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Purchase intention toward organic food among young consumers using theory of planned behavior: role of environmental concerns and environmental awareness

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This study aims to propose an extended model of the theory of planned behavior (TPB) which helps us to investigate young Chinese consumers from college and university, and who are aged 18 to 30 years, on purchase intention for organic food. Using a sample of 515, analyses were done using structural equation modeling. The findings indicated that attitude (A), subjective norms (SNs), and perceived behavioral control (PBC) have positive effects on the purchase intention of young consumers for organic food. Moreover, attitude has a positive effect on environmental concerns (EC). Furthermore, EC has a positive effect on young consumers' purchase intentions for organic food. Findings indicated that EC positively mediates the association between attitude and young consumers' purchase intentions for organic food. More importantly, the relationship between all latent variables (A, SNs, PBC) and purchase intention by young consumers is positively moderated by environmental awareness.

Keywords: attitude; environmental concerns; environmental awareness; purchase intention; perceived behavioral control; subjective norms

1. Introduction

The Theory of Planned Behavior (TPB) is an extended model of the theory of Reasoned action and one of the most extensive models for social psychologists to predict behavioral intention (Ajzen 1985; Collins and Carey 2007). In the field of environmental protection intentions, many researchers also use the TPB as an important theoretical basis to understand whether consumers intend to follow environmental protection behaviors (Lam 1999; Chen and Tung 2010; Bamberg 2003). Some of these studies combine the theory of planned behavior with other determinants and extend them to their research models. For example, (Chen and Tung 2010) established an extended TPB research model that combines the ethics and consequences of recycling to explain consumers' recycling intentions and found that the extended TPB research model can achieve this. For example, in the context of organic food, Yadav and Pathak (2016b) use the TPB model to explain consumers' decision-making process for

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purchasing organic food. The results of the two studies show that the TPB model can strongly predict consumers' willingness to purchase organic food.

With the increasingly severe problems of food safety and the environment, various steps and certification projects have been carried out by the Chinese government. For example, organic food, green food, harmless products, and good agricultural practices (GAP) have been used sequentially. Grounded on resources, advantages such as labor resources, and the pursuit of economic benefits, organic food production in China has been increasing rapidly.

China is growing as a leader in sustainable and organic agriculture. The total area of certified organic agriculture increased more than five times between 2005 and 2018, to 3.1 million hectares. Moreover, China was ranked third after Australia and Argentina in certified organic area in 2017. Therefore, total organic sales in China ranked fourth after the United States, Germany and France. Furthermore, $65 billion of organic food is exported from China per annum. This success is seeding a transformation toward a more sustainable food system within China (Scott and Si 2020).

In small and medium-sized cities, the consumption of organic food is even rarer, while in rural areas, organic food sales are almost zero (He *et al.* 2019). However, with the recent increase in Chinese consumers' income and consumption levels, food nutrition and food safety issues have increasingly attracted attention, and the domestic market for organic food has developed rapidly (Scott *et al.* 2018). Although China's average gross domestic product (GDP) is still low due to the differences between the eastern and western regions and between rural and metropolitan areas, residents have greater purchasing power in medium-sized or large cities, especially cities in the eastern coastal regions (Xu and Yang 2020). Therefore, the organic food market has shown great potential to a certain extent. Since China is a densely populated country with massive production and consumption potential, the development of its organic food market may affect the global organic food market (Tariq *et al.* 2019).

Some research has been carried out on consumers and organic food in different countries. Yiridoe, Bonti-Ankomah, and Martin (2005) have reviewed the literature on consumers and organic food in relation to these issues. In this study, the focus is on demand, to analyze the factors that influence consumers' choice of organic food. Most empirical studies on demand for organic food have analyzed this, and according to the methodology adopted, these studies can be divided into two categories. The first group consists of papers that use discrete selection models to study factors that influence consumers' choice of organic food. At the same time, the second group also analyzed the basic factors that explain the choice of organic food, but adopted different methodological methods (He *et al.* 2019). As part of the first group, Huang (1996) established a bivariate probability model to assess the factors that influence the freshness of agricultural products. The model will guide/help American consumers not to choose chemical pesticides. A few scholars such as Thompson and Kidwell have studied the way consumers choose organic foods and related factors by using discrete models such as probit or logit (Loureiro, McCluskey, and Mittelhammer 2001; Gracia and de Magistris 2008). At the same time, in the second group, Schifferstein and Oude Ophuis (1998) conducted a discriminant analysis to determine the main factors that explain the Dutch consumers' decision to purchase organic food. In addition to these studies, many scholars have adopted various methods, such as confirmatory factor analysis, path analysis, moderate regression analysis (MRA) and structural equation modeling (SEM), to name a few (Chryssohoidis and Krystallis 2005; Arvola *et al.* 2008).

Young consumers denote a powerful engine in the development of eco-friendly conscious population, as well as a promising market for organic products. Organizations and marketers therefore increasingly focus on and develop strategic marketing campaigns and environmental education programs that target the young consumer segment. Indeed, prior scholars have produced contradictory results while assessing young consumers' intention toward organic products (Xie *et al.* 2015; Lian and Yoong 2019), and have called for future studies in the context of developing countries (Pham *et al.* 2019). Therefore, this study aims to investigate a number of moral, emotional, rational and self-identity determinants that may impede or support green purchase intention among young consumers. Most importantly, this study provides a comprehensive understanding of why young consumers are more conscious of organic foods, what are the motivational factors and how their intention could be affected.

Finally, based on current research, it is clear that more research on organic food purchase intentions and demand has been carried out in the United States and Europe, although some empirical research on organic food and consumers has been conducted in Asia. However, none of the up-to-date references specifically analyze the mediating and moderating role of environmental concerns and environmental awareness that influence young consumers' choice of organic food in the Chinese market. Hence, the move to organic farming can be beneficial to the environment and health, and also a lucrative business, provided that consumers' intentions coincide. So, to discover young consumers' intentions, this study aimed at exploring the determining factors that affect the intention to buy organic food in China. It also sought to establish the mediating role of environmental concerns and the moderating role of awareness in young consumers' intent to purchase organic food.

2. Theoretical background and literature review

The structure of the proposed framework is shown in Figure 1. There are nine hypotheses from six structures, namely, attitudes to buying organic food, subjective norms, perceived behavior control, environmental awareness, and young consumers' purchase intention for organic food.

