

Study on Green Consumption Intention of University Students in the Guangdong-Hong Kong-Macao Greater Bay Area

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Keywords: The guangdong-hong kong-macao greater bay area, University student, Green consumption intention, Theory of planned behavior

Abstract: Green consumption is gradually becoming one of the key concerns in the world. In order to explore the green consumption intention of university students in the Guangdong-Hong Kong-Macao Greater Bay Area, this study is based on the theory of planned behavior (TPB) to explore the influence of environmental values, subjective norms, perceived behavioral control. Questionnaires and regression analyses were used to analyze 628 samples. The results showed that altruistic values, ecological values, Altruistic values, ecological values, norm of the nation, norm of university, price reasonableness, choice diversity, habits, and purchasing power all positively influence green consumption intentions, and egoistic values negatively influenced, while norm of family and friends do not have a significant effect on green consumption intentions. The findings of this study contribute to guiding university students' green consumption concepts, promoting green ideas and green lifestyles, and facilitating green development in the Guangdong-Hong Kong-Macao Greater Bay Area.

1. Introduction

It has always been the goal of the world to protect the ecological environment while developing. the Guangdong-Hong Kong-Macao Greater Bay Area plays a leading role in Chinese economic development, *the Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area* (2019) pointed out that we should vigorously promote the construction of ecological civilization, establish the concept of green development, promote the formation of green and low-carbon lifestyles, and aim to fully establish an international first-class bay area where the ecological environment should be effectively protected by 2035. Sustainable development not only relies on green production by governments and businesses but also requires residents to choose green lifestyle choices in their daily lives. University students are a large group that will have an impact on society in the future. The consumption consciousness of university students can effectively expand the green consumption of society. University is an important period for the formation of consumption values, so cultivating the green consumption consciousness and establishing the correct green consumption values are conducive to ecological conservation in the Guangdong-Hong Kong-Macao Greater Bay Area. It can also provide advice for the sustainable development of international first-class bay areas

and world-class city clusters.

In recent years, most studies on university students' green consumption intention have focused on specific influencing factors, such as social norms, social networks, and opinion leaders. There are almost no studies in the context of the Guangdong-Hong Kong-Macao Greater Bay Area. Green consumption is pro-environment behavior. Environmental values can significantly influence it. University is a period when students are receptive to new ideas, so the norm of others is particularly important. At the same time intention can be hindered by various factors. Therefore, this study examines the effects of environmental values, subjective norm of different objects, as well as internal and external control beliefs on university students' green consumption intentions in the Guangdong-Hong Kong-Macao Greater Bay Area.

2. Literature Review and Research Hypothesis

2.1 Green Consumption

Green was first proposed by the International Organization of Consumer Unions (IOCU) in 1963. Green consumption means that consumers pay attention to ecological protection and sustainable development in the selection, use and post-processing of products, so that the balance between demand and environmental protection will be achieved, and the negative impact on the environment can be minimized while achieving consumption goals (Sun, Liu & Zhao, 2019; Lao & Wu, 2013; Sheng, Gong & Xie, 2019). In 2020, the Global Environment Outlook considers green consumption as the basis of sustainable development. It reflects the environmental awareness and social responsibility of consumers, reducing the consumption of resources and energy to ensure the sustainability of resources and meet the basic needs of future generations (do Paço et al., 2019).

Green consumption has spontaneity and positive externalities. Consumers will make sacrifices in terms of costs, performance, and convenience because of environmental protection without deserved rewards (Peattie, 2010; Ning & Lao, 2020). Therefore, green consumption needs to be promoted by certain drivers. Previous studies have shown that socio-demographic, intrapersonal values, product information, existing environmental issues, income, and other personal-related, product-related, environment-related drivers influenced green consumption (Testa et al., 2021; Cerri et al., 2018). In addition, consumer habits and stereotypes also play a larger role in hindering green consumption (Zhang & Li, 2017; Halder et al., 2020). Huang et al. (2022) argued that not only government and enterprises should guide and motivate the green consumption intentions of consumers, but also residents should pull the green industry chain from individual behavior. Wang, Shen, and Chu (2021) argued that governments and businesses need to convince consumers of the positive effects of green consumption, reduce their reasons against green consumption and bridge the gap between attitudes and intentions.

