84)	0.11	0.74
Meats and fish	3.37(0.97)	3.28(1.04)	2.78	0.10
Cereal and grains	3.64(1.01) ^a	3.49(0.96) ^b	8.47	0.004
Processed foods	3.20(1.06) ^a	3.01(1.09) ^b	10.81	0.001
overall	3.61(0.79)	3.55(0.83)	2.04	0.15
Perception to the attributes				
Animal welfare	3.94(0.70)	3.98(0.66)	1.05	0.31
Freshness	3.84(0.90)	3.80(0.91)	0.60	0.44

Nutritional content	4.18(0.63)	4.17(0.66)	0.004	0.95
Naturalness	3.64(0.90)	3.60(0.90)	0.86	0.35
Ecological welfare	3.73(0.96)	3.66(0.96)	2.01	0.16
Sensory appeal	3.78(0.88)	3.74(0.85)	0.49	0.48
Affordability	2.18(0.94) ^a	2.01(0.87) ^b	14.26	<0.001
Utilitarian attitudes	3.78(0.76) ^a	3.67(0.77) ^b	6.84	0.01
Hedonic attitudes	3.57(0.76)	3.49(0.79)	3.458	0.06
Ethical attitudes	3.92(0.87)	3.92(0.91)	0.02	0.88
General attitudes	3.99(0.62)	3.98(0.62)	<0.001	0.99
Purchase intention	3.85(0.73)	3.79(0.75)	1.76	0.19

Note: Different letter superscripts indicate the post-hoc comparison of group means (Bonferroni adjusted) is significant (at 0.05). The same letter indicates the post-hoc comparison is not significant. All comparisons are made within rows.

The columns with F(degree of freedom 1, df2) and P indicate the test results of the main effects of MANOVA.

4.2.3. Age

Significant age differences were identified in the MANOVA (Wilks' lambda: $F = 4.70$, $p < 0.001$) (see Table 4.2.3.). The results in purchase intention revealed that the participants of the 30-45-year-old group reported the strongest purchase intention (although not significantly higher than those 45 and above year-old group) and the highest overall purchasing frequency (although not significantly higher than those of 45 and above year-old group), especially in the frequency of purchasing processed foods. The participants of the 30-45-year-old group had a more favourable perception of organic foods, especially they perceived organic foods as more affordable than other groups. They also associated greater utilitarian and hedonic benefits with organic products.

4.2.4. Education

Significant education differences were identified in the MANOVA (Wilks' lambda: $F = 1.52$, $p = 0.03$; see Table 4.2.4.). The results in purchase intention revealed that the undergraduate participants had the highest overall purchasing frequency

(although not significantly higher than the graduate participants), especially in the frequency of purchasing organic vegetables, fruits, cereals and grains. The undergraduate participants also had a more positive perception of the attributes of organic foods, especially freshness and naturalness. The undergraduate and graduate participants had more positive attitudes towards the benefits of organic foods, especially the utilitarian and hedonic benefits.

Table 4.2.3.: Mean (Standard Deviation) of Organic Food Perception, Attitudes, and Behaviour by Age

Factors and items	18-30yrs (533)	30-45yrs(886)	45+ (114)	F(2, 1507)	P
The category of organic foods					
Fruits and vegetables	3.76(0.84) ^{ab}	3.84(0.81) ^a	3.58(0.76) ^b	5.52	0.004
Meats and fish	3.33(1.03)	3.34(0.99)	3.14(1.07)	2.04	1.13
Cereal and grains	3.44(1.06) ^b	3.61(0.94) ^a	3.58(0.95) ^{ab}	4.87	0.01
Processed foods	3.00(1.11) ^b	3.16(1.06) ^a	2.90(1.03) ^b	5.71	0.003
overall	3.46(0.81) ^b	3.66(0.82) ^a	3.47(0.76) ^{ab}	10.47	<0.001
Perception to the attributes					
Animal welfare	3.93(0.65) ^a	4.01(0.68) ^a	3.71(0.73) ^b	11.15	<0.001
Freshness	3.80(0.88) ^a	3.86(0.91) ^a	3.55(0.92) ^b	5.96	0.003
Nutritional content	4.14(0.68)	4.20(0.64)	4.15(0.54)	1.69	0.19
Naturalness	3.38(0.88) ^b	3.73(0.89) ^a	3.90(0.80) ^a	32.44	<0.001
Ecological welfare	3.50(0.99) ^b	3.78(0.94) ^a	3.75(0.87) ^a	14.76	<0.001
Sensory appeal	3.69(0.87) ^b	3.81(0.85) ^a	3.68(0.82) ^{ab}	3.76	0.02
Affordability	2.02(0.86) ^b	2.14(0.94) ^a	1.86(0.72) ^b	6.97	0.001
Utilitarian attitudes	3.57(0.73) ^b	3.82(0.76) ^a	3.62(0.83) ^b	19.08	<0.001
Hedonic attitudes	3.41(0.76) ^b	3.60(0.78) ^a	3.42(0.80) ^b	11.31	<0.001
Ethical attitudes	3.79(0.92) ^b	4.01(0.86) ^a	3.84(0.97) ^{ab}	10.33	<0.001
General attitudes	3.90(0.61) ^b	4.04(0.62) ^a	3.97(0.67) ^{ab}	8.90	<0.001
Purchase intention	3.68(0.78) ^b	3.90(0.71) ^a	3.74(0.78) ^{ab}	15.48	<0.001

Note: Different letter superscripts indicate the post-hoc comparison of group means (Bonferroni adjusted) is significant (at 0.05). The same letter indicates the post-hoc comparison is not significant. All comparisons are made within rows.

The columns with F(degree of freedom 1, df2) and P indicate the test results of the main effects of MANOVA.

Table 4.2.4.: Mean (Standard Deviation) of Organic Food Perception, Attitudes, and Behaviour by Education

Factors and items	College and below(148)	Undergraduate (1149)	Graduate (235)	F(2, 1506)	P
The category of organic foods					
Fruits and vegetables	3.61(0.90) ^b	3.81(0.81) ^a	3.81(0.83) ^{ab}	3.93	0.02
Meats and fish	3.21(0.98)	3.32(1.01)	3.41(1.03)	1.65	0.19
Cereal and grains	3.35(1.03) ^b	3.57(0.97) ^a	3.57(1.03) ^{ab}	3.24	0.04
Processed foods	2.98(1.02)	3.09(1.08)	3.14(1.09)	0.99	0.37
overall	3.38(0.85) ^b	3.60(0.81) ^a	3.56(0.82) ^{ab}	5.12	0.01
Perception to the attributes					
Animal welfare	3.91(0.68)	3.97(0.68)	3.95(0.69)	0.65	0.52
Freshness	3.63(1.07) ^b	3.85(0.88) ^a	3.77(0.90) ^{ab}	4.15	0.02
Nutritional content	4.13(0.66)	4.18(0.66)	4.19(0.60)	0.47	0.63
Naturalness	3.58(0.85) ^{ab}	3.65(0.90) ^a	3.49(0.91) ^b	3.53	0.03
Ecological welfare	3.53(0.94)	3.71(0.98)	3.65(0.86)	2.72	0.07
Sensory appeal	3.71(0.88)	3.78(0.85)	3.66(0.86)	2.18	0.11
Affordability	2.03(0.80)	2.10(0.91)	2.02(0.90)	1.01	0.37
Utilitarian attitudes	3.52(0.78) ^b	3.74(0.77) ^a	3.75(0.71) ^a	5.45	0.004
Hedonic attitudes	3.33(0.79) ^b	3.55(0.77) ^a	3.53(0.80) ^a	5.01	0.01
Ethical attitudes	3.77(0.94) ^b	3.92(0.91) ^{ab}	4.01(0.78) ^a	3.36	0.04
General attitudes	3.81(0.68) ^b	4.01(0.62) ^a	3.97(0.60) ^a	6.71	0.001
Purchase intention	3.64(0.79) ^b	3.84(0.74) ^a	3.80(0.71) ^{ab}	4.80	0.01

Note: Different letter superscripts indicate the post-hoc comparison of group means (Bonferroni adjusted) is significant (at 0.05). The same letter indicates the post-hoc comparison is not significant. All comparisons are made within rows.

The columns with F(degree of freedom 1, df2) and P indicate the test results of the main effects of MANOVA.

4.2.5. Income

Significant income differences were identified in the MANOVA (Wilks' lambda: $F = 2.88, p < 0.001$; see Table 4.2.5.). Generally, the participants of the 300k-500k income group and the participants of the 500k and above income group demonstrated the highest overall purchasing frequency, especially in the frequency of purchasing organic cereals, grains, and processed foods. The participants of the 150k and below income group showed the least favourable perception of most of the attributes (such as nutritional

content, naturalness, ecological welfare, and sensory appeal), as well as the least positive attitudes towards the various benefits compared with other income groups.

Table 4.2.5.: Mean (Standard Deviation) of Organic Food Perception, Attitudes, and Behaviour by Household Income

Factors and items	<150k (383)	150-300k (624)	300-500k (381)	>500k (145)	F (3,150)	P
The category of organic foods						
Fruits and vegetables	3.61(0.88) ^b	3.79(0.80) ^a	3.92(0.80) ^a	3.93(0.74) ^a	10.62	<0.001
Meats and fish	3.18(1.03) ^b	3.30(0.98) ^{ab}	3.44(1.03) ^a	3.49(0.97) ^a	5.77	0.001
Cereal and grains	3.33(1.03) ^c	3.53(0.97) ^b	3.75(0.92) ^a	3.64(0.98) ^{ab}	12.05	<0.001
Processed foods	2.92(1.14) ^{bc}	3.04(1.05) ^b	3.27(1.00) ^a	3.26(1.17) ^{ab}	8.39	<0.001
overall	3.35(0.84) ^c	3.57(0.79) ^b	3.72(0.80) ^a	3.82(0.77) ^a	18.61	<0.001
Perception to the attributes						
Animal welfare	3.86(0.67) ^b	3.99(0.67) ^a	3.98(0.70) ^{ab}	4.07(0.67) ^a	4.79	0.003
Freshness	3.73(0.90)	3.80(0.89)	3.89(0.94)	3.90(0.86)	2.48	0.06
Nutritional content	4.06(0.68) ^b	4.21(0.65) ^a	4.21(0.62) ^a	4.26(0.60) ^a	5.65	0.001
Naturalness	3.38(0.90) ^b	3.65(0.92) ^a	3.77(0.83) ^a	3.74(0.89) ^a	13.62	<0.001
Ecological welfare	3.50(1.00) ^b	3.72(0.93) ^a	3.79(0.94) ^a	3.74(0.96) ^a	7.08	<0.001
Sensory appeal	3.64(0.90) ^b	3.79(0.85) ^a	3.78(0.86) ^a	3.86(0.78) ^a	3.68	0.01
Affordability	2.04(0.88)	2.04(0.89)	2.17(0.94)	2.08(0.89)	1.78	0.15
Utilitarian attitudes	3.49(0.79) ^b	3.74(0.73) ^a	3.86(0.74) ^a	3.85(0.77) ^a	17.89	<0.001
Hedonic attitudes	3.36(0.78) ^b	3.54(0.76) ^a	3.60(0.77) ^a	3.68(0.78) ^a	9.48	<0.001
Ethical attitudes	3.66(0.94) ^b	3.98(0.87) ^a	4.03(0.85) ^a	4.06(0.84) ^a	15.34	<0.001
General attitudes	3.82(0.67) ^b	4.01(0.61) ^a	4.08(0.61) ^a	4.07(0.52) ^a	13.11	<0.001
Purchase intention	3.58(0.80) ^b	3.84(0.74) ^a	3.95(0.67) ^a	4.00(0.64) ^a	20.21	<0.001

Note: Different letter superscripts indicate the post-hoc comparison of group means (Bonferroni adjusted)

is significant (at 0.05). The same letter indicates the post-hoc comparison is not significant. All comparisons are made within rows.

The columns with F(degree of freedom 1, df2) and P indicate the test results of the main effects of MANOVA.

4.2.6. Household Sizes

Significant household size differences were identified in the MANOVA (Wilks' lambda: $F = 2.66, p < 0.001$; see Table 4.2.6.). The results showed that the participants of households with 1-2 people had the lowest overall purchase frequency and the lowest purchasing frequency on all types of organic foods compared to the participants of other

household sizes. Overall, they held the least favourable perceptions (such as animal welfare, naturalness, sensory appeal, and affordability) toward the attributes and exhibited less positive attitudes toward the various benefits (such as utilitarian and hedonic benefits) than those of larger households.