2.1. Extended model of TPB

2.1.1. The elements of the extended TPB model

TPB derived from reasoned action theory given by (Fishbein and Ajzen 1975). It pointed out that intention can be assessed by two latent variable attitudes and subjective norms. The theory focused on forecasting human behaviors (e.g. purchase, decision making, or based on situation/subjective context) by suggesting that behavioral intentions influence individual behavior; these are mainly aroused by attitudes and subjective norms. Hence, the theory is based on two important parts; first, the function of observed magnitudes (attitude), the consumer may associate with the behavior. Second, subjective norms relate to the belief that an important person or group of people will approve and support a particular behavior. Subjective norms are determined by the perceived social pressure from other people on certain behavior and their motivation to correspond to the views of these people. The vitality of these determinants and the degree to which they impact a particular behavior may be affected. They are investigating the intentions and behavior" (Eriksson 2007). An advanced level of the TRA is

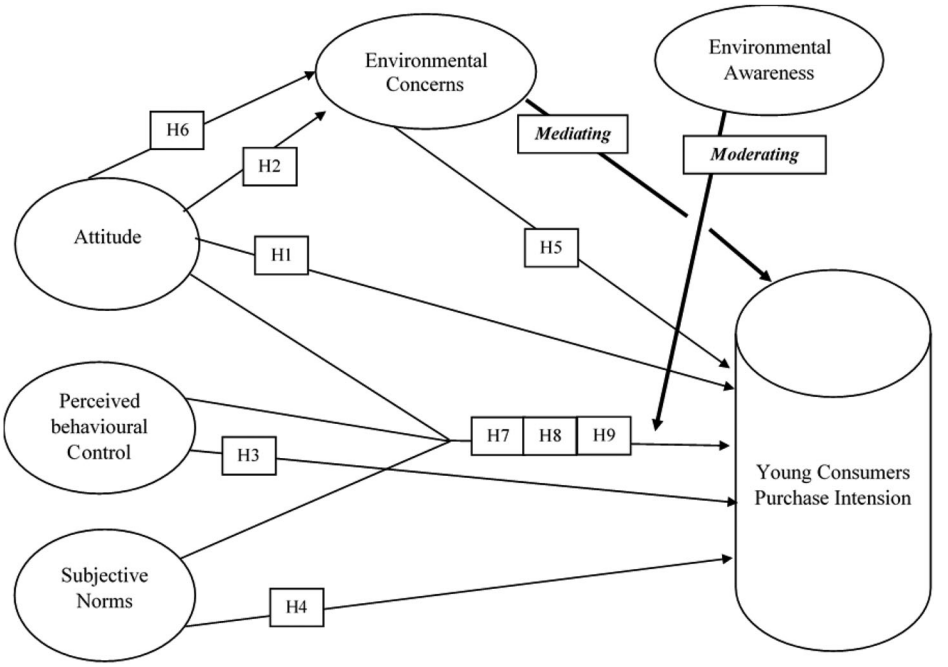

Figure 1. Conceptual model for extended theory of planned behavior.

the TPB, with perceived behavioral control added as another variable (Ajzen 1991). The theory postulates intent as a cognitive representation of a person's preparation to perform a given behavior, which is considered to be a direct cause of the behavior. This intention is determined by three things: their attitude toward specific behavior, subjective norms, and perceived behavioral control (Ajzen 1991). Hence, the theory is widely used in several areas to enlighten the specific behavior of a person toward a particular phenomenon (Sharma and Foropon 2019; Nahapetyan *et al.* 2019; Giampietri *et al.* 2018).

2.1.2. Attitude toward environmental concerns and organic food

In studies of consumer psychology, attitude has always been considered a key component for behavioral intention and actual behavior. Attitude is general and specific terms that consumers like and dislike when making product or service decisions. Attitude to organic food has been considered a vital construct that effectively anticipates pre-environmental market intention and consumption (Blackwell, Miniard, and Engel 2006; Yazdanpanah and Forouzani 2015). In general, consumers with positive attitudes toward organic foods/green offerings are more inclined to buy green offerings (Clark *et al.* 2019; Trivedi, Patel, and Acharya 2018). Previous studies reveal that most consumers have a favorable response to organic foods (Larson 2018; Yadav and Pathak 2016a). Therefore, on the basis of literature reviewed, the subsequent hypothesis is proposed:

According to Fazio (1995) attitude is the interaction in memory between a given object and a brief assessment of that object. Attitudes may reveal consumers'

psychological assessment of products (Bonne *et al.* 2007; Xu *et al.* 2020). In particular, previous research has focused on the relationship between attitude and intentional behavior. For example, Irland (1993) concluded that consumers' willingness to purchase depends on their environmental attitudes. According to Tsen *et al.* (2006), attitude is one of the main factors that predicts consumers' willingness to purchase green products. Mostafa (2007) found that in many cultures, there is a positive relationship between attitude and behavioral intention. Attitude has a definite role in accepting specific behavioral decisions (Huang *et al.* 2018). When studying environment and attitudes, attention to the environment is important (Yadav and Pathak 2016b). Zhou *et al.* (2013) found that environmental issues have a positive impact on China's attitude toward organic food consumers. Ayub, Naziman, and Samat (2018) observe that environmental issues have a positive impact on consumers' attitudes toward organic food, which further affects their willingness to purchase organic food (Pham *et al.* 2019). Kushwah, Dhir, and Sagar (2019) have considered the direct and indirect impacts of environmental concerns and found that environmental concerns influenced attitudes and willingness to purchase organic food. Therefore, we assume:

H1- Attitude has a positive effect on young consumers' purchase intentions for organic food.

H2- Attitude has a positive effect on environmental concerns.

2.1.3. Perceived behavioral control (PBC)

This is an individual's verdict related to their abilities either to engage in specific behavior or not. According to Al-Swidi *et al.* (2014), PBC defined as "the People's awareness of available resources such as the purchasing power of organic foods is more high-priced than non-organic foods. The availability of time is also critical because, in various countries, people need to find a specialty store to buy organic food". Shin *et al.* (2018) noted that along with the other two items of the TPB, attitude and subjective norms, PBC is considered as a main latent variable that influences the selection of organic menus. Al-Swidi *et al.* (2014), using a study of a sample of 184 (faculty and students) of Southern-Punjab, China, confirmed the significant effects of PBC on purchase intention toward organic food. In contrast, by focusing on genetically modified food consumption intention, an investigation about Iranian respondents employing TPB, a hypothesis in relation to influences of PBC toward purchase intention of food, was rejected (Akbari *et al.* 2019). Therefore, it is assumed that;

H3- Perceived behavioral control has a positive effect on young consumers' purchase intentions for organic food.