2.2 Theory of Planned Behavior

The Theory of Planned Behavior (TPB), developed by Ajzen in 1991, suggests that individual behavior is influenced by attitudes toward the behavior, subjective norm and perceived behavioral control. Attitude reflects the individual's thoughts about behavior. Subjective norm is the intervention of others. Perceived behavioral control is the degree of an individual's perception of hindering or facilitating factors when performing a certain behavior. All three factors will impact behavioral intention and then influence behavior, while perceived behavioral control can also impact directly on behavior.

TPB has good explanatory and predictive power, and it has been widely used in accounting for green consumption intention and behavior. Moon, Mohel and Farooq (2020) found that the perceived

seriousness of environmental problems affects green consumption intentions by surveying Pakistani university students. Yang (2017) surveyed the consumption of green hotel products in Chinese universities and found that subjective norm and attitudes play a major role in students' buying willingness to green hotel products. In the study of Olya et al. (2019), subjective norm and perceived behavioral control all influence customers' willingness to revisit and recommend green hotels while the effect of perceived behavioral control is not significant.

2.3 Research Hypothesis

Environmental values are the values that individuals perceive about environmental problems (Wu and Sun, 2006). Stern and Dietz (1999) divided environmental values into three dimensions: egoistic values, altruistic values and ecological values. The three dimensions are respectively based on the perspectives of personal interests, social interests and ecological environment. Pro-environmental behavior will get people to pay more without deserved reward, so egoistic values have a negative impact on green consumption, while altruistic values and ecological values have a positive impact (Sheng, Gong and Xie, 2019; Ding, Jiang and Wang, 2021). Wang and Zhou (2019) demonstrated that ecological values can positively influence attitudes and ecological consumption behavior by surveying Xuzhou citizens. do Paço et al. (2019) found that pro-environmental attitudes can influence environmental values, while environmental values also positively influence green consumption behavior through attitudes. Zhu, Zhou, Zhang and Liu (2019) argued that Hangzhou citizens are environmentally conscious and collectivist. Environmental values make their consumption behavior tend to protect the environment. perceptions of green consumption from individuals, society and the environment can influence green consumption attitudes. Therefore, this study proposes the following hypothesis.

- H1: Environmental values significantly and positively affect intention to green consumption.
- H1a: Egoistic values significantly and negatively affect intention to green consumption.
- H1b: Altruistic values significantly and positively affect intention to green consumption.
- H1c: Ecological values significantly and positively affect intention to green consumption.

Consumers' attitudes toward environmental concerns will not always lead to their consumption behavior (do Paço et al., 2019), as subjective norm will impact behavior. Subjective norm are the pressures from society that individuals feel to support or oppose a behavior when deciding whether to perform it, and the degree to which consumers comply with the pressure. Hagger and Chatzisarantis (2005) classified subjective norm into the injunctive and descriptive norm. The influence of subjective norm on intention is related to personal characteristics, and peer norm are more likely to promote green consumption (Dupont, Harms & Fiebelkorn, 2022; Paul & Patel, 2015). Yang (2017), in his study of university students' consumption of green hotel products, argued that peer influence, superior influence, and social media had an impact on green consumption behavior, and that there is a "herd mentality" in their green consumption. Therefore, this study proposes the following hypothesis.

- H2: Subjective norm significantly and positively affects intention to green consumption.
- H2a: Norm of the nation significantly and positively affects intention to green consumption.
- H2b: Norm of university significantly and positively affects intention to green consumption.
- H2c: Norm of family and friends significantly and positively affects intention to green consumption.

