

# Study on the Influencing Factors of Behavioral Intention for Express Packaging Recycling in the Context of Sustainable Development: A Case Study of Chinese Universities

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## Abstract

In the context of global sustainable development, express packaging recycling plays an important role in the sustainable development of society and the environment. This article conducted a questionnaire survey on 605 undergraduate students from 45 universities located in Jiangxi Province. Additionally, quantitative research was carried out with the assistance of SPSS and AMOS to investigate the factors that influence the willingness of college students to engage in express packaging recycling behavior. According to the findings, students' perceived behavioral control, the convenience of express packaging stations, and the perceived benefits all had small and significant positive effects on the intention of express packaging recycling. Policy promotion had significant positive and medium effect size on packaging recycling intention. In total, the four variables contributed 65% of variance on undergraduate students' willingness to participate in express packaging recycling. In light of this, the article proposes that future studies should investigate other factors that may influence students' willingness to participate in express packaging recycling. Moreover, it is also suggested that establishing the willingness of students to participate in packaging recycling can be increased through the promotion of policy propaganda and the establishment of convenient express packaging recycling stations, the simplification of the process of express packaging recycling, and the provision of certain incentives. This will ultimately achieve the recycling of express packaging and promoting the sustainable development of society.

**Keywords:** Behavioral Intention, Express Packaging Recycling, Sustainable Development, Case Study, China

## Introduction

The notion of sustainable development was initially put forth in the report "Our Common Future" in 1987 by the Brundtland Commission, which was founded by the United Nations. Since its inception, this concept has emerged as a pivotal concern in modern social and economic progress. The 2030 Agenda for Sustainable Development presented a set of 17 distinct goals aimed at achieving sustainable development. These goals addressed a wide range of concerns related to social, economic, and environmental aspects. The 11th and 12th sustainable development goals emphasized the importance of constructing inclusive, secure, resilient, and sustainable cities and human communities. This involves reducing pollution, minimizing resource usage, promoting sustainable consumption behaviors, and establishing sustainable consumption and production patterns.

In exploring sustainable development, the recycling and reuse of express packaging is an important aspect, directly relating to the efficient use of resources and environmental protection. According to the latest data from the State Post Bureau of the People's Republic of China, as of 2023, China's express delivery volume has reached 162.48 billion pieces, ranking first in the world (Bureau, 2024). At the same time, the express delivery industry consumes over 10 million tons of paper waste and about 2 million tons of plastic waste annually, and this trend is increasing year by year (Daily, 2023). The large amount of express packaging waste poses challenges to urban waste management and resource recycling. Many plastic packaging and foam materials are difficult to effectively recycle and process, resulting in resource waste and environmental pollution. To address this issue, China has also taken a series of measures. In 2020, the "Guiding Opinions on Strengthening the Standardization of Green Express Packaging" was issued, putting forward requirements on the layers, void ratio, and tape usage of express packaging to avoid repetitive packaging and excessive packaging (Council, 2020). At the same time, it vigorously promotes the concept of green consumption, guiding consumers to choose environmentally friendly packaging, reduce packaging or opt for packaging-free products, and reduce unnecessary express packaging waste.

However, the recycling of express packaging is a systematic project that requires the participation of the government, enterprises, and consumers. In particular, college students are a crucial part of express packaging recycling. According to the "Campus Express Industry Development Report (2022)" published by the China Education Logistics Association and Alibaba Research Institute, the number of campus express deliveries nationwide increased from 2.5 billion pieces in 2018 to 3 billion pieces in 2022 (China Association for Campus Management & Research, 2022). The increasing number of express packaging will cause pressure on the environment. Therefore, the society should shoulder the responsibility of mitigating such pressure via different approaches including express package recycling. Under such circumstance, consumers' intention towards recycling express packages be studied to better conduct strategies. Hence, this study explores the impact of consumer behavior intentions on the recycling of express packaging from the perspective of the college student consumer group, promoting the green development of the express industry, reducing resource consumption and environmental burdens, and achieving sustainable development. This study aims to answer the following three questions:

1. What is the level of college students' behavioral intention towards express packaging recycling at universities in Jiangxi Province?

2. Do perceived behavioral control, perceived benefits, convenience, and policy promotion have significant effects on college students' behavioral intention towards express packaging recycling at universities in Jiangxi Province?

3. What are the contributions of perceived behavioral control, perceived benefits, convenience, and policy promotion to college students' behavioral intention towards express packaging recycling?

