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Examining consumers' willingness to pay premium price for organic food

Tong Hu¹, Abdullah Al Mamun ^{2✉}, Mohammad Nurul Hassan Reza³, Mengling Wu ² & Qing Yang ²

This study examines the factors influencing organic food consumption and willingness to pay premium prices in the context of an emerging economy. The extended attitudinal behavior-scenario model, rooted in Signaling theory, served as the foundation for the proposed model. A convenience sample of 470 young Chinese consumers was collected through online and offline surveys. Partial least squares structural equation modeling was used to test the hypothesized relationships. The results reveal that consumers' environmental concern, environmental values, value perception, price sensitivity, and green promotion significantly affect their attitudes toward organic food. In addition, consumers' health consciousness, value perception, price sensitivity, and green promotion demonstrate significant positive effects on their intention to consume organic food. Moreover, consumer attitude toward organic food substantially influences their intention to consume it. Similarly, consumer attitude, intention, and green psychological benefits significantly affect their willingness to pay premium prices for organic food. In addition, the indirect effects of consumer attitude toward organic food and intention to consume in the relationship between the factors and willingness to pay premium prices provide interesting findings. This study offers valuable guidance for policymakers in developing appropriate strategies to expand the organic food market and provides a solid foundation for future research on organic food consumption. This study suggests that policymakers should concentrate on enhancing awareness and knowledge of organic food, promoting organic food production, and prioritizing campaigns that emphasize the exceptional health advantages of organic food to encourage greater consumption.

¹ Business School, Nantong Institute of Technology, Nantong City, Jiangsu Province 226000, China. ² UKM - Graduate School of Business, Universiti Kebangsaan Malaysia, 43600 Selangor, Malaysia. ³ Faculty of Business and Management, UCSI University, 56000 Cheras, Kuala Lumpur, Malaysia. ✉email: mamun7793@gmail.com

Introduction

Globally, there has been a growing interest in organic food consumption driven by increasing consumer concerns about wellness, eco-friendly practices, and the safety of food products (Diagourtas et al. 2023; Leonidou et al. 2022). The organic food market has experienced robust growth, driven by rising consumer awareness and demand for healthier food options. According to recent statistics, the global organic food market is expected to reach USD 272.18 billion by 2027, growing at a compound annual growth rate of 12.0% from 2020 to 2027 (Business Insider, 2020). This phenomenon is especially prevalent in North America and Europe, where higher disposable incomes and increased environmental awareness have led consumers to be more inclined to pay extra for organic products (Organic Trade Association, 2022). Additionally, government policies and regulations in many countries are increasingly supporting organic farming practices, further fueling the growth of this market.

In recent years, China has faced several food safety incidents, including the melamine, gutter oil, and clenbuterol scandals, which have significantly impacted public health (Liu et al. 2022). The widespread use of pesticides, fertilizers, and growth regulators in “petroleum agriculture” has been called into question. Reports indicate that pesticide residues can make up to 60% of soil, and agricultural pollution has exceeded industrial and urban pollution. Agricultural environmental and food pollution resulting from the use of agricultural products as raw materials is becoming increasingly prevalent. Thus, increasing the production of organic foods in a green and environmentally friendly manner has become a meaningful way to address food safety concerns and improve public health (Zhou et al. 2013). Consequently, consumer interest in organic food consumption is growing, and guiding this behavior is critical for promoting healthy living and reducing the risk of foodborne illnesses.

Compared to emerging economies, research on organic food consumption behavior in Europe and other Western countries has been more prevalent. Rana and Paul (2017) summarized the factors influencing willingness to consume organic food, including self-centered awareness, altruistic factors, and biosphere motivations. Among these factors, health factors (Cheung and To, 2019; Leonidou et al. 2022) and environmental attributes (Le-Anh and Nguyen-To, 2020; Leonidou et al. 2022) are considered to be significant motivators for organic food consumption. In addition, consumers’ willingness and ability to pay (Leonidou et al. 2022; Ghali-Zinoubi and Toukabri, 2019), psychological factors (Ahmed et al. 2023) and consumer marketing (Sun et al. 2020) are also linked to consumer behavior. These studies also found that positive attitudes toward green products can predict consumer behavior.

However, there is a paucity of research on Chinese consumers’ organic food consumption behavior relative to the abundant literature on the subject in Europe and other Western countries. This is because early domestic organic agricultural products were primarily geared toward export, and obtaining a price premium through export trade was the main motivation for producers. Despite consumers’ willingness to consume organic food in recent years, sales have not increased significantly. In 2019, the worldwide per capita consumption of organic food amounted to 108 yuan, with Denmark and Switzerland leading the way by 2,683 yuan per capita each. However, China’s per capita consumption of organic food was only 57 yuan, which is nearly half of the global average. According to Carrington et al. (2010), the discrepancy between customers’ words and actions, particularly regarding their purchase of organic food, significantly contributes to the gap between attitudes and behaviors among customers (Iweala et al. 2019). Chinese consumers, who are affected by the asymmetry of market information, lack sufficient understanding

of organic food before it becomes an “experience product” and “trust product.”

Consequently, consumers are usually unwilling to pay a hefty price because they aim to avoid risks. Typically, organic food costs four to five times more than conventional food, creating a significant disparity between consumers’ desire to purchase and their willingness to pay the premium (Sultan et al. 2020; Bernabéu et al. 2022). Studies show that the price premium for organic food has become a major obstacle to consumers’ purchasing decisions (Kim et al. 2022; Liu et al. 2022). Therefore, it is of great significance for organic food producers and the development of the organic food industry to clarify consumers’ willingness to pay (WTP) premiums and guide them to pay reasonably from the perspective of consumer cognition or payment ability. Thus, this study aims to investigate the factors influencing willingness to pay premium prices for organic food (WPOF) in the context of an emerging economy such as China. Specifically, this study addressed the following research questions:

RQ1. How do consumers’ personal characteristics affect their attitudes toward organic food (AOF) and their intentions to consume organic food (IOF)?

RQ2. Do consumers’ AOF influence their IOF?

RQ3. Do consumer AOF, IOF, and green psychological benefits (GPB) affect their WPOF?

This study constructs a research framework that integrates signaling theory and attitude–behavior–context (ABC) theory to address the proposed research questions. The framework is validated using 470 data points collected from China. The findings of this study will contribute to the advancement of organic food consumption and industrial development in emerging economies. By utilizing an innovative approach that combines signaling theory and the ABC model, this study expands the existing literature on the WTP in the emerging organic food market by exploring consumer WTP at a premium in the absence of awareness, unclear preferences, and limited payment ability.

Literature review

Theoretical foundation. Signaling theory originates from information economics, and its theoretical basis is “information asymmetry,” which states that there are differences in the information obtained by buyers and sellers in the market, and sellers have complete information while buyers have incomplete information. In China’s emerging organic food market, information asymmetry has become an important barrier to consuming organic food (Nuttavuthisit and Thøgersen, 2015). Prior to organic food being recognized as a “mature” and “trusted” product by consumers, the asymmetry of information between buyers and sellers leads to insufficient knowledge among consumers, and they are typically reluctant to pay a high price for it due to the consumption risk (Akerlof, 1970). Therefore, appropriate signals can lead to favorable results for sellers in terms of sales (Chairunnisa and Perdhana, 2020; Hussain et al. 2020). Signaling theory suggests that the health and environmental attributes of organic foods can serve as communication channels between companies and consumers. Consumers interpret the signals they receive based on their health needs, environmental protection, green values, and support for organic food. By integrating these signals, consumers can strengthen their organic attitudes and consumption intentions and ultimately guide their purchasing decisions. Therefore, this study incorporates the signaling theory and focuses on consumer behavior research.

The ABC theory, proposed by Stern et al. (1999) and expanded by Sembiring (2021), elucidates the relationship between consumer behavior and green purchasing. According to

theoretical models, individuals are motivated to act based on the anticipated outcomes of their behavior (Goh and Balaji, 2016). This theory posits that attitudes significantly influence specific behaviors (Sugandini et al. 2020; Goh and Balaji, 2016). Walia et al. (2019) and Nguyen-Viet (2022) applied ABC theory to the domain of green consumption, examining environmental, social, and health-related issues. Moreover, some studies have employed this theory to study consumer purchasing behavior (Walia et al. 2019; Nguyen-Viet, 2022). Thus, this study combines the ABC and signaling theories to explore consumers' WPOF, emphasizing their personal characteristics and psychological factors.

