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Study on Characteristics and Factors of Secondary School Students' Green Consumption Behavior from The Perspective of Green Education

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ABSTRACT

As the society pays more and more attention to environmental protection and sustainable development of, green education has gradually become an important topic in the field of education. This study addresses the impact of green education on secondary school students' green thinking and behavior in depth. Using a questionnaire survey, this study finds that formal green education in schools helps to motivate secondary school students to pay extra for purchasing environmentally friendly products, and reinforces the green idea of "reuse, reuse many times". Informal green education helps secondary school students to establish the idea of "green living and eco-friendly shopping". In addition, there is no significant difference between the choices of green behaviors of secondary school students in public and private settings, and there is no significant difference between the choices of green behaviors of secondary school students in public and private settings. These findings are of great theoretical value in understanding the influence of green education on secondary school students' green thinking and behavior.

KEYWORDS

Green consumption; Green behavior; Green awareness; Green education.

1. INTRODUCTION

Globally, environmental problems are becoming more serious, with climate change, resource depletion and damage to ecosystems provoking widespread concern in human society. These problems pose a major challenge to the planet's ecological balance and future socio-economic development. In particular, rising global temperatures, rising sea levels, ecosystem collapse and over-exploitation of natural resources have become realities that cannot be ignored. Against this background, the promotion of environmentally friendly behaviors and sustainable consumption behaviors has become particularly urgent, which has attracted many experts and scholars to conduct in-depth research on green consumption behaviors. The author, as a middle school student, has also investigated and studied the green consumption behavior of the middle school student groups around her.

The consumption decisions and values of secondary school students, as part of the adolescent population, are potentially important for the sustainability of future societies. Adolescents in this age group are in a critical period of forming their personal perceptions and values, so understanding their consumption behaviors and the factors that influence them is essential for developing strategies for the sustainability of future societies.

In recent years, green education has gradually emerged as an important issue in the field of global education. Yang Shuzi, an academician of the Chinese Academy of Sciences, once put forward the

concept of "green education" at the "Chinese and Foreign Primary and Secondary School Principals' Forum". According to him, "science and humanities are intertwined to produce 'green'. The blending of the two can generate the correct pursuit of goals, excellent thinking quality and good relations with the outside world."

Green education, which aims to cultivate students' concept of ecological civilization and awareness of environmental protection, emphasizes harmonious coexistence between human beings and nature and advocates the idea of sustainable development. Characterized by its comprehensive, open, practical and innovative nature, green education encourages students to give play to their spirit of innovation and explore new ways and means of solving environmental problems. For example, promoting the consumption of green products has long-term environmental benefits. Green products are mostly composed of high technology and materials, and most of them have higher production costs than ordinary products, and are therefore sold at higher prices. For the average consumer, price is an important factor affecting their consumption, and relatively expensive green products make consumers reluctant to engage in green consumption. Therefore, it is necessary to take measures such as green education to make the public have a substantive understanding of green products.

2. LITERATURE REVIEW

2.1. Impact of green education on students

Zhou Jiahao (2022), in "The Practice of Innovative "Making of Flyboards" under the Threshold of Green Education", considers the labor course as a testing ground for practicing green education, and describes the classroom teaching of making of flyboards, mentioning that students' classroom mood, labor quality and other aspects belong to the part of green education [1].

The article "Creating a 'Green University' for Sustainable Development", written by Wang Dazhong, President of Tsinghua University and an academician, emphasizes the importance and urgency of building a "green university" at Tsinghua University, and describes in detail its connotations, objectives and main contents. Wang Dazhong pointed out that building a green campus will make the university an important talent training base and scientific research center in the field of environmental protection and sustainable development. Building a green university should contribute to education, scientific and technological research, and campus construction respectively.

As one of China's top universities, Tsinghua University's efforts to build a "green university" will not only have a far-reaching impact both at home and abroad, but will also serve as a model for other institutions of higher education. This initiative will help to cultivate environmentally conscious and highly qualified personnel, promote the development of environmental protection technology, and facilitate the active participation of universities in realizing the strategy of sustainable development.