### **Theoretical Foundation of Behavioral Intention for Express Packaging Recycling**

#### *Theory of Planned Behavior*

The Theory of Planned Behavior (TPB) is an important behavior prediction model in social psychology, widely used to explain and predict the motivations and determining factors behind individual behavior. This theory was proposed by social psychologist Icek Ajzen in 1985, as a further development of the earlier Theory of Reasoned Action and Planned Behavior Theory (Ajzen, 1985). Initially, Ajzen proposed the precursor to the Theory of Planned Behavior - the Theory of Reasoned Action. Later research revealed that behavior prediction not only depends on individuals' attitudes and subjective norms but also on perceived behavioral control. Therefore, Ajzen expanded his theory to TPB, incorporating individuals' subjective assessments of their control over the behavior.

The core concepts of TPB are threefold: the first is attitude, which refers to an individual's positive or negative evaluation of a specific behavior; the second is subjective norm, which refers to the perceived expectations or support from important others regarding the behavior; the third is perceived behavioral control, which refers to the degree of belief an individual has in their ability to control a specific behavior (Ajzen, 1991). Attitudes can be influenced by the expected outcomes of the behavior, the advantages and disadvantages it brings, and its social impact. Subjective norms reflect the social pressure and expectations of the individual's social environment. Perceived behavioral control includes the individual's subjective evaluation of the difficulty and capability related to the behavior.

TPB has been widely applied to predict and explain various behaviors. Researchers measure attitudes, subjective norms, and perceived behavioral control to predict behavioral intentions and actual behaviors. For instance, Dong Xuewang et al (2023), integrated the TPB and found that classification attitude, perceived behavioral control, and tourism experience have a significant positive impact on tourists' willingness to sort garbage. Zhang Wenrui and Zhiguang (2022), based on the TPB, used questionnaires and structural equation models to empirically analyze the public's willingness to participate in different "Internet + tree planting" modes, finding that attitudes significantly positively influence public participation willingness. Xu Jiaqi and Shengxiang (2022), studied the factors influencing farmers' willingness to purchase green agricultural products, discovering that the willingness to purchase green agricultural products is influenced by environmental attitudes and perceived behavioral control. Wang Xiaoqian and Xingfu (2022), based on the TPB, constructed a structural equation model of the influencing factors of traditional cultural study tours to explore the main factors influencing traditional cultural study tour behavior. The study found that behavioral attitudes and subjective norms have a significant positive impact on the willingness to participate in traditional cultural study tours. Suwan et al (2022), constructed a model of the mechanisms behind college students' willingness to sort garbage, finding that behavioral

attitudes and perceived behavioral control significantly influence their willingness to sort garbage. Other researchers found that behavioral attitudes, subjective norms, and perceived behavioral control all positively influence farmers' willingness to participate in the management of non-point source pollution in farmland (Hu Mengya et al., 2021). Wang Yang and Panheng (2022), investigated farmers' willingness to adopt straw return practices, finding that subjective norms, behavioral attitudes, and perceived behavioral control all positively influence their willingness to adopt straw return practices.

### **Social Exchange Theory**

Social Exchange Theory (SET) is one of the important theories in social psychology and sociology, explaining social behavior as an exchange that emphasizes interdependence, relationships, trust, and commitment (Cook et al., 2008). The theory was initially proposed by George Herbert Mead in the 1950s and was later further developed and refined by scholars such as Peter Blau and Richard Emerson. These scholars introduced the concept of the "social psychological mechanisms of exchange relations," emphasizing individuals' perceptions and behaviors in exchanges. SET includes four core concepts: exchange relationships, costs and benefits, expectations, and equity principle.

**Exchange Relationships:** SET posits that social relationships can be viewed as exchange relationships, where individuals satisfy each other's needs and goals by exchanging resources, services, emotions, or other benefits (Blau, 2017). This exchange is not limited to material resources but also includes emotional support, information, time, power, and more.

**Costs and Benefits:** Individuals weigh the costs and benefits when engaging in exchanges. Costs can include time, money, and effort, while benefits can be material rewards or emotional satisfaction (Homans, 1958). SET suggests that individuals tend to maximize benefits while minimizing costs.

**Expectations:** An individual's behavior depends on their expectations of the exchange. Expectations are formed based on past experiences and anticipated future outcomes (Cook et al., 2008). If individuals expect greater rewards from the exchange, they are more likely to participate in it.

**Equity Principle:** SET emphasizes the fairness in exchange relationships. Individuals tend to expect that exchange relationships are equitable, meaning their contributions and returns are proportional (Gouldner, 1960). Inequitable exchange relationships can lead to dissatisfaction and potential dissolution of the relationship.

### **Model Construction of Behavioral Intention for Express Packaging Recycling**

*Perceived Behavioral Control, Perceived Benefits, Convenience, Policy Promotion, and Behavioral Intention*

According to TPB, consumers' perceived behavioral control influences their behavioral intentions, which in turn affects their actual behavior. Perceived behavioral control refers to an individual's perception of their ability to execute a particular behavior. In simpler terms, it is an individual's self-assessment of whether they can complete a behavior, emphasizing the degree of control they feel they have over it. Generally, the stronger the perceived behavioral

control, the easier it is for an individual to carry out a behavior, leading to stronger behavioral intentions and subsequent actions. In the context of recycling express packaging, if consumers believe the process is simple, they are more likely to have a strong intention to recycle and thus participate in the recycling process, achieving the goal of packaging recovery.