Review of the existing literature. Researchers have investigated consumers' intentions and WTP more for organic products. For instance, Chen et al. (2024) examined consumers' WTP for carbon-labeled beef products in urban China. The authors found that a significant portion of consumers were willing to pay a premium for beef products labeled with carbon footprint information, indicating a growing awareness and concern about the environmental impact of their food choices. In a study conducted by Thuannadee and Noosuwan (2023), the researchers examined consumers' WTP for locally produced organic chicken and investigated the factors influencing this willingness across various meat preferences in Thailand. In this study, consumers showed different WTP for local organic chicken based on their meat preferences, whereas non-preferred chicken consumers had a higher willingness. Taste and health concerns were key factors influencing willingness. Chicken-preferred consumers valued taste, whereas non-preferred consumers were driven by health concerns. Ngo et al. (2023) explored the determinants of consumer intention to purchase food with safety certifications in Vietnam, focusing on urban consumers in Hanoi. This study found that consumer attitude played the most significant role in consumers' intention to purchase safely certified vegetables. This attitude is largely influenced by subjective norms, which include social pressures or influences from others.

Grimm et al. (2023) investigated consumers' WTP for organic rice in Indonesia, using a non-hypothetical experiment. This study found that consumers are willing to pay an average price premium of 20% for organic rice compared with conventional rice. Providing information on the health and environmental benefits of organic food did not significantly increase consumers' WTP. The study also examined the effect of income on WTP, finding that higher income levels were associated with greater WTP for organic rice. Markoni et al. (2023) explored the meat consumption practices of green consumers in Vietnam and Switzerland, focusing on whether their choices were driven by health. In Vietnam, meat consumption by green consumers is influenced primarily by health and food safety concerns. By contrast, in Switzerland, the negative environmental consequences of meat consumption are more significant. In both countries, meat consumption is linked to social status and cultural practices. In Vietnam, family influence is stronger, and meat is a non-negotiable part of special occasional meals. In Switzerland, meat is often consumed in social gatherings. Yilmaz (2023) employed a theoretical framework to evaluate the factors that shape consumer attitudes toward buying organic products. The stimulus–organism–response model was used to investigate the relationships between stimuli (including marketing and information), perceived benefits (such as health, environmental impact, animal welfare, and food safety), and purchasing decisions.

Kumar et al. (2023) incorporated the Theory of Reasoned Action to examine consumers' attitudes and willingness to purchase organic foods in India. The findings revealed that

health consciousness (HC) significantly influences consumers' attitudes and willingness to purchase organic foods. However, it shows a negative association with actual buying behavior because of perceived higher costs. Liu et al. (2023) investigated consumer preferences and WTP for eco-labeled eggs in Chongqing, China. The authors found that consumers were willing to pay a significant premium for eco-labeled eggs. Le and Nguyen (2022) integrated the Theory of Planned Behavior and the Norm Activation Model to investigate organic food purchase intentions in Vietnam. The findings of this study revealed that attitude towards organic food is the most critical factor influencing purchase intention. This attitude is significantly shaped by environmental awareness and knowledge of organic foods. Saha et al. (2022) studied consumers' WTP for safe chicken meat in Bangladesh using a contingent valuation method. These findings demonstrate that consumers are willing to pay a premium for safe chicken meat, with the average WTP being significantly higher than the market price for conventional chicken meat. Education, income level, and health awareness are the key factors that positively influence consumers' WTP for safe chicken meat. Thøgersen and Zhou (2012) conducted a study to examine the motivations of early adopters of organic foods in China. The authors found that, like in Western Europe, the early adoption of organic food in China is positively associated with universalist values. Furthermore, personal attitudes toward purchasing organic food in China are strongly linked to beliefs about the healthiness, taste, and environmental friendliness of organic food.

Despite the abundance of literature on organic food consumption behavior, the reviewed studies indicate that only a few have explored the psychological factors that influence consumers' choices regarding organic food, including their attitudes, intentions, and WTP for such products. To address this research gap, the present study investigates consumers' behaviors and attitudes towards organic food.

Organic food industry in China. Organic food usually refers to the growing environment of raw materials that are free from pollution, production, and processing; do not use pesticides, chemical fertilizers, growth hormones, and other chemical synthetic substances; and do not use genetically modified technology in food (Lee and Yun, 2015; Hasimu et al. 2017). In the 1990s, China began exploring the path of organic agriculture, with early organic products primarily manifested in an export-oriented mode in which obtaining a price premium through export trade was the main motive of producers. In 2000, the market for organic food consumption in China began to grow, and by 2021, the country had risen to become the fourth largest consumer of organic food globally. The Chinese government has continued to provide policy support, such as subsidies for organic food cultivation technology. The findings from the Chinese market reveal trends that are consistent with global research on organic food consumption. For instance, the WTP a premium for organic products observed in China aligns with trends reported in Europe and North America. These similarities suggest that the motivations and behaviors identified may be applicable in other international contexts.

Hypotheses development

Environmental concern (EC). According to previous research, consumer characteristics and overall ecological attitudes are crucial factors in shaping sustainable consumption behavior (Balderjahn, 1988). The primary motivation behind consumers' conservation behavior is their inherent concern for the environment and society (Bamberg, 2003). Studies have confirmed that consumers' EC influences their purchase of environmentally

friendly products (Lavuri, 2022). Consumer attitudes and behaviors toward green purchasing have shown a greater preference for eco-friendly products and services because of ECs (Amallia et al. 2021). The natural environment is important for green energy purchase decisions. Individuals who are environmentally conscious are more inclined to foster favorable beliefs in safeguarding the environment and minimizing ecological harm (Gadenne et al. 2011). Hartmann and Apaolaza-Ibáñez (2012) confirmed that environmental consciousness promotes positive attitudes toward certain products. Based on this explanation, we hypothesize the following:

H_{1a-b}: *EC positively affects the AOF and the IOF.*

Environmental values (EV). Values are essentially enduring convictions that shape individuals' mental frameworks and direct their actions, ultimately influencing their conduct in pursuit of set objectives (Schwartz and Sagiv, 1995). Studies have shown that consumers tend to form emotional connections with products that align with their personal values, which can influence their buying decisions (Greibitus et al. 2015). EV can impact environmental protection behaviors by evoking concerns about the consequences of environmental degradation (Stern and Dietz, 1994). These values encompass a broad spectrum of activist and passive behaviors, including consumer psychology, guideline acceptance, and ecological concern (Stern and Dietz, 1994). Based on these findings, we hypothesize the following:

H_{2a-b}: *EV positively affects the AOF and the IOF.*

Health Consciousness (HC). The literature suggests that an individual's HC is directly related to their engagement in health-oriented behaviors (Pham et al. 2019). Nagaraj (2021) provided empirical evidence for the positive and influential role of HC in consumers' purchase and consumption intentions. Rana and Paul (2017) noted that HC is linked to the inclusion of nutritious food in one's diet and, as a result, is associated with purchasing organic food. According to Leonidou et al. (2022), consumers who prioritize the environment, health, and safety are more inclined to have a positive perspective on organic products than those who are primarily focused on prices. Rana and Paul (2017) observed that health-conscious consumers demonstrate a growing preference for organic food over conventionally grown foods. Based on the discussion above, we hypothesize the following:

H_{3a-b}: *HC positively affects the AOF and the IOF.*

Value perception (VP). The perceived value of a product is considered a crucial factor driving sustained consumption and payment of premium prices. When purchasing a product, customers typically evaluate its value, consider their willingness to pay a higher price, and determine whether to proceed with the purchase (Yu and Lee, 2019; Ogiemwonyi et al. 2020). Wang et al. (2018a, 2018b) conducted a study on consumer behavior towards purchasing remanufactured products and discovered a strong positive correlation between them. Zhang et al. (2020) scrutinized consumer attitudes toward energy-saving appliances and found that consumer intention significantly influences the purchase of such appliances. de Medeiros et al. (2016) reported that the perceived value of eco-friendly products plays a substantial role in consumers' willingness to purchase them. Woo and Kim (2019) explored the various dimensions of green perceived values and established the interconnections between these values, attitudes, and purchase intentions. The results revealed that all underlying dimensions significantly affect consumer attitudes, substantially affecting their purchase intentions. Hence, we hypothesize the following:

H_{4a-b}: *VP positively affects the AOF and the IOF.*

Price sensitivity (PS). The concept of how significant variations in a product's price influence customer choices when making purchases is known as PS (Zepeda and Deal, 2009). Pricing plays a crucial role in establishing a product's market position (Ghali-Zinoubi and Toukabri, 2019). Generally, consumers believe that a higher price signifies a superior quality product, whereas a lower price suggests a lower quality product (Hsu et al. 2017). Consequently, pricing can shape consumers' perceptions of products. Therefore, PS is a significant concern for consumers who prioritize environmental sustainability (Sultan et al. 2020), and can directly or indirectly influence their likelihood of making a purchase (Molinillo et al. 2020). Environmentally conscious individuals view eco-friendly products as both more advantageous and costly than traditional alternatives (Prakash et al. 2019). Those who prioritize quality and safety over price are more inclined to purchase organic food items (Liang et al. 2017). Consequently, the quality of organic food items significantly affects PS. Thus, we hypothesize the following:

H_{5a-b}: *PS positively affects the AOF and the IOF.*

Green promotion (GP). The green marketing mix emphasizes the GP of organic foods (Ahmed et al. 2023). In their efforts to promote products, marketers share information on environmental advantages and offer suggestions for environmental conservation. Yusiana et al. (2021) revealed that consumers' attitudes toward green advertising significantly influenced their purchasing intentions for green products. According to Bailey et al. (2014), green advertising can influence consumers' emotions and assessments, ultimately shaping their attitudes towards green ads and environmentally friendly products or brands. A similar finding was reported by Ahmed et al. (2023), who discovered a positive and statistically significant correlation between green advertising and consumers' intentions to make environmentally conscious purchases. According to research conducted by Sun et al. (2020), who analyzed data from 671 survey responses, green marketing campaigns have a positive influence on consumers' willingness to buy products with eco-friendly labels. Thus, we hypothesize the following:

H_{6a-b}: *GP of organic food has a positive effect on the AOF and the IOF.*

Green psychological benefits (GPB). Psychological benefits, characterized by feelings of satisfaction and improved mental state (Ahmad and Zhang, 2020), significantly impact consumer attitudes and intentions toward green purchasing. Consumers are inclined to buy eco-products or services that offer self-expressive advantages and/or self-satisfaction as they provoke a favorable emotional state resulting from proactive assistance to others (Allison et al. 2013). This behavior aligns with the findings of Batra and Ray (1986), who emphasize that consumers are motivated by the desire to express themselves and gain personal satisfaction. According to signaling theory, marketers (signalers) can send messages (regarding EC) to customers, promoting positive attitudes and behaviors toward green purchasing (Connelly et al. 2011). If a message is sufficiently strong and resonates with customers, it can enhance the level of self-expressive benefits, thereby strengthening the influence of customer attitudes on green purchasing intentions. This idea is supported by empirical evidence from Wüstenhagen and Bilharz (2006), who indicate that some consumers are willing to pay a premium for green energy to enhance their self-esteem, rather than being solely motivated by environmental considerations.

Furthermore, considering the significance of natural experiences for psychological benefits, it is imperative that people always seek to be in the company of nature to improve their physical and mental health (Hwang and Choi, 2017). This

awareness plays a vital role in the formation of customer values and attitudes toward green products, leading to pro-environmental behaviors and WTP more for organic food. Therefore, we hypothesize the following:

H_{7a-c}: *GPB positively affects the AOF, IOF, and WPOF.*

Attitude toward organic food (AOF). An individual's attitude serves as a crucial factor in forecasting behavioral intentions (Cao et al. 2022; Liu et al. 2006). Attitude is characterized as a positive or negative evaluation of cognitive beliefs regarding a specific concept, person, object, program, or action (Maseeh et al. 2022). Trong Nguyen et al. (2023) indicates that attitude is among the most important determinants of green purchasing behavior, as it represents a psychological emotion. Franceschinis et al. (2017) demonstrated that individuals with greater environmental consciousness and a favorable outlook on sustainability are more inclined to embrace renewable heating technologies. Similarly, Milovantseva's (2016) investigation revealed that households exhibiting higher levels of environmental awareness showed a greater willingness to pay extra for eco-friendly information and communication devices. Ramos-Real et al. (2018) explored that individuals with higher environmental awareness are more willing to pay a premium for electric vehicles. Thus, consumers generally believe that green products, particularly organic foods, are devoid of pesticides and food additives, undergo minimal processing, and are more desirable than their conventional counterparts, thereby enhancing perceived value and driving purchasing decisions. Hence, we hypothesize the following:

H₈₋₉: *AOF positively influences the IOF and WPOF.*

Intention to consume organic food (IOF). The level of interest among customers in consuming organic food plays a crucial role in determining how ready they are to pay for it. This concept, known as WTP, refers to the maximum amount of money that a consumer is willing to spend on a product or service, as stated by Homburg et al. (2005). The perceived value of products, services, or technologies influences purchase intention and willingness to pay more. However, a key distinction exists between these two concepts. While purchase intention assesses an individual's preference for buying a product or service (Liu et al. 2006), WTP measures the value of that product or service in monetary terms (Homburg et al. 2005; Stefani et al. 2006). WTP is an essential variable, as highlighted by Mkhize and Ellis (2020), as it is a major obstacle to organic food consumption owing to its high price.

Consumers who exhibit a strong intention to consume organic products, services, or technologies are often driven by the desire to protect the environment and maintain their health. These individuals often believe that organic or eco-friendly products are healthier and have a reduced environmental impact, leading to a positive attitude and an increased WTP premium for products that align with their values. For instance, consumers' attitudes and intentions toward green technologies influence their WTP at a premium price for these products or services (Franceschinis et al. 2017; Milovantseva 2016; Ramos-Real et al. 2018). Similarly, in ecotourism, tourists' attitudes significantly affect their WTP premiums (Lu et al. 2016). Hansla et al. (2008) investigated eco-friendly electricity consumption behavior and established a robust positive association between attitude and WTP. This relationship has also been established as statistically significant in the context of green freight transportation, as reported by Schniederjans and Starkey (2014), organic menus, as researched by Shin et al. (2017), green housing, as studied by Li et al. (2018), and green hotels, as investigated by Yadav et al. (2019). In other words, the relationship between attitude and WTP has been observed to be

significant in various contexts. Hence, we propose the following hypothesis:

H₁₀: *The IOF positively influences WPOF.*

The associations hypothesized are depicted in Fig. 1 below.

Research methodology

Research design. A cross-sectional approach was employed in this study to evaluate the effects of various factors on attitudes and intentions regarding organic food, ultimately determining consumers' WTP for higher prices for these products. The study population comprised Chinese consumers aged 18–35 years. The data collection process involved a survey utilizing questionnaires. Based on the recommendation of Faul et al. (2009), we used G*power analysis to determine the appropriate sample size for our study. The analysis indicated that a minimum of 114 participants were necessary to ensure sufficient statistical power. However, we used a sample size of 470 to avoid the challenges of a minimum sample size.

Measurement of constructs. This study utilized a self-administered questionnaire that featured a seven-point Likert scale to measure the constructs. To ensure content validity, the measurement items were derived from existing literature and tailored to suit the study's purposes. The scales for EC were adopted from De Toni et al. (2018) and Durmaz and Akdoğan (2023), while environmental value items were based on Tan et al. (2022) and Kiatkawsin and Han (2017). The HC items were adapted from Nagaraj (2021). The scales of VP were modified from Mohd Suki et al. (2022), Lin and Huang (2012), and Seegerbarth et al. (2016), whereas the items for PS were adapted from Walser-Luchesi and Calmelet (2007), Hsu et al. (2017), and Ghali-Zinoubi and Toukabri (2019). The items for GP were adopted from Ahmed et al. (2023), Bailey et al. (2018), and Pettersson et al. (2016), while those for GPB were modified from Hartmann and Apaolaza-Ibáñez (2012). The scales for AOF were adopted from Mohd Suki et al. (2022), and the items for IOF were adapted from Parashar et al. (2023). Finally, the items for the WPOF were adapted from Namkung and Jang (2017). The details of the items used in this study are presented in Supplementary Material, Table S1.

Data collection. The questionnaire was translated by a professional translation agency, and the content was uploaded to SoJump, an online survey platform, before distribution. The data collection for this study was conducted from May to June 2023 using a combination of offline and online methods. Offline investigators filled out the questionnaire using a face-to-face form in SoJump and distributed it to consumers at the entrance and exit of Sam's Club and RT-Mart supermarkets in Nantong, Jiangsu Province, China. The online questionnaire was distributed through the "SoJump" links. The questionnaires were forwarded to investigators outside Nantong to ensure the quality of the answers to the online questionnaires. The QR code of the questionnaire was distributed through the WeChat and QQ communication platforms. The investigators were instructed to emphasize the importance of filling out the questionnaire truthfully and to explain to the respondents that the results of the survey would only be used for academic research and that no personal information would be disclosed. In total, 470 questionnaires were administered. However, 19 questionnaires were excluded because of invalid and straight-line answers, and 451 valid questionnaires were determined, accounting for 95.95% of the total questionnaires. The survey sample is presented in Supplementary Material, Table S2.

