Analysis of the Current Low-Carbon Consumption of College Students and Its Influencing Factors

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Abstract: In the face of the major challenges of global warming and international extreme climate disasters, the "low-carbon" issue has attracted extensive attention from all countries in the world. China has also put forward the strategic goal of achieving carbon peak and carbon neutrality. College students are one of the main groups in China's current consumption market, and the survey of the current situation of low-carbon consumption among university students can help to grasp the current awareness and acceptance of low-carbon consumption among college students and promote low-carbon development. This paper takes college students as the research object and analyzes the current situation and influencing factors of low-carbon consumption of college students by means of questionnaire survey and multiple regression analysis, and finds that the low-carbon consumption behavior of college students needs to be improved. Factors such as product credibility, social atmosphere and government policies have significant influence on college students' low-carbon consumption behavior, and countermeasures to guide college students' low-carbon consumption are put forward for these factors.

1. Introduction

As the economy continues to develop, human demand for resources expands, the natural environment is damaged, problems such as global warming, the frequent occurrence of international extreme weather have intensified. More and more countries realize the importance of coordinating economic development and environmental protection, and reducing CO_2 emissions has become a topic of common concern to the international community. As one of the world's responsible countries, China has always adhered to the concept of a community with a shared future for mankind and implementing sustainable development. At present, China has clearly proposed to strive to peak carbon dioxide emissions before 2030 and achieve carbon neutrality before 2060. Reducing CO_2 emissions is a matter of urgency. Low-carbon consumption is the foundation of the development of low-carbon economy. From the perspective of the process of social reproduction, consumption is the end point of social reproduction, but also the starting point of social reproduction, people's consumption behavior and lifestyle have a decisive role in energy consumption and carbon dioxide emissions.[0] The "carbon reduction mechanism" of low-carbon consumption can help achieve the dual carbon goal as soon as possible through the dual effect of direct reduction of carbon emissions through low-carbon consumption and indirect emission reduction of low-carbon production of enterprises.[0]

Currently, college students are one of the main players in China's consumption market, and their

huge consumption demand, diverse consumption patterns and advanced consumption concepts make whether their consumption is low-carbon or not of great significance to promoting low-carbon consumption and achieve the goal of dual carbon. Studying the current situation and influencing factors of low-carbon consumption among contemporary college students can put forward countermeasures and suggestions for further promoting low-carbon consumption among college students, and promote the development of low-carbon economy in the whole society. By combing through the existing literature at home and abroad, it is found that the research on the influencing factors of low-carbon consumption mainly focuses on demographic characteristics and subjective psychological variables. In the new environment of prominent environmental and climate problems at home and abroad and promote the realization of the dual carbon goals, there are few empirical studies on specific groups. Therefore, aiming at the group of college students, this paper analyzes the current problems and main influencing factors of low-carbon consumption of college students through questionnaire survey method and multiple regression, and gives countermeasures and suggestions based on empirical research results.

2. The current low-carbon consumption status of college students

2.1 Definition of the concept of low-carbon consumption

Regarding the concept of low-carbon consumption, Zhou Hou wei believe that the broad meaning of low-carbon consumption includes five levels: The first is "constant temperature consumption", which emits the lowest greenhouse gas emissions in the consumption process; The second is "economic consumption", that is, the minimum consumption of resources and energy; The third is "safe consumption", that is, consumption behavior has the least harm to the health of consumer subjects and the human living environment; The fourth is "sustainable consumption", which has the least harm to the sustainable development of human beings; Fifth, "new field consumption", turning to consumption of new energy to encourage the development of low-carbon technologies, research and development of low-carbon products, and expanding new consumption areas to achieve the purpose of promoting economic transformation.[0] Wang Jian ming and He Ai zhong believe that low-carbon consumption behavior refers to consumers' conscious implementation of low-energy, low-pollution and low-emission consumption behavior in the process of daily consumption, and low-carbon consumption behavior is mainly aimed at personal consumption, and its core keyword is to reduce carbon emissions.[0]