2.2. Green Behavior and Green Consumption

In "Analysis of the formation mechanism of consumers' green consumption behavior - based on the perspective of group pressure and environmental cognition", Yu Wei explores the formation mechanism of consumers' green consumption behavior, especially from the aspects of group pressure and environmental cognition. The article put forward several hypotheses and used questionnaires and structural equation modeling to analyze the data in order to verify the research hypotheses and draw conclusions [2].

Yu Wei concludes that group pressure has a significant effect on consumers' environmental awareness, but not on the direct effect on green consumption behavior; consumers' environmental awareness significantly affects their perceived green value and green consumption behavior; environmental knowledge has a significant effect on environmental awareness and perceived green value, but not on the direct effect on green consumption behavior; and consumers' perception of green value of a

product significantly affects their green consumption behavior. This study provides valuable suggestions for businesses to develop green products and promote green consumption. Businesses can enhance the attractiveness of green products by promoting consumers' environmental awareness and strengthening their environmental knowledge. In addition, understanding consumers' perceptions and attitudes toward green values can help companies to better design and promote their products, Limitations of the Study and Directions for Future Research.

Although this study provides insights into the mechanism of green consumption behavior formation, there are some limitations, such as the sample scope focusing mainly on consumers in specific cities. Future research could expand the sample scope to explore the green consumption behaviors of consumers in different regions and cultural contexts, as well as examine other factors that may influence green consumption behaviors.

In "Exploring the Generation of "Apple Culture" Phenomenon in Colleges and Universities and Its Countermeasures", Chenqi Zhang focuses on the phenomenon of "apple culture" that has emerged in Chinese colleges and universities in recent years, discusses its impact on college students' consumption concepts and proposes strategies to solve the problem from the perspective of "green consumption concept". The article analyzes the phenomenon of "apple culture" and its countermeasures. The article analyzes the negative impact of "apple culture" on college students' consumption concepts, explores the reasons for this phenomenon, and puts forward countermeasures to cultivate college students' green consumption concepts [3].

The study points out that college students pay too much attention to the brand influence and social status symbol of Apple cell phone and neglect its practical use; due to the expensive price of Apple cell phone, some families have to bear extra financial pressure to satisfy their children's needs; college students pay more attention to the material consumption and neglect the consumption of spirituality and culture, which affects the overall personal development. Such a phenomenon is due to the fact that with globalization and economic development, the western consumerist ideas influence the consumption behavior of college students. And, young college students try to reflect their self-worth and social status by owning fashionable goods such as Apple cell phones. Importantly, colleges and universities have deficiencies in ideological and political education and consumerism education, failing to effectively cultivate students' green consumerism.

The article emphasizes that in the context of modern society, it is an important task to cultivate the green consumption concept of college students. By analyzing the popularity of "apple culture" in Chinese colleges and universities, the article points out its negative impact on college students' consumption concepts, as well as the social and family problems caused by it. The article concludes that by strengthening the education of socialist core values, consumer ethics education and improving the social environment, college students can be effectively guided to form a healthy and rational consumption concept, which is of great significance to the promotion of the harmonious development of the society.

2.3. Summary

Since green education started late in China, as of November 24, 2023, a search for "green education" on the China Knowledge Network (CNN) platform yielded only 2,419 results. Most of the results are related to national policies, such as the construction of ecological civilization and green campus, which leads to the misunderstanding of the concept of "green" in some studies, and often equates labor practice with green education.

In terms of the research targets of the green education theme, most scholars focus on universities, kindergartens, and higher vocational colleges and universities, with a narrower research group and very little research on secondary school students. Scholars focus more on green campus construction and classroom construction, less on informal green education, more on campus hardware facilities and less on students' thinking and behavioral levels.

Some studies have used the research method of questionnaires to measure consumers' green consumption intention, and this idea of empirical research helps to better perceive the relationship between green education and green consumption, but the questionnaires' use of hypothetical questions can lead to distortions in the assessment of consumers' green consumption behavior.