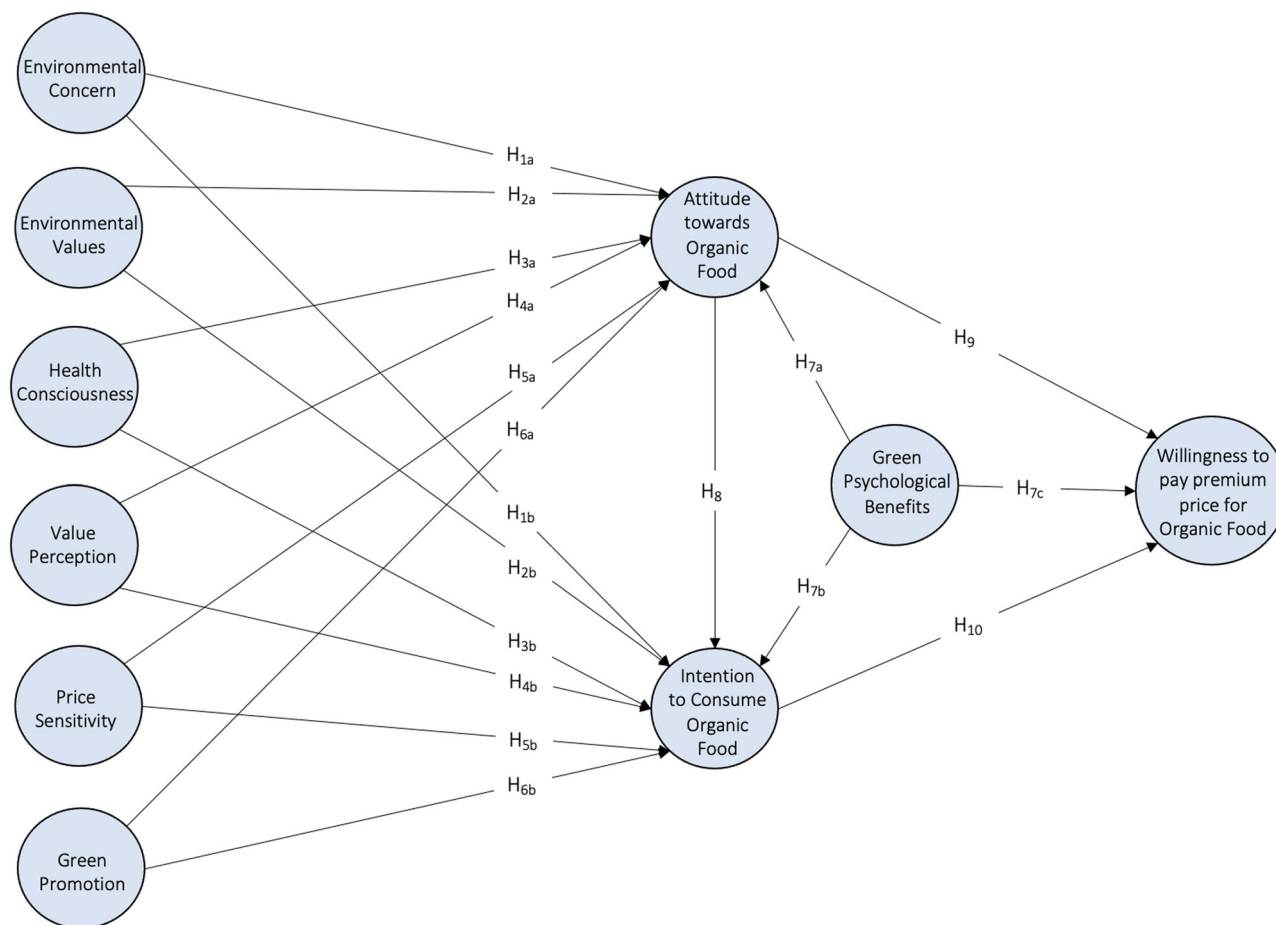


Fig. 1 Research framework.

Common method bias. Harman's single-factor test was used to determine the presence of common method bias (CMB) in the study. This widely used approach ensures that the model is not affected by CMB (Kock, 2015). The analysis showed that a single factor explained 33.96% of the variance, which fell below the 50% threshold, indicating that the CMB was not a significant concern in the dataset. In addition, variance inflation factor (VIF) values below 3.3 indicate the absence of collinearity issues (Kock, 2015). As shown in the Supplementary Material, Table S3 (full collinearity test), the VIF values of the variables ranged from 1.391 to 2.399, indicating that the covariance among the variables was not significant.

Multivariate normality. The assessment of multivariate normality was conducted using a statistical web application called Web Power (<https://webpower.psychstat.org/models/kurtosis/>). The analysis revealed that the p values for both multivariate skewness and kurtosis were below 0.05, indicating that the data did not follow a normal distribution.

Data analysis method. To assess the reliability and validity of the constructs, we employed structural equation modeling partial least squares (PLS-SEM) using SmartPLS version 3.1. The evaluation process consisted of two stages. Initially, we examined the measurement model by assessing the reliability and validity of the constructs (Hair et al. 2017, 2019). Following this, we analyzed the structural model to determine the associations between exogenous and endogenous constructs. The study utilized predictive relevance (R^2) and effect size (f^2) to evaluate the model estimation and comprehend the path effects of the constructs (Hair et al.

2019). Furthermore, research has examined the indirect impacts of attitude and IOF on the connections between influencing factors and WPOF (Hair et al. 2019). Additionally, the study employed multi-group analysis (MGA) to detect group disparities and assess model invariance, thereby offering a more detailed understanding of how the model functions across diverse populations.

Results

Demographic characteristics. Demographic details of the respondents are presented in Supplementary Material, Table S2 (Demographic details). Specifically, the sample comprised 47% male and 53% female participants. Most of the young consumers belonged to the age group of 26–30 years (46.4%), followed by 21–25 years (37.3.2%), 31–35 (11.3%), and 18–20 (4.9%). Among respondents, 24.6% were single, 66.5% were married, and 8.8% were divorced or widowed. Most of the respondents had a good education, with those having bachelor's degrees comprising 52.5%, college and below accounting for 25.5%, master's degrees or above 19.3%, and doctoral degrees 2.7%. Most respondents (35.3%) had a monthly income of RMB 3001–6000, followed by RMB 6001–9000 (25.5%), below RMB 3000 (20.8%), RMB 9001–12,000 (13.5%), more than RMB 15,000 (1.8%), and RMB 12,001–15,000 (3.1%). Regarding the respondents' employment status, 46.3% were employed full-time, 29.7% were employed part-time, 13.5% were students, and 9.3% were seeking opportunities. The monthly food expenditure of most respondents (32.6%) was RMB 1001–2000, followed by RMB 2001–3000 (32.4%), below RMB 1000 (16.9%), RMB 3001–4000 (12.4%), and more than RMB 4000 (5.8%). In terms of weight, 35.7% of the

Table 1 Reliability and validity.

Variables	Items	Mean	Std. deviation	Cronbach's alpha	Dijkstra-Hensele's rho	CR	AVE
EC	5	4.969	1.429	0.904	0.906	0.928	0.721
EV	5	5.155	1.418	0.912	0.914	0.935	0.741
HC	5	4.792	1.369	0.878	0.878	0.911	0.672
VP	5	5.441	1.231	0.901	0.903	0.927	0.716
PS	5	4.878	1.329	0.870	0.877	0.905	0.656
GP	5	5.361	1.254	0.907	0.910	0.931	0.729
AOF	5	4.977	1.330	0.896	0.897	0.923	0.706
IOF	5	5.264	1.308	0.903	0.904	0.928	0.720
GPB	5	5.196	1.399	0.916	0.917	0.937	0.749
WPOF	3	5.225	1.369	0.923	0.923	0.942	0.764

EC environmental concern, EV environmental values, HC health consciousness, VP value perception, PS price sensitivity, GP green promotion, AOF attitude toward organic food, IOF intention to consume organic food, GPB green psychological benefits, WPOF willingness to pay premium price for organic food, CR composite reliability, AVE average variance extracted. Source: Author's data analysis.

participants were overweight, 23.7% were obese, 21.3% were slightly overweight, and 19.3% were healthy. Fit respondents comprised 79.2% of the sample, while unfit respondents comprised 20.8%. The majority of respondents (53.2%) exercised for 1–2 days, followed by 3–5 days (24.4%), never or rarely exercised (19.1%), and more than 5 days (3.3%).