Table 4.2.6.: Mean (Standard Deviation) of Organic Food Perception, Attitudes, and Behaviour by Household Size

Factors and items	1-2(198)	3(831)	4 and above (504)	F(2, 1507)	P
The category of organic foods					
Fruits and vegetables	3.52(0.95) ^b	3.84(0.79) ^a	3.81(0.81) ^a	12.05	<0.001
Meats and fish	3.06(1.02) ^b	3.34(0.98) ^a	3.38(1.04) ^a	7.48	0.001
Cereal and grains	3.30(1.06) ^b	3.57(0.96) ^a	3.60(0.98) ^a	7.12	0.001
Processed foods	2.88(1.07) ^b	3.10(1.05) ^a	3.14(1.12) ^a	4.21	0.02
overall	3.30(0.87) ^b	3.60(0.78) ^a	3.65(0.82) ^a	14.04	<0.001
Perception to the attributes					
Animal welfare	3.79(0.70) ^b	3.98(0.68) ^a	3.99(0.66) ^a	7.03	0.001
Freshness	3.68(0.94) ^b	3.81(0.90) ^{ab}	3.87(0.89) ^a	3.05	0.05
Nutritional content	4.09(0.69)	4.20(0.65)	4.17(0.62)	2.02	0.13
Naturalness	3.39(0.90) ^b	3.68(0.90) ^a	3.62(0.89) ^a	8.40	<0.001
Ecological welfare	3.53(1.02) ^b	3.73(0.95) ^a	3.67(0.95) ^{ab}	3.95	0.02
Sensory appeal	3.53(0.89) ^b	3.79(0.86) ^a	3.80(0.83) ^a	8.23	<0.001
Affordability	1.76(0.77) ^b	2.10(0.91) ^a	2.16(0.91) ^a	14.99	<0.001
Utilitarian attitudes	3.40(0.80) ^b	3.79(0.75) ^a	3.71(0.75) ^a	21.73	<0.001
Hedonic attitudes	3.27(0.75) ^b	3.59(0.76) ^a	3.52(0.79) ^a	13.62	<0.001
Ethical attitudes	3.75(0.95) ^b	3.99(0.87) ^a	3.87(0.90) ^{ab}	7.04	0.001
General attitudes	3.78(0.74) ^b	4.03(0.61) ^a	3.98(0.58) ^a	12.99	<0.001
Purchase intention	3.51(0.85) ^b	3.88(0.72) ^a	3.83(0.71) ^a	21.05	<0.001

Note: Different letter superscripts indicate the post-hoc comparison of group means (Bonferroni adjusted) is significant (at 0.05). The same letter indicates the post-hoc comparison is not significant. All comparisons are made within rows.

The columns with F(degree of freedom 1, df2) and P indicate the test results of the main effects of MANOVA.

4.2.7. Household Structures

One-way MANOVA test (Wilks' lambda: $F = 7.54, p < 0.001$) found significant differences between households with or without children (see Table 4.2.7.). The

participants with children reported the most favourable perceptions of organic foods and demonstrated the highest purchasing frequency. They held the most positive attitudes toward the benefits of organic foods. In contrast, the participants without children reported fewer organic food purchases and had less favourable perceptions. They reported less positive attitudes toward organic food and its benefits.

Table 4.2.7.: Mean (Standard Deviation) of Organic Food Perception, Attitudes, and Behaviour by Household Structure

Factors and items	Without children (460)	With children (1043)	F(1, 1478)	P
The category of organic foods				
Fruits and vegetables	3.66(0.90) ^b	3.85(0.78) ^a	17.38	<0.001
Meats and fish	3.17(1.05) ^b	3.39(0.99) ^a	14.86	<0.001
Cereal and grains	3.31(1.04) ^b	3.66(0.93) ^a	40.68	<0.001
Processed foods	2.94(1.10) ^b	3.15(1.06) ^a	12.26	<0.001
overall	3.36(0.85) ^b	3.67(0.78) ^a	47.00	<0.001
The locations to buy organic foods				
Supermarkets	3.58(0.92) ^b	3.77(0.83) ^a	15.85	<0.001
Organic food stores	2.79(1.13) ^b	3.25(1.09) ^a	53.32	<0.001
Health stores	2.79(1.18) ^b	3.16(1.14) ^a	32.33	<0.001
Farmers' market	3.01(1.14)	3.10(1.12)	1.72	0.19
Perception to the attributes				
Animal welfare	3.86(0.66) ^b	4.01(0.68) ^a	14.78	<0.001
Freshness	3.75(0.92)	3.84(0.90)	3.42	0.07
Nutritional content	4.07(0.70) ^b	4.23(0.62) ^a	18.79	<0.001
Naturalness	3.36(0.88) ^b	3.74(0.89) ^a	58.21	<0.001
Ecological welfare	3.52(0.94) ^b	3.77(0.95) ^a	21.92	<0.001
Sensory appeal	3.59(0.88) ^b	3.83(0.85) ^a	26.69	<0.001
Affordability	1.94(0.83) ^b	2.14(0.93) ^a	17.07	<0.001
Utilitarian attitudes	3.48(0.75) ^b	3.82(0.75) ^a	65.92	<0.001
Hedonic attitudes	3.34(0.74) ^b	3.61(0.78) ^a	37.27	<0.001
Ethical attitudes	3.75(0.93) ^b	4.00(0.86) ^a	25.20	<0.001
General attitudes	3.81(0.68) ^b	4.06(0.58) ^a	53.05	<0.001
Purchase intention	3.56(0.81) ^b	3.93(0.68) ^a	80.61	<0.001

Note: Different letter superscripts indicate the post-hoc comparison of group means (Bonferroni adjusted) is significant (at 0.05). The same letter indicates the post-hoc comparison is not significant. All comparisons are made within rows.

The columns with F(degree of freedom 1, df2) and P indicate the test results of the main effects of MANOVA.

In summary, significant demographic differences were identified. The demographic groups that frequently purchased organic food coincide with those that expressed a strong preference for it. Overall, the participants who regularly bought organic food and had the most favourable perceptions were higher-income, well-educated, aged 30 to 45, and from larger households, particularly those with children.

4.3. Predictors of Organic Food Purchase

To identify the most important demographic or psychosocial predictor of organic food purchase behaviour, this study employed neural networks to identify potential organic food consumers based on demographic and psychological characteristics. Neural networks are utilized due to their ability to model complex, non-linear relationships among variables, making them particularly suitable for capturing the complexity of consumer behaviour. This set of analyses aligns with research Objective 2 to investigate which demographic or psychological factor can most effectively predict consumers' purchase intention and purchase behaviour towards organic food. In a series of neural networks, demographic variables and psychological variables, including the perceptions of the attributes of organic foods, were used as features to predict purchase intention and purchase behaviour.

4.3.1. Demographic Variables as Predictors

In a model, demographic variables, including education, income, family structure, place of residence, age, family size, and gender, were used as features (input layer) to predict purchase intention and purchase behaviour (output layer). The rate of correctly

predicting (sensitivity) a participant has a strong purchase intention was 61.3% for the training phase and 69.5% for the testing phase. The model achieved an Area Under the Receiver Operating Characteristic Curve (AUC) of 0.657 with these demographic variables, which did not meet the acceptable standard for model performance. The sensitivity of predicting frequent purchases is 64.0% for the training phase and 61.9% for the testing phase. However, the AUC (0.632) of the model falls below the acceptable level.

The results show that education level, household income, and household structure are the three most important demographic variables in predicting purchase intention (See Figure 4.3.1.-1), with education as a feature that has the clearly largest importance of 0.53. The results of using demographic variables (input layer) to predict purchase behaviour (output layer) show that education remained the most important feature. However, its importance is reduced compared with its importance when predicting purchase intention. When predicting purchase behaviour, Income and family structure are the next most important features, while their importance increased as compared to when predicting intention (See Figure 4.3.1.-2).

4.3.2. Psychological Variables

In another model, psychological variables, including participants' perception of nutritional content, animal welfare, sensory appeal, freshness, ecological welfare, affordability, and naturalness, were used as features (input layer) to predict their purchase intention and purchase behaviour (output layer).

The rate of correctly predicting (sensitivity) that a participant has a strong purchase intention was 75.5% for the training phase and 79.2% for the testing phase. The result of

the predictive effect of psychological variables on purchase intention is considered excellent since the AUC of the model reached 0.818. The sensitivity of predicting frequent purchases is 75.7% for the training phase and 73.9% for the testing phase. The result of the predictive effect of psychological variables on purchase behaviour is considered acceptable since the AUC of the model is 0.725.

The result indicated that the perception of nutritional content, followed by animal welfare and sensory appeal were most important in predicting purchase intention (See Figure 4.3.2.-1). The results of using psychological variables (input layer) to predict purchase behaviour indicated that the perception of nutritional content, animal welfare, and sensory appeal are the three most important variables in predicting purchase behaviour (see Figure 4.3.2.-2). The importance ranking of the psychological variables in predicting intention and behaviour remains largely unchanged, except for participants' perceptions of affordability and ecological welfare. Affordability is ranked 6th in predicting intention and 4th in predicting behaviour, while ecological welfare is ranked higher in predicting intention (5th) than predicting behaviour (7th).

4.3.3. Demographic and Psychological Variables

In another model, demographic and psychological variables were used as features (input layer) to predict purchase intention and purchase behaviour (output layer). The sensitivity a participant has a stronger purchase intention was 77.6% for the training phase and 78.9% for the testing phase. The result of the predictive effect of both demographic and psychological variables on purchase intention is considered as excellent since the AUC of the model reached 0.836. The sensitivity of predicting frequent purchases was 70.9% for the training phase and 76.1% for the testing phase. The result of

the predictive effect of both demographic and psychological variables on purchase behaviour is considered acceptable since the AUC of the model is 0.772.

The results indicate that the perception of nutritional content and animal welfare and education are the three most important variables in predicting purchase intention (See Figure 4.3.3.-1). The results of using both demographic and psychological variables (input layer) to predict purchase behaviour (output layer) indicate that the perception of affordability, animal welfare, and education are the three most important variables in predicting purchase behaviour (See Figure 4.3.3.-2).

Overall, the AUCs obtained from the neural networks in this study are considered acceptable, given the small sample size. By comparing Figure 4.3.3.-1 and Figure 4.3.3.-2, it becomes evident that the variables share both similarities and differences in predicting purchase intention and purchase behaviour. Perception of animal welfare, sensory appeal, freshness, and education level are among the strongest predictors for both purchase intention and purchase behaviour. There are notable importance ranking changes in predicting intention versus predicting behaviour. While the affordability ranks 7th in predicting intention, it replaces the nutritional content as the most important variable in predicting behaviour. Another noticeable change is that while income appears to be less important in predicting intention (12th), it ranks notably higher (7th) when predicting purchase behaviour indicating it is relatively more important in predicting behaviour than predicting intention.

The neural network analyses in this study reveal that while demographic variables alone have limited predictive power for consumers' purchase intention and purchase behaviour regarding organic food (AUCs of 0.657 and 0.632), incorporating

psychological variables significantly enhances model performance, yielding excellent and acceptable AUCs of 0.818 for purchase intention and 0.725 for purchase behaviour. Combining both demographic and psychological variables further improves predictive accuracy (AUCs of 0.836 and 0.772), indicating that psychological factors, particularly perceptions of nutritional content, animal welfare, and sensory appeal, are more influential than demographic factors.

Figure 4.3.1.-1 The Importance of Independent Variables (Demographic Variables) in Predicting Purchase Intention

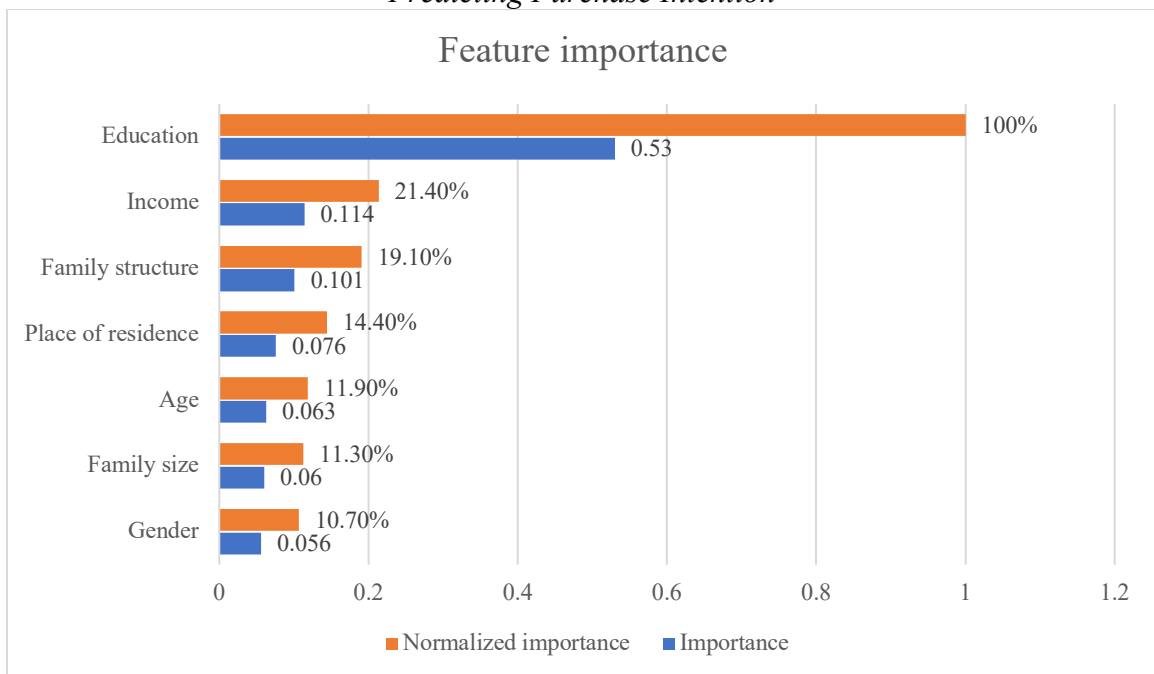


Figure 4.3.1-2: The Importance of Independent Variables (Demographic Variables) in Predicting Purchase Behaviour.