2.2. Subjective norms (SNS)

According to Zhu (2018), subjective norms refer to the social stress you receive from people around you and those who are essential to your life. Subjective norms play a vital role in the utilization and purchase intentions of young consumers for organic foods (Bai, Wang, and Gong 2019). Although, few of the studies have criticized the use of this construct based on the culture (Akbari *et al.* 2019). Zagata (2012) proposed

that one of the essential and related sources of societal influence toward consumption and choices of organic food mostly comes from ancestors and companions, while co-workers have fewer influences. Research carried out by Scalco *et al.* (2017), based on TPB, and grounded in green food purchase intention, indicated that SNs have greater importance and positive effects on purchasing intentions. In contrast, an Indian study employed by Kumar, Manrai, and Manrai (2017) on a sample of 235 students in post-graduate study found insignificant effects for SNs toward the purchase intention for environmentally sustainable products. As per the investigation, there is a significant influence by SNs toward green food buying intention (Yadav and Pathak 2017). Therefore, we proposed:

H4- Subjective norms have a positive effect on young consumers' purchase intentions for organic food.

2.3. Environmental concern (EC)

According to Crosby (1981), environmental concern is defined as "strong attitude for protecting the environment." (18) To better understand the receptiveness of the green movement in a nation, examining the consumer view about issues related to the environment and how these views are reflected in their organic food purchases can be a good starting point (Koklic *et al.* 2019). Concern about the environment is fundamental to environmental research and it is an important factor in the consumer decision-making process (Liao, Shen, and Shi 2020). If the consumer has a higher degree of concern toward the environment this may result in some eco-friendly purchasing (do Paço *et al.* 2013). Heightened concern for the environment resulted in greater likelihood for buying eco-friendly products (Bhattacharyya and Cummings 2014; Kalafatis *et al.* 1999). Research on organic food shows that those who consume organic food were more concerned about the environment, as compared to the general population (Hughner *et al.* 2007; Azzurra, Massimiliano, and Angela 2019). Alibeli and Johnson (2009) define environmental concern as the degree to which people understand environmental problems and their willingness to solve environmental problems. (Diamantopoulos *et al.* 2003) report that environmental issues are an important factor in consumer decision-making. Aman, Harun, and Hussein (2012), Indriani, Rahayu, and Hadiwidjojo (2019) observe that more and more environmentally conscious consumers will increase their willingness to purchase organic food. Consumers who pay more attention to the environment may purchase organic food (Konuk 2018). Therefore, people usually regard environmental concerns as a strong motivation for purchase (Zheng and Liu 2019). Several studies have examined the impact of environmental issues on willingness to purchase organic food (Konuk 2018; Wang, Pham, and Dang 2020; Cheung and To 2019).

Scholars have increased the focus on environmental concern as it is the result of growing concerns by consumers toward environmental sustainability and is considered one of the key issues of environmental records. Diekmann and Franzen (2019, 2) define environmental concerns as realization "that environmental conditions are threatened by human resource consumption and pollution." Urban (1986) is the pioneer to raise questions related to environmental concerns. He believes that this is a multidimensional measure consisting of "value, environmental attitudes, and ecologically responsible behavioral intentions" (Urban 1986, 2). Additionally, researchers have

utilized distinctive approaches to hypotheses and measure this latent variable. According to Weigel and Weigel (1978), the common scale includes the EC scale and the new environmental pattern. Therefore, we suggested the following hypotheses:

H5- Environmental concerns have a positive effect on young consumers' purchase intentions for organic foods.

Attention to the environment refers to people's awareness of environmental problems and their desire to solve them (Singh and Bansal 2012). Esmaeilpour and Bahmiary (2017) have reported that international research shows that consumers pay more attention to environmental changes and change their behavior in this regard (Papadopoulos *et al.* 2010). The community's focus on the environment has led to the emergence of a new type of consumer, indicating their concerns in purchasing decisions (Chamorro and Bañegil 2006).

Few researchers have reported that environmental concern has a positive effect on consumer attitudes toward environmentally friendly products and services which further affect their willingness to purchase (Huang *et al.* 2018). More specifically, a significant positive impact of environmental concerns on the purchase intention of a wide range of eco-friendly/organic food has been proposed. For example, Haghjou *et al.* (2013) have reported that environmental concerns have had a significant positive impact on consumers' willingness to purchase organic food (environmentally friendly vehicles). They further reported the significant impact of environmental concerns on consumers' willingness to purchase biofuels. The discovery of Ahmad and Juhdi (2010) shows the significant positive impact of environmental concerns on organic food purchasing behavior and good civic behavior on the environment. Paul and Rana (2012) found that environmental concerns had a significant positive impact on consumers' intentions to favor green energy brands. Mostafa (2009) identified environmental concerns in the main variables that influence consumer attitudes and willingness to purchase green products. Lockie *et al.* (2004) also reported that attention to the environment would positively affect consumers' attitudes toward organic food, which in turn will further affect their organic food purchase intentions. Even researchers such as Voon, Sing Ngui, and Agrawal (2011), Kushwah, Dhir, and Sagar (2019) mentioned the importance of paying attention to the environment, even when evaluating the company's intention to adopt cleaner technologies. This shows the importance of focusing on the environment in two situations; firmness and personal intentions and actions. Based on the above discussion, the following hypotheses are proposed. According to the literature review, the following assumptions can be drawn.

H6- Environmental concern positively mediates the association between attitude and young consumers' purchase intention for organic foods.

2.4. Environmental awareness

Examining attitudes toward environmental sustainability, numerous researchers have shown that the decision to buy and consume organic food is strongly and progressively determined by environmental awareness among consumers. (Laureti and Benedetti 2018). According to Zsóka *et al.* (2013), environmental awareness means donating information and awareness about environmental issues and resolutions. Moreover, Safari *et al.* (2018) interchangeably used environmental awareness with environmental

knowledge, and considered the key determinants of green behavior. It is vital for the wellbeing of society at large scale to spread environmental awareness and sensitivity education among the human population. Chen (2007) concludes that increasing environmental awareness, along with worries about harmless foods, caused individuals to question contemporary farming practices, so that sustainability of the environment can continue. It is considered an essential element affecting the consumption behavior of individuals and the sustainability of the environment (Choi and Johnson 2019). Hence, the following hypotheses are suggested.

H7- Environmental awareness positively moderates the association between attitude and young consumers' purchase intention for organic food.

H8- Environmental awareness positively moderates the association between PBC and young consumers' purchase intention for organic food.