Bo Fan and Zhuang Guiyang refer to low-carbon consumption as low-carbon life consumption, focusing on the study of the mechanism and promotion policies of energy conservation and carbon reduction on the consumer side [0]. He Ai zhong, Li Tao wu, Gai Yan tao and believe that low-carbon consumption is an ecological consumption mode that pursues harmonious coexistence between human and nature, economy society and ecological environment on the basis of meeting the basic requirements of human health and survival, and its essence is to reduce the consumption of fossil energy such as coal and oil, reduce the emission of greenhouse gases such as carbon dioxide, and alleviate the environmental pollution caused by this in the process of consumption.[0] Guo Wen ying believes that low-carbon consumption refers to consumers' choice of low-carbon products, decision-making and purchase taking into account the information displayed on carbon labels, relevant policies and social atmosphere, psychological factors, social norms and other factors, according to their own cognition, purchasing behavior.[0]

On the basis of drawing on the research on low-carbon consumption in domestic and foreign literature, combined with the characteristics of college students, this paper defines low-carbon consumption as follows: its content mainly includes three aspects, one is to choose environmentally friendly and pollution-free green products; The second is to pay attention to low-carbon treatment in

the consumption process to avoid polluting the environment; The third is to guide consumers to change their consumption concepts in order to achieve the purpose of sustainable development.

2.2 Questionnaire design and sample analysis

This paper designs a questionnaire according to the characteristics of college students, and sets a total of 21 questions, covering the individual characteristics of college students, the objective environment, awareness and behavior of college students' low-carbon consumption. This questionnaire was designed and distributed online on the questionnaire star, and a total of 229 questionnaires were collected. In order to ensure the validity of the data, 213 valid questionnaires were finally obtained by setting screening questions, and the effective recovery rate of the questionnaires was 93%.

From the basic situation of the sample (as shown in Table 1), the gender composition of the overall sample shows that there are more female students, and the ratio is roughly 3:7, which is relatively unbalanced. The grade composition showed that there were more senior students (55.4%); The composition of majors is mostly in the category of economics and management, and the distribution of other majors is relatively even; The monthly consumption level is concentrated in 1000-2000.

Table 1: Basic information of the sample of interviewed college students

Projects	Category	Sample size	Proportion
Gender	Male	61	28.64%
	Female	152	71.36%
Grade level	Freshman	16	7.51%
	Sophomore	29	13.62%
	Third	33	15.49%
	Senior	118	55.4%
	Postgraduate students	17	7.98%
Specialize	Science and engineering	51	23.94%
	Economics and management	90	42.25%
	Literature and history	51	23.94%
	Other	21	9.86%
Monthly consumption level	Less than1000	22	10.33%
	1000—1500	99	46.48%
	1500—2000	71	33.33%
	2000—3000	14	6.57%
	Over 3000	7	3.29%

2.3 Analysis of the current situation of low-carbon consumption among college students

The analysis of the current situation of low-carbon consumption of college students in this paper mainly includes two aspects, one is the investigation of the objective environment of low-carbon consumption, and the other is the measurement of college students' awareness of low-carbon consumption behavior. The measurement of the objective environment of low-carbon consumption of college students mainly involves three aspects: enterprises, governments and society. From the data (Table 2), it can be seen that enterprises do not produce and publicize low-carbon products enough, and most college students do not see or hear about low-carbon products; Although the government publicizes low-carbon consumption, the incentive policies for low-carbon consumption are not enough; College students talk less about low-carbon consumption, indicating that society does not pay enough attention to low-carbon consumption.

Table 2: Survey of the objective environment of low-carbon consumption among college students

Category	Indicators	Sample size	Proportion
Do you usually see low carbon products on the market?	None	16	7.51%
	Occasionally	155	72.77%
	Frequently	42	19.72%
Do you usually come across a lot of publicity about low carbon goods?	None	36	16.9%
	Occasionally	125	58.69%
	Frequently	52	24.41%
Have you heard of any business initiatives to encourage low carbon consumption？	None	47	22.07%
	Occasionally	113	53.05%
	Frequently	53	24.88%
Have you heard about incentives to encourage low carbon consumption or production？	None	45	21.13%
	Occasionally	111	52.11%
	Frequently	57	26.76%
Have you heard about the awareness and education on low carbon consumption？	None	24	11.27%
	Occasionally	106	49.77%
	Frequently	83	38.97%
Do you friends and family talk about low carbon consumption and other related issues？	None	72	33.8%
	Occasionally	106	49.77%
	Frequently	35	16.43%