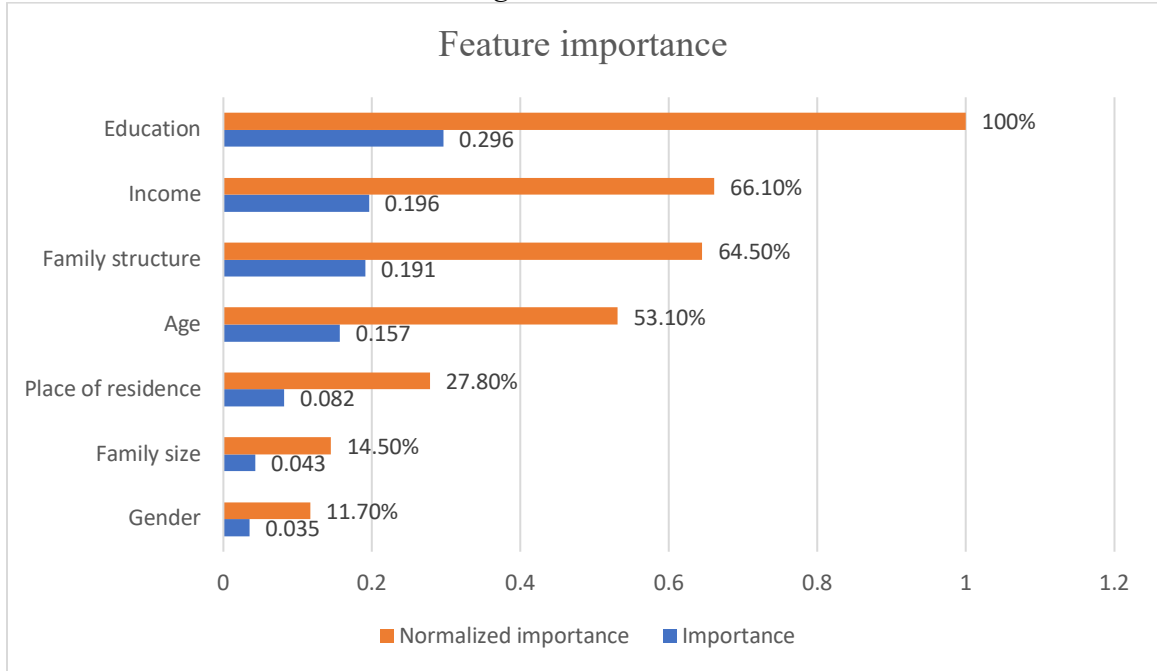


Figure 4.3.2.-1: The Importance of Independent Variables (Psychological Variables) in Predicting Purchase Intention

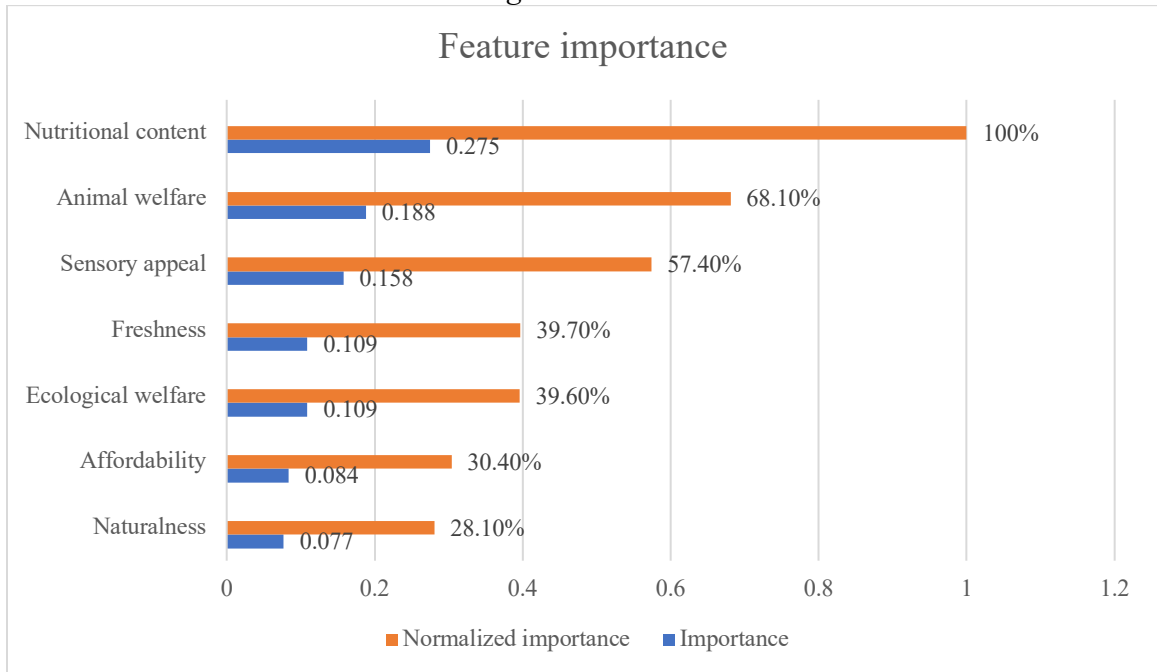


Figure 4.3.2.-2: The Importance of Independent Variables (Psychological Variables) in Predicting Purchase Behaviour

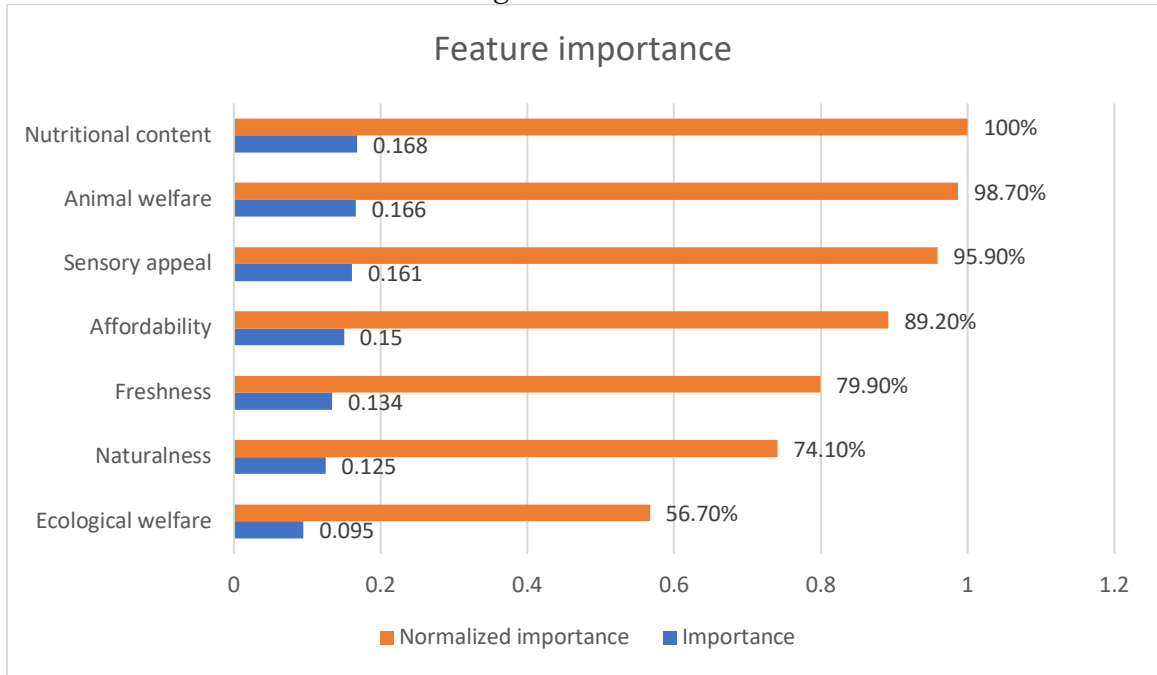


Figure 4.3.3.-1: The Importance of Independent Variables (Demographic and Psychological Factors) in Predicting Purchase Intentions.

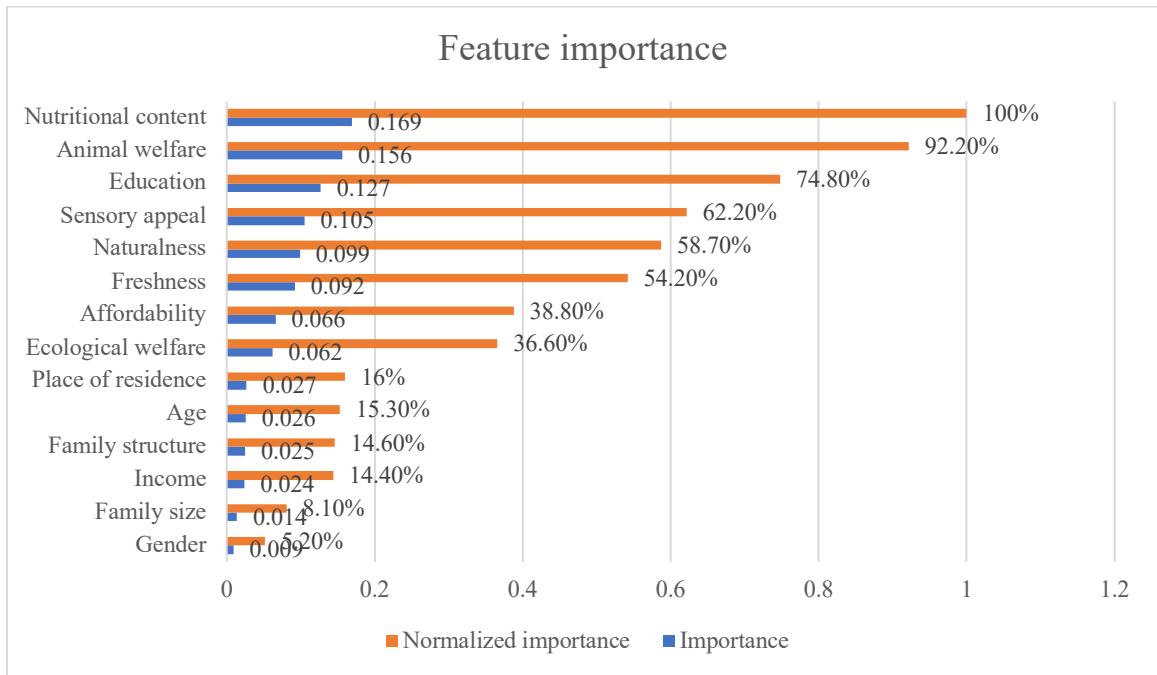
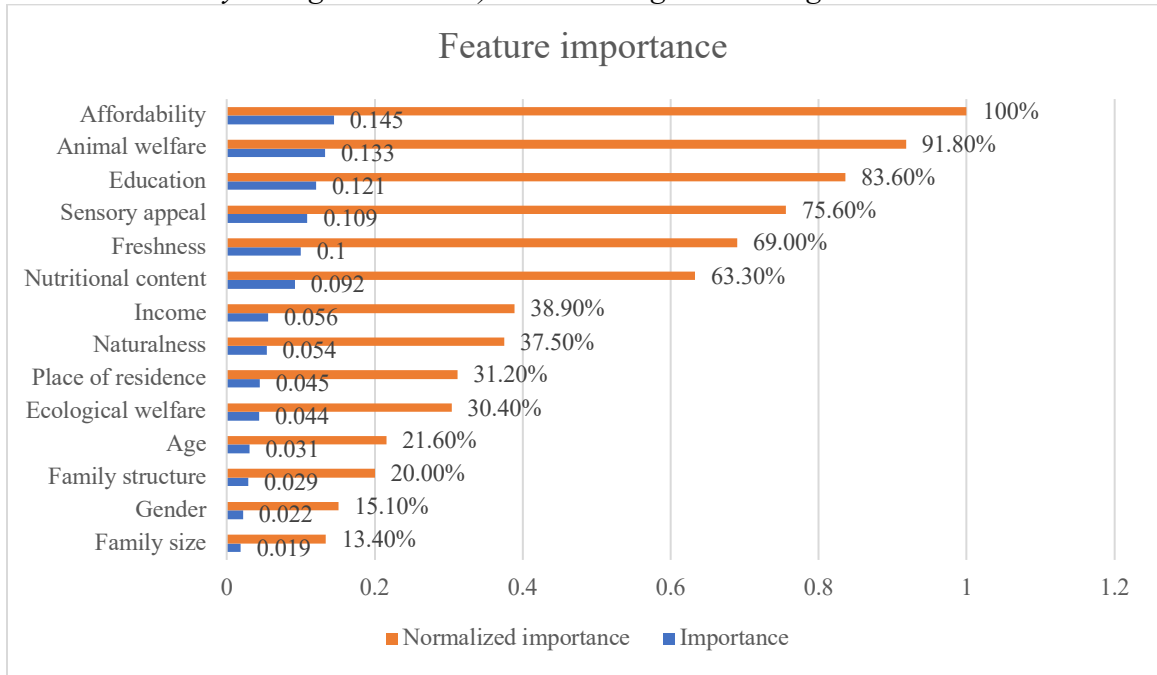


Figure 4.3.3.-2: The Importance of Independent Variables (Demographic and Psychological Factors) in Predicting Purchasing Behaviour.



4.4. Stimulus-Organism-Response

The results of linear regression analysis on the Stimulus-Organism relationship (independent variables: perception of various attributes; dependent variables: attitudes toward various benefits; see Table 4.4.) indicate that almost all participants' perceptions of organic food attributes demonstrate significant positive relationships with their attitudes toward hedonic, utilitarian, and ethical benefits. Specifically, in the regression model explaining the attitude of utilitarian benefits, all the perceptions of attributes, including nutritional content (Hypothesis H5.b is supported) and naturalness (H5.a), were significant. Judging by the size of the estimated coefficient ($b = 0.202$), it is surprising to find that the perceptions of sensory appeal were the strongest predictor of utilitarian benefits. In the model explaining attitudes toward hedonic benefits, all predictors except

for the perception of nutritional content were significant. The perception of sensory appeal was the strongest predictor (H6.b supported), and freshness (H6.a supported) also significantly influenced attitudes toward the hedonic benefits of organic foods. In the model explaining attitudes toward ethical benefits, the perception of ecological welfare was significant with the largest coefficient (H7.b supported), and animal welfare (H7.a supported) was also significantly associated with attitudes toward the ethical benefits of organic products foods.