Current studies in society emphasize the urgency of environmental issues and the need for sustainable development strategies. They point out that the global environment is facing great challenges, such as climate warming, ozone layer depletion, acid rain, and loss of biodiversity, due to population growth, resource scarcity, and environmental degradation. And, most scholars believe that education and science and technology are the key to achieving sustainable development. Higher education institutions, especially leading universities like Tsinghua University, can play an important role in environmental protection and sustainable development by providing environmental education and promoting green technology research and demonstration projects.

Tsinghua University's "Green University" concept includes three aspects: green education, green technology and green campus. The goal of this concept is to cultivate environmentally conscious human resources through the integration of education and science and technology, to promote environmentally friendly technologies and methods, and to promote environmental protection and sustainable development through practical demonstrations on campus. At the consumer level, the importance of fostering green consumerism is emphasized, especially among college and university students. Consumers can be promoted to adopt more environmentally friendly and sustainable consumption behaviors through education, group pressure and environmental awareness-raising.

While all of these initiatives show concern for and positive responses to environmental issues, there are challenges, including the need to change traditional education and consumption patterns, technological and financial constraints, and the need for greater international cooperation and support from all sectors of society.

3. ANALYSIS OF FACTORS INFLUENCING GREEN EDUCATION

3.1. Research hypotheses

Green consumption refers to consumption that meets individual needs but is also concerned with the overall well-being of society and minimizes damage to the environment. The concept originated in the Western eco-movement of the late 1960s and early 1970s, which focused on pollution and energy conservation, but initially focused mainly on limiting the consumption of environmentally harmful goods and adopting environmentally friendly measures (e.g., recycling and public transportation). As the concept of sustainable development has taken hold, green consumption has also come to include more active purchasing of green products and, in turn, promoting the production of green products and services.

Green thinking is the tendency of people to adopt green consumption behaviors. It is the internal drive of green consumption and the necessary process of transforming green consumption cognition into behavior. In this paper, the 5R principles of green living are adopted: Reduce to conserve resources and reduce pollution; Rcevaluate to green consumption and environmental protection; Reuse to reuse and reuse many times; Recycle to classify, recycle and recycle; and Rescue to protect the nature and the survival of all things.

Education generally consists of formal and non-formal education. Formal education generally refers to formal education received in schools, while informal education refers to education other than that. This study also categorizes green education into formal and informal green education.

In summary, the following hypotheses are proposed for this study:

Hypothesis 1: Formal green education in schools has a low impact on secondary school students' green consumption behavior, and informal education helps to enhance secondary school students' green consumption behavior

Hypothesis 2: Formal green education in schools helps to increase the level of green thinking identity among secondary school students, and informal education helps to increase the level of green thinking identity among secondary school students

Hypothesis 3: Differences between public and private occasions affect secondary school students' green consumption behavior

Hypothesis 4: Differences in economic status will affect secondary school students' green consumption behavior

3.2. Basic information on the questionnaire

According to the results of this questionnaire, 110 valid responses were collected. In the basic information section of the questionnaire, we learned important information such as gender, age and monthly household income of the respondents.

First of all, in terms of gender, the total number of male respondents is 57, which is about 51.82%, while the number of female respondents is 53, which is about 48.18%. In addition, the number of respondents who did not fill in the gender is 0, which is 0%.

Second, in terms of age groups, we divided the respondents into two main groups: middle school students aged 12-15 and high school students aged 16-18. The results show that the number of respondents from middle school students is 42, accounting for 38.18% of the total respondents, while the number of respondents from high school students is 68, accounting for 61.82%. The number of respondents who did not fill in their age was 0 or 0%.

Finally, in terms of monthly household income, we can see that the income level is diversified. According to the division of income range, the number of respondents whose monthly household income is between 2000-5000RMB is 33, accounting for 30%; the number of respondents whose monthly household income is between 5000-10000RMB is 27, accounting for 24.55%; the number of respondents whose monthly household income is between 10000-20000RMB is 20, accounting for 18.18%; the number of respondents whose monthly household income is between 20000-50000RMB There are 17 respondents, accounting for 15.45%; while the number of respondents whose monthly household income is above 50,000RMB is 12, accounting for 10.91%. At the same time, 1 person did not fill in the monthly household income, accounting for 0.91%.