H9- Environmental awareness positively moderates the association between SNs and young consumers' purchase intention for organic food.

3. Research methodology

3.1. Study design

Complex functions affected by various factors can describe consumers' motives for purchasing organic food and their choices. These motives and choices show certain inconsistencies due to differences in the location and culture of consumers. Meanwhile, it is assumed that the reasons for consumers refusing to buy organic food are as follows: too expensive; inconvenient to buy; little understanding of organic food; variety and brand are limited; difficult to compare and choose; do not trust organic food; the taste is not better than traditional food; think no healthier than traditional food; think it is not good for the environment, and others (Chryssohoidis and Krystallis 2005; Schifferstein and Oude Ophuis 1998).

The present study is quantitative. More specifically, this article employed a survey questionnaire to reach young consumers in the country by using a connivance sampling method. For surety of the accurate hypothetical structure, an instrument was pre-tested by 5 academic experts and researchers and 2 pilot studies were conducted with 40 consumers in a separate region of the country one-to-one. After pre-testing and the alteration of vague and inappropriate items, the final survey-based closed-ended questionnaire was administered to harvest more specific designs for a defendant's viewpoint. To accumulate more information no limit was set for respondents. The present study employed a field survey technique to gather information from the respondents. The survey was carried out in summer from June 2019 to August 2019 from 09:00 to 13:00 and from 15:00 to 18:00 from Monday to Sunday. To collect more responses, the respondents were all organic food consumers. A survey questionnaire was distributed in the target localities and consumers from the supermarket were required to fill in the questionnaire, indicating whether they had purchased organic food. However, to work effectively, we used our field assistants who had a good understanding of local values, principles, and the language. This facilitated us with distributing, collecting relevant information, and returning questionnaires according to our guidelines. Primarily, the questionnaire was inscribed in English and soon after translated

into Chinese because a substantial proportion of participants failed to understand English. In the meantime, we had distributed and assembled a survey questionnaire; giving clear instructions about the purpose, objectives, questionnaire, research methods, etc. We also thoroughly explained the terminology and theoretical terms to reduce misunderstanding by participants. Our questionnaire contained a letter explaining the purpose of the survey and ensuring the confidentiality of the participants. However, 600 questionnaires were distributed in four provinces of China, namely; Jiangsu, Shanghai, Beijing, and Sichuan. A total of 600 questionnaires were distributed, although 85 questionnaires were unusable; we used 515 for data analysis because some participants did not answer all the questions or chose two answers for one question. Hence, the response rate was 85.8%. As per the rule of thumb (Kline 2015), for sample size, there should be 10 to 15 parameters for each item, this study consists of six latent variables which includes 22 items (22*15 = 330). Therefore, the sample (515) used in this study adequately satisfies the rule (Kline 2015). Data analysis was done using Partial Least Squares Structural Equation Modeling. To measure each part of the variables, we used a five-point Likert scale ranging from "strongly disagree" to "strongly agree."

3.2. Respondents' information

The sample size was 515, among them 313 (60.7%) were female, and 202 (40.3%) were male students. Data were collected from young consumers (students) from colleges and universities; the respondents were required to answer whether they were students from a college or university. However, they selected a particular response. Moreover, three age groups included - <18, 18-24, and 25-30. The majority of the respondents fall in the range of 18-24 (59.4%), while the rest of (39.6%) fall in the range of 25-30. More specifically, 462 (89.7%) of the respondents were unmarried, the remaining 53 (10.3%) were married. Taking into consideration the education of respondents out of 515, approximately 248 (48.15%) were undergraduate students, 172 (33.4%) were masters students, and 95 (18.45%) were Ph.D. students. Their family income ranged from < RMB 6,000 = (35.7%), RMB 12,000 to 15,000 (30.3%), and the remaining have > RMB 15,000 (34.0%). Most of the respondents reside in one of the most populous cities of the country, Nanjing 220 (42.7%), followed by Shanghai (19.5%), Beijing (13.16%), and Chengdu (24.64%). The cities such as Jiangsu, Shanghai, Beijing, and Sichuan are located in China's most developed economic zone. These cities have close relationships with Hong Kong, Macau and Taiwan. They constitute the most important organic food market in mainland China. Retailers, especially supermarkets and specialty stores, dominate the domestic organic market. The main sales channels are through traditional supermarkets and high-end supermarkets, which control more than 80% of the retail market. The number of speciality stores is growing, but their sales are limited. The empirical research in this region provides a good example and reflects the current status and development trends in the Chinese organic food market. These four provinces were selected due to convenience and the emerging growth of student ratios in terms of locals and foreigners.

3.3. Measures of the items

The present study adopted a well-established and widely used scale. To measure the construct of attitude a five-item scale was taken from (Yadav and Pathak 2016b; Jaiswal and

Kant 2018). For assessments of environmental concerns, a four-item scale was taken from Paul, Modi, and Patel (2016). A three-item scale for purchase intention of organic food was taken from Biswas and Roy (2015). Additionally, perceived behavioral control was measured using three items drawn from Qi and Ploeger (2019). While three items for subjective norms were adopted (Han, Hsu, and Sheu 2010). Environmental awareness or environmental knowledge interchangeably used by previous scholars, was measured using three items taken from Maichum, Parichatnon, and Peng (2016) and two items taken from Asif *et al.* (2018). The questionnaire used a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." This scale asks respondents to indicate whether they strongly disagree or agree with a series of statements on a particular topic. Also, a Likert scale is an orderly scale from which respondents choose the option that best supports their opinion. It can be used to measure someone's attitude by measuring the extent to which they agree or disagree with a particular question or statement. A five-point Likert scale ranging from "strongly agree" to "strongly disagree" was employed, as it has been recommended by researchers to reduce the frustration level of respondents and increase response rate and response quality (Table 1). See Annex (online supplementary data) for a full list of constructs used in the study.

4. Results

Results were obtained using Partial least square structural equation modeling (PLS-SEM). Several tests mainly related to reliability, validity, and path coefficients, confirm that the measured data do not have multicollinearity and other data-related deviations (Hair *et al.* 2010). This analysis section used a two-way approach to assess the results.

a. Assessment of measurement model.
b. Structural model (Hair *et al.* 2010; Henseler, Ringle, and Sinkovics 2009).

4.1. PLS-SEM assessment of the measurement model

As per Henseler, Ringle, and Sinkovics' (2009) suggestions for measuring the model of study, scholars are required to assess the reliability of the individual items, internal consistency, content validity, convergent validity, and discriminant validity.