The results of the linear regression on the Organism-Response relationship (Dependent variable: purchase intention; Independent variables: attitudes toward various benefits of organic foods) indicate that participants' attitudes toward the benefits of organic foods significantly influence their purchase intention. Specifically, the participants' attitudes toward the utilitarian (*coefficient* = 0.497, $p < 0.01$; H2.a supported) and hedonic (*coefficient* = 0.186, $p < 0.01$; H2.b supported) benefits of organic foods were significantly associated with their purchase intention and the influence of attitudes towards utilitarian benefits is greater than that of hedonic benefits. However, it is noteworthy that attitudes towards ethical benefits were not a significant predictor of purchase intention, which contradicts the hypothesis (H2.c not supported).

Table 4.4: The Estimated Coefficients of Linear Regressions Using the Perception of Organic Foods' Attributes to Predict the Attitudes to the Benefits of Organic Foods.

Dependent Variable:	Utilitarian attitude	Hedonic attitude	Ethical attitude
Predictors			
Animal welfare	0.137***	0.120***	0.092***
Freshness	0.068***	0.073***	0.004
Nutritional content	0.169***	0.046	0.122***
Naturalness	0.162***	0.161***	0.141***

Dependent Variable: Predictors	Utilitarian attitude	Hedonic attitude	Ethical attitude
Ecological welfare	0.127***	0.129***	0.147***
Sensory appeal	0.202***	0.193***	0.055**
Affordability	0.127***	0.121***	0.030

Note: ** $p < 0.05$, *** $p < 0.01$.

4.5. Theory of Planned Behaviour

The results of the linear regression on purchase intention indicate that the overall attitude towards organic foods (*coefficient* = 0.609, $p < 0.01$; H2.a, H2.b, and H2.c supported), subjective norm (*coefficient* = 0.227, $p < 0.01$; H3 supported), and perceived behavioural control (*coefficient* = 0.105, $p < 0.01$; H4 supported) each significantly influence purchase intention. It is noteworthy that overall attitudes towards organic foods are the strongest predictor of purchase intention. The results of the group of linear regressions on purchase frequencies show that purchase intention significantly impacts the overall organic foods purchasing frequency (*coefficient* = 0.632, $p < 0.01$), as well as the frequencies of purchasing organic fruits and vegetables (*coefficient* = 0.533, $p < 0.01$), organic fish and meat (*coefficient* = 0.467, $p < 0.01$), organic cereals and grains (*coefficient* = 0.466, $p < 0.01$), and organic processed foods (*coefficient* = 0.313, $p < 0.01$). Notably, the purchase intention most strongly predicts the frequency of purchasing organic vegetables and fruits.

In summary, all the hypotheses based on the Theory of Planned Behaviour are supported. The participants' overall attitudes towards organic foods, subjective norms, and perceived behavioural control significantly influence their purchase intention, and the

purchase intention significantly influences the frequency of purchasing all various types of organic foods.

By comparing the results of the linear regression models with the study's hypotheses, it is evident that all hypotheses were supported, except for the influence of attitudes towards ethical benefits on purchase intention. Additionally, some unexpected findings emerged. Beyond the anticipated factors of naturalness, nutritional content, and affordability, participants' perceptions of organic food attributes, such as animal welfare, freshness, ecological welfare, and sensory appeal, were found to significantly influence their attitudes toward the utilitarian benefits of organic foods. Moreover, perceptions of animal welfare, naturalness, ecological welfare, and affordability also significantly impacted attitudes toward the hedonic benefits of organic foods, alongside sensory appeal and freshness. Lastly, perceptions of nutritional content, naturalness, and sensory appeal significantly influenced attitudes toward the ethical benefits of organic foods, in addition to ecological and animal welfare.

4.6. Combining SOR and TPB

This study aims to test a behaviour model that integrates TPB and SOR as a comprehensive theoretical framework (see Figure 2.5.-1). This set of analyses aligns with research objective 3, which is to examine the psychological mechanisms through which the perception of attributes, attitudes, subjective norms, perceived behavioural control (including accessibility and information provision), and purchase intention influence purchase behaviour.

This analysis began with a structural equation model (SEM) that specified that all the perceptions of attributes influence all the attitudes toward benefits (hedonic,

utilitarian, and ethical). Furthermore, all benefits affect intention, and intention impacts purchase behaviour. In the initial model, the purchase intention was also explained by the subjective norm and perceived behavioural control. The model specification was subsequently revised based on the test results, eliminating the paths that were not significant. One major path found to be not significant was the relationship between the attitude toward ethical benefits and purchase intention. After removing this path, the model fit became unacceptable ($CFI < 0.90$, $RMSEA > 0.10$). As a result, the model added two paths: from ethical attitude to hedonic attitude and from ethical attitude to utilitarian benefits, which led to an increase in goodness of fit.

The model specification of the final SEM is illustrated in Figure 4.6. The overall model demonstrated acceptable fit indices across the five food categories, with CFI and RMSEA values indicating an acceptable fit: Organic fruits and vegetables ($CFI = 0.925$, $RMSEA = 0.094$), meats and fish ($CFI = 0.916$, $RMSEA = 0.100$), cereals and grains ($CFI = 0.922$, $RMSEA = 0.096$), processed foods ($CFI = 0.916$, $RMSEA = 0.097$), and overall organic food purchasing frequency ($CFI = 0.919$, $RMSEA = 0.101$). While the coefficients remained consistent across the models, the relationship between purchase intention and purchase behaviour varied slightly depending on the type of food analyzed.

Table 4.6. presents all the estimated coefficients and their p-values of the SEM predicting overall organic food purchase behaviour. The results for the Stimulus-Organism relationship revealed that different attributes of organic food significantly predicted utilitarian, hedonic, and ethical benefits. In terms of utilitarian benefits, which emphasize the practical and functional advantages of organic food, nutritional content (H5.b), naturalness (H5.a supported), and affordability (H5.c supported) were among the

significant predictors, while sensory appeal, animal welfare, ecological welfare, and freshness were also significant. For hedonic benefits, which relate to the sensory enjoyment and pleasure derived from consuming organic food, the significant predictors included sensory appeal (H6.b) and freshness (H6.a supported), along with affordability, naturalness, animal welfare, and ecological welfare. For ethical benefits, which are associated with moral and societal concerns, the strongest predictors were ecological welfare (H7.b supported). Animal welfare (H7.a) was also a significant predictor, although the size of the coefficient was smaller than other significant predictors, including naturalness, nutritional content, and sensory appeal.

The result for TPB model (also Organism-Response; attitude, subjective norm, perceived behaviour control-purchase intention-purchase behaviour) found that participants' attitudes toward the utilitarian (H2.a supported) and hedonic (H2.b supported) benefits of organic foods, as well as subjective norms (H3 supported) and perceived behavioural control (including information provision, which is indicative how much the consumers know about organic foods and accessibility (H4 supported), significantly influence their purchase intention. However, contrary to the hypotheses, participants' attitudes toward the ethical benefits of organic foods did not significantly impact their purchase intention ($p > 0.05$). Furthermore, the study revealed that attitudes toward the ethical benefits do significantly influence attitudes toward the utilitarian and hedonic benefits, thereby exerting an indirect effect on purchase intention. In other words, participants' attitudes toward the utilitarian and hedonic benefits fully mediate the relationship between their attitudes toward the ethical benefits and purchase intention.

The result also indicated that purchase intention significantly influences the frequency of purchasing all types of organic foods. Purchase intention significantly influences overall organic foods purchasing frequency (H1 supported), as well as the frequency of purchasing organic vegetables and fruits, organic meats and fish, organic grains and cereals, and organic processed foods.

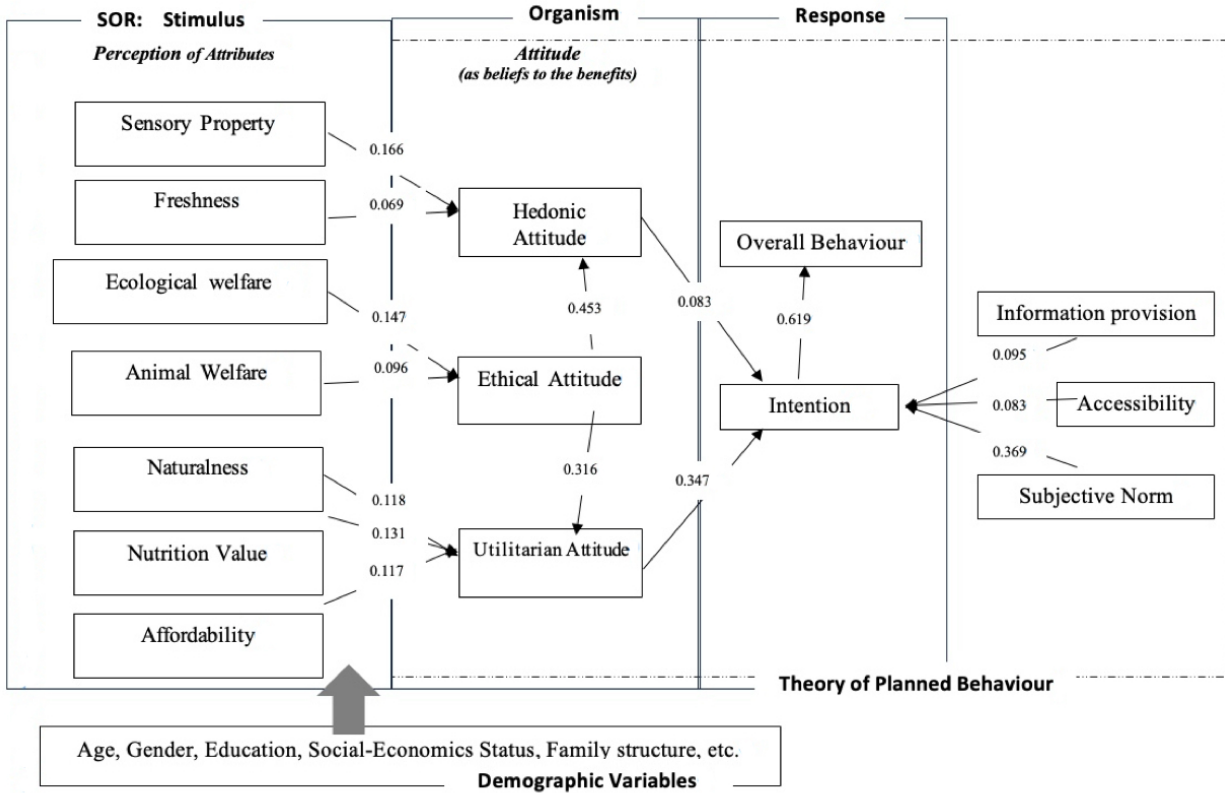
Table 4.6.: The result of the structural equation model.

Relationships	Coefficients	S.E.	P-value
Ethical attitudes<---animal welfare	0.096	0.033	P<0.001
Ethical attitudes<---sensory appeal	0.063	0.027	P=0.014
Ethical attitudes<---naturalness	0.142	0.027	P<0.001
Ethical attitudes<---nutritional content	0.122	0.037	P<0.001
Ethical attitudes<---ecological welfare	0.147	0.025	P<0.001
Utilitarian attitudes<---sensory appeal	0.185	0.019	P<0.001
Utilitarian attitudes<---freshness	0.066	0.018	P=0.002
Utilitarian attitudes<---ecological welfare	0.080	0.018	P<0.001
Utilitarian attitudes<---animal welfare	0.108	0.023	P<0.001
Utilitarian attitudes<---naturalness	0.118	0.019	P<0.001
Utilitarian attitudes<---nutritional content	0.131	0.027	P<0.001
Utilitarian attitudes<---affordability	0.117	0.017	P<0.001
Hedonic attitudes<---naturalness	0.096	0.019	P<0.001
Hedonic attitudes<---affordability	0.108	0.017	P<0.001
Hedonic attitudes<---sensory appeal	0.166	0.019	P<0.001
Hedonic attitudes<---freshness	0.069	0.018	P<0.001
Hedonic attitudes<---ecological welfare	0.062	0.018	P=0.006
Hedonic attitudes<---animal welfare	0.077	0.023	P<0.001
Utilitarian attitudes<---ethical attitudes	0.316	0.018	P<0.001
Hedonic attitudes<---ethical attitudes	0.453	0.018	P<0.001
Purchase intention<---utilitarian attitudes	0.347	0.023	P<0.001
Purchase intention<---hedonic attitudes	0.083	0.022	P<0.001
Purchase intention<---subjective norm	0.369	0.016	P<0.001
Purchase intention<---accessibility	0.083	0.019	P<0.001
Purchase intention<---information	0.095	0.018	P<0.001
provision			
Purchase behaviour (overall) <---purchase intention	0.619	0.022	P<0.001

Note: *The coefficients are standardized estimations; S.E. = Standard errors.*

This table is based on the relationship between purchase intention and overall organic foods purchasing frequency. The results of SEMs based on the relationship between purchase intention and the frequency of purchasing other types of organic foods are listed in Appendix II

Figure 4.6.: The structural equation model framework for the empirical analyses.



Note: The arrows in the figure only indicate the parts consistent with the hypotheses.

Chapter 5. Discussion

This study analyzed consumer behaviours and attitudes toward organic foods in China by employing neural network models and structural equation modelling within the frameworks of the Stimulus-Organism-Response (SOR) model and the Theory of Planned Behaviour (TPB). The key findings indicate that psychological variables, particularly perceptions of nutritional content and animal welfare, are more influential than demographic variables in predicting purchase intention. Attitudes toward utilitarian and hedonic benefits significantly impact purchase intention, while ethical attitudes influence purchase intention indirectly through these attitudes. Additionally, subjective norms and perceived behavioural control positively affect purchase intention, which in turn predicts the frequency of purchasing various types of organic foods. These results underscore the importance of psychological factors over demographic ones in shaping consumer behaviour, suggesting that marketing strategies should focus on enhancing consumers' perceptions of organic foods' attributes to promote organic food purchase.