According to the three meanings of low-carbon consumption, the measurement framework of low-carbon consumption (Table 3) is given, and the different answers to the treatment methods of garbage are scored according to the interviewed college students' understanding of low-carbon, the selection and use of low-carbon products, and the current situation of low-carbon consumption of college students is measured according to the scores. A score of 9 or more is defined as excellent, a score of 6-9 is defined as good, a score of 3-6 is defined as passed, and a score of less than 3 is defined as unqualified. Through the analysis of sample data, the number of samples with excellent low-carbon consumption behavior of college students is 19, accounting for about 9%, the number of unqualified samples is 7, accounting for about 3%, the number of good samples is 102, accounting for about 48%, and the number of qualified samples is 85, accounting for about 40%.

Through the analysis of the questionnaire results, it can be seen that most college students have good low-carbon consumption behavior, but less excellent performance, and most of them are in the qualified stage, which shows that college students' awareness of low-carbon consumption needs to be strengthened and low-carbon consumption behavior needs to be improved.

Table 3: Measurement framework of low-carbon consumption behavior of college students

Measurement framework of low-carbon consumption behavior of college students	
Measure the stem of the questions	Options and scores
How well do you know carbon economy，carbon neutrality and carbon peaking？	No knowledge =0 marks，fairly knowledge=1 marks，very knowledge=2 marks
Level of understanding of dual carbon targets？	Correct answer=2 marks，incorrect answer=0 marks
Do you consciously choose low carbon products in your daily life？	will=2marks，won't=0 marks，in principle but influenced by price=1 marks
Which mode of transport do you usually use to get around？	Public transport, walking, bicycle sharing=2 marks, private car=1marks, other=0 marks
How often you use disposable when dining or shopping？	never=2marks，occasionally=1 marks, often=0 marks
Are you conscious of separating your waste in your daily life？	yes=2 marks，no=0 marks

3. Analysis of the influencing factors of low-carbon consumption of contemporary college

students

3.1 Model setting and variable selection

Consumer behavior is influenced by many complex factors. Starting from the homo economicus hypothesis, consumption behavior is mainly regulated by material consumption and personal interests of income; Starting from the assumption of social people, consumption motivation and behavior are not only affected by material stimuli, but also by the stimulation of social norms and factors such as values, attitudes, and knowledge.[7] Compared with ordinary consumption, low-carbon consumption requires increasing the constraints on carbon emissions of consumption behavior, and incorporating energy-saving and low-carbon ecological benefits into the utility of consumer demand, which involves higher costs of money, energy, and time, and its influencing factors are often more complex.[2] Therefore, selecting and defining the influencing factors of low-carbon consumption is the premise of studying the influencing factors of low-carbon consumption of college students. At present, the research on the influencing factors of low-carbon consumption mainly includes two aspects. On the one hand, it is based on the study of subjective psychological variables. Ajzen's planned behavior theory states that the will to act has a dominant effect on behavior, and the influence of the former on the latter is positively correlated, and the theory also analyzes the way in which individual psychological factors act on behavior through behavioral will.[8] Liu Yang concluded through the Fisher step-by-step discrimination method that college students' perception of environmental problems has a significant impact on college students' low-carbon consumption behavior, and college students' low-carbon consumption mastery knowledge, personal consumption concept, social responsibility awareness, and individual characteristics have obvious influences, and on the whole, the subjective psychological consciousness variables of college students have a greater impact on college students' low-carbon consumption behavior than individual characteristics.[9] Since the subjects interviewed in this paper are college students, belonging to homogeneous groups, individual characteristics are not much different, consumption habits and consumer psychology are more consistent, resulting in small differences in low-carbon consumption behaviors, so it is no longer studied. The other is research based on the external environment, Ma Hai liang, Li Meng ge and Tian Ze attributed the influencing factors of low-carbon consumption to five aspects, namely social factors, natural factors, family factors, personal factors and behavioral cognition.[10] Shi Hong jing empirically analyzed the positive effects of values, attention, administrative policies, operational capabilities and social norms on low-carbon consumption behavior through descriptive statistics, one-way variance model and multiple linear regression model.[11] Yang Liang liang and Cheng Cai feng, obtained empirical data through questionnaire survey methods and conducted empirical analysis, and the results showed that there were significant differences in individual values, current environmental concerns, group norms, policy publicity efforts, and the influence of the product itself on college students' low-carbon consumption behavior.[12] Accordingly, this paper divides the factors affecting college students' low-carbon consumption behavior into product credibility, social atmosphere, government policies, and climate and environmental events.