Through the above data, we can get a preliminary understanding of the gender distribution, age structure and family economic status of the respondent group, and this information provides an important reference basis for subsequent in-depth analysis.

3.3. Impact of formal and informal education on green behavior

After correlation and regression analyses, there was a significant relationship between formal green education provided by the school and "willingness to pay extra for more environmentally friendly products". The value of R^2 in the regression analysis was 0.055, indicating that there may be multiple explanations for this result.

Table 1. Correlation analysis of the effect of formal education on green behavior

sports event	average value	(statistics) standard deviation	Does the school offer a formal green education program, such as an environmental program or a sustainability program?	If schools offer formal green education programs, to what extent do you think these programs have influenced your green consumer behavior?	How often do you use public transportation (subway, bike share, bus, etc.)?	Are you willing to pay extra for greener products?
Does the school offer a formal green education program, such as an environmental program or a sustainability program?	1.97	0.74	1			
If schools offer formal green education programs, to what extent do you think these programs have influenced your green consumer behavior?	2.23	0.99	0.02	1		
How often do you use public transportation (subway, bike share, bus, etc.)?	2.39	1.13	-0.04	0.03	1	
Are you willing to pay extra for greener products?	2.06	0.80	0.13	0.23*	-0.06	1
* p<0.05 ** p<0.01						

Table 2. Regression analysis of the impact of formal education on green consumption behavior

sports event	regression coefficient	t-value	p-value	VIF
a constant (math.)	1.64	8.88	0.000**	-
If schools offer formal green education programs, to what extent do you think these programs have influenced your green consumer behavior?	0.19	2.51	0.014*	1.00
sample size	110			
R^2	0.055			
Adjustment R^2	0.046			
F	F(1,108)=6.287, p=0.014			
* p<0.05 ** p<0.01				

First, the effects of green education may be reflected in knowledge transfer and cognitive change. Through classroom teaching, field trips, etc., individuals are exposed to knowledge about environmental issues and are made aware of the relationship between purchasing environmentally friendly products and environmental protection. This cognitive change may lead them to be more inclined to support environmentally friendly products and even be willing to pay extra for them.

Second, green education may affect the attitudes and values of individuals. By learning about environmental ethics and sustainable development, individuals may have developed more positive attitudes toward environmental protection and see it as an important value. In this case, they are more likely to be willing to realize their values by purchasing environmentally friendly products.

In addition, social factors may also play an important role in green education influencing individual purchasing behavior. Individuals who receive green education in school may form an environmentally conscious social group, and there may be a certain amount of social pressure and social acceptance among them that purchasing environmentally friendly products is the right behavior. In this case, individuals are more likely to be influenced by their peers and be willing to pay extra for the purchase of environmentally friendly products.

Finally, green education may lead individuals to transform their environmental values into practical actions by raising their awareness of environmental behaviors and their sense of responsibility. This transformation into action may make individuals more willing to pay extra for the purchase of environmentally friendly products, thus contributing to the development and popularization of the market for environmentally friendly products.

Although the R^2 value is small, green education has a significant effect on whether individuals are willing to pay extra for purchasing more environmentally friendly products. This finding has important implications for the implementation of environmental education and the formulation of environmental policies.

Table 3. Correlation analysis of the impact of non-formal education on green behaviors (I)

sports event	average value	(statistics) standard deviation	Have you been exposed to informal green education, such as public service announcements, short videos, etc., at school or elsewhere?	How often are you exposed to informal green education such as PSAs, short videos, etc.?	Do you think informal forms of green education, such as public service announcements and short videos, are more likely to resonate with your environmental behavior?	How often do you use public transportation (subway, bike share, bus, etc.)?	Are you willing to pay extra for greener products?
Have you been exposed to informal green education, such as public service announcements, short videos, etc., at school or elsewhere?	2.05	0.73	1				
How often are you exposed to informal green education such as PSAs, short videos, etc.?	2.54	1.30	0.05	1			
Do you think informal forms of green education, such as public service announcements and short videos, are more likely to resonate with your environmental behavior?	1.95	0.79	0.19*	0.07	1		
How often do you use public transportation (subway, bike share, bus, etc.)?	2.39	1.13	-0.01	0.04	-0.06	1	
Are you willing to pay extra for greener products?	2.06	0.80	0.10	0.00	0.02	-0.06	1
* p<0.05 ** p<0.01							