Validity and reliability. Various statistical techniques were employed to assess the reliability, convergent validity, and discriminant validity of the measurement models. Table 1 presents a summary of the findings, including an analysis of the constructs' mean values and standard deviations. The mean values were in line with theoretical expectations, and the standard deviations suggested a suitable distribution of scores within the sample. We assessed the reliability using two measures: Cronbach's alpha and composite reliability. Both metrics yielded values exceeding 0.70, suggesting that the constructs had satisfactory reliability.

We analyzed the average variance extracted (AVE) to evaluate the convergent validity of the constructs. This metric assesses the amount of variance attributed to the latent construct in relation to measurement error. The results (Table 1) showed that the AVE for all constructs was higher than 0.50, indicating a high level of convergent validity. Moreover, Dijkstra-Hensele's rho was evaluated, and the results (Table 1) showed that the minimum value was 0.877, which exceeded the threshold of 0.70 (Hair et al. 2019). Multicollinearity among the predictor variables was also evaluated using VIF values. None of the predictor variables showed VIF values above the recommended threshold of three, indicating the absence of multicollinearity issues. The results are presented in Supplementary Material, Table S4 (Collinearity statistics).

To evaluate the discriminant validity of the constructs, researchers employed two methods: the Fornell and Larcker (1981) criterion and the heterotrait-monotrait ratio (HTMT). The Fornell and Larcker approach involves comparing the square root of the average variance extracted (AVE) for each construct with the correlations between constructs. When the AVE is greater than the comparison, discriminant validity is considered acceptable. The findings (presented in Supplementary Material, Table S5) demonstrated that the AVE square root was greater than the other values in the same column, indicating a satisfactory level of discriminant validity. Additionally, the HTMT results (Supplementary Material, Table S5, Discriminant validity) revealed that the values were less than 0.85, confirming the existence of discriminant validity (Henseler et al. 2016). Moreover, the factor loadings (Supplementary Material, Fig. S1, Measurement model) and cross-loadings (Supplementary Material, Table S6) for each indicator of the constructs were calculated.

The indicators (items) of each construct yielded a factor loading greater than 0.70, and each indicator loaded higher on its intended construct than on any other construct, indicating adequate discriminant and convergent validity.

Hypothesis testing. The structural model was subjected to a series of statistical analyses to determine various values, including the path coefficient, *t* value, predictive relevance (R^2), and effect size (f^2), as shown in Table 2 and Fig. 2. The results of these analyses revealed that EC had a statistically significant influence on AOF ($\beta = 0.081$ and $p = 0.038$), supporting H_{1a} . The findings also indicated that EV ($\beta = 0.146$ and $p = 0.002$) and VP ($\beta = 0.188$ and $p = 0.000$) were strongly associated with AOF, thereby supporting H_{2a} and H_{4a} . Additionally, the analysis showed that PS had a significant impact on AOF ($\beta = 0.088$ and $p = 0.040$), supporting H_{5a} . Moreover, the results indicated that GP was positively related to the AOF ($\beta = 0.219$ and $p = 0.000$), accepting H_{6a} . However, the results revealed that HC ($\beta = 0.063$ and $p = 0.093$) and GPB ($\beta = 0.051$ and $p = 0.158$) did not have a significant impact on AOF, rejecting H_{3a} and H_{7a} .

The study found that HC ($\beta = 0.134$ and $p = 0.002$) and VP ($\beta = 0.223$ and $p = 0.000$) were significantly associated with the IOF, thereby supporting H_{3b} and H_{4b} . PS was found to have a significant impact on the IOF ($\beta = 0.131$ and $p = 0.009$); indicating that H_{5b} was supported. The results also showed that GP was positively related to the IOF ($\beta = 0.143$ and $p = 0.005$), thus supporting H_{6b} . However, the results revealed that EC ($\beta = 0.038$ and $p = 0.206$), EV ($\beta = -0.013$ and $p = 0.395$), and GPB ($\beta = 0.044$ and $p = 0.200$) did not have a significant impact on IOF; therefore, H_{1b} , H_{2b} , and H_{7b} were not supported.

The results revealed that AOF ($\beta = 0.113$ and $p = 0.015$), GPB ($\beta = 0.327$ and $p = 0.000$), and IOF ($\beta = 0.309$ and $p = 0.000$) had a significant impact on WPOF; therefore, H_9 , H_{7c} , and H_{10} were supported. The model reported an explained variance of 35.4% for AOF, 33.7% for IOF, and 47.4% for WPOF.

The findings of indirect effects are presented in Table 3 revealed that the AOF did not influence the relationship between EC ($\beta = 0.009$ and $p = 0.106$), EV ($\beta = 0.017$ and $p = 0.052$), HC ($\beta = 0.007$ and $p = 0.142$), PS ($\beta = 0.010$ and $p = 0.114$), GPB ($\beta = 0.006$ and $p = 0.201$), and IOF. However, the results showed that the AOF did not influence the relationship between EC ($\beta = 0.022$ and $p = 0.053$), HC ($\beta = 0.017$ and $p = 0.108$), GPB ($\beta = 0.014$ and $p = 0.153$) and WPOF. Besides, there was no significant effect of IOF between EC ($\beta = 0.012$ and $p = 0.211$), EV ($\beta = -0.004$ and $p = 0.395$), GPB ($\beta = 0.014$ and $p = 0.201$), and WPOF.

Nevertheless, a significant effect of AOF was found between VP ($\beta = 0.021$ and $p = 0.030$), GP ($\beta = 0.025$ and $p = 0.024$), and

Table 2 Hypothesis testing.

Hypothesis	Beta	Standard error	Confidence interval	t value	p value	R ²	f ²	Decision	
H _{1a}	EC → AOF	0.081	0.046	(0.006, 0.156)	1.777	0.038	0.354	0.007	Supported
H _{2a}	EV → AOF	0.146	0.050	(0.065, 0.232)	2.903	0.002		0.023	Supported
H _{3a}	HC → AOF	0.063	0.047	(-0.014, 0.143)	1.322	0.093		0.004	Rejected
H _{4a}	VP → AOF	0.188	0.050	(0.105, 0.269)	3.778	0.000		0.038	Supported
H _{5a}	PS → AOF	0.088	0.050	(0.008, 0.175)	1.756	0.040		0.009	Supported
H _{6a}	GP → AOF	0.219	0.056	(0.126, 0.308)	3.939	0.000		0.046	Supported
H _{7a}	GPB → AOF	0.051	0.051	(-0.033, 0.135)	1.002	0.158		0.003	Rejected
H _{1b}	EC → IOF	0.038	0.047	(-0.038, 0.116)	0.821	0.206	0.337	0.002	Rejected
H _{2b}	EV → IOF	-0.013	0.048	(-0.093, 0.068)	0.267	0.395		0.000	Rejected
H _{3b}	HC → IOF	0.134	0.047	(0.059, 0.212)	2.852	0.002		0.020	Supported
H _{4b}	VP → IOF	0.223	0.053	(0.133, 0.308)	4.204	0.000		0.050	Supported
H _{5b}	PS → IOF	0.131	0.056	(0.044, 0.225)	2.359	0.009		0.018	Supported
H _{6b}	GP → IOF	0.143	0.055	(0.055, 0.236)	2.606	0.005		0.018	Supported
H _{7b}	GPB → IOF	0.044	0.052	(-0.044, 0.129)	0.843	0.200		0.002	Rejected
H ₈	AOF → IOF	0.113	0.052	(0.029, 0.200)	2.172	0.015		0.013	Supported
H _{7c}	GPB → WPOF	0.327	0.041	(0.258, 0.395)	7.884	0.000	0.474	0.165	Supported
H ₉	AOF → WPOF	0.266	0.045	(0.193, 0.339)	5.920	0.000		0.105	Supported
H ₁₀	IOF → WPOF	0.309	0.042	(0.237, 0.376)	7.309	0.000		0.144	Supported

EC environmental concern, EV environmental values, HC health consciousness, VP value perception, PS price sensitivity, GP green promotion, AOF attitude toward organic food, IOF intention to consume organic food, GPB green psychological benefits, WPOF willingness to pay premium price for organic food.
Source: Author's data analysis.