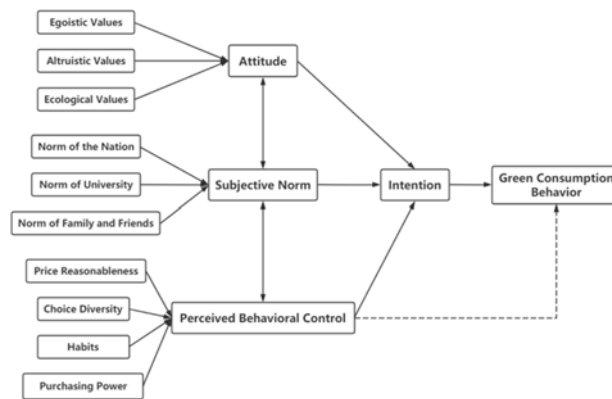


Fig.1 The Conceptual Model

Perceived behavioral control is a facilitator or hindrance to consumers' green consumption behavior. It can influence behavior through intention indirectly, as well as directly promote or inhibit behavior. Ajzen and Fishbein (2005) divided perceived behavioral control into internal control beliefs and external control beliefs, with internal control being a factor from the individual and external control being a factor from products and producers. External factors such as price, type, function and publicity act on perceived availability, then affect intention. Internal factors such as financial strength and demographic variables also contribute to the gap between intention and behavior (Gao and Wei, 2018; Chen and Zhao, 2015; Sun, Liu & Zhao, 2019). Many scholars have found that habit is a key driver of green consumption and that consumer behavior is more the result of habit than rational thought (Peattie, 2010; Eddie Guo, 2019; MacInnes, Grün & Dolnicar, 2021). Therefore, this study proposes the following hypothesis.

- H3: Perceived behavioral control significantly and positively affects intention to green consumption.
- H3a: Purchasing power significantly and positively affects intention to green consumption.
- H3b: Habits significantly and positively affect intention to green consumption.
- H3c: Price reasonableness significantly and positively affects intention to green consumption.
- H3d: Choice diversity significantly and positively affects intention to green consumption.

3. Method

3.1 Questionnaire Design

The questionnaire of this study is divided into two parts. The first part is demographic variables, aiming to screen university students from the Guangdong-Hong Kong-Macau Greater Bay Area as respondents. The second part is the green consumption intention and behavior survey, which involves three main factors, namely attitudes, subjective norm and perceived behavioral control. Attitudes are reflected by environmental values, which are divided into egoistic values, altruistic values and ecological values. Subjective norm measures the normative role of people with different social distances for university students. Perceived behavioral control reflects the facilitating or hindering role of includes internal control, such as purchasing power and habits, and external control, such as price reasonableness and choice diversity. The questionnaire used a 5-point Likert Scale, and questions are based on scales developed by Lao, Deng, Zhang, Yarimoglu, Gunay, and Han.

3.2 Data Collection

This study used a sampling survey method. The questionnaire was distributed in September 2021 to university students in the Guangdong-Hong Kong-Macao Greater Bay Area. A total of 628 questionnaires were distributed, of which 544 were valid, with an effective rate of 86.63%. A preliminary analysis of the collected valid data yielded the following results. Among the respondents, 240 were males and 304 were females, accounting for 44.12% and 55.88% of the valid samples respectively. The grades distribution was 116, 125, 204, 136 and 47 for freshmen, sophomores, juniors, seniors and postgraduates respectively, with the most respondents in the third year of university, accounting for 37.50% of the effective sample.

4. Result

4.1 Reliability Analysis

SPSS 26.0 was used to analyze the data. Since the data may be certain errors or biases in the measurement and sampling process, it is necessary to first test the consistency of the data, measure the reliability of the scale, and judge the reliability of the data. In this study, Cronbach's α coefficient was used as the judgment criterion for reliability analysis. After testing, it can be seen that the overall Cronbach's α coefficient of the total scale reached 0.858, and the Cronbach's α coefficients of attitude, subjective norm, perceived behavioral control, and intention were 0.873, 0.874, 0.797, and 0.717, which were all greater than 0.7. The scales have good reliability and stability and can be analyzed in depth.

4.2 Validity Analysis

The validity analysis of the scales was divided into content validity and structural validity analysis. Since the scales in this study were mostly based on previous studies, they had high content validity. The structural validity analysis of the scale adopted exploratory factor analysis. Before conducting factor analysis, the scale data were subjected to Kaiser-Meyer-Olkin (KMO) test and Bartlett's test to determine whether the data were suitable for factor analysis. The results showed that the KMO coefficient of the total scale was 0.870 with a P-value of $0.000 < 0.05$, and there was a strong correlation between the variables. The validity tests results of environmental values, subjective norm, perceived behavioral control, and intention is shown in Tab.1. The KMO of each variable was greater than 0.6, and they passed Bartlett's test, so factor analysis could be conducted. Principal component analysis was used, and the results were shown in Table 1. All factor loadings were greater than 0.5, and the CRs were greater than 0.7 and AVEs were greater than 0.5, which proved that the structural validity of this questionnaire scale reached an acceptable level.