Table 4. Correlation analysis of the impact of informal education on green behaviors (II)

sports event	average value	(statistics) standard deviation	Do you think informal forms of green education, such as public service announcements and short videos, are more likely to resonate with your environmental behavior?	Have you been exposed to informal green education, such as public service announcements, short videos, etc., at school or elsewhere?	How often are you exposed to informal green education such as PSAs, short videos, etc.?	Do you take the initiative to learn about the production process, the source of raw materials, and the environmental impact of a product before making a purchasing decision?	Would you like to buy second-hand products to minimize resource waste and environmental burden?
Do you think informal forms of green education, such as public service announcements and short videos, are more likely to resonate with your environmental behavior?	1.95	0.79	1				
Have you been exposed to informal green education, such as public service announcements, short videos, etc., at school or elsewhere?	2.05	0.73	0.19*	1			
How often are you exposed to informal green education such as PSAs, short videos, etc.?	2.54	1.30	0.07	0.05	1		
Do you take the initiative to learn about the production process, the source of raw materials, and the environmental impact of a product before making a purchasing decision?	2.42	0.96	-0.08	0.09	0.07	1	
Would you like to buy second-hand products to minimize resource waste and environmental burden?	2.05	0.80	-0.15	-0.18	-0.03	0.14	1
* p<0.05 ** p<0.01							

After correlation analysis, we found that there is no significant correlation between informal green education (e.g., short videos, public service announcements, etc.) and individuals' green consumption behavior. There may be several reasons for this finding.

First, informal green education, such as short videos and public service announcements, is usually limited in time, making it difficult to deliver environmental concepts and related knowledge in depth. Due to the short duration of short videos and the relatively limited time for information delivery, it is difficult for audiences to gain a deeper knowledge and understanding of environmental issues. As a result, even if audiences gain some environmental knowledge while watching these short videos or advertisements, such knowledge may not be sufficient to profoundly influence their consumption behavior.

Second, there is a lack of a direct path between informal green education content and specific green consumption behaviors. Short videos or public service announcements (PSAs) often focus on conveying environmental concepts and calls to action, but lack specific guidance or advice on linking these concepts to actual consumption behaviors. Audiences may be inspired by these messages, but lack a clear path of action and actionability, making it difficult to translate environmental awareness into actual purchasing behavior.

In addition, informal green education may be limited by audience exposure and uptake. Although short videos and public service announcements have certain distribution channels and audience groups, not everyone is exposed to or influenced by such content. Therefore, even if green education content exists, it is limited in the number of people reached and the degree of influence, making it difficult to form a significant correlation.

In summary, through the statistical and numerical analysis of the results of the questionnaire survey, it can be concluded that the first half of hypothesis 1 is valid, while the second half is not valid, i.e., the formal green education in schools has a low impact on the green consumption behavior of secondary school students, while the informal education can not contribute to the enhancement of the green consumption behavior of secondary school students.

3.4. Impact of formal and informal education on green thinking

Table 5. Correlation analysis of the impact of formal education on green thinking (I)

sports event	average value	(statistics) standard deviation	If schools offer formal green education programs, to what extent do you think these programs have influenced your green consumer behavior?	Conservation of resources and reduction of pollution (Reduce)	Green living, eco-friendly shopping (Re-evaluate)	Reuse, multiple use (Reuse)
If schools offer formal green education programs, to what extent do you think these programs have influenced your green consumer behavior?	2.23	0.99	1			
Conservation of resources and reduction of pollution (Reduce)	3.79	1.29	0.12	1		
Green living, eco-friendly shopping (Re-evaluate)	3.80	1.33	0.15	0.78**	1	
Reuse, multiple use (Reuse)	3.90	1.10	0.21*	0.64**	0.78**	1
* p<0.05 ** p<0.01						