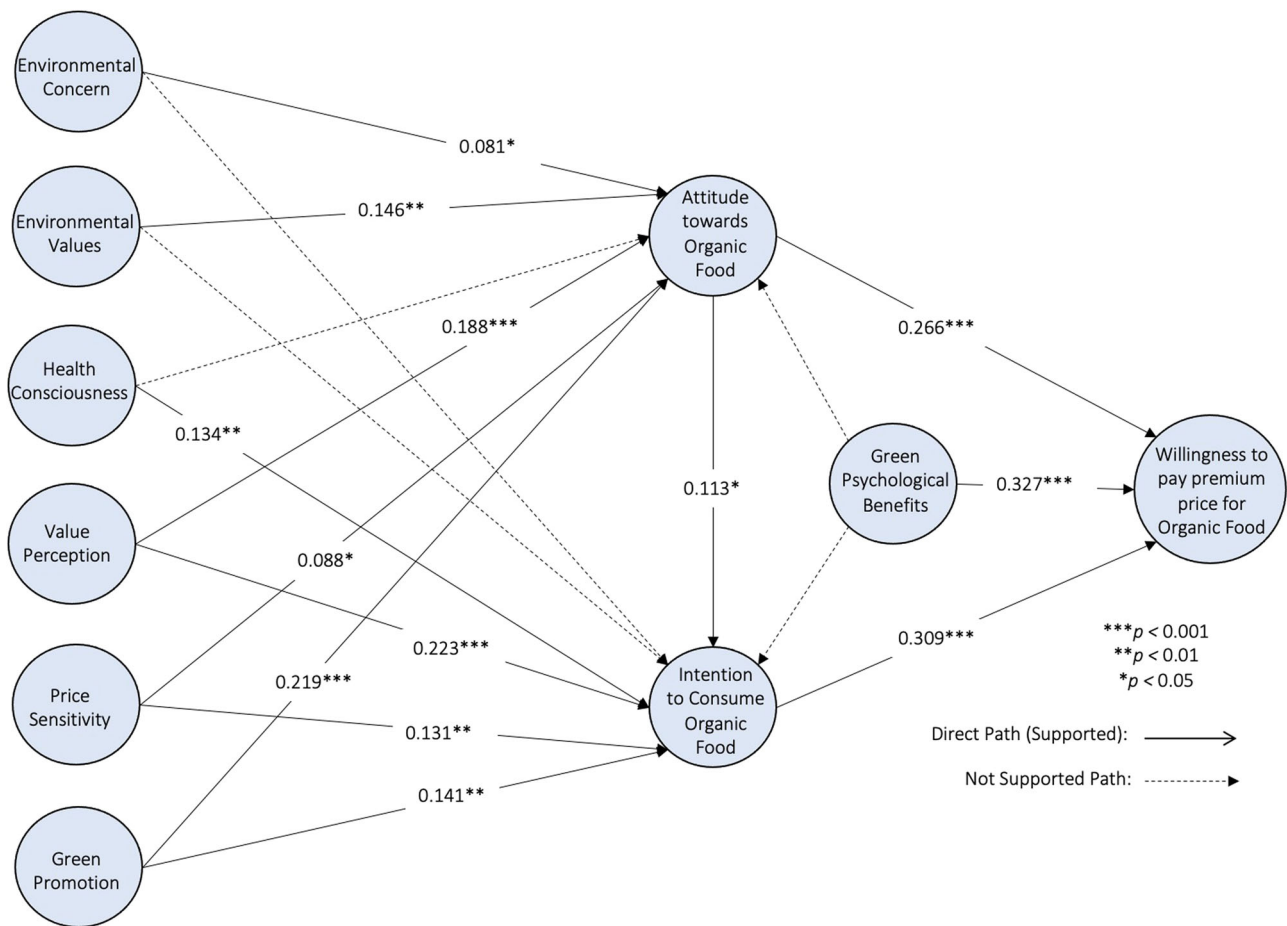


Fig. 2 Final model with findings.

IOF. Thus, the results showed that AOF had a significant effect on the relationship between EV and WPOF ($\beta = 0.039$ and $p = 0.004$). Meanwhile, the indirect effects of AOF on the relationships between perceived value ($\beta = 0.050$ and

$p = 0.001$), PS ($\beta = 0.024$ and $p = 0.042$), and GP ($\beta = 0.058$ and $p = 0.002$) and WPOF were statistically significant.

Similarly, this study found that the IOF indirectly impacted the relationships between HC ($\beta = 0.041$ and $p = 0.004$), perceived

Table 3 Indirect effects.

Indirect associations	Beta	Standard error	Confidence interval	t value	p value
EC → AOF → IOF	0.009	0.007	(0.000, 0.023)	1.247	0.106
EV → AOF → IOF	0.017	0.010	(0.003, 0.036)	1.628	0.052
HC → AOF → IOF	0.007	0.007	(-0.002, 0.019)	1.071	0.142
VP → AOF → IOF	0.021	0.011	(0.005, 0.041)	1.888	0.030
PS → AOF → IOF	0.010	0.008	(0.000, 0.027)	1.206	0.114
GP → AOF → IOF	0.025	0.013	(0.006, 0.047)	1.974	0.024
GPB → AOF → IOF	0.006	0.007	(-0.004, 0.019)	0.839	0.201
EC → AOF → WPOF	0.022	0.013	(0.001, 0.045)	1.614	0.053
EV → AOF → WPOF	0.039	0.015	(0.016, 0.065)	2.627	0.004
HC → AOF → WPOF	0.017	0.013	(-0.003, 0.040)	1.238	0.108
VP → AOF → WPOF	0.050	0.016	(0.026, 0.078)	3.128	0.001
PS → AOF → WPOF	0.024	0.014	(0.002, 0.047)	1.717	0.043
GP → AOF → WPOF	0.058	0.020	(0.028, 0.096)	2.850	0.002
GPB → AOF → WPOF	0.014	0.013	(-0.010, 0.035)	1.026	0.153
EC → IOF → WPOF	0.012	0.015	(-0.011, 0.037)	0.804	0.211
EV → IOF → WPOF	-0.004	0.015	(-0.029, 0.020)	0.267	0.395
HC → IOF → WPOF	0.041	0.015	(0.017, 0.068)	2.696	0.004
VP → IOF → WPOF	0.069	0.021	(0.036, 0.105)	3.294	0.000
PS → IOF → WPOF	0.041	0.018	(0.013, 0.071)	2.279	0.011
GP → IOF → WPOF	0.044	0.020	(0.015, 0.080)	2.233	0.013
GPB → IOF → WPOF	0.014	0.016	(-0.014, 0.040)	0.838	0.201
AOF → IOF → WPOF	0.035	0.016	(0.009, 0.062)	2.154	0.016

EC environmental concern, EV environmental values, HC health consciousness, VP value perception, PS price sensitivity, GP green promotion, AOF attitude toward organic food, IOF intention to consume organic food, GPB green psychological benefits, WPOF willingness to pay premium price for organic food.
Source: Author's data analysis.

value ($\beta = 0.069$ and $p = 0.000$), PS ($\beta = 0.041$ and $p = 0.011$), GP ($\beta = 0.044$ and $p = 0.013$) and WPOF. In addition, this study revealed that the IOF has a significant effect on the relationship between consumer AOF and WPOF ($\beta = 0.035$ and $p = 0.016$).

Multi-group analysis. In this study, we used partial least squares multi-group analysis (PLS-MGA) to investigate variations in parameter estimates across different categories. Prior to conducting PLS-MGA, the measurement invariance of composite models (MICOM) technique was applied to evaluate the degree of uniformity among groups within the chosen categories, namely, sex, physical fitness, and education. The results of the MICOM analysis are shown in Supporting Material 1 (Table S4). The permutation p values for all constructs, except for EC in the sex category and EV in the education category were greater than 0.05, indicating measurement invariance across groups and granted us to proceed with PLS-MGA. The original hypotheses were tested to assess the applicability of sex, healthy/unhealthy status, and education to the two groups of characteristics under consideration, and the results showed that all the factors were applicable. The MGA analysis (as presented in Table 4) showed no notable disparities between sexes or health-related groups regarding their perception of WTP for organic food premiums. Nevertheless, within the education category, the impact of EC on IOF was found to be more pronounced among individuals without a bachelor's degree than among those who had attained this level of education. No significant differences were observed for the other hypotheses in this category.