SET highlights that costs and benefits are central concepts in social exchanges. Costs can include time, effort, and money. Recycling express packaging can be seen as an exchange between consumers and recycling companies. Consumers may perceive that recycling companies will reprocess and reuse the packaging collected from them, thereby reducing costs and increasing benefits for the company. However, from the consumer's perspective, there are no direct benefits. SET posits that exchanges must be based on fairness to occur. Therefore, recycling behavior must provide some return to both parties. This return not only includes money but also the time, effort, and perceived potential benefits for the consumer. Consequently, consumers are more likely to engage in recycling behavior if the process is convenient and they can perceive benefits, thus participating in the recycling activities of express packaging.

Moreover, some scholars have studied the impact of policy advocacy on behavioral intentions, finding that it promotes the intention to recycle express packaging (Wan et al., 2017). Policy advocacy includes both regulatory and promotional aspects. Regulatory aspects refer to whether relevant departments have established policies or legal regulations to support express packaging recycling. Promotional aspects involve guiding the public to participate in packaging recycling through campaigns, thereby raising consumer awareness and achieving recycling goals.

Based on the above research, the article proposes the following hypotheses:

**H1:** Perceived behavioral control has a significant positive impact on the intention of university students in Jiangxi Province to recycle express packaging.

**H2:** Perceived benefits have a significant positive impact on the intention of university students in Jiangxi Province to recycle express packaging.

**H3:** Convenience has a significant positive impact on the intention of university students in Jiangxi Province to recycle express packaging.

**H4:** Policy promotion has a significant positive impact on the intention of university students in Jiangxi Province to recycle express packaging.

Figure 1 presented the research framework of this study. According to the research hypotheses and research objectives, perceived behavioral control, policy promotion, perceived benefits, and convenience are the independent variables, and behavioral intention is the dependent variable in this study. The four independent variables are perceived to have influences on the dependent variable.