Table 6. Correlation analysis of the impact of formal education on green thinking (II)

sports event	average value	(statistics) standard deviation	If schools offer formal green education programs, to what extent do you think these programs have influenced your green consumer behavior?	Separate recovery, recycling (Recycle)	Conservation of Nature, Coexistence of All Things (Rescue)
If schools offer formal green education programs, to what extent do you think these programs have influenced your green consumer behavior?	2.23	0.99	1		
Separate recovery, recycling (Recycle)	3.88	1.09	0.18	1	
Conservation of Nature, Coexistence of All Things (Rescue)	3.89	1.18	0.16	0.68**	1
* p<0.05 ** p<0.01					

Table 7. Regression analysis of the impact of formal education on green thinking

sports event	regression coefficient	t-value	p-value	VIF
a constant (math.)	3.37	13.28	0.000**	-
If schools offer formal green education programs, to what extent do you think these programs have influenced your green consumer behavior?	0.24	2.28	0.025*	1.00
sample size	110			
R^2	0.046			
Adjustment R^2	0.037			
F	F(1,108)=5.200, p=0.025			
* p<0.05 ** p<0.01				

After correlation and regression analyses, it can be found that there is a significant correlation between formal green education in schools and the enhancement of the level of green thinking in secondary school students, but the correlation is only limited to the item of the green thinking "reuse, reuse many times".

First of all, for secondary school students, reuse and multiple use are environmental behaviors that are relatively easy to understand and practice. Compared with other green concepts, such as saving energy and reducing carbon emissions, reuse and multiple use are more direct, more concrete and easier to practice in daily life. Secondary school students may be more likely to accept and apply this concept to their own lives, for example, by reducing the use of disposable items and separating garbage to achieve effective use of resources.

Secondly, the environmental behaviors of reusing and reusing may be more accessible and more practical for secondary school students. Compared to environmental behaviors that require higher technical or financial support, such as purchasing solar energy equipment and participating in environmental funds, reuse and recycling rely more on personal choices and behavioral habits. Therefore, secondary school students are more likely to adopt these behaviors in their daily lives and can immediately see the environmental effects of these behaviors, thus strengthening their identification with this green concept.

Green education in schools may focus more on emphasizing the recycling of resources and environmental protection, with "reuse, reuse, reuse" being one of the key environmental concepts. Schools usually teach this concept to students through classroom teaching and field trips, and provide relevant knowledge and case studies for better understanding and acceptance by students.

Finally, formal green education provided by schools may emphasize the environmental concept of "reuse and recycle" in a targeted manner, and deepen students' recognition of this concept through various teaching resources and activities. For example, schools may organize waste recycling activities and environmental protection lectures, etc., in order to guide students to pay attention to the reuse and recycling of resources through practical actions.

Table 8. Correlation analysis of the impact of informal education on green thinking

sports event	average value	(statistics) standard deviation	Have you been exposed to informal green education, such as public service announcements, short videos, etc., at school or elsewhere?	How often are you exposed to informal green education such as PSAs, short videos, etc.?	Do you think informal forms of green education, such as public service announcements and short videos, are more likely to resonate with your environmental behavior?	Conservation of resources and reduction of pollution (Reduce)	Green living, eco-friendly shopping (Re-evaluate)
Have you been exposed to informal green education, such as public service announcements, short videos, etc., at school or elsewhere?	2.05	0.73	1				
How often are you exposed to informal green education such as PSAs, short videos, etc.?	2.54	1.30	0.05	1			
Do you think informal forms of green education, such as public service announcements and short videos, are more likely to resonate with your environmental behavior?	1.95	0.79	0.19*	0.07	1		
Conservation of resources and reduction of pollution (Reduce)	3.79	1.29	-0.12	-0.13	0.12	1	
Green living, eco-friendly shopping (Re-evaluate)	3.80	1.33	-0.22*	-0.01	0.17	0.78**	1
* p<0.05 ** p<0.01							