Discussion

The findings of this study corroborate the significant impact of ECs on AOF, aligning with prior research by Cheung et al. (2015). Their study demonstrated that both ECs and knowledge of organic food play key roles in shaping positive consumer attitudes toward such products. Nonetheless, the current investigation found no significant link between ECs and consumption

intentions, which aligns with the earlier observations made by Tan et al. (2017). Tan et al. (2017) postulated that consumers' ECs are not the primary motivators of pro-environmental behavior. Although consumers are concerned about various environmental issues and demonstrate an interest in eco-friendly products in their daily lives, this awareness does not translate into a WPOF, resulting in no significant impact of ECs on the IOF.

Additionally, EV were positively correlated with the AOF, which is consistent with previous research results (Shin et al. 2017; Zhu et al. 2013). In other words, consumer AOF consumption improves when their EV are enhanced. In addition, improved consumer AOF can promote the WPOF, which is consistent with previous research. However, the relationship between EV and the intention to purchase organic food was not proven to be statistically significant. This unexpected outcome warrants careful consideration of the potential contributing factors. Individuals with strong EV may face practical obstacles such as limited access to affordable organic products. It appears that the decision to consume organic food is influenced not only by values but also by the practicality of incorporating such choices into one's lifestyle and financial situation.

Contrary to previous studies (Chen, 2009; Leonidou et al. 2022), HC was found to have no significant impact on AOF consumption. One possible explanation for this discrepancy may be the perception of health threats among young consumers, as the majority are in good health and do not perceive their current food consumption habits as posing a significant health burden. Consequently, there is no impetus for them to change their existing food consumption pattern, a finding supported by the study conducted by Su et al. (2022). However, the results of the current study revealed a positive correlation between HC and IOF, contrary to the lack of association with attitudes. Several factors contributed to this hypothesis. Individuals with an increased awareness of health issues may seek organic alternatives to achieve their health-related objectives. Moreover, health-conscious individuals may view the consumption of organic foods as a tangible and proactive measure toward preserving or

Table 4 Multi-group analysis.

	Sex			Perceived physically fitness		
	Male vs. female			Fit vs. unfit		
	Difference	Two-tailed <i>p</i> value	Significant difference?	Difference	Two-tailed <i>p</i> value	Significant difference?
EC → AOF	-0.035	0.353	No	0.119	0.169	No
EV → AOF	-0.132	0.098	No	-0.011	0.461	No
HC → AOF	-0.046	0.311	No	-0.010	0.483	No
VP → AOF	0.045	0.325	No	-0.098	0.224	No
PS → AOF	-0.007	0.473	No	-0.081	0.269	No
GP → AOF	0.002	0.492	No	0.168	0.132	No
GPB → AOF	0.091	0.203	No	0.034	0.399	No
EC → IOF	0.091	0.168	No	0.024	0.412	No
EV → IOF	-0.011	0.452	No	0.004	0.500	No
HC → IOF	0.113	0.121	No	0.071	0.297	No
VP → IOF	-0.046	0.325	No	-0.123	0.194	No
PS → IOF	0.048	0.332	No	0.243	0.050	No
GP → IOF	-0.071	0.253	No	-0.127	0.158	No
GPB → IOF	0.135	0.102	No	-0.090	0.242	No
AOF → IOF	-0.062	0.272	No	0.073	0.281	No
AOF → WPOF	-0.066	0.218	No	-0.095	0.162	No
GPB → WPOF	0.066	0.203	No	-0.009	0.456	No
IOF → WPOF	0.072	0.188	No	-0.015	0.430	No
No bachelor degree vs. bachelor degree and above						
	Difference	Two-tailed <i>p</i> value	Significant difference?			
EC → AOF	-0.054	0.327	No			
EV → AOF	0.119	0.175	No			
HC → AOF	-0.074	0.255	No			
VP → AOF	0.042	0.368	No			
PS → AOF	-0.073	0.285	No			
GP → AOF	0.063	0.319	No			
GPB → AOF	0.074	0.269	No			
EC → IOF	0.274	0.007	Yes			
EV → IOF	-0.142	0.109	No			
HC → IOF	0.050	0.353	No			
VP → IOF	-0.099	0.223	No			
PS → IOF	-0.061	0.342	No			
GP → IOF	0.163	0.107	No			
GPB → IOF	-0.085	0.279	No			
AOF → IOF	-0.122	0.152	No			
AOF → WPOF	0.096	0.196	No			
GPB → WPOF	-0.082	0.180	No			
IOF → WPOF	-0.055	0.279	No			

EC environmental concern, EV environmental values, HC health consciousness, VP value perception, PS price sensitivity, GP green promotion, AOF attitude toward organic food, IOF intention to consume organic food, GPB green psychological benefits, WPOF willingness to pay premium price for organic food.
Source: Author's data analysis.

enhancing their well-being. Thus, the IOF may represent a more direct expression of health-driven decision-making than broader and potentially more intricate attitudes.

As expected, VP plays a crucial role in shaping consumer attitudes and intentions to consume organic food, and our findings align with those of previous research in this area. Several studies have analyzed the relevance of product value to attitudes and intentions toward organic food, including those by Wang et al. (2022), Dangelico et al. (2021), and Liao et al. (2020). These studies have demonstrated that when consumers recognize the functional, emotional, and EV associated with organic food, their AOF becomes more favorable, and their IOF becomes clearer. In addition, the results of the current study revealed that consumer AOF and consumption intention significantly mediated the relationship between their perceived value and WPOF.

This study revealed that highly price-conscious consumers generally have positive views towards organic food and are inclined to consume it, corroborating the results of Eberle et al. (2023). Despite the premium pricing of organic products, price-

sensitive individuals recognize their value (Liang et al. 2017). Essentially, those who are more attentive to the costs of their purchases are better equipped to appreciate the advantages of opting for organic food. Importantly, the study found that consumers' AOF and their IOF played a crucial mediating role in the connection between PS and WPOF. This observation is in line with the previous research conducted by Yang et al. (2021).

Unexpectedly, our study revealed that green psychological advantages did not influence attitudes or intentions toward organic food consumption, contradicting our initial prediction. This outcome might be explained by the fact that organic food is typically consumed privately, which reduces the perception of the benefits associated with visible consumption behaviors. Our results align with those of Griskevicius et al. (2010), indicating that status-driven motivations enhance the appeal of green products only when they are consumed in public settings rather than private ones. Furthermore, signaling theory suggests that the pursuit of status enhances the desirability of environmentally friendly products, particularly when they have a higher price tag.

Nevertheless, organic food remains a fundamental and relatively affordable commodity, even with a considerable price difference compared with conventional alternatives. Moreover, the ABC theory was developed based on the outcomes of the validated model. The statistical findings indicate that a positive attitude towards organic food enhances the likelihood of consumption, while both a favorable attitude and strong intention to consume significantly affect the willingness to pay a premium price.

The MGA provided valuable insights into the potential effects of demographic factors on the relationships examined in this study. Our findings indicate that there were no significant differences in the relationships between sex and physical fitness categories, suggesting that these demographic factors do not significantly alter the dynamics of attitudes, intentions, and willingness to pay for organic food among consumers. However, when examining the education category, an interesting pattern emerged. Specifically, the effect of EC on the IOF was found to be significantly higher among respondents who did not possess a bachelor's degree compared to those who had a bachelor's degree. This finding suggests that individuals with lower formal education levels may place greater emphasis on ECs when forming their intentions to consume organic food. No significant differences were observed for the other hypotheses within the education category, indicating that the relationships between other predictors and the IOF were consistent across different educational backgrounds. These results highlight the importance of considering educational background in understanding consumer behavior towards organic food. It appears that environmental messaging and education might resonate more strongly with those who have lower levels of formal education, potentially due to differing levels of exposure to environmental issues or varying sources of information. Future research could further explore these educational differences to develop more targeted communication strategies that effectively address the concerns and motivations of diverse consumer segments.

Implications

Theoretical implications. This study, which explored the complex factors influencing consumer choices, specifically the willingness to pay higher prices for organic products, represents a notable advancement in the understanding of organic food purchasing behavior. This study offers several valuable insights to enhance the current body of knowledge in this field. First, the theoretical model synthesized signaling and ABC theories, providing a comprehensive lens through which to understand the complex interplay between individual attitudes, behaviors, and influential factors in the context of organic food consumption. This integration bridges gaps in existing theoretical models and offers a more holistic perspective on consumer decision-making processes.

Second, this study focuses on the WTP premium, which is a crucial indicator of consumer interest and commitment to sustainable choices. This addresses the limitations of many organic food research studies that often focus on attitude or purchase intention as endpoints. This study provides valuable insights into purchasing behavior from a consumer's perspective, suggesting a positive predisposition toward supporting organic products, even at higher costs.