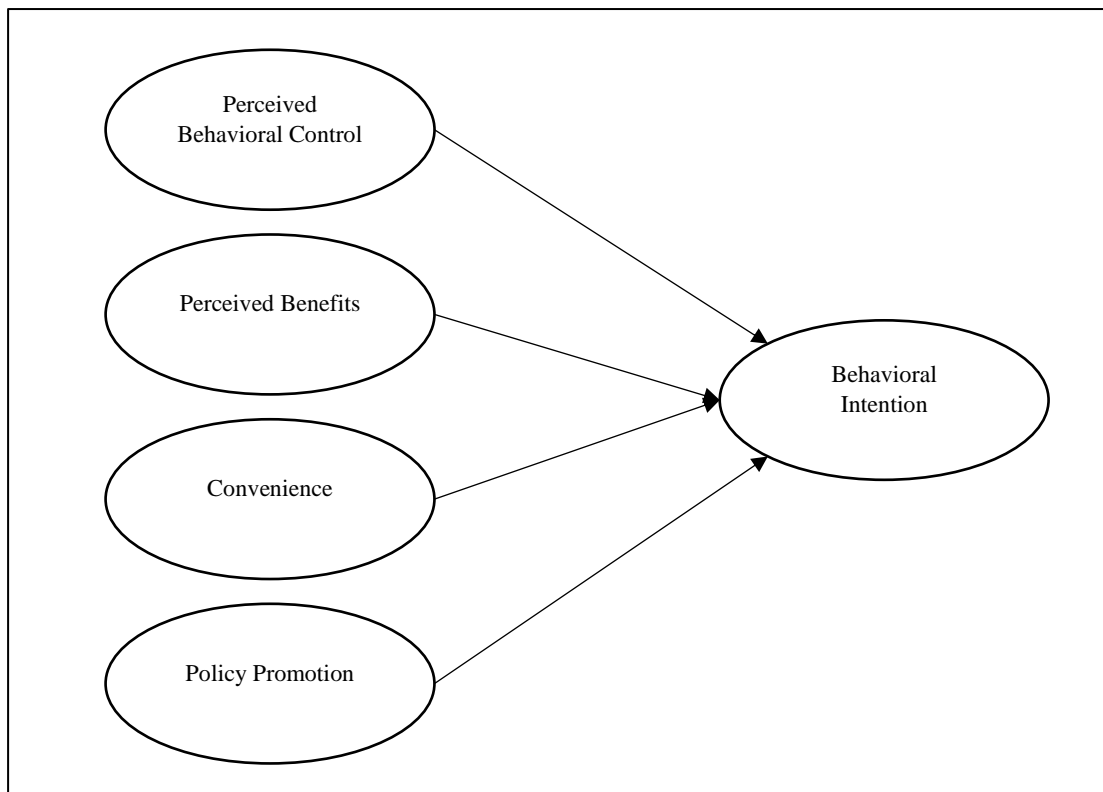


Figure 1. Proposed Research Framework

### Research Method

This study aims to investigate the influence of perceived behavioral control, policy advocacy, perceived benefits, and convenience on the intention of college students in Jiangxi Province to recycle express packaging. To validate this framework model, quantitative method using questionnaire was conducted in this study. The collected data were analyzed for basic information using SPSS25.0, and path analysis was conducted through SEM-AMOS structural equation modeling to verify the hypotheses proposed in the research.

### Research Questionnaire

The research questionnaire is divided into two parts. The first part gathers demographic information about the respondents, including gender, grade, monthly consumption, and monthly online shopping frequency. The second part investigates the perspectives and influencing factors related to college students' participation in express packaging recycling. This section uses a 5 point-Likert scale, where respondents rate the relevant questions on a scale of 1 to 5 based on their opinions. A rating of "1" indicates strong disagreement, while a rating of "5" indicates strong agreement. Table 1 displays the specific content and sources of the questionnaire.

Table 1

*Contents and Sources of Research Questionnaire*

Variable	Abbreviation	Items	Sources
Perceived Behavioral Control (PBC)	PBC 1	In everyday life, I am able to control my behavior well.	(Zhi, 2014), (Oztekin et al., 2017)
	PBC 2	I can decide on my own whether to participate in recycling express packaging.	
	PBC 3	If I want to participate in recycling express packaging, I am fully capable of doing so.	
	PBC 4	In my spare time, I can recycle express packaging.	
	PBC 5	It is easy to distinguish whether express packaging is recyclable.	
	PBC 6	In the future, I am confident that I will continue to use recyclable express packaging.	
Perceived Benefits (PB)	PB 1	Cash or points rewards for recycling express packaging would make me more willing to participate in recycling	(He Wei et al., 2014), (Yali, 2017)
	PB 2	Participating in recycling express packaging would make others see me as an environmentally conscious and morally upright person.	
	PB 3	Participating in recycling express packaging makes me feel that I am contributing to environmental protection, giving me a strong sense of accomplishment.	
Convenience	Convenience 1	There are no convenient express packaging recycling points around me.	(Limei & Fumao, 2012), (Ying, 2009), (Pinyu & Jafun, 2003)
	Convenience 2	If the recycling point were closer to me, I might choose to participate in express packaging recycling.	
	Convenience 3	If the recycling process for express packaging were easy to follow, I would be very willing to participate.	
	Convenience 4	If I have the time and energy, I am willing to participate in express packaging recycling.	
Policy Promotion (PP)	PP 1	There are policies and regulations in place for handling express packaging recycling.	(Fumao et al., 2011), (Wan et al., 2017), (Ming et al., 2015)
	PP 2	I can learn about express packaging recycling through media such as television and the internet.	
	PP 3	I can find information about incentive programs for express packaging recycling on some websites or at express stations.	

Behavioral Intention (BI)	BI 1	When I have express packaging that can be recycled, I will prioritize recycling it.	(Lizin et al., 2017),
	BI 2	In the future, I plan to participate in express packaging recycling activities.	(Mahmud & Osman, 2010),
	BI 3	I am very willing to participate in express packaging recycling activities.	(Ari & Yilmaz, 2016)
	BI 4	I will encourage my family and friends to participate in express packaging recycling.	
	BI 5	In the future, I will frequently participate in express packaging recycling activities.	

### Research Sample

This study conducted a questionnaire survey across 45 undergraduate universities in Jiangxi Province. The respondents were undergraduate students from these universities. A total of 1000 samples were distributed to undergraduates from these 45 universities through a proportional stratified sampling method. Questionnaires were distributed to respondents through SoJump (wjx.cn), an online survey platform from March 1, 2024, with a collection deadline of May 1, 2024. A total of 873 questionnaires were collected, yielding a response rate of 87.3%. After removing invalid data, the final effective sample consisted of 605 responses.

### Research Results

#### Demographic Information

This study used SPSS version 25.0 for basic information statistics and SEM-AMOS version 24.0 for model construction, path analysis, and hypothesis testing. Table 2 presents the demographic information of the respondents.