5.1. Purchase Behaviour on Organic Foods in China

The results of this study provide significant insights into the organic food purchasing behaviours of Chinese consumers living in large cities. First, the high overall frequency of organic food purchases, with 90.4% of respondents purchasing organic foods at least "Sometimes," reflects an acceptance of organic products. Moreover, the participants were inclined toward purchasing organic fruits and vegetables at a higher frequency (93.2% of the participants "sometimes" purchased organic vegetables and

fruits or more frequently) than other categories, which aligns with previous research conducted in Canada (Zeidan & Loftsgard, 2022). This suggests that consumers may prioritize fresh produce when considering organic options, likely due to the perceived direct health benefits of consuming less processed, pesticide-free food (Rahman et al., 2021).

The findings also highlight a notable discrepancy in the frequency of purchasing organic processed foods. This could be attributed to trust issues, such as consumers' skepticism about the "organic" label on processed items or their perception that the benefits of organic certification are more relevant to fresh products like fruits and vegetables rather than processed foods (Nagy et al., 2022).

Regarding retail locations, supermarkets emerged as the most frequent source of organic food purchases, with 91% of participants buying from supermarkets at least "Sometimes.", which aligns with a previous study (Padel & Foster, 2005). This may indicate that supermarkets are perceived as more accessible or convenient than specialized stores. In contrast, health stores had the lowest purchase frequency, which may reflect the limited availability of organic products in these outlets.

The correlation analysis between the preference ratio of food categories and purchase locations revealed interesting patterns. The positive correlation between supermarket purchases and the frequency of purchasing organic fruits and vegetables indicates that supermarkets are the preferred venue for acquiring staple organic products (Hjelmar, 2011). This preference may be due to the convenience and accessibility of this retail setting. On the other hand, the negative correlation between supermarket purchases and organic meats and fish suggests that consumers may be turning to more specialized

stores, such as organic food stores or farmer's markets, for these products. This statement is supported by the positive correlation between purchasing from organic food stores and the frequency of buying organic meats and fish. One of the possible explanations is that consumers trust the specialized stores more and perceive them as offering higher-quality or more ethically sourced animal products compared to supermarkets (Hamzaoui-Essoussi & Zahaf, 2012). Another possible explanation is that the availability of organic meat and fish is limited in supermarkets in China, but of course, further investigation is needed to assess this speculation.

Finally, the negative correlation between health stores and the frequency of purchasing organic fruits and vegetables might indicate that health stores are seen more as niche providers for processed or supplement-related organic products, as reflected by the positive correlation between health stores and the frequency of purchasing organic processed foods. This could be due to the specialized product range that these stores typically offer, catering more to specific health-conscious consumers who may seek processed or ready-to-consume organic goods.

This study analyzed different demographic groups to reveal significant differences in consumer attitudes, perceptions, and purchase intentions regarding organic food. These findings offer not only new insights into consumer behaviour in the Chinese organic food market but also provide valuable guidance for policymakers and marketers.

In terms of gender differences, the study found that men displayed more positive attitudes toward organic food in terms of utility benefits, and they had higher purchase frequencies in some food categories. This contrasts with earlier studies, which generally

concluded that women are more inclined to purchase organic food (Fatha & Ayoubi, 2023).

Younger consumers (18 to 30) generally showed lower purchasing frequency and less favourable perceptions. Previous research has also found that while younger individuals tend to have strong environmental awareness, their economic constraints and sensitivity to organic food prices often hinder their purchasing behaviour (Pham et al., 2019).

The influence of education and income is also significant. The higher the level of education and income, the more likely consumers are to purchase organic food, and their attitudes, particularly regarding hedonic and ethical benefits, are more positive. This finding is consistent with previous research, which shows that well-educated and higher-income consumers are willing to pay a premium for high-quality organic products, especially when they align with utilitarian and hedonic values (Ghali-Zinoubi, 2021).

Household structure and size also play a crucial role in organic food purchasing. Larger households, especially those with children, exhibited the highest purchase frequencies and the most positive attitudes. This finding is consistent with previous research that shows parents tend to be more concerned about food safety and their children's health (Woś et al., 2022). Conversely, smaller households or those without children purchased less organic food, which may indicate that these groups place less emphasis on organic food's health and nutritional benefits.

5.2. Predictors of Purchasing

The results of this study reveal great differences between the key factors influencing purchase intention and purchase behaviour for organic food. For purchase

intention, nutritional content perception and animal welfare perception are the most important predictors, while purchase behaviour is primarily driven by affordability and animal welfare perception. This distinction can be explained by the different psychological mechanisms involved in forming intentions versus making actual purchasing decisions, and these findings provide an interesting comparison to previous research.

In consumer behaviour research, purchase intention is typically driven by attitudes and subjective perceptions of the product (Ajzen, 1991). This study supports this view, demonstrating that consumers rely heavily on perceived product attributes such as nutritional value and animal welfare when forming their intention to purchase organic food. This aligns with a previous study (Akaichi et al., 2019), which argued that perceptions of nutritional content and animal welfare are key drivers of organic food purchase intention.

However, external economic conditions often influence actual purchasing behaviour in addition to these perceptions (Patharia et al., 2022). Noticeably, income plays a more critical role in predicting purchase behaviour than purchase intention. Moreover, the study's finding shows that affordability is the most important predictor of purchase behaviour is consistent with existing literature. Numerous studies have pointed out that while consumers firmly intend to buy organic food, high prices remain a significant barrier to actual purchases (Tandon et al., 2021; Xing et al., 2022). This suggests that even when consumers hold positive attitudes toward organic food due to utilitarian or ethical considerations, high prices can deter them from translating their intentions into action.

In conclusion, purchase intention is more influenced by consumers' perceptions of organic food quality and ethical considerations, while actual purchase behaviour is affected by external economic factors such as price. This finding aligns with previous literature (Lee & Yun, 2015) while providing new insights into the transition from intention to behaviour.

5.3. A Behavioural Model of Organic Food Purchase

This study is grounded in the Stimulus-Organism-Response (SOR) model (see Figure 2.5.-1) to investigate how consumers' perceptions of organic foods' attributes (Stimulus) impact their attitudes toward the benefits of organic foods (Organism) and how these attitudes influence their purchase intention (Response). The organic food attributes examined include sensory appeal, freshness, ecological welfare, animal welfare, naturalness, nutritional content, and affordability.

According to the results of the structural equation modelling, some of the hypotheses proposed were confirmed. Specifically, the participants' perceptions of the sensory appeal and freshness of organic foods significantly influence their attitudes towards the hedonic benefits of organic foods, which is consistent with the prior studies (Anisimova, 2016; Loebnitz & Grunert, 2018; Spendrup et al., 2016; Vergura et al., 2020). The participants' perceptions of ecological welfare and animal welfare significantly affect their attitudes towards the ethical benefits of organic foods, which is consistent with the prior studies (Dias et al., 2015; Zander & Hamm, 2010). Moreover, the participants' perceptions of naturalness, nutritional content, and affordability influence their attitudes towards the utilitarian benefits of organic foods, which is consistent with the prior studies (Chang & Wildt, 1994; Fotopoulos et al., 2003; Lee &

Yun, 2015; Loebnitz & Grunert, 2018; Pérez-Villarreal et al., 2020; Rödiger & Hamm, 2015; Sadiq et al., 2021; Yan et al., 2022).

The structural model results also revealed new findings beyond the hypotheses. Specifically, the participant's perceptions of the sensory appeal and naturalness of organic foods significantly influenced their attitudes toward the ethical benefits of organic foods. Additionally, the participants' perceptions of sensory appeal, freshness, ecological welfare, and animal welfare significantly impacted their attitudes toward the utilitarian benefits of organic foods. Moreover, the participants' perceptions of ecological welfare, animal welfare, naturalness, and affordability significantly influenced their attitudes toward the hedonic benefits of organic foods. This phenomenon may be attributed to the halo effect, a cognitive bias in which a certain characteristic of an object shapes the perception of other unrelated attributes, often leading to distorted or overly generalized evaluations (Nufer, 2019). Notably, positive information is more likely to trigger halo effects than negative information (Gräf & Unkelbach, 2016). In this study, the consumers generally recognize most attributes of organic food and hold positive attitudes toward its benefits, indicating a favourable belief toward the advantages of organic food, which may lead to the unexpected relationships between "perception of attributes" and "attitudes toward the benefits."

This research was grounded in the Theory of Planned Behaviour and investigated the effects of consumers' attitudes towards the utilitarian, hedonic and ethical benefits of organic foods, subjective norms, and perceived behavioural control (incorporating information provision and accessibility) on their purchase intentions for organic food and

the influence of purchase intention on the frequency of purchasing various types of organic foods.

The results of the structural equation modelling indicate that consumers' attitudes towards the utilitarian and hedonic benefits of organic foods were found to significantly impact their purchase intentions, which supported the hypothesis and was consistent with the prior research, which indicated that purchase intention is predicted by utilitarian and hedonic attitudes (Lee & Yun, 2015). The results also revealed some deviations from the hypotheses. Specifically, consumers' attitudes towards the ethical benefits of organic foods were not found to significantly influence their purchase intentions. Furthermore, consumers' attitudes toward the ethical benefits of organic foods can significantly influence their attitudes toward the utilitarian and hedonic benefits, thereby indirectly affecting their purchase intention. In other words, consumers' attitudes toward the utilitarian and hedonic benefits of organic foods fully mediate the relationship between their attitudes toward the ethical benefits and purchase intention.

The result of SEM show that the participants' attitudes towards the ethical benefits of organic foods do not directly and significantly influence their purchase intentions, which contradicts the findings of previous studies (Szmigin & Carrigan, 2005). Some studies may offer explanations for the finding that participants' attitudes toward the ethical benefits of organic foods did not significantly influence their purchase intention in this study. According to previous research, the intention-behaviour gap, where consumers express strong environmental intentions but have a low actual purchase rate of environmentally friendly products, suggests that other factors play a more significant role in purchasing decisions, as consumers' ethical awareness is a complex psychological

process influenced by multiple factors (N. Kim & Lee, 2023). One of the explanations for the ethical attitudes that did not have a direct effect on purchase intention may be that the ethical benefits of organic food, such as ecological welfare and animal welfare, do not provide direct personal gains to consumers. In other words, consumers' ethical attitudes toward organic food are inherently more altruistic compared to their utilitarian and hedonic attitudes (Kerr et al., 2004), and, thus, are less likely to directly influence their purchase intentions.

Although attitudes towards ethical benefits did not show a direct impact on purchase intention, they are significantly associated with attitudes towards utilitarian and hedonic benefits, which in turn significantly impacted purchase intention. This indicates that attitudes towards utilitarian and hedonic benefits fully mediated the effect of ethical attitudes on purchase intention, which is consistent with a prior study, consumers' ethical values (such as universalism) can indirectly influence their ethical decision-making by affecting their utilitarian attitudes (Fok et al., 2016). This phenomenon may be explained by the halo effect (Gräf & Unkelbach, 2016; Nufer, 2019), whereby consumers' recognition of the ethical benefits of organic food positively influences their perceptions of its utilitarian and hedonic benefits. Thus, ethical attitudes indirectly affect purchase intentions by enhancing utilitarian and hedonic attitudes toward organic food.

The results show that subjective norms can significantly influence the consumers' purchase intention, which is consistent with previous studies conducted in Finland (Arvola et al., 2008; Tarkiainen & Sundqvist, 2005) and a study conducted in Vietnam (C. Nguyen et al., 2020). People are influenced by social pressure and often seek to conform to societal norms. When those around respondents believe they should buy

organic food, the respondents are likely to show a stronger intention to purchase organic products (Utami et al., 2018). Subjective norms can also significantly influence self-identity, such that when individuals perceive that those around them expect them to purchase organic products, their own intention to buy organic products is likely to be strengthened (Thorbjørnsen et al., 2007).

The results show that perceived behavioural control (incorporates information provision and accessibility) of organic food significantly influences consumers' purchase intention, which is consistent with a prior study (Hasan & Suciarto, 2020). Information provision can significantly influence consumers' purchase intention on foods (Weingarten, 2023). Furthermore, the subjective knowledge of consumers is more influential than objective knowledge on their purchase intention (Hoque & Alam, 2020). Therefore, the purchase intention of organic foods may depend more on the consumers' subjective knowledge about the organic foods than objective knowledge. Meanwhile, accessibility can significantly influence consumers' purchase intention, and organic food producers should develop their distribution channels to increase product penetration (Carvalho et al., 2016).

Additionally, purchase intention impacts the frequency of purchasing various types of organic food. To be more specific, purchase intention most strongly predicts the frequency of purchasing organic vegetables and fruits and least strongly predicts the frequency of purchasing organic processed foods.

5.4. Implications

5.4.1. Theoretical Implication

The findings of this study provide valuable theoretical insights by extending the application of the Stimulus-Organism-Response (SOR) model and the Theory of Planned Behaviour (TPB) in the context of organic food purchase. In examining the psychological mechanisms that influence consumers' decisions to purchase organic food, this study incorporates not only the Theory of Planned Behaviour (TPB), a widely used framework for studying consumer purchasing behaviour (Ahmed et al., 2021; Jiang & Wu, 2022), which assumes the consumers are rational (Ajzen, 1991), but also the Stimulus–Organism–Response (SOR) model. The SOR model provides insight into how external factors, namely the attributes of organic food, shape consumers' attitudes toward organic products (perception of the attributes-attitudes). By accounting for both cognitive and affective assessments, the SOR model helps address the TPB's inherent assumption that consumers make rational decisions. The SOR model offers a framework that views the overall attitude toward organic food as cognitive and affective responses to the attributes of organic food (stimuli) and further breaks down the overall attitude into utilitarian, hedonic, and ethical aspects.