Third, this study identifies a set of factors, including EC, EV, HC, VP, PS, GPB, and GP, that play a significant role in shaping consumers' attitudes and intentions toward their WPOF.

Fourth, examining AOF and intentions to consume it as intermediary factors helps to provide a more comprehensive understanding of the mental processes that link personal values to behavioral outcomes.

Fifth, according to the recommendations of Owens and Nowell (2001), this study focused on the younger generation, aged between 18–35 years. Owens and Nowell (2001) emphasized that young consumers tend to be more responsive to emotional appeals than rational ones, underscoring the significance of studying this age group separately to comprehend the emotional appeals that affect consumer behavior in China. These findings can be replicated in other emerging and developing countries as well.

Finally, this study's focus on China adds a valuable dimension to its theoretical framework. By situating the model within the Chinese market, this study acknowledges the influence of cultural, economic, and social factors on consumer decision-making. For instance, in China, cultural factors such as the historical emphasis on traditional medicine and natural ingredients play a significant role in shaping consumer attitudes toward organic food (Campos and Qi, 2024). This contrasts with Western countries, where the emphasis may be more on health benefits and environmental sustainability (Moser, 2016). Moreover, economic growth and rising incomes in China have led to an increasing middle class that is willing to pay a premium for organic food. This economic shift is paralleled by a growing awareness of food safety issues, prompting consumers to opt for organic options (Zhang et al. 2018). In contrast, in many Western countries, the organic food market has matured, and while income levels still play a role, factors such as EC and HC are more pronounced drivers (Moser, 2016). Additionally, the collectivist culture in China means that consumer decisions are often influenced by family and social circles. In Western countries, individualistic cultures may lead to more independent decision-making processes, with personal values and beliefs playing a larger role (Zhang et al. 2020). This cultural, economic, and social contextualization enriches the broader cross-cultural applicability of the theoretical model and offers insights into the unique dynamics of organic food consumption.

Practical Implications. Based on the findings of this study, recommendations for increasing consumers' WPOF are proposed from both government and business perspectives.

From the government's perspective, it is necessary to guide premium organic food consumption as a provider of public goods. To achieve this, the government should focus on enhancing consumer awareness of organic food through public welfare propaganda that emphasizes the environmental and health benefits of organic food. This approach will help shape consumer values related to environmental protection and health, enhance their sense of access, honor, and happiness in green consumption, and promote common environmental governance. Additionally, the government should establish and improve laws and regulations related to organic food, create strict mechanisms for accessing organic food, and regularly publish the names of organic food producers and approved products. Encouraging technological innovation, increasing the output of organic agricultural products, and reducing production costs and prices of organic food through taxes and subsidies are also beneficial.

From a business perspective, producers and marketers should consider VP, which is an important factor in consumers' WPOF. Consumers evaluate the value of organic food in terms of quality, price, emotion, and ecology. However, as inherently trustworthy products, the value of organic foods may not be immediately apparent. Thus, it is incumbent on companies to enhance the publicity of the value of organic food, as backed by authoritative research data, to demonstrate its worth. Additionally, many individuals believe that organic food consumption provides environmental benefits but at the cost of higher prices and

reduced convenience. To encourage more consumers to choose organic options, companies must improve the performance and quality of their organic products while keeping prices competitive with conventional alternatives.

Moreover, companies can increase consumers' WPOF by highlighting the unique value of organic food and educating consumers about its benefits. This can be achieved through product innovation and differentiation, targeted marketing, and the creation of a sense of exclusivity and superior quality associated with organic food. Companies can also invest in sustainable and environment-friendly packaging to promote their commitment to environmental protection.

However, economic factors continue to serve as the main barrier preventing consumers from purchasing organic food, with significant government subsidies having a marked impact on consumer behavior. This study proves that consumers' WPOF is enhanced when promoted through green marketing strategies such as subsidies, promotions, or discounts. The role of information access channels in enhancing consumers' WPOF cannot be overstated; thus, expanding producers' promotional strategies and channels is paramount. Accordingly, producers and sellers of organic food should innovate their information dissemination and sales channels, emphasizing the need for diversified information dissemination channels, paying attention to network publicity, cultivating new-generation consumer groups, and changing the creative thinking behind advertisements. Implementing these initiatives can guide consumers toward organic food and promote the concept of an organic lifestyle.

Conclusions, limitations, and future recommendations

This study aimed to shed light on the complex and diverse landscape of organic food consumption among young Chinese individuals. By synthesizing signaling and ABC theories, this study endeavored to decipher the intricate interplay of consumer EC, environmental value, VP, PS, and GP that shapes consumer attitudes, intentions, and WPOF. The findings revealed that consumers' EC, EV, VP, PS, and GP exhibited significant positive effects on their AOF. Consumer HC, VP, PS, and GP demonstrated significant positive effects on the IOF. Moreover, consumer AOF substantially influenced their intentions to consume it. Similarly, consumers' attitudes, intentions, and GPB significantly affected their WPOF. The findings of these indirect relationships also offer valuable insights into organic food consumption and consumer behavior research. However, EC failed to demonstrate a significant effect on WPOF.

This study makes several unique contributions by integrating Signaling Theory and ABC Theory to offer a comprehensive understanding of organic food consumption. It addresses the gap in research by focusing on WTP a premium for organic food rather than just attitudes or purchase intentions. The validation of the indirect effects, including attitudes towards organic food, intention to consume, and GPB, provides deeper insights into consumer behavior. Additionally, the study's focus on the younger generation (aged 18–35) highlights their responsiveness to organic food, and the multi-group analysis reveals no significant differences in perceptions or WTP across sex or health groups, challenging previous assumptions and offering new perspectives on demographic influences. The findings provide valuable insights for marketers, policymakers, and educators. By comprehending the factors influencing organic food consumption, targeted interventions, educational programs, and marketing strategies that are consistent with consumer values and preferences can be devised. In the contemporary world, where environmental sustainability and

health awareness are becoming significant considerations in consumer decision-making, this research makes a valuable contribution to the ongoing discourse surrounding sustainable food practices.

Although this study makes a significant contribution to the field of organic food consumption, it is important to recognize its limitations. The cross-sectional nature of this study, which involved data collection at a single point in time, limited its capacity to determine causal relationships or track changes over time. To address this, future research should adopt longitudinal approaches to gain a more comprehensive understanding of the patterns of organic food consumption and the evolution of related attitudes and intentions. Combining qualitative findings from interviews or focus groups with quantitative data can offer a more holistic view of how consumers make decisions. This study investigated specific factors, including consumer EC, EV, VP, PS, and GP, on consumer attitudes and intentions toward organic food and WTP premium prices. However, other factors, such as socioeconomic factors, perceived danger, and pro-environmental behavior, that may impact consumers' attitudes and intentions toward organic food consumption were not considered. Future research should explore these factors to better understand the complex consumer behavior toward organic food consumption. Furthermore, moderating factors, such as green labeling, consumer trust, and consumer knowledge, should be considered to better understand this phenomenon. Moreover, this study focused solely on organic food consumption and did not examine particular types of organic food, such as vegetables, grains, and organic fruits. Future studies should explore the consumption of these specific types of organic foods. This study focused on a specific age group (18–35 years), and future research should aim to include other generations, such as Gen Y and Z. Furthermore, as this study was conducted in China, there is potential for future research to replicate these findings through comparative analyses in other countries. This study contributes to the global discourse on organic food consumption by offering a detailed case study from China, a rapidly growing market. The insights gained provide a foundation for understanding consumer behavior worldwide and suggest that similar research in diverse international settings could further validate and expand upon these findings. This study provides significant insights into organic food consumption. Future studies should address the limitations identified in this study to gain a more thorough understanding of this topic.

Data availability

Data will be available on request, further inquiries can be directed to the corresponding author/s.

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Author contributions

Tong Hu, Mohammad Nurul Hassan Reza, and Qing Yang: Conceptualization, Investigation, Methodology, Writing—original draft preparation. Abdullah Al Mamun and Mengling Wu: Conceptualization, Methodology, Formal Analysis, Writing—review & editing.

Competing interests

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Ethical approval

The Human Research Ethics Committee of Nantong Institute of Technology, China approved this study (Ref. No. BS-NIT-2023-0901) This study has been performed in accordance with the Declaration of Helsinki.

Informed consent

Written informed consent for participation was obtained from respondents who participated in the survey.

Consent to publish

All authors approved the manuscript and gave their consent for submission and publication.

Additional information

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Correspondence and requests for materials should be addressed to Abdullah Al Mamun.

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