Table 2  
*Demographic Information (n = 605)*

Characteristics		Frequency	Percentage
Gender	Male	199	32.9%
	Female	406	67.1%
Grade	Freshman	400	66.1%
	Sophomore	156	25.8%
	Junior	33	5.5%
	Senior	16	2.6%
Monthly Consumption	Less than 1000 RMB	81	13.4%
	1001-2000 RMB	439	72.6%
	2001-3000 RMB	59	9.8%
	Over 3001 RMB	26	4.3%
Monthly Online Shopping Frequency	1-3 times	142	23.5%
	4-6 times	208	34.4%
	Over 6 times	255	42.1%

From Table 2, among the 605 respondents, 67.1% are female students and 32.9% are male students, with the number of female students being more than double that of male students.



These students are mainly freshmen ( $n = 400$ , 66.1%), followed by 156 sophomores. The total number of juniors and seniors is less than 10% of the total.

Regarding monthly consumptions, 72.6% of the students spend between 1000 and 2000 RMB per month, 13.4% spend less than 1000 RMB per month, 9.8% spend between 2000 and 3000 RMB per month, and only 4.3% spend more than 3000 RMB per month.

As for the frequency of online shopping per month, most students (42.1%) shop online more than 6 times a month, 34.4% shop online 4 to 6 times a month, and the smallest group, 23.5%, shops online 1 to 3 times a month. This indicates that although most students' monthly consumption is between 1000 and 2000 yuan, they frequently engage in online shopping.

## 5.2 Descriptive Analysis

Table 3 displays data descriptive statistics. Mean, standard deviation (SD), and three levels of low, moderate, and high were employed to address research question 1. Nunnally and Bernstein (1994) stated that for a five-point Likert Scale, the mean score between 1 and 2.33 is low, whereas 2.34 to 3.66 is moderate, and 3.67 to 5 is high.

Table 3

*Descriptive Statistics (n = 605)*

	Mean (M)	Standard Deviation (SD)	Level
Behavioral Intention	3.72	.68	High

Notes: Low ( $1 \leq M \leq 2.33$ ), Moderate ( $2.34 \leq M \leq 3.66$ ), High ( $3.67 \leq M \leq 5$ ).

According to Table 3, it is concluded that college students' behavioral intention towards express packaging recycling at universities in Jiangxi Province is high. The result indicated that Jiangxi universities' students are willing to participate in packaging recycling activities.

## 5.3 Reliability and Validity

Before conducting the path analysis, the normality of the data was assessed by examining the skewness and kurtosis values. Table 4 presents the normality results. Generally, if the skewness values are within the range of  $\pm 2$  (Tabachnick & Fidell, 2007) and the kurtosis values are within the range of  $\pm 7$  (Byrne, 2010), the data can be considered to follow a normal distribution. As shown in the table, the values for this study fall within the specified ranges. Therefore, the data distribution in this study conforms to a normal distribution.

Table 4

*Assessment of Normality (n = 605)*

Items		Min	Max	Skewness	C.R.	Kurtosis	C.R.
Perceived Control 1	Behavioral	1	5	-0.358	-3.598	0.298	1.494
Perceived Control 2	Behavioral	1	5	-0.187	-1.873	0.220	1.104
Perceived Control 3	Behavioral	1	5	-0.118	-1.188	-0.091	-0.458
Perceived Control 4	Behavioral	1	5	-0.205	-2.058	0.060	0.303
Perceived Control 5	Behavioral	1	5	-0.157	-1.578	-0.131	-0.656
Perceived Control 6	Behavioral	1	5	-0.190	-1.903	0.060	0.300
Perceived Benefits 1		1	5	-0.170	-1.704	-0.176	-0.884
Perceived Benefits 2		1	5	-0.307	-3.083	-0.012	-0.059
Perceived Benefits 3		1	5	-0.306	-3.074	0.077	0.386
Convenience 1		1	5	-0.522	-5.239	0.667	3.347
Convenience 2		1	5	-0.449	-4.505	0.276	1.384
Convenience 3		1	5	-0.608	-6.104	0.669	3.359
Convenience 4		1	5	-0.497	-4.986	0.102	0.509
Policy Promotion 1		1	5	-0.259	-2.602	0.001	0.007
Policy Promotion 2		1	5	-0.426	-4.273	0.117	0.587
Policy Promotion 3		1	5	-0.362	-3.638	-0.034	-0.170
Behavioral Intention 1		1	5	-0.422	-4.239	0.043	0.217
Behavioral Intention 2		1	5	-0.259	-2.595	-0.122	-0.612
Behavioral Intention 3		1	5	-0.055	-0.549	-0.211	-1.058
Behavioral Intention 4		1	5	0.050	0.498	-0.253	-1.270
Behavioral Intention 5		1	5	-0.118	-1.184	-0.270	-1.356