Table 1 Validity Results

Factor		AVE	CR	KMO	Bartlett's test
Environmental Values	Egoistic Values	0.769	0.909	0.676	Pass
	Altruistic Values				
	Ecological Values				
Subjective Norm	Nation	0.614	0.905	0.833	Pass
	University				
	Family and Friends				
Perceived Behavioral Control	Price Reasonableness	0.725	0.940	0.647	Pass
	Choice Diversity				
	Habits				
	Purchasing Power				
Intention	Green Consumption Intention	0.697	0.821	0.682	Pass

4.3 Hypotheses Test Results

After reliability and validity analyses of the scales, a multiple linear regression model was used for hypothesis testing. The test results showed that egoistic values and ecological values significantly affect intention ($P < 0.001$), with correlation coefficients of -0.158 and 0.307. Altruistic values significantly affect intention ($P < 0.05$), with correlation coefficients of 0.119. The findings support H1a, H1b and H1c. Environmental values had a significant impact on the green consumption intention of university students in the Guangdong-Hong Kong-Macao Bay Area, confirming H1. The analysis shows that ecological values have the greatest impact on green consumption intention, while egoistic values negatively affect intention.

In terms of subjective norms, norm of the nation significantly affects intention ($P < 0.001$), with a correlation coefficient of 0.217. Norm of university is also a significant factor ($P < 0.01$), with a correlation coefficient of 0.146. However, the influence of family and friends on the green consumption intention of university students in the Guangdong-Hong Kong-Macao Bay Area is not significant. H2a and H2b is supported while H2c is not, and H2 is partially accepted. The call of the nation and government has the strongest guiding effect on university students and the most significant positive promotion effect on green consumption intention. The influence of university and fellow students is the second strongest, while the norm of family and friends is not significant. It is probably due to the independent life of university students.

Both external control beliefs and internal control beliefs in perceived behavioral control promote green consumption intention. Purchasing power and choice diversity significantly affect intention ($P < 0.001$), with correlation coefficients of 0.242 and 0.206, and H3a, H3d hold. The influences of consumption habits and price reasonableness are significant ($P < 0.05$), with correlation coefficients of 0.081 and 0.063, confirming H3b and H3c. Therefore, the findings support H3. According to the analyses of correlation coefficients, purchasing power is the main obstacle to university students' green consumption intention, followed by choice diversity, while the influence of consumption habits and price reasonableness is weak.

Table 2 Hypotheses Test Results of Proposed Model

<i>Path</i>	<i>Hypothesis</i>	<i>Path coefficient (β)</i>	<i>P</i>	<i>Result</i>
Egoistic Values → Intention	H1a	-0.158	***	Supported
Altruistic Values → Intention	H1b	0.119	*	Supported
Ecological Values → Intention	H1c	0.307	***	Supported
Norm of the Nation → Intention	H2a	0.217	***	Supported
Norm of University → Intention	H2b	0.146	**	Supported
Norm of Family and Friends → Intention	H2c	0.077	0.135	Not supported
Purchasing Power → Intention	H3a	0.242	***	Supported
Habits → Intention	H3b	0.081	*	Supported
Price Reasonableness → Intention	H3c	0.063	*	Supported
Choice diversity → Intention	H3d	0.206	***	Supported

Note: * denotes $P < 0.05$, ** denote $P < 0.01$, *** denote $P < 0.001$

5. Conclusions, Implications, Contributions, and Limitations

5.1 Conclusions

Based on the theory of planned behavior, this study investigates the green consumption intention

of college students in the Guangdong-Hong Kong-Macao Greater Bay Area from attitudes, subjective norm and perceived behavioral control. The empirical analysis shows that, firstly, environmental values significantly affect the green consumption intention of university students in the Guangdong-Hong Kong-Macao Greater Bay Area. Egoistic values negatively affect intention, altruistic values and ecological values positively affect it, and egoistic values and ecological values have the greatest impact. Secondly, norm of the nation and university significantly and positively affect university students' intention of green consumption, but the impact of family and friends is not significant. Thirdly, internal control factors and external control factors significantly affect green consumption intention. Purchasing power and choice diversity have the greatest impact on intention, while habits and price reasonableness have a weaker influence.