4.2. Reliability of the individual item

This was measured by considering the external load of the item associated with a particular construction (Hair *et al.* 2012). Hair *et al.* (2016) recommended that it should be retained between 0.40 and 0.70, while (Chin 1998) proposed that it should exceed 0.5. Hence, as demonstrated in Table 2, all the values of items for six constructs were adequately satisfied and meet the standard values noted in the range of 0.694 and 0.945.

As per the rule of thumb set by Nunnally (1987) the value of Cronbach's Alpha should be greater than 0.7. As displayed in Table 2, the values of CA fall in the range of 0.764 to 0.918. Therefore, it is concluded that the present study adequately meets the standard for reliability of the measures.

Table 1. Descriptive statistics.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Gender	515	1.00	2.00	1.3922	0.48872
College/University	515	1.00	2.00	1.6738	0.46928
Age	515	1.00	3.00	2.3864	0.52580
Marital Status	515	1.00	2.00	1.1029	0.30414
Education	515	1.000	3.000	1.70291	0.760843
Income	515	1.00	3.00	1.9320	0.79959
City	515	1.00	4.00	2.1883	1.21816
Valid N (listwise)	515				

4.3. *Internal consistency reliability*

According to Bagozzi and Yi's (1988) rule of thumb, the value of composite reliability must be equal to or greater than 0.7. Table 2 reflects the CR coefficient values of the hypotheses, which are in the range of 0.850 to 0.941, indicating that these measures have sufficient reliability.

4.4. *Assessment of the convergent validity*

According to the rule of thumb, the value of AVE should be equivalent to 0.5 or above (Chin 1998; Fornell and Larcker 1981). The value of AVE of the present study, as reflected in Table 2 falls in the range of 0.586 to 0.841 henceforth, it is concluded that this study demonstrated the acceptable range for assessment of convergent validity.

4.5. *Assessment of the discriminant validity*

Dualistic approaches were used to evaluate the "discriminant validity" of the variables. It was ensured that the cross-loadings of indicators must be higher than any other opposing hypotheses (Hair *et al.* 2012). Fornell and Larcker (1981) specify the standard; the square root of the AVE for each construct should exceed the relationship between the construct and other model constructs. Hence, as reflected in Table 3, both approaches ensured the satisfaction of the results and validity. Therefore, it can be concluded that all structures used in this study have sufficient discriminant validity levels.

4.6. *An assessment of the structural model*

This article utilized PLS bootstrapping with 600 bootstraps and 515 cases with the motive to enlighten the path coefficients and their significance (Henseler, Ringle, and Sinkovics 2009). A comprehensive overview of the structural model evaluations, along with the statistics related to moderation of environmental awareness are presented in Figure 1 and Tables 4 and 5.

To evaluate the variance of the measures, PLS-SEM suggests evaluating the R^2 coefficient, also known as the coefficient of determination (Hair, Ringle, and Sarstedt 2011). According to Cohen (1998), the values of R^2 are set to 0.60, 0.33, and 0.19,

Table 2. Measurement of model.

Constructs	Loadings	Items	CA	CR	AVE
Attitude (A)	A1	0.863	0.918	0.936	0.746
	A2	0.836			
	A3	0.860			
	A4	0.901			
	A5	0.858			
Environmental Awareness (EA)	EA1	0.859	0.904	0.929	0.723
	EA2	0.824			
	EA3	0.862			
	EA4	0.838			
	EA5	0.866			
Environmental Concerns (EC)	EC1	0.731	0.764	0.850	0.586
	EC2	0.694			
	EC3	0.822			
	EC4	0.809			
Perceived Behavioral Control (PBC)	PBC1	0.924	0.906	0.941	0.841
	PBC2	0.929			
	PBC3	0.898			
Purchase Intention (PI)	PI1	0.867	0.843	0.905	0.761
	PI2	0.865			
	PI3	0.886			
Subjective Norms (SNS)	SNS1	0.945	0.907	0.941	0.841
	SNS2	0.863			
	SNS3	0.941			

respectively, which are a rule of thumb, and these values are defined as significant, moderate, and weak. Instead, according to the rule of thumb, these are set to 0.75, 0.5, and 0.25, respectively (Henseler, Ringle, and Sinkovics 2009). Hair *et al.* (2010) recommended that the R^2 coefficient depends on the conditions in which a particular study is performed. However, according to Falk and Miller (1992) an R^2 factor of 0.10 is also satisfactory.

Meanwhile, as reflected in Table 6, the present study R^2 noted was 0.644. This proposes that attitude, environmental concerns, PBC, and SNs determine 62.4% of the variation in organic consumers' intent to purchase organic foods. According to Chin (1998), the obtained R^2 value is moderate. An additional test f^2, inner VIF was employed to ensure multicollinearity and data-related deviations. The variance inflation factor (VIF) was also performed to measure the amount of multicollinearity in a set of multiple regression variables. Mathematically, the VIF for a regression model variable is equal to the ratio of the overall model variance to the variance of a model that includes only that single independent variable. If the VIF is equal to 1 there is no multicollinearity among factors, but if the VIF is greater than 1, the predictors may be moderately correlated. A VIF between 5 and 10 indicates a high correlation that may be problematic. Therefore, per our estimations, the VIF of our variables was less than 3. Hence there is no issue of multicollinearity.

4.7. Q^2 Predictive relevance PLS path model

Taking into account the responsiveness of the measures, this study used a cross-validation redundancy measure, Q^2, to evaluate the model according to the

Table 3. Latent variable correlation & square root of average variance extracted.

	1	2	3	4	5	6
A	***0.556***					
EA	0.042	***0.522***				
EC	0.149	0.423	***0.343***			
PBC	0.213	0.387	0.229	***0.707***		
PI	0.238	0.546	0.161	0.495	***0.579***	
SNs	0.026	0.157	0.011	−0.014	0.192	***0.707***

recommendations of Ringle, Sarstedt, and Straub (2012). It represents the model's out-of-sample predictive power or predictive relevance given by the Q^2 (Geisser 1974; Stone 1974). In the structural equation model, the Q^2 value of the specific reflection endogenous latent variable is greater than zero, indicating the expected link between the path model and the specific dependent construct. Also, relative measures of predictive relevance (q2 values of 0.02, 0.15, and 0.35, respectively) indicate that for an endogenous construct, the predictive relevance of the exogenous construct is small, average, or larger. Therefore, as shown in Table 4, the results of the study indicate that the model has a small and medium predictive relevance.