This research integrates ethical benefits into the theoretical discussion, while previous studies on organic food have predominantly emphasized consumer attitudes toward utilitarian and hedonic benefits (Lee & Yun, 2015). The study demonstrates that Chinese consumers' perceptions of organic food attributes significantly influence their attitudes not only toward utilitarian and hedonic benefits but also toward ethical benefits, such as animal welfare and ecological welfare. This deepens the understanding of how

different benefit perceptions contribute to shaping purchase intentions, offering a more comprehensive theoretical model for analyzing organic food purchase behaviour.

In particular, the structural equation model reveals that while attitudes toward ethical benefits do not directly affect purchase intention, they exert an indirect influence by enhancing attitudes toward utilitarian and hedonic benefits. This mediation effect adds a layer of complexity to existing theories, suggesting that ethical perceptions play a subtler role in influencing consumer behaviour than previously thought. This theoretical contribution is critical for expanding the scope of the SOR and TPB models beyond traditional Western contexts to rapidly developing markets like China.

5.4.2. Methodological Implication

From a methodological standpoint, this study demonstrates the value of integrating advanced neural network models alongside more traditional methods, such as structural equation modelling (SEM). The neural networks enabled the identification of complex, non-linear relationships between demographic and psychological factors, providing a more nuanced understanding of which variables most significantly predict purchase intentions and behaviours. In contrast, SEM offered a clear and structured means to test predefined hypotheses and understand mediating relationships between constructs.

A comparative analysis of the two approaches reveals their complementary strengths. While SEM excels in testing specific theoretical models and understanding the direct and indirect pathways through which attitudes and perceptions shape behaviour, neural networks excel in predictive accuracy and the ability to uncover hidden patterns in large datasets. The combination of these methods allowed for both hypothesis-driven analysis and data-driven insights, offering a more robust exploration of the factors

influencing organic food purchase. This methodological diversity is a key contribution to consumer behaviour research, suggesting that future studies should consider leveraging both machine learning techniques and traditional statistical models to gain a more holistic understanding of consumer decisions.

5.4.3. Practical Implication

Practically, the results on the consumers' favourable organic food type and location to purchase organic foods offer several actionable insights for the organic food industry in China. Firstly, the high frequency of purchases of organic fruits and vegetables highlights the importance of continuing to emphasize the freshness and health benefits of these products (Rahman et al., 2021). Marketing strategies should focus on these attributes to maintain and potentially increase consumer interest. Secondly, the lower purchase frequency of organic processed foods reflects consumer trust issues regarding organic certification (Nagy et al., 2022). This suggests that the industry needs to enhance transparency in labelling and standards to build consumer confidence. Moreover, supermarkets, as the primary channels for organic food purchases, should focus on improving the accessibility and availability of organic products to meet consumer demand (Hjelmar, 2011). Specialized stores can attract niche consumers by offering higher-quality and ethically sourced animal products, appealing to those who prioritize ethical considerations (Hamzaoui-Essoussi & Zahaf, 2012). Finally, health stores could specialize in organic processed foods or supplements, catering to health-conscious consumers seeking these specific products. Overall, these implications suggest that different sectors within the organic food industry should adjust their strategies to better align with consumer needs and preferences.

The findings also highlight the importance of targeting various demographic characters with tailored marketing strategies. Firstly, organic food brands should implement region-specific approaches, emphasizing price advantages in markets like Shanghai and focusing on health and environmental benefits in other cities. Secondly, there's an opportunity to attract male consumers by highlighting qualities like freshness, nutrition, naturalness, ecological welfare, sensory appeal, and affordability. Thirdly, to engage younger consumers, brands should be price-flexible and utilize digital channels to promote organic food as trendy and health-conscious. Additionally, offering premium products that emphasize nutritional value and sensory appeal can cater to higher-income, better-educated consumers. Finally, by highlighting the health, safety, and nutritional benefits of organic products, brands can appeal to larger families with children.

Moreover, the neural network analysis revealed the perceptions of nutritional content is the most influential factors driving purchase intention, and affordability is the most influential factor driving purchase behaviour. These findings suggest that marketing strategies should focus on these attributes, particularly in cities like Beijing, Chongqing, and Shanghai, where consumer awareness of organic food may vary significantly across urban and suburban populations. Organic food brands should also be mindful of the different attributes that influence purchase intention and purchase behaviour. To enhance consumers' purchase intentions, they should highlight the nutritional content of organic foods. Simultaneously, by addressing pricing issues associated with organic foods, they can increase consumers' purchase frequency.

The framework of this study combined TPB and SOR models, which go beyond the popular analyses solely based on TPB. The refined model offers insights into the

organic food industry in that it reveals the contribution of specific attributes and benefits to consumers' purchase intention. According to the structural equation model results, consumers' perceptions of organic food attributes, such as sensory appeal, nutritional value, and ecological welfare, significantly influence their attitudes toward the benefits of organic food, which in turn affect their purchase intentions. Consequently, organic food producers could boost consumers' positive attitudes, and thus increase purchase intentions by emphasizing these attributes. Moreover, the findings indicate that attitudes toward utilitarian benefits exert the most substantial influence on purchase intentions. Producers may, therefore, prioritize promoting attributes that enhance consumers' utilitarian attitudes, such as perceptions of naturalness and nutritional content.

China's rapid economic development and increasing consumer spending present substantial growth opportunities for the organic food market. The development of organic agriculture not only aligns with the modernization of Chinese agriculture but also addresses food safety concerns and promotes healthier food choices for consumers. Policymakers can use these insights to set organic certification standards that reflect consumer concerns, while producers can fine-tune their offerings to better meet the needs of different demographic groups. By doing so, the organic food industry in China can improve market penetration and foster greater consumer acceptance.

5.5. Limitations and future research

This study has certain limitations. First, the sample is limited to urban and suburban residents in Beijing, Shanghai, and Chongqing, which may only partially represent the broader population of China. These three cities are major metropolitan areas with unique economic, cultural, and social characteristics, so consumer behaviours

observed here might differ from those in other regions of the country. Second, the data were primarily collected through online surveys, which could introduce a bias toward highly educated individuals with easy access to the Internet. This method may exclude individuals from rural areas or those with limited internet access, potentially skewing the results toward a more technologically connected demographic. Moreover, the frequency of purchasing various organic foods was measured through self-reported data. Future research should consider adopting more objective measurement methods, such as direct observation or purchase tracking, to improve data accuracy. Self-reported data often suffer from social desirability and recall biases, leading respondents to provide answers that are more socially acceptable or positive (Tempelaar et al., 2020). In this study, respondents may have been influenced by social desirability, resulting in a high level of acknowledgement of the benefits of organic food and a significant influence of subjective norms on their purchase intentions. As a result, consumers might overestimate the frequency of their organic food purchases. For instance, participants might claim they purchase organic products more frequently to align with perceived social expectations or norms. Additionally, recall bias may have affected respondents' ability to recall their organic food purchase frequency (Khare & Vedel, 2019). This can lead to inaccuracies if participants forget past purchases or misremember the frequency of their buying behaviour. In contrast, objective behavioural data can provide more reliable and accurate insights. Methods like tracking actual sales data or observing shopping habits can offer a more precise understanding of consumer behaviour. Compared to studies based on self-reported data, longitudinal studies can observe changes in consumer behaviour over time

and assess the long-term impacts of policies and market interventions (Polman & Maglio, 2023).

Different cultural, economic, and social backgrounds across various regions can significantly influence consumer purchasing behaviour (Pratesi et al., 2021; Šostar & Ristanović, 2023). Expanding the study's scope will better capture consumers' attitudes and behavioural differences nationwide. Therefore, future research should consider broadening the sample to include more diverse geographic regions and city sizes, including small cities and rural areas, to gain a more comprehensive understanding of organic food purchase in China. This broader approach can help identify regional variations and unique factors that influence purchasing decisions in different communities.

There is a certain discrepancy between the demographic characteristics of the study's respondents and those found in the general population, as most participants in this study have higher levels of education and income. This discrepancy may be attributed to the fact that completing online surveys is more prevalent among those with higher educational levels, who are generally more receptive to new technologies (Gatzka & Hell, 2018). Additionally, nearly half of the households in Beijing, Shanghai, and Chongqing consist of 1-2 people, and 17.7% of families have a child(ren) (National Bureau of Statistics of China, 2023), whereas in this study, around 87% of the respondents' households consist of three or more people with nearly 70% of the families have at least one child. This discrepancy may be due to the study calling upon the primary grocery shopper for their family to participate. The rapid development of the internet-based food delivery industry has significantly changed food purchase habits

(Choudhury, 2022). Young people living alone in big cities or young couples without children, often facing heavy work pressures and fast-paced lifestyles, are more likely to opt for takeout or restaurant dining than spend significant time on food preparation and cooking (Magner, 2019). As home cooking allows for the selection of ingredients and control over the quality of raw materials, it is appealing to older generations or families with children (Veveva, 2024). The recruitment in this study invited participants who were “primarily responsible for preparing food for their families,” therefore people coming from households with children or more family members might be more likely to answer the call.

In this research, when measuring respondents’ attitudes toward the hedonic benefits of organic food, this study adopted questions previously used in a published study in the field of consumer behaviour regarding organic food (Lee & Yun, 2015). These questions included “Not fun-fun,” “Dull-exciting,” and “Not thrilling-thrilling,” which may not be perceived as applicable to the food purchase experience. Although the Chinese translation of these items tried to adapt to food purchase without distorting the original meaning of the literature, they may still be improved for food-related research contexts. One direction for future studies may be developing a hedonic attitude scale specifically for food purchases.

The CFA on the measurements indicated that some factor loadings and Cronbach’s alpha values fell below the cutoff thresholds. Several factors may have contributed to the relatively low validity and reliability. First, as argued above, the items regarding hedonic attitudes were not adequately applicable to the food consumption experience. Second, some items were reverse-worded. For instant, one question asked whether organic food

was perceived as expensive, while another asked whether it was perceived as cheap, potentially misleading respondents. Finally, although the survey was carefully translated from English into Chinese, cultural differences between English-speaking and Chinese contexts may have led to varying interpretations. Future research can improve factor loadings and Cronbach's alpha by refining questionnaire items and developing measurements that are more suitable for Chinese consumers.

For the SEM, the model goodness-of-fit indices range from good to marginally acceptable. For all the SEM models, the CFI values exceed the benchmark value of 0.90 (Lai & Green, 2016), while the RMSEA values (0.09 to 0.10) are slightly larger than the commonly acceptable cutoff point of 0.08. Prior studies have suggested that the omission of key variables may be a cause of high RMSEA value (MacCallum et al., 1996). The SEM used in this study assumed that specific attribute perceptions (animal welfare, ecological welfare, sensory appeal, freshness, nutritional content, naturalness, and affordability) influence attitudes toward the benefits of organic food. However, the attributes considered are not exhaustive. For instance, safety, product quality, and trust may also play important roles (Pedersen et al., 2023; Wee et al., 2014). Future research could include a broader range of organic food attributes to potentially achieve a lower RMSEA. Despite the low RMSEA value, good CFI values in the context of this study suggest a reasonable level of confidence in the model's overall fit. According to a study testing the importance of the goodness-of-fit index in various contexts (Rigdon, 1996), CFI appears more suitable for exploratory contexts, while RMSEA is better suited for confirmatory contexts. The SEM in this study adopted an exploratory approach by integrating the TPB and SOR models to explore the potential psychological variables and

psychological mechanisms underlying consumers' purchases of organic food. Therefore, in assessing the model fit, this study relies more on the CFI value.

In this research, when using a neural network to explore the variables that most influence purchase intention and purchase behaviour, the model fits are merely acceptable. Future research could aim to achieve better-fit results by increasing the sample size.

With the rapid development of live-streaming commerce, social media, and online food delivery platforms, future studies should also investigate the impact of these new business operations on consumer behaviour and organic food purchasing patterns. Understanding the role of emerging trends in consumer decision-making will be crucial for developing more targeted marketing and promotion strategies (Pousttchi & Dehnert, 2018). For instance, word-of-mouth on social media and online reviews can significantly influence consumer purchasing decisions. In contrast, the convenience of innovative technology and online platforms can increase the accessibility and purchase frequency of organic food. These technologies can make it easier for consumers to access organic products, potentially leading to increased sales and market growth.

Additionally, a brand's intangible and emotional qualities can enhance consumer loyalty, and marketing strategies such as labelling and packaging significantly impact consumer purchasing decisions (Keller, 2020; Miquel Vidal & Castellano-Tejedor, 2022). Effective branding can create emotional connections with consumers, making them more likely to choose a particular brand over competitors (Loureiro et al., 2012). Future research could explore how brand perception and marketing strategies influence consumer purchase decisions regarding organic products. Different brands and marketing

approaches may have varying effects on organic food purchases, and optimization suggestions could be derived from such studies. By understanding which strategies are most effective, companies can tailor their marketing efforts to better meet consumer needs and preferences, potentially increasing market share.

Although the Theory of Planned Behaviour (TPB) is a long-established model, it continues to be extensively applied in contemporary psychological and behavioural research. Recent studies have employed TPB to investigate a variety of consumer behaviours: one study in India explored consumers' e-waste disposal intentions (Lidwin et al., 2024); another study conducted in Europe examined purchasing intentions toward organic vegetables (Loera et al., 2022); and a study in Jordan utilized the TPB framework to understand consumer purchase intentions regarding renewable energy (Almrafee & Akaileh, 2023). This study attempted to address the limitations of TPB by integrating the SOR model into the analytical framework. Future research should explore current advances in consumer behaviour research and apply more advanced models to organic food purchasing decisions. For example, a relatively new theory argues that attitudes and behaviours may share a reciprocal relationship, meaning that while attitudes shape behaviours, behaviours can also influence attitudes (Zanna & Rempel, 2008). While TPB emphasizes the impact of attitude on behaviour, in organic food consumption, the purchase behaviour and consumption experience of particular organic food can also contribute to the attitude, beliefs, and perception of organic products. Future research could explore how consumers' organic food purchasing behaviours, including the types of organic food purchased and the retail locations frequently visited, which in turn affect their attitudes toward organic products. Such research could further enhance theoretical

understanding of the dynamic interplay between consumer attitudes and behaviours in the organic food market.