The reliability of this questionnaire is verified using Cronbach's alpha ( $\alpha$ ) (Sekaran, 2003) and composite reliability (CR). Based on the rule of thumb, when  $\alpha < 0.6$ , the data reliability is unacceptable, when  $0.6 \leq \alpha < 0.7$ , it is questionable, when  $0.7 \leq \alpha < 0.8$ , the data reliability is acceptable, when  $0.8 \leq \alpha < 0.9$ , the data reliability is good, and when  $\alpha \geq 0.9$ , the data reliability is excellent (Sekaran, 2003). Generally, CR value needs to be greater than 0.7 (Fornell & Larcker, 1981). Table 5 presents the criteria for Cronbach's alpha. The results indicate good reliability of all these variables. The validity of the questionnaire is verified through convergent validity, and discriminant validity. Convergent validity is satisfied if the factor loadings and average variance extracted (AVE) are both greater than 0.5. Discriminant validity is tested by comparing the AVE with the squared correlations ( $r^2$ ) of other constructs. Generally, if AVE is greater than  $r^2$ , it indicates that discriminant validity is met (Fornell & Larcker, 1981).

Table 5

*Test for Cronbach's alpha (n = 605)*

Variables	Item Numbers	$\alpha$
Perceived Behavioral Control	6	.859
Perceived Benefits	3	.819
Convenience	4	.846
Policy Promotion	3	.881
Behavioral Intention	5	.913

Table 6 presents the composite reliability (CR), factor loadings, and AVE of the data. Results indicate all factor loadings are greater than 0.5, and the AVE for each variable exceeds 0.5. This indicates that each variable has achieved good convergent validity. Additionally, the composite reliability values are all above 0.7, meeting the requirements for composite reliability. Based on this, the collected data demonstrate excellent composite reliability and convergent validity.

Table 6

*Reliability and Validity Test (n = 605)*

Variables	CR	AVE	Items	Factor Loading
Perceived Behavioral Control	.858	.505	PBC 1	.654
			PBC 2	.741
			PBC 3	.832
			PBC 4	.749
			PBC 5	.641
			PBC 6	.624
Perceived Benefits	.822	.608	PB 1	.742
			PB 2	.766
			PB 3	.828
Convenience	.855	.601	Convenience 1	.552
			Convenience 2	.835
			Convenience 3	.861
			Convenience 4	.813
Policy Promotion	.883	.717	PP 1	.766
			PP 2	.866
			PP 3	.903
Behavioral Intention	.914	.680	BI 1	.735
			BI 2	.837
			BI 3	.847
			BI 4	.830
			BI 5	.867

Notes: CR, Composite Reliability; AVE, Average Variance Extracted.

Table 7 presents the discriminant validity values of the data. The square root of the AVE for each variable is greater than the correlations between that variable and the others, i.e.,  $\sqrt{\text{AVE}}$

> |r|. This indicates that the variables have good discriminant validity, thereby satisfying the requirements for discriminant validity.

Table 7

*Test of Discriminant Validity*

	PBC	PB	Convenience	PP	BI
Perceived Behavioral Control	<b>0.711</b>				
Perceived Benefits	0.573 <sup>***</sup>	<b>0.779</b>			
Convenience	0.567 <sup>***</sup>	0.744 <sup>***</sup>	<b>0.775</b>		
Policy Promotion	0.499 <sup>***</sup>	0.426 <sup>***</sup>	0.391 <sup>***</sup>	<b>0.847</b>	
Behavioral Intention	0.595 <sup>***</sup>	0.668 <sup>***</sup>	0.680 <sup>***</sup>	0.635 <sup>***</sup>	<b>0.824</b>

Note : <sup>\*\*\*</sup>  $p < 0.001$

In summary, the obtained data exhibit excellent composite reliability, convergent validity, and discriminant validity. Therefore, the data meet the reliability and validity requirements, making them suitable for further regression analysis.

**Confirmatory Factor Analysis and Structural Equation Modeling**

Confirmatory factor analysis (CFA) is used to assess the fit of the measurement model. Generally, a good model fit is indicated when the chi-square to degrees of freedom ratio ( $\chi^2/df$ ) is less than 5, the values for goodness of fit index (GFI), comparative fit index (CFI), normed fit index (NFI), Tucker-Lewis index (TLI), and incremental fit index (IFI) are all greater than 0.9, and the root mean square error of approximation (RMSEA) is less than 0.08 (Hu & Bentler, 1999). Hair et al. suggest that achieving at least three to four of these indicators is necessary for a model to be considered a good fit (Hair et al., 2010). Table 8 presents the fit indices for the measurement model in this study. As shown in the table, all values meet the required criteria, indicating that the measurement model has a good fit with the data and is suitable for further path analysis.

Table 8

*Model Fit Indices*

$\chi^2$	DF	$\chi^2/df$	GFI	NFI	CFI	IFI	TLI	RMSEA
450.513	177	2.545	.936	.943	.964	.965	.958	.051

Note:  $p = 0.000$

**Hypothesis Testing**

Table 9 presents the results of the regression analysis in this study. The regression analysis results are used to test the hypotheses proposed in the article.