4.7.1. *Testing of the hypotheses*

Table 4 demonstrates that the results of the structural model and the standardized path coefficient indicated positive effects among the constructs in the structural model. The results show that attitude has a positive effect on young consumers' purchase intention for organic food (H1: $\beta 1 = 0.132$, $t = 3$ .65, $p = 0.000$) specified that H1 was supported. Whereas, H2, the positive estimate of coefficients between attitude toward purchasing intention for organic food, is positively associated with environmental concerns were significant positive effects (H2: $\beta 2 = 0.149$, $t = 2.862$, $p = 0.004$). As a consequence, H2 was supported. The influence of EC (H3: $\beta 3 = 0.45$, $t = 13.99$, $p = 0.000$) positively affects young consumers' purchase intention for organic food. Thus H3 was supported. Perceived behavioral control significantly affects young consumers' purchase intention for organic food (H4: $\beta 4 = 0.155$, $t = 3.764$, $p = 0.000$), supporting H4. Subjective norms positively affect young consumers' purchase intention for organic food with (H5: $\beta 5 = 0.252$, $t = 7.011$, $p = 0.000$). Therefore, H5 was supported. Environmental concerns showed an indirect mediating effect in the relationship between attitude and young consumers' purchase intention for organic food (H5: $\beta 6 = 0.067$, $t = 2.954$, $p = 0.003$), supporting H6.

4.7.2. *Testing of the moderation effect*

The technique of product indicators employing structural equation modeling partial least squares (PLS) was used in the present study to identify and evaluate the moderating power of the effect of environmental awareness on the association (A-PI, PBO-PI, and SNS-PI) (Chin 2010). This study employed a product indicator method because the suggested moderating construct was continuous (Rigdon, Schumacker, and Wothke 1998). Moreover, to assess the moderating effects, the Cohen (1998) rule was used. Recalling H7, it has been proposed that environmental awareness positively moderates

Table 4. Heterotrait-monotrait ratio.

	1	2	3	4	5	6
A						
EA	0.084					
EC	0.168	0.5				
PBC	0.219	0.427	0.5			
PI	0.257	0.624	0.821	0.564		
SN	0.041	0.167	0.102	0.075	0.211	

Table 5. Path coefficients and hypotheses testing.

Hypotheses	Relationships	Beta	Mean	SD	t-value	p-value	Decision
Direct							
H1	A -> PI	0.132	0.132	0.036	3.65	0.000	Supported
H2	A -> EC	0.149	0.153	0.052	2.862	0.004	Supported
H3	PBC -> PI	0.155	0.158	0.041	3.764	0.000	Supported
H4	SNs -> PI	0.252	0.252	0.036	7.011	0.000	Supported
H5	EC -> PI	0.45	0.451	0.032	13.99	0.000	Supported
Mediating Effect/Indirect							
H6	A -> EC -> PI	0.067	0.068	0.023	2.954	0.003	Supported
Moderating Effects							
H7	A*EA -> PI	0.093	0.093	0.028	3.381	0.001	Supported
H8	PBC*EA -> PI	0.094	0.092	0.024	3.926	0.000	Supported
H9	SNs*EA -> PI	−0.301	−0.296	0.043	7.068	0.000	Supported

the association between attitude and young consumers' purchase intention for organic food. It is assessed that Figure 1 and Table 5 suggest that the A * EA interaction terms i.e. $\beta = 0.093$, $t = 3.381$, $p = 0.001$ were significant. Therefore, H7 has received full support. Also, H8 has proposed that EA moderates the association between PBC and PI. Similarly, as can be seen, Figure 1 and Table 5 suggested that the PBC * EA interaction terms $\beta = 0.094$, $t = 3.926$, $p = 0.000$ were significant. Thus, the H8 has also received full support. Furthermore, H9 has shown that the relationship between PBC and purchase intention of the young consumer for organic food significantly moderates with environmental awareness. As indicated, Figure 1 and Table 5 showed that the SNS * EA interaction term ($\beta = -0.301$, $t = 7.068$, $p = 0.000$) was significant. Similarly, H9 has also received full support. According to the rule of evidence from the path, coefficients were used to illustrate the moderating effect of leadership on the link between A-PI, PBC-PI, and SNS-PI, Figures 2–4, proposing improved relationships (Aiken, West, and Reno 1991).

4.7.3. *Testing the power of the moderating effects*

The strength of the moderating effects could be estimated by assigning the R^2 value of the core and the R2 complete model, and the power of the moderating effects could be estimated using the following formula (Henseler and Fassott 2010; Cohen 1998).

$$\text{Effect Size} : (\text{f})^2 = \frac{R^2 \text{ model with moderator} - R^2 \text{ model without moderator}}{1 - R^2 \text{ model with moderator}}$$

Table 6. Cross validated redundancy.

	SSO	SSE	Q^2 (=1-SSE/SSO)
EC	2,060.00	2,035.92	0.012
PI	1,545.00	838.595	0.457

According to Cohen (1998), the values of 0.02, 0.15, and 0.35 represent weak, moderate, and strong measurement effect sizes, respectively. As per the rule of Cohen (1998), the power of the moderating effect of leadership was assessed and reported in Table 7. On the other hand, Chin, Marcolin, and Newsted (2003) stated that a small effect size does not necessarily mean that the causal preservative effect is irrelevant.

Chin, Marcolin, and Newsted (2003) stated that even a small interaction effect could make sense under exceptional moderating settings; if the resulting beta changes are expressive, at that time, it is important to consider these conditions. This recommended that the moderating effects of environmental awareness in behavior, PBC, SNs, and the purchase intention of young consumers' association could be significant.

The slope for the association between attitude and young consumers' purchase intention is moderated by environmental awareness and the association became stronger when EA is low. The slope is given in Figure 2.

The slope for the association between PBC and young consumers' PI is moderated by environmental awareness and the association became stronger when EA is low. The slope is given in Figure 3.

The slope for the association between SNS and young consumers' PI is moderated by environmental awareness and the association became stronger when EA is high. The slope is given in Figures 4 and 5.

5. Discussion

Previous consumer studies based on consumer willingness to pay analysis have had inconsistent results on the effect of consumer characteristics on organic foods, assuming that consumers purchasing intention is equal to their actual payment behavior. Therefore, this study proposed the extended TPB model to explore factors affecting young consumers' purchase intentions for organic food in China. Generally, this study proved the latent variables employed in the study determine 64.4% of the changes in the intention of young consumers to purchase organic food. Moreover, the present study suggested nine hypotheses, as reflected in Table 1, among them, five were direct, one indirect, and three related to moderating effects. The present study hypotheses were proved with a significant level of p and t values (i.e. $t > 2$, and p- <0.05). Thus, findings were consistent with recent studies (Qi and Ploeger 2019; Jaiswal and Kant 2018).