5.6. Conclusions

By surveying over 1,500 consumers in Beijing, Shanghai, and Chongqing, this study reveals that consumers mostly prefer to purchase organic food from supermarkets, with organic fruits and vegetables identified as the most frequently purchased categories. Moreover, there were notable associations between the types of organic products purchased and the retail locations selected by consumers. Demographic variables were also found to significantly influence perceptions, attitudes, purchase intentions, and purchase behaviours toward organic food. Specifically, individuals who regularly purchased organic products and demonstrated the most favourable perceptions generally had higher incomes and higher educational levels, were aged between 30 and 45 and came from larger household sizes, particularly those with children. This research also demonstrates that perceptions of organic food attributes play a pivotal role in shaping purchase intentions and behaviours. Specifically, perceived nutritional content emerged as the most influential predictor of purchase intentions, while perceptions of affordability most strongly predicted actual purchase behaviour. Furthermore, structural equation modelling revealed that hedonic and utilitarian attitudes were directly associated with increased purchase intention, whereas ethical attitudes demonstrated an indirect effect on purchase intention through its positive effect on hedonic and utilitarian attitudes.

These findings contribute to theory, methodology, and practice. Theoretically, by incorporating ethical benefits into the integrated SOR–TPB framework, the study shows that Chinese consumers' perceptions of organic food attributes shape utilitarian, hedonic,

and ethical attitudes, with ethical attitudes indirectly boosting purchase intentions through their positive effect on utilitarian and hedonic attitudes. Methodologically, using neural networks alongside structural equation modelling uncovers both complex, non-linear relationships and clear mediating pathways, offering a holistic view of the consumer decision-making process. Practically, highlighting nutritional and cost-related advantages can enhance adoption, while ethical considerations can reinforce broader attitudes that indirectly promote purchase intentions.

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Appendix I: Questionnaire

Hello, this is a questionnaire about your household's food purchase and purchasing Behaviour. We would like to invite the **primary grocery shopper** of the household to fill out the questionnaire. You can choose not to answer any questions that you prefer not to answer.

1. Are you the primary grocery shopper of your household? Y/N/ Prefer not to say
2. Where are you currently living?

a) Beijing; b) Shanghai; c) Chongqing; d) Other e) Prefer not to say

note: *If the answer is Other, the system will jump to the end of the survey and acknowledgment.*

3. What is your gender?

a) Man; b) Woman; c) Prefer to self-describe; d) Prefer not to say.

4. Please indicate the year you were born: _____

- a) After 1994 b) From 1980 to 1994 c) From 1965 to 1979 d) From 1946 to 1964
e) Before 1946 f) Prefer not to say

5. Which of the following best describes the area you live in? a) Urban b) Suburban
c) Rural d) Prefer not to say

6. Housing: which of the following best describes where you currently live?

- a) Detached/semi-detached House or Townhouse
b) Small Apartment/Condo with 10 or less than 10 units
c) Large Apartment/Condo with more than 10 units
d) Mini home or mobile home
e) Other: please indicate _____
f) Prefer not to say

7. What is the highest level of education you have completed?

- a) No certificate, diploma or degree
b) High school diploma or equivalent
c) Trade certificate or diploma (apprenticeship)
d) College, CEGEP or other non-university certificate or diploma
e) University certificate or diploma below bachelor's level
f) Bachelor's degree
g) University certificate, diploma or degree above bachelor's level
h) Prefer not to say

8. What is your occupation?

- a) Private business employee
b) Government employee (public servant)
c) State-owned business employee
d) business owner
e) Retired

- f) Unemployed
 - g) Prefer not to say
9. What category does your total yearly household income fall into?
- a) Less than CNY 80,000
 - b) Between CNY 80,000 and 150,000
 - c) Between CNY 150,000 and 300,000
 - d) Between CNY 300,000 and 500,000
 - e) Between CNY 500,000 and 1000,000
 - f) Above CNY 1000,000
 - g) Prefer not to say
10. How many individuals live in your household (including all children and adults)?
- a) 1-2 b)3 c)4 d)5 e)6 or above f) Prefer not to say
11. Which of the following best describes your family structure?
- a) I Live alone
 - b) I live with a spouse/partner but not child(ren)
 - c) I live with a spouse/partner and child(ren)
 - d) I live with my child(ren) as a single parent.
 - e) I live with my parent(s) or grandparent(s)
 - f) None of the above: please describe _____
 - g) Prefer not to say

Please indicate your level of agreement or disagreement with the following statements:

1: Strongly disagree, 2: Disagree, 3: Neither agree nor disagree, 4: Agree, 5: Strongly agree 6: Prefer not to say

Perception to the attributes

Animal welfare (Wee et al., 2014)

- 12. Organic farming treats animals humanely.
- 13. Organic farming always considers the animal well-being.

Freshness (Roitner-Schobesberger et al., 2008)

- 14. Organic food is fresher than the other products.

Nutritional content.

- 15. Organic food contains a lot of vitamins and minerals.*
- 16. Organic food keeps me healthy.
- 17. Organic food is nutritious.
- 18. Organic food is high in protein.*

Naturalness.

- 19. Organic food contains no additives.
- 20. Organic food contains natural ingredients.
- 21. Organic food contains no artificial ingredients.

Ecological welfare.

- 22. Organic food has been produced in a way which has not shaken the balance of nature.
- 23. Organic food is packaged in an environmentally friendly way.

Sensory appeal.

- 24. Organic food looks nice.
- 25. Organic food has a pleasant texture.
- 26. Organic food tastes good.

Price.

- 27. Organic food is expensive.
- 28. The price of organic food is high.

Perceived Benefits

In considering your experience with Organic Food Products, please provide your feedback by indicating your perceptions along the following scales (1-5 & Prefer not to say).

Utilitarian attitudes.

- 29. Ineffective–effective.
- 30. Not helpful–helpful. *
- 31. Not functional–functional.
- 32. Unnecessary–necessary.

Hedonic attitudes.

- 33. Not fun–fun.
- 34. Dull–exciting.
- 35. Not delightful–delightful.*
- 36. Not thrilling–thrilling.

Ethical attitudes (McEachern & McClean, 2002)

- 37. Unethical – Ethical.
- 38. Irresponsible - Responsible
- 39. Immoral -- Moral.
- 40. Unrighteous – Righteous*

Please indicate your level of agreement or disagreement with the following statements:

1: Strongly disagree, 2: Disagree, 3: Neither agree nor disagree, 4: Agree, 5: Strongly agree 6: Prefer not to say

Attitudes (Yadav & Pathak, 2016)

- 41. Buying organic food is a good idea.
- 42. Buying organic food is a wise choice.
- 43. I like the idea of buying organic food.
- 44. Buying organic food would be pleasant.

Subjective norm (Yadav & Pathak, 2016)

- 45. Most people important to me, think that I should buy organic food.
- 46. Most people, important to me, would want me to purchase organic food.
- 47. People whose opinion I value would prefer that I shouldn't buy organic food.

Perceived behavioural control (Yadav & Pathak, 2016)

- 48. To buy or not to buy organic food is entirely up to me. *
- 49. I am confident that if I want, I can buy organic food.
- 50. I didn't have the resources and time to buy organic food.

Accessibility:

51. Organic food is always sufficiently available (Tarkiainen & Sundqvist, 2005).
52. Organic vegetables are available in the market (Vijayan, 2015).

Information provision: (Vijayan, 2015)

53. Organic foods are labeled with accurate information or the organic status of products;
54. There is a lack of information to indicate the source of organic production

Purchase intention

55. I intend to buy organic bread in the near future (Tarkiainen & Sundqvist, 2005).

56. If I had to do it again, I would buy organic food.
57. I try to buy organic food because it is the best choice for me.
58. I consider myself to be a loyal patron of organic food.

Self-reported behaviour (Tarkiainen & Sundqvist, 2005)

Please indicate your frequency of purchase of organic foods with the following statements:

- a) Never, b) Rarely, c) Sometimes, d) Often, e) very often f) Prefer not to say
59. Please indicate how often you purchase Fresh organic Vegetables and Fruits
60. Please indicate how often you purchase organic Meat and Fish
61. Please indicate how often you purchase organic Grain and Cereal
62. Please indicate how often you purchase pre-packaged (processed) organic food
63. Please indicate how often you purchase organic food in general

Where to buy organic food: (Hamzaoui Essoussi & Zahaf, 2009)

Please indicate your frequency of purchase of organic foods with the following statements:

- a) Never, b) Rarely, c) Sometimes, d) Often, e) very often f) Prefer not to say
64. Please indicate how often you purchase organic food from Supermarkets.
65. Please indicate how often you purchase organic food from Organic Food stores
66. Please indicate how often you purchase organic food from health stores
67. Please indicate how often you purchase organic food from farmers market

Note: most of the questions (except those with in-text citations) about organic food are adapted from (Lee & Yun, 2015).

The questions marked with an asterisk (*) in the questionnaire were removed before its distribution.

The questions regarding respondents' occupations were not used in the data analysis.

Chinese version:

我们恳请最经常为其家庭购买食品的城镇居民填写此问卷，在填写问卷的过程中您可以跳过任何问题。

1. 您是您的主要购物者吗？ 是/否
2. 您目前居住在哪里？ a) 北京； b) 上海； c) 重庆； d) 其他
3. 下列哪个最能描述您居住的区域？ a) 城市 b) 郊区 c) 农村

注：如果不是经常为家庭购物，不是居住在北京、上海、重庆，不是居住在城市或郊区的，则系统会跳转到调查结束环节

4. 您的性别是？ a) 男性； b) 女性
5. 请注明您的年龄： a) 18-30 岁 b) 30-45 岁 c) 45-60 岁 d) 60 岁以上
6. 您完成的最高教育水平是什么？ a) 小学及以下 b) 初中 c) 高中/职高/技校大专（或同等学历） d) 本科（或同等学历） e) 硕士研究生 f) 博士研究生 g) 其他（请具体说明）
7. 您的职业是？ a) 学生教师/学术工作者 b) 医疗相关职业 c) 技术人员 d) 政府工作者 e) 企业员工/管理人员 f) 自由职业者 g) 企业主/老板 h) 农民 i) 退休 j) 无业/待业 k) 其他（请具体说明）
9. 您家庭的年收入属于哪个范围？ a) 八万元以下 b) 八万至十五万元 c) 十五万至三十万元 d) 三十万至五十万元 e) 五十万至一百万元 f) 一百万元以上
10. 您家庭有多少人居住（包括所有儿童和成人）？ a) 1-2 b) 3 c) 4 d) 5 e) 6 或以上
11. 下面哪个最能描述您的家庭结构？【请勾选所有符合的项目】 a) 我独自生活 b) 我和配偶/伴侣生活，但没有孩子 c) 我和配偶/伴侣及孩子一起生活 d) 我作为单亲父母与孩子一起生活。 e) 我与父母或祖父母一起生活 f) 以上都不是：请描述_____

请表明您对以下陈述的赞同或不赞同程度：

1: 非常不同意, 2: 不同意, 3: 既不同意也不反对, 4: 同意, 5: 非常同意

12. 有机农业以人道的方式对待动物。
13. 有机农业保护动物权益。
14. 有机食品比传统方式生产的食品新鲜。
15. 有机食品有益健康。
16. 有机食品营养丰富。
17. 有机食品不含添加剂。
18. 有机食品含有天然成分。
19. 有机食品不含人造成分。
20. 有机食品的生产方式不会打破自然平衡。
21. 有机食品采取的包装方式有益于环保。
22. 有机食品品相好。
23. 有机食品口感好。
24. 有机食品味道好。
27. 有机食品很贵。
28. 有机食品的价格便宜。

请在如下 1-5 的尺度中勾选最合适的选项来描述您对有机食品的消费体验 (1-5)。

-有机食品是：

- 29. 无效果的 1-2-3-4-5 有效果的 (1-2-3-4-5 代表无效果的-有效果的的程度)
- 30. 不实用的 1-2-3-4-5 非常实用 (1-2-3-4-5 代表不实用的-非常实用的的程度)
- 31. 不必要的 1-2-3-4-5 非常必要的 (1-2-3-4-5 代表不必要的-非常必要的的程度)
- 32. 不好玩的 1-2-3-4-5 好玩的 (1-2-3-4-5 代表不好玩的-好玩的的程度)
- 33. 无聊的 1-2-3-4-5 令人兴奋的 (1-2-3-4-5 代表不无聊的-令人兴奋的的程度)
- 34. 不愉快的 1-2-3-4-5 令人愉快的 (1-2-3-4-5 代表不愉快的-令人愉快的的程度)
- 35. 不符合伦理的 1-2-3-4-5 符合伦理的 (1-2-3-4-5 代表不符合伦理的-符合伦理的的程度)
- 36. 不负责任的 1-2-3-4-5 负责的 (1-2-3-4-5 代表 不负责任的-负责的的程度)
- 37. 不道德的 1-2-3-4-5 道德的 (1-2-3-4-5 代表不道德的-道德的的程度)