Table 9

*Regression Analysis*

Path	B	$\beta$	SE	C.R.	<i>p</i>
Perceived Behavioral Control ---> Behavioral Intention	0.16	0.11	0.06	2.56	0.01
Perceived Benefits ---> Behavioral Intention	0.23	0.25	0.06	3.74	***
Convenience ---> Behavioral Intention	0.35	0.31	0.06	5.69	***
Policy Promotion ---> Behavioral Intention	0.32	0.36	0.03	9.64	***

Notes: \*\*\* $p < 0.001$ ; SE, standard error; C.R., critical ratio. B, unstandardized regression;  $\beta$ , standardized regression weight;  $R = .748$ ;  $R^2 = .56$ .

From the table, it can be seen that perceived behavioral control, perceived benefits, convenience, and policy promotion all have significant positive effects on behavioral intention. That is to say, in the eyes of undergraduate students in Jiangxi Province, perceived behavioral control significantly and positively influences their willingness to participate in express packaging recycling behavior ( $\beta = 0.112$ ,  $p = 0.010 < 0.05$ ), confirming hypothesis H1. Specifically, when perceived behavioral control increases by one standard deviation, the behavioral intention of the students will increase by 0.112 standard deviations. Undergraduate students perceive that perceived benefits significantly and positively influence their willingness to participate in express packaging recycling behavior ( $\beta = 0.215$ ,  $p < 0.001$ ), confirming hypothesis H2. Specifically, when perceived benefits increase by one standard deviation, the behavioral intention of the students will increase by 0.251 standard deviations. Undergraduate students believe that convenience significantly and positively influences their willingness to participate in express packaging recycling behavior ( $\beta = 0.314$ ,  $p < 0.001$ ), confirming hypothesis H3. Specifically, when convenience increases by one standard deviation, the behavioral intention of the students will increase by 0.314 standard deviations. Undergraduate students perceive that policy promotion will have a significant and positive impact on their willingness to participate in express packaging recycling behavior ( $\beta = 0.364$ ,  $p < 0.001$ ), confirming hypothesis H4. Specifically, when policy promotion increases by one standard deviation, the behavioral intention of the students will increase by 0.364 standard deviations. Figure 2 shows the results of the structural equation model in this study.

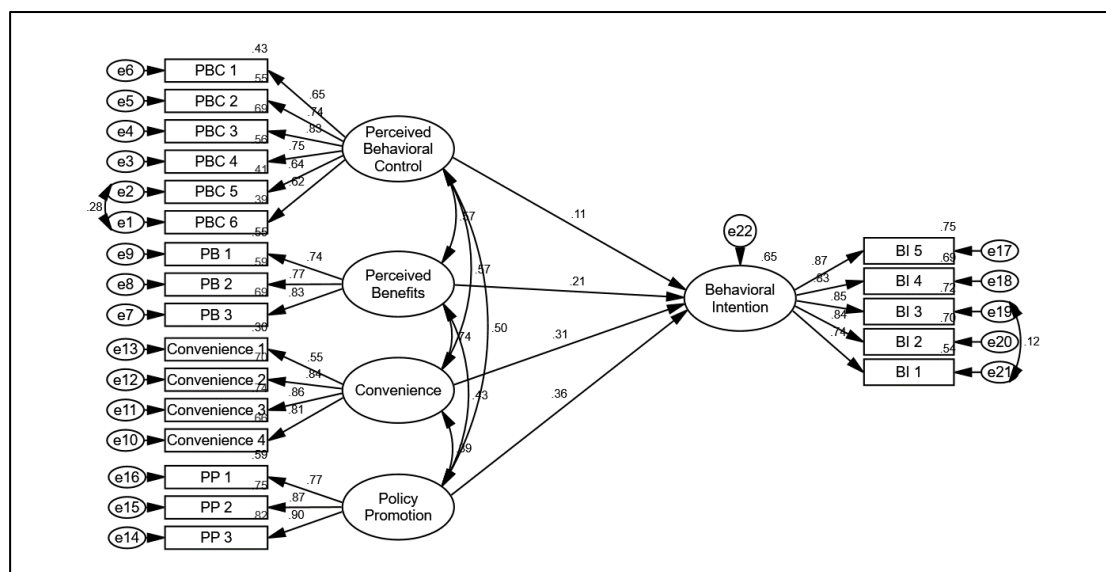


Figure 2. SEM Analysis Result

**Contributions of Perceived Behavioral Control, Perceived Benefits, Convenience, and Policy Promotion on Behavioral Intention**

The effect size ( $f^2$ ) was calculated to assess perceived behavioral control, perceived benefits, convenience, and policy promotion on students’ behavioral intention towards express packaging recycling. As a rule of thumb, effect sizes of 0.35, 0.15, and 0.02 represent large, medium, and small effect sizes respectively (Cohen, 1988). Table 10 displays the results of effect sizes of the four independent variables on behavioral intention.