The results show that young consumers' purchase intentions for organic food could be predicted through attitudes and subjective norms, perceived behavioral control, environmental concerns, and environmental awareness. Attitude, SNs, and PBC were found to have significant effects on young consumers' purchase intention for organic food and this is supported by Woo and Kim (2019), Chi *et al.* (2019), Maichum, Parichatnon, and Peng (2016). Our results show that the theory of planned behavior model and its measures were appropriate for this study. The empirical findings indicate that attitude has a positive effect on young consumers' purchase intentions for organic

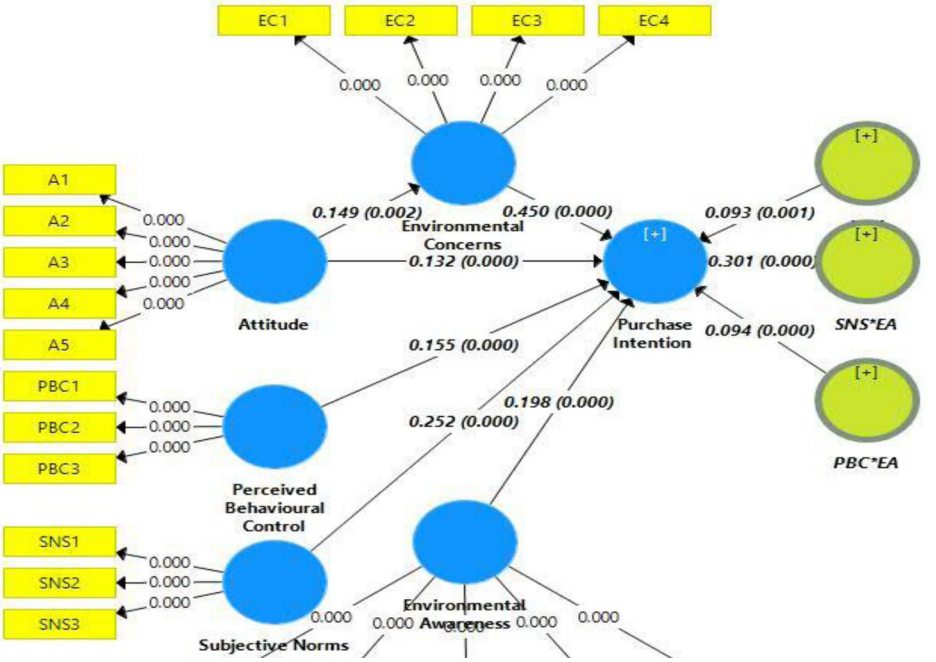

Figure 2. Structural Equation Modeling (Path coefficient and *p*-value).

food. According to He *et al.* (2019), attitude is one of the main factors playing an important role in predicting the intention of consumers to buy green food. It has been observed that the more positive a consumer is in purchasing behavior, the stronger the consumer's intention to act under his or her control (Maichum, Parichatnon, and Peng 2016).

Results also indicate that attitude has a positive effect on environmental concerns, reflecting that consumers with positive environmental behavior create a more positive intention to act in an environmentally conscious manner and behave according to this intention. Positive consumer attitude toward environmental protection greatly supports the purchase of green food, which is supported by the findings of Lim, Perumal, and Ahmad (2019).

The empirical finding reported that perceived behavioral control has a positive effect on young consumers' purchase intention for organic food. PBC is considered to be determined by the set of accessible control beliefs; that is, beliefs about the presence of factors that may facilitate or hinder the performance of the behavior. More importantly, the power of each control belief is weighted by the perceived power of the control factor, and the products are pooled (Watts and Chi 2019). The theory of planned behavior suggests that people are much more likely to intend to enact certain behaviors when they feel that they can enact them successfully (Ajzen 1991).

The findings show that subjective norms have a positive effect on young consumers' purchase intention for organic food, which indicates that SNs are the stronger determinant of young consumers' purchase intention toward organic food, which is supported by Chi *et al.* (2019). The outcome of SNs specifies that the influence of family and friends makes people pay more attention to the reasons for purchasing

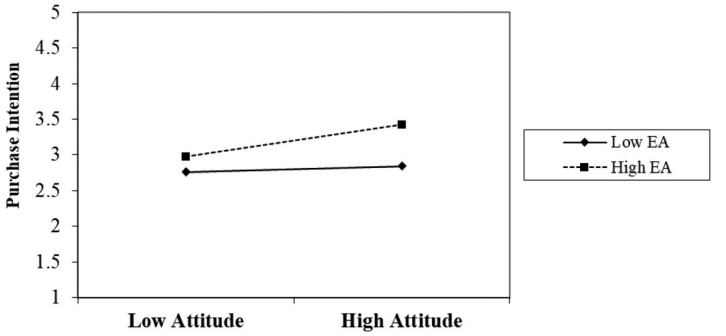

Figure 3. The slope for the interactive effect of attitude and EA on PI.

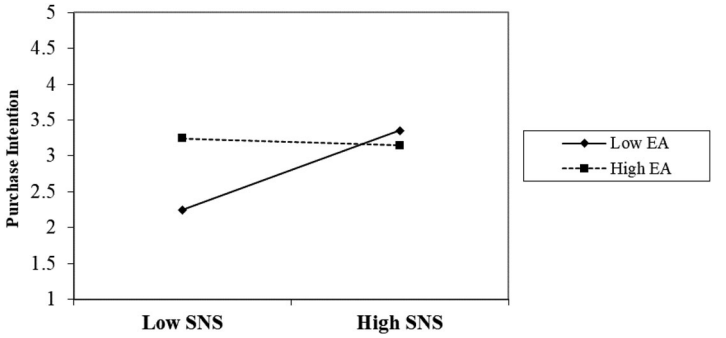

Figure 4. The slope for the interactive effect of SNS and EA on PI.

Table 7. Strength of moderating effects based on the rule of Cohen 1998.

Endogenous latent variable	R^2	Interaction terms	f^2	Effect-size
Purchase Intention	0.644	A*EA	0.021	Small
		PBC*EA	0.025	Small
		SNS*EA	0.127	Small

organic foods for young consumers. Therefore, family norm values imparted by parents in China, and purchase intention was associated (Jiang *et al.* 2019).