5.2 Implications

Through the analysis and hypotheses testing of green consumption intention of university students in the Guangdong-Hong Kong-Macao Greater Bay Area, this study provides the following implications.

Guiding the egoistic values and stimulating green consumption behaviors can promote the green consumption intention of university students in the Guangdong-Hong Kong-Macao Greater Bay Area. University students generally think that green consumption is good for protecting the ecological environment, but most of them think they have not experienced the benefits of green consumption for themselves. Green consumption is a kind of pro-environmental behavior, so university students will be negative to green consumption because they pay a lot without substantial reward. Guiding university students' egoistic values, making them aware of the benefits of green consumption for individuals, strengthening the concept of 'a Community of Shared Future for Mankind', and motivating green consumption, bridging the gap between payoff and reward, the negative impact of egoistic values can be diminished, or even turned into a positive impact.

Universities in the Guangdong-Hong Kong-Macao Greater Bay Area need to pay attention to education on the green consumption concept so as to implicitly influence students' consumption intention. The call of the nation and government is often strong binding, so students are more obedient to the subjective norm of the nation and government. The university period is a transition stage for students from the family to society, and students usually obey lecturers and professors at this stage, so university motivation plays a guiding role for students. According to the results of the questionnaire, from freshman to postgraduate, those scoring 4 or above for the 'norm of university' account for 37.9%, 41.6%, 45.1%, 58.8% and 58.5%, the overall obedience of students to norm of university is on the rise, indicating the significant guiding role of school during university in the Guangdong-Hong Kong-Macao Greater Bay Area. However, the norm of family and friends does not significantly affect green consumption intention, probably for the fact that university students are mostly away from their families and friends who grew up together, and the normative role is gradually weakening.

The hindering effect of habits on students' intention to green consumption is not significant, and university students are willing to pay a premium if they think green consumption is worthwhile. Being in the coastal areas and high-speed development of the Internet, university students in the Guangdong-Hong Kong-Macao Greater Bay Area are more receptive to new ideas. Consumption habits do not significantly affect the willingness to new consumption patterns, so making students know more about green consumption during university and guiding students to establish a correct concept of green consumption can effectively promote green consumption. In recent years, university students gradually accept to pay a premium in consumption, so changing students' perceptions of green consumption patterns will make them willing to pay a premium for pro-

environmental behaviors, and the impact of high prices on green consumption intention will be smaller as long as it is in a reasonable range.

5.3 Contributions and Limitations

With the popularization of higher education and the expansion of enrollment, university students gradually become a large consumer group. When they enter society, university students will become the main consumer of society, and their consumption concept almost represents the social consumption concept. University students have a large relationship network, and their consumption concept and behavior can influence their families, friends, colleagues and communities, so it is significant to cultivate the green consumption concept during the university period. As a world-class city cluster along the coast of China, the Guangdong-Hong Kong-Macao Greater Bay Area has a unique nature, both in terms of mutual communication among Guangdong, Hong Kong and Macao, and in terms of opening up to the outside world. Therefore, the ideology of university students in this area also has its own characteristics. Studying the influencing factors of green consumption intention of university students in Guangdong-Hong Kong-Macao Greater Bay Area is conducive to guiding university students in the Greater Bay Area to form green consumption awareness in a targeted manner, and achieving the goals of the Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area that promotes the construction of ecological civilization and facilitates the sustainable development of the Greater Bay Area.

Admittedly, there are still some limitations in this study. Firstly, the definition of “green consumption behavior” may affect the respondents' choices. This study did not specify “green consumption” as a certain consumption behavior when designing the questionnaire, and some respondents responded that they did not know what green consumption was. Common behaviors such as low-carbon travel, waste sorting, and water and electricity saving are all green consumption behaviors, but some respondents do not consider these behaviors as green consumption. Secondly, the questionnaire has certain limitations. The respondents may only choose according to the general view of the society, which leads to a large difference in the judgments of objective information such as price and choice of green consumption. Green consumption is influenced by many factors, but this study has only surveyed some of them. Whether the green consumption intention of university students in the Guangdong-Hong Kong-Macao Greater Bay Area is affected by more unique factors needs to be further studied.

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