Table 9. Regression analysis of the impact of informal education on green thinking

sports event	regression coefficient	t-value	p-value	VIF
a constant (math.)	4.60	12.49	0.000**	-
Have you been exposed to informal green education, such as public service announcements, short videos, etc., at school or elsewhere?	-0.39	-2.31	0.023*	1.00
sample size	110			
R^2	0.047			
Adjustment R^2	0.038			
F	F(1,108)=5.324, p=0.023			
* p<0.05 ** p<0.01				

After regression and correlation analyses, it can be found that there is a significant correlation between informal green education and the enhancement of the degree of green thinking of secondary school students, but the correlation is only limited to the item of green thinking, "green life, environmental protection shopping".

First of all, green living and eco-shopping are environmental concepts that are easier for secondary school students to understand and accept. Compared with some abstract environmental concepts, such as carbon emission reduction and ecosystem protection, green living and eco-shopping are closer to the daily life experience and practical needs of secondary school students. Therefore, it is easier for secondary school students to apply these concepts to their own lives and agree on the importance of such environmentally friendly behaviors.

Second, informal green education, especially in the form of short videos and public service announcements, may be more focused on appealing to individuals to change their consumption habits and lifestyles in order to achieve environmental goals. These short videos and advertisements tend to convey the message of green living and eco-friendly shopping to secondary school students through vivid displays and clear and concise language, thus eliciting their empathy and recognition.

In addition, green living and environmental protection shopping are practical and actionable for secondary school students. By changing their lifestyles and consumption behaviors, secondary school students can directly participate in environmental practices and realize their environmental values. This direct practical experience may enhance their level of identification with green living and eco-shopping, leading to a significant correlation with informal green education.

In summary, by analyzing the statistics and figures of the results of the questionnaire survey, it can be concluded that hypothesis two is valid.

3.5. Influence of public and private settings on green behaviors

Through correlation analysis, it can be concluded that there is no significant correlation between the difference between public and private occasions and the green consumption behavior of secondary school students. This may be due to the fact that secondary school students have already formed their own consumption habits and values, and thus will not be influenced by the external environment to make changes.

Table 10. Correlation analysis of the impact of the nature of the occasion on green behavior

sports event	average value	(statistics) standard deviation	How often do you sort and recycle garbage at school or other public places?	How often do you use disposable tableware to eat when ordering takeout at school or other public places?	How often do you use disposable tableware to eat when ordering takeout at home?	How often do you sort and recycle your garbage at home?
How often do you sort and recycle garbage at school or other public places?	2.20	1.10	1			
How often do you use disposable tableware to eat when ordering takeout at school or other public places?	2.51	1.26	0.01	1		
How often do you use disposable tableware to eat when ordering takeout at home?	2.36	1.24	-0.06	0.01	1	
How often do you sort and recycle your garbage at home?	2.43	1.27	0.11	-0.05	-0.02	1
* p<0.05 ** p<0.01						

3.6. Economic influences on green behavior

Table 11. Correlation analysis of economic impacts on green behaviors

sports event	average value	(statistics) standard deviation	Your monthly household income?	Are you willing to pay extra for greener products?	Would you like to buy second-hand products to minimize resource waste and environmental burden?	When dining out, what do you spend most of your money on?	How often do you use public transportation (subway, bike share, bus, etc.)?
Your monthly household income?	2.55	1.39	1				
Are you willing to pay extra for greener products?	2.06	0.80	-0.14	1			
Would you like to buy second-hand products to minimize resource waste and environmental burden?	2.05	0.80	0.15	-0.12	1		
When dining out, what do you spend most of your money on?	2.05	0.74	-0.08	-0.04	0.10	1	
How often do you use public transportation (subway, bike share, bus, etc.)?	2.39	1.13	0.10	-0.06	-0.08	-0.01	1
* $p<0.05$ ** $p<0.01$							

Through correlation analysis, it can be concluded that there is no significant correlation between differences in economic status and green consumption behavior of secondary school students. There may be several reasons for this result.