Table 10  
Effect Sizes Results

Relationship	Effect size ( $f^2$ )	Magnitude
Perceived behavioral control → Behavioral intention	0.000	Small
Perceived Benefits → Behavioral intention	0.018	Small
Convenience → Behavioral intention	0.036	Small
Policy promotion → Behavioral intention	0.226	Medium

Notes: Large:  $f^2 > 0.35$ ; Medium:  $0.15 < f^2 < 0.35$ ; Small:  $0.00 < f^2 < 0.15$ .

Results from Table 10 indicates that though the four independent variables have statistically significant positive effects on behavioral intention, their contributions on students’ intention to participate in express packaging recycling vary differently. Specifically, only policy promotion has a medium effect size on behavioral intention, the remaining three variables only have small effect sizes on behavioral intention. In other words, to arouse college students’ intention to participate in express packaging recycling activities, more policy promotions are needed. This will give more effects on students.

The study also found that in explaining undergraduate students' willingness to participate in express packaging recycling, perceived behavioral control, perceived benefits, convenience, and policy promotion together accounted for 65% of the variance. This indicates that these four factors can largely (65%) explain whether undergraduate students are willing to

participate in express packaging recycling. At the same time, the result suggests that the remaining 35% of behavioral intention comes from other influencing factors. Hence, future studies be paid on investigating other factors that may influence students' willingness to participate in express packaging recycling.

### **Conclusions**

The article conducted a survey study on the willingness of 605 undergraduate students from 45 universities in Jiangxi Province to participate in express packaging recycling behavior, exploring the influencing factors of undergraduate students' willingness to participate in express packaging recycling behavior in Jiangxi Province. The results revealed that there was a high level of students' intention to participate in express recycling behavioral. Moreover, perceived behavioral control, perceived benefits, convenience, and policy promotion all have significant and positive effects on undergraduate students' willingness to participate in express packaging recycling behavior. The study also found that among these four influencing factors, policy promotion has the greatest impact on undergraduate students' willingness to participate in express packaging recycling behavior, with a medium effect size of 0.226. Students generally believe that improving relevant policies and expanding related propaganda and incentive schemes for express packaging recycling through television, the internet, and other means can effectively encourage students to participate in the process of express packaging recycling. The convenience of express packaging recycling also plays a certain role in influencing whether students are willing to participate in this activity. Proximity to express packaging recycling centers and convenient packaging recycling methods can encourage student participation in express packaging recycling. Additionally, students' own time and energy also affect their participation in express packaging recycling to a certain extent.

Compared to policy promotion and convenience, perceived benefits and perceived behavioral control have relatively lower impacts on students' participation in express packaging recycling. However, even though the influence is relatively low, it indicates that increasing students' willingness to participate in express packaging recycling can be achieved by providing certain benefits. Additionally, from the perspective of students' willingness to participate in express packaging recycling, it can be seen that students are generally willing to engage in the process of express packaging recycling. Therefore, the article suggests that to increase the willingness of Jiangxi Province's university students to participate in express packaging recycling, it can mainly be achieved by promoting policy propaganda, establishing convenient express packaging recycling centers, simplifying the process of express packaging recycling, and providing certain rewards to enhance students' willingness to participate in packaging recycling, ultimately achieving the goal of express packaging recycling.

The article also found that 35% of the willingness to participate in express packaging recycling is influenced by other factors. Therefore, future research could focus on other aspects that influence the willingness to participate in express packaging recycling, exploring more influencing factors, and thus enhancing students' willingness to participate in express packaging recycling from different perspectives and to different extents.

Furthermore, the article has certain limitations. On one hand, the study sample only includes undergraduate students from universities, excluding vocational college students, ordinary junior and senior high school students, and graduate students, which to some extent limits the generalizability of the research results to all student groups. On the other hand, the sample size of the study is limited, although statistically representative, expanding the sample size may provide more favorable evidence for the results. Therefore, the article suggests that future research should conduct more comprehensive studies by expanding the sample size and the research population.

Currently, sustainable development is one of the major global issues. Sustainable Development Goals 11 and 12 explicitly state the need to establish more inclusive and sustainable cities and human communities, reduce environmental pollution, reduce resource waste, and encourage sustainable consumption. In a society where online shopping is prevalent, the express delivery industry not only brings convenience to people but also imposes certain pressure and burden on the environment and resource utilization. As important members of the online shopping group, university students have the important mission of fostering awareness and behavior of sustainable development, and they should lead by example, fully recognize their important role in promoting sustainable development, actively participate in the process of promoting sustainable development through various means and contribute to global sustainable development.

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