请表明您对以下陈述的赞同或不赞同程度：

1: 非常不同意, 2: 不同意, 3: 既不同意也不反对, 4: 同意, 5: 非常同意

- 38. 购买有机食品是个好主意。
- 39. 购买有机食品是明智的选择。
- 40. 我喜欢购买有机食品的想法。
- 41. 购买有机食品是愉快的体验。
- 42. 我的亲朋好友大多认为我应该买有机食品。
- 43. 对我很重要的人中的大多数人会希望我购买有机食品。
- 44. 我愿意听取意见的人认为我不应该买有机食品。
- 45. 我能随时买到有机食品。
- 46. 我没有资源和时间购买有机食品。
- 47. 有机食品供应量充足。
- 48. 市场上总能买到有机蔬菜。
- 49. 有机食品的包装上标有准确的产品信息;
- 50. 有机产品缺乏准确的产地信息
- 51. 我打算在不久后购买有机产品。
- 52. 如果我再次选择, 我会购买有机食品。
- 53. 有机食品是最佳的购买选择。
- 54. 我是有机食品的忠实顾客。

请使用以下选项描述您消费有机食品的频率：

1) 从不, 2) 很少, 3) 有时, 4) 经常, 5) 非常频繁

- 55. 购买新鲜有机蔬菜和水果的频率
- 56. 购买有机肉类和鱼类的频率
- 57. 购买有机谷物和谷类的频率

- 58. 购买预包装（加工）有机食品的频率
- 59. 总体而言，购买有机食品的频率

请描述您从如下场所购买有机食品的频率：

- 1) 从不, 2) 很少, 3) 有时, 4) 经常, 5) 非常频繁
- 60. 从超市购买有机食品的频率。
 - 61. 从有机食品店购买有机食品的频率。
 - 62. 从健康商店购买有机食品的频率。
 - 63. 从农贸市场购买有机食品的频率。

Appendix II: The results of the structural equation models

The structural equation model analysis of the Stimulus-Organism relationship demonstrated that various attributes of organic food predicted specific benefits, including utilitarian, hedonic, and ethical ones. For utilitarian benefits, which highlight the practical and functional advantages of organic food, key predictors included sensory appeal ($b=0.185$, $P<0.001$), nutritional content ($b=0.131$, $P<0.001$), naturalness ($b=0.118$, $P<0.001$), affordability ($b=0.117$, $P<0.001$), animal welfare ($b=0.108$, $P<0.001$), ecological welfare ($b=0.080$, $P<0.001$), and freshness ($b=0.066$, $P=0.002$). Similarly, when it comes to hedonic benefits, which relate to the sensory enjoyment and pleasure derived from consuming organic food, the most influential predictors were sensory appeal ($b=0.166$, $P<0.001$), affordability ($b=0.108$, $P<0.001$), naturalness ($b=0.096$, $P<0.001$), animal welfare ($b=0.077$, $P<0.001$), freshness ($b=0.069$, $P<0.001$), and ecological welfare ($b=0.062$, $P=0.010$). On the other hand, for ethical benefits, which are associated with moral and societal concerns, the strongest predictors were ecological welfare ($b=0.147$, $P<0.001$), naturalness ($b=0.142$, $P<0.001$), nutritional content ($b=0.122$, $P<0.001$), animal welfare ($b=0.096$, $P<0.001$), and sensory appeal ($b=0.063$, $P=0.014$).

The result of the Theory of Planned Behaviour (also Organism-Response; attitude, subjective norm, perceived behavioural control-purchase intention-purchase behaviour) showed that participants' attitudes toward utilitarian ($b=0.347$, $p<0.001$) and hedonic ($b=0.083$, $p<0.001$) benefits, along with subjective norms ($b=0.369$, $p<0.001$) and

perceived behavioural control, which includes how informed consumers are about organic food ($b=0.095$, $p<0.001$) and its accessibility ($b=0.083$, $p<0.001$), significantly impacted purchase intention. However, contrary to the hypotheses, participants' attitudes toward ethical benefits did not significantly affect purchase intention ($p>0.05$). Nonetheless, the study found that attitudes toward ethical benefits significantly influenced attitudes toward utilitarian ($b=0.316$, $p<0.001$) and hedonic ($b=0.453$, $p<0.001$) benefits, thus indirectly affecting purchase intention. Essentially, attitudes toward utilitarian and hedonic benefits fully mediated the relationship between ethical benefits and purchase intention.

The findings also demonstrated that purchase intention has a significant impact on the frequency of purchasing all categories of organic foods. Specifically, purchase intention significantly influences the frequency of buying organic vegetables and fruits ($b=0.520$, $p<0.001$), organic meats and fish ($b=0.454$, $p<0.001$), organic grains and cereals ($b=0.453$, $p<0.001$), as well as organic processed foods ($b=0.304$, $p<0.001$). Note: Tables Appendix II-1 to Appendix II-4 present the four models, with the only difference between them being the varying effects of purchase intention on the frequency of purchasing different types of organic foods.

Relationships	Coefficients (Standardized estimates)	Standard Error	P
Ethical attitudes<---animal welfare	0.096	0.033	$P<0.001$
Ethical attitudes<---sensory appeal	0.063	0.027	$P=0.014$
Ethical attitudes<---naturalness	0.142	0.027	$P<0.001$
Ethical attitudes<---nutritional content	0.122	0.037	$P<0.001$
Ethical attitudes<---ecological welfare	0.147	0.025	$P<0.001$
Utilitarian attitudes<---sensory appeal	0.185	0.019	$P<0.001$
Utilitarian attitudes<---freshness	0.066	0.018	$P=0.002$
Utilitarian attitudes<---ecological welfare	0.080	0.018	$P<0.001$
Utilitarian attitudes<---animal welfare	0.108	0.023	$P<0.001$

Relationships	Coefficients (Standardized estimates)	Standard Error	P
Utilitarian attitudes<---naturalness	0.118	0.019	P<0.001
Utilitarian attitudes<---nutritional content	0.131	0.027	P<0.001
Utilitarian attitudes<---affordability	0.117	0.017	P<0.001
Hedonic attitudes<---naturalness	0.096	0.019	P<0.001
Hedonic attitudes<---affordability	0.108	0.017	P<0.001
Hedonic attitudes<---sensory appeal	0.166	0.019	P<0.001
Hedonic attitudes<---freshness	0.069	0.018	P<0.001
Hedonic attitudes<---ecological welfare	0.062	0.018	P=0.006
Hedonic attitudes<---animal welfare	0.077	0.023	P<0.001
Utilitarian attitudes<---ethical attitudes	0.316	0.018	P<0.001
Hedonic attitudes<---ethical attitudes	0.453	0.018	P<0.001
Purchase intention<---utilitarian attitudes	0.347	0.023	P<0.001
Purchase intention<---hedonic attitudes	0.083	0.022	P<0.001
Purchase intention<---subjective norm	0.369	0.016	P<0.001
Purchase intention<---accessibility	0.083	0.019	P<0.001
Purchase intention<---information provision	0.095	0.018	P<0.001
Purchase behaviour<---purchase intention	0.520	0.024	P<0.001

Table Appendix II-1: The result of the structural equation model based on the relationship between purchase intention and the frequency of purchasing organic fruits and vegetables

Relationships	Coefficients (Standardized estimates)	Standard Error	P
Ethical attitudes<---animal welfare	0.096	0.033	P<0.001
Ethical attitudes<---sensory appeal	0.063	0.027	P=0.014
Ethical attitudes<---naturalness	0.142	0.027	P<0.001
Ethical attitudes<---nutritional content	0.122	0.037	P<0.001
Ethical attitudes<---ecological welfare	0.147	0.025	P<0.001
Utilitarian attitudes<---sensory appeal	0.185	0.019	P<0.001
Utilitarian attitudes<---freshness	0.066	0.018	P=0.002
Utilitarian attitudes<---ecological welfare	0.080	0.018	P<0.001
Utilitarian attitudes<---animal welfare	0.108	0.023	P<0.001
Utilitarian attitudes<---naturalness	0.118	0.019	P<0.001
Utilitarian attitudes<---nutritional content	0.131	0.027	P<0.001
Utilitarian attitudes<---affordability	0.117	0.017	P<0.001
Hedonic attitudes<---naturalness	0.096	0.019	P<0.001
Hedonic attitudes<---affordability	0.108	0.017	P<0.001
Hedonic attitudes<---sensory appeal	0.166	0.019	P<0.001
Hedonic attitudes<---freshness	0.069	0.018	P<0.001
Hedonic attitudes<---ecological welfare	0.062	0.018	P=0.006

Relationships	Coefficients (Standardized estimates)	Standard Error	P
Hedonic attitudes<---animal welfare	0.077	0.023	P<0.001
Utilitarian attitudes<---ethical attitudes	0.316	0.018	P<0.001
Hedonic attitudes<---ethical attitudes	0.453	0.018	P<0.001
Purchase intention<---utilitarian attitudes	0.347	0.023	P<0.001
Purchase intention<---hedonic attitudes	0.083	0.022	P<0.001
Purchase intention<---subjective norm	0.369	0.016	P<0.001
Purchase intention<---accessibility	0.083	0.019	P<0.001
Purchase intention<---information provision	0.095	0.018	P<0.001
Purchase behaviour<---purchase intention	0.454	0.031	P<0.001

Table Appendix II-2: The result of the structural equation model based on the relationship between purchase intention and the frequency of purchasing organic meats and fish

Relationships	Coefficients (Standardized estimates)	Standard Error	P
Ethical attitudes<---animal welfare	0.096	0.033	P<0.001
Ethical attitudes<---sensory appeal	0.063	0.027	P=0.014
Ethical attitudes<---naturalness	0.142	0.027	P<0.001
Ethical attitudes<---nutritional content	0.122	0.037	P<0.001
Ethical attitudes<---ecological welfare	0.147	0.025	P<0.001
Utilitarian attitudes<---sensory appeal	0.185	0.019	P<0.001
Utilitarian attitudes<---freshness	0.066	0.018	P=0.002
Utilitarian attitudes<---ecological welfare	0.080	0.018	P<0.001
Utilitarian attitudes<---animal welfare	0.108	0.023	P<0.001
Utilitarian attitudes<---naturalness	0.118	0.019	P<0.001
Utilitarian attitudes<---nutritional content	0.131	0.027	P<0.001
Utilitarian attitudes<---affordability	0.117	0.017	P<0.001
Hedonic attitudes<---naturalness	0.096	0.019	P<0.001
Hedonic attitudes<---affordability	0.108	0.017	P<0.001
Hedonic attitudes<---sensory appeal	0.166	0.019	P<0.001
Hedonic attitudes<---freshness	0.069	0.018	P<0.001
Hedonic attitudes<---ecological welfare	0.062	0.018	P=0.006
Hedonic attitudes<---animal welfare	0.077	0.023	P<0.001
Utilitarian attitudes<---ethical attitudes	0.316	0.018	P<0.001
Hedonic attitudes<---ethical attitudes	0.453	0.018	P<0.001
Purchase intention<---utilitarian attitudes	0.347	0.023	P<0.001
Purchase intention<---hedonic attitudes	0.083	0.022	P<0.001
Purchase intention<---subjective norm	0.369	0.016	P<0.001
Purchase intention<---accessibility	0.083	0.019	P<0.001

Relationships	Coefficients (Standardized estimates)	Standard Error	P
Purchase intention<---information provison	0.095	0.018	P<0.001
Purchase behaviour<---purchase intention	0.453	0.030	P<0.001

Table Appendix II-3: The result of the structural equation model based on the relationship between purchase intention and the frequency of purchasing organic cereals and grains

Relationships	Coefficients (Standardized estimates)	Standard Error	P
Ethical attitudes<---animal welfare	0.096	0.033	P<0.001
Ethical attitudes<---sensory appeal	0.063	0.027	P=0.014
Ethical attitudes<---naturalness	0.142	0.027	P<0.001
Ethical attitudes<---nutritional content	0.122	0.037	P<0.001
Ethical attitudes<---ecological welfare	0.147	0.025	P<0.001
Utilitarian attitudes<---sensory appeal	0.185	0.019	P<0.001
Utilitarian attitudes<---freshness	0.066	0.018	P=0.002
Utilitarian attitudes<---ecological welfare	0.080	0.018	P<0.001
Utilitarian attitudes<---animal welfare	0.108	0.023	P<0.001
Utilitarian attitudes<---naturalness	0.118	0.019	P<0.001
Utilitarian attitudes<---nutritional content	0.131	0.027	P<0.001
Utilitarian attitudes<---affordability	0.117	0.017	P<0.001
Hedonic attitudes<---naturalness	0.096	0.019	P<0.001
Hedonic attitudes<---affordability	0.108	0.017	P<0.001
Hedonic attitudes<---sensory appeal	0.166	0.019	P<0.001
Hedonic attitudes<---freshness	0.069	0.018	P<0.001
Hedonic attitudes<---ecological welfare	0.062	0.018	P=0.006
Hedonic attitudes<---animal welfare	0.077	0.023	P<0.001
Utilitarian attitudes<---ethical attitudes	0.316	0.018	P<0.001
Hedonic attitudes<---ethical attitudes	0.453	0.018	P<0.001
Purchase intention<---utilitarian attitudes	0.347	0.023	P<0.001
Purchase intention<---hedonic attitudes	0.083	0.022	P<0.001
Purchase intention<---subjective norm	0.369	0.016	P<0.001
Purchase intention<---accessibility	0.083	0.019	P<0.001
Purchase intention<---information provison	0.095	0.018	P<0.001
Purchase behaviour<---purchase intention	0.304	0.035	P<0.001

Table Appendix II -4: The result of the structural equation model based on the relationship between purchase intention and the frequency of purchasing organic processed foods

Appendix III: Statement

This research was conducted by Yining Liu under the supervision of Dr. Christopher Hartt and Dr. Ji Lu. The selection of the research topic, study design, data collection, data analysis, and thesis writing are all original works. A range of artificial intelligence (AI) tools was employed to assist in the completion of this thesis, including the application of neural networks for part of the data analysis. Moreover, Grammarly® and ChatGPT 4.o® were utilized for the editing of the thesis draft. The author reviewed all outputs produced by artificial intelligence tools and thoroughly revised the text produced by the AI to ensure that the final document accurately reflects the research objectives, protocols, analyses, and findings of the study.