According to our findings, environmental concerns have a positive effect on young consumers' purchase intentions for organic foods. Earlier research in the environmental field, such as green energy brands and green buying behavior (Maichum, Parichatnon, and Peng 2016), has confirmed that environmental concerns motivate pro-environmental purchase behavior or intention.

On the other hand, environmental concerns positively mediate the association between attitude and young consumers' purchase intention for organic foods (Esmaeilpour and Bahmiary 2017). Lim, Perumal, and Ahmad (2019) proclaimed that environmental concerns are one of the main variables affecting consumers' attitudes toward the purchase intention for green foods. Our results show that when considering environmental concerns as a mediator in the relationship between attitudes and purchase intention of young consumers to predict the mediating role of EC, the impact of EC is supported (Nguyen, Nguyen, and Nguyen 2019). However, the mediated

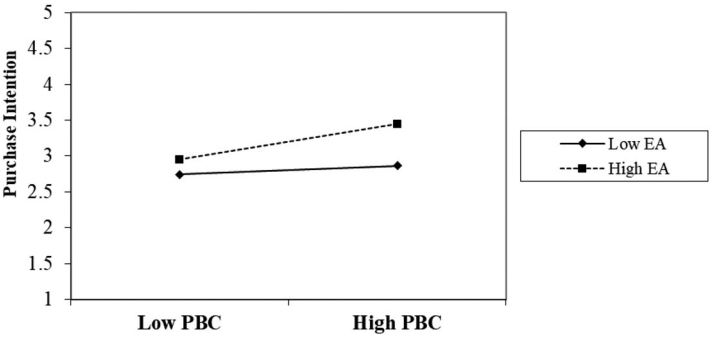

Figure 5. The slope for the interactive effect of PBC and EA on PI.

relationship indicates that environmental concerns affect young consumers' purchase intentions indirectly through attitude toward purchase intention of young consumers, which, in turn, directly affects young consumers' purchase intentions (Khaola, Potiane, and Mokhethi 2014). Findings indicate that environmental awareness positively moderates the association between attitude and young consumers' purchase intention for organic food. Environmental sustainability becomes more vital to youth and society. Hence, the moderation effects of environmental awareness supported and notified significant results that were consistent with Yi (2019). Whereas environmental awareness positively moderates the association between SNs and young consumers' purchase intention for organic food.

On the other hand, Environmental awareness positively moderates the association between PBC and young consumers' purchase intention for organic food. In high-awareness groups, attitudes have a greater impact on behavioral intentions than social norms. In contrast, in low awareness groups, social norms have a more significant impact on purchase intentions than attitudes. These results are consistent with previous studies (Pham *et al.* 2019; Zhang *et al.* 2018; Burucuoglu and Erdogan 2019).

6. Conclusion

This study attempted to examine how attitude, SNs, and PBC affect young consumers' purchase intentions for organic food using the theory of planned behavior. Moreover, this study also investigated the mediating and moderating role of environmental concerns, and environmental awareness to determine the purchase intention of young consumers for organic food in China. Keeping to the several well-established rules of thumb in the results section, the study proved and supported all of the hypotheses constructed. However, consumer support for the organic food market is based on individual attitudes and SNs. In particular, social stressors are more powerful than other factors. Meanwhile, the next influencing factors are attitude and PBC of younger consumers for organic foods. In other words, social consensus and norms are more critical to the transition to organic food through consumer engagement. Personal involvement depends on the consumer's attitude toward the activities perceived by society and the value of social justice. Strong consumer support for organic foods may lead to resistance to inorganic food culture. Our results indicate that high environmental awareness is associated with greater willingness to support the purchase intention of new consumers for organic food. Environmental groups and consumers lead the movement to buy

organic food, thus increasing consumer awareness. With this trend in mind, young consumers' willingness to buy organic foods may become more common. Buying sustainable organic foods is one way to achieve sustainable production of organic foods. In the past, it was difficult to produce organic food sustainably due to highcost issues. However, our proposed conceptual model of extended TPB also helps to alleviate cost issues, useful for marketing professionals and engaging new consumers in organic food. This can be a novel contribution to the present research in the literature.

6.1. Limitations and future research direction

This study was limited to the major cities of China, due to time and financial constraints, and only the field survey was used as a data collection tool. It can be spread via social media, emails, or other useful methods. The present study is more suitable for other developed countries. Although this study offers evocative evidence and effects concerning the purchase intentions of young consumers in China, similar to other developing countries, there are several other investigations to be made. Therefore, this paper encourages researchers to carry out similar research, but expands the attributes that affect young consumers' willingness to buy organic food to improve the reliability and effectiveness of the current research results. The upcoming investigation should combine both the purchase intention of the young consumers and their actual behavior toward consuming organic food. The advanced investigation should categorize the kinds of organic food offerings so that distinctive strategies can be established. The mediating role of environmental concerns can be explored further with the remaining latent variable of the TPB. Finally, the present study could be extended to other developing, as well as under-developed, countries.

6.2. Theoretical and practical implications

The current research theoretically and practically contributes by establishing the moderating role of environmental concerns and environmental awareness in organic food purchase intentions. The study also compared the drivers of organic food purchase willingness in four major provinces of China. Secondly, the study enabled practitioners to formulate effective marketing strategies in the four main provinces based on the best motivation for organic food purchase intentions. From the research, it is evident that the consumption level of organic food in China is positively correlated with the income level of consumers. Although most consumers may have realized the health benefits of eating organic foods, they still do not buy organic foods because they are expensive compared to traditional foods that are cheap and readily available. Nevertheless, it is clear that despite the high price of organic food, there are still some consumers who are willing to pay higher prices due to issues such as the health and nutritional benefits associated with organic food. The nutritional value of organic food is the main motivation that has a positive effect on consumption. The study also showed that active marketing activities can be launched to make consumers aware of the health and other environmental benefits of eating organic food, which will ultimately affect the purchase intention and sales volume of organic food. Besides, this study also guides policymakers in the country and other countries to switch to organic agriculture, because it meets the wishes of consumers, which is indeed good for the environment and health, and profitable for businesses. In the current study, income

only considers standards for middle-class consumers, which can be further improved to include more standards that meet middle-class qualifications.

The present study also helps to increase consumers' willingness to buy organic food and has a positive impact on the domestic and regional environment in China and internationally. The legislators/policymakers will be supported and guided on what needs to be highlighted in the policy to improve the purchase intention process of young consumers toward organic food. It also helps future researchers in a similar field by expounding areas of interest, which will need further study and more in-depth analysis

Disclosure statement

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Supplemental data

Supplemental data for this article can be accessed here.

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