First, secondary school students may have been popularized and nurtured with green consumption concepts in their family and school environments. Regardless of the level of monthly family income, if families and schools have a certain degree of attention to environmental awareness and guide students to understand and agree on the importance of green consumption through education and practice, secondary school students may exhibit similar green consumption behaviors to some extent.

Second, secondary school students may be more influenced by their peers and social environment than by the economic situation of their families. They may focus more on social identity and group

pressure than on the economic situation of their individual families, resulting in no significant difference in their consumption behavior depending on their monthly family income.

In addition, secondary school students may have a strong self-identity and values regarding green consumption. Even though they come from families with different income levels, if they share a common identity and belief in environmental protection, they may try to choose green consumption as much as they can afford.

In summary, the lack of significant correlation between differences in monthly family income and the green consumption behavior of secondary school students may be due to the fact that the consumption behavior of secondary school students is more influenced by the environmental influences of their families and schools, the influence of society and peers, and their personal environmental awareness and values. These factors make secondary school students show some stability and consistency in green consumption, which does not vary significantly depending on their family's financial situation.

4. RECOMMENDATIONS

Ecosystem theory. Ecosystem theory was first proposed by Bronfenbrenner in 1979, and later scholars began to study it, and gradually applied this theory to psychology and sociology and other related disciplines. Understanding Human Behavior and the Social Environment takes a holistic view of the relationship between the individual and the environment, i.e., the socio-ecological system perspective, and ecosystem theory focuses on the four levels of micro-, meso-, external-, and macro-level influences on the individual.

Brown Fenbrenner pointed out that human behavior is not only affected by individual psychology, but also the environment in which the individual is located will also have an impact on it and should be taken seriously, and he believed that the micro, meso, appearance and macro systems sometimes have a direct impact on the individual, and sometimes indirectly through the sub-systems. Microsystem refers to the environment in which an individual has the closest and most direct contact in life, including relatives and family environment in the family, teachers' campus environment in the school, peer groups, etc. These microsystems will directly affect the formation of individual qualities and values, and for infants the family is the microsystem, and for children when they grow up a little bit, the family, the school, and their peers belong to the microsystems, which microsystems influence individual cognition and behavior. environments influence the individual's cognition and behavior.

Through the study, it can be found that green education has an impact on the environmental awareness and behavior of secondary school students, but it is relatively weak, and there are many other factors that can also affect the green behavior and awareness of secondary school students.

4.1. Formal education in schools

With regard to green education in China, it is recommended that, in terms of formal education in schools, diversified green education curricula should be designed to cover environmental sciences, sustainable development and ecology, and that they should be integrated into school curricula, so as to ensure that students receive relevant education at different grades and subjects. In addition, schools should promote green practice programs, such as tree-planting and waste recycling activities, so that students can experience environmental protection actions first-hand and enhance their environmental awareness and sense of responsibility. At the same time, green energy facilities, such as solar power generation systems and energy-saving lamps, should be introduced to revamp the campus environment, so as to create a more environmentally-friendly learning and living space for students.

4.2. Informal social education

In the area of informal social education, it is suggested that students should be encouraged to participate in social practice activities, such as volunteer services and community environmental protection activities, so as to cultivate their awareness of environmental protection and their sense of responsibility. At the same time, activities such as green technology exhibitions and science and technology forums should be organized to enable students to learn about the latest scientific and technological achievements in environmental protection, and to stimulate their interest in green technology and their desire to explore it. In addition, government departments, social organizations and enterprises can jointly carry out environmental education activities, and jointly provide students with rich and diverse learning resources and practical opportunities.

4.3. Family Education

In terms of family education, parents should actively participate in green education, pay attention to their children's growth in environmental education together with schools, and encourage families to practise a green lifestyle in their daily lives. At the same time, parents can popularize environmental protection knowledge among their children, and through personal demonstration and guidance, cultivate their children's environmental awareness and behavioral habits. In addition, families should advocate resource conservation and educate children to cherish resources and cultivate their sense of conservation through practical actions such as saving water and electricity.

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