By sorting out the questionnaire data, the total score of college students' low-carbon consumption behavior was taken as the dependent variable, and product credibility, social atmosphere, government policy and climate and environmental events were used as independent variables. The independent variables are categorical variables, expressed in words, and the categorical variables are assigned to dummy variables. To simplify the analysis, treat the "indefinite" option in the sample as the "disagree" option

Establish the multiple linear regression equation as

$$y = \alpha + \beta_1 D_1 + \beta_2 D_2 + \beta_3 D_3 + \beta_4 D_4 + \mu_1 \tag{1}$$

Among them: y is the total score of college students' low-carbon consumption behavior, D_1, D_2, D_3, D_4 respectively, indicating product credibility, social atmosphere, government policies and climate and environmental events, α indicating other factors affecting college students' low-carbon consumption behavior, which means that when the variables remain unchanged, the change of college students' low-carbon consumption behavior., β_i. represents the degree of influence of each variable on college students' low-carbon consumption behavior, and μ_1 represents the random.

3.2 Regression process and results analysis

In this paper, stata is used for regression analysis, and heteroscedasticity, autocorrelation and multicollinearity tests are performed on the model. The model does not have the above problems. The regression results are shown in the table.

Table 4: Econometric analysis results of influencing factors of low-carbon consumption behavior of college students

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.796	0.392	14.800	0.000
D1	0.815	0 .401	2.030	0.044
D2	0.965	0.300	3.220	0.002
D3	-0.565	0.262	-2.160	0.032
D4	0.048	0.345	0.140	0.889
R-squared	0.084		F-statistic	4.770
Adjusted R-squared	0.066		Prob(F-statistic)	0.001

Data source: Collated from stata result output

From the regression results (Table 4), it can be seen that the p-value of the F test is 0.001, and the result is less than 0.05, which shows that the regression equation is significant and statistically significant. Among the hypothetical influencing factors affecting college students' low-carbon consumption behavior, product credibility had a significant impact on college students' low-carbon consumption, with an impact coefficient of 0.815. The price and quality of the product will directly affect whether college students are willing to buy low-carbon products, whether low-carbon products are easy to identify is related to whether college students can choose low-carbon products, in general, the more favorable the price of the product, the higher the quality and identifiability, the higher the possibility of college students choosing low-carbon products.

The social atmosphere also had a significant impact on the low-carbon consumption behavior of college students, with an impact coefficient of 0.965. This is mainly due to herd mentality. As the most sensitive to social trends and the most able to drive social popularity, college students are more susceptible to the influence of others and more likely to influence others, and the discussion and consumption of low-carbon consumption and low-carbon products by people around them will directly affect their consumption behavior. With the development of big data and the Internet, consumers can understand products more directly and comprehensively through media promotion, and college students, as the most extensive and active group on the Internet, have a strong ability to receive and find information, and the stronger the social atmosphere of low-carbon consumption, the more it can promote low-carbon consumption of college students.

In terms of government policies, the impact coefficients are -0.565, which has a significant impact. Government taxes on high-carbon behaviors or economic incentives for low-carbon behaviors can significantly affect the low-carbon consumption behavior of college students.

Climate and environmental events did not have a significant impact on college students' low-carbon consumption behavior, with impact coefficients of 0.048. This may be because most college students are not particularly clear about the link between low-carbon consumption and environmental climate.

4. Research conclusions and countermeasures

4.1 Research conclusions

Taking college students as the research object, this paper examines the current situation of college students' low-carbon consumption by analyzing the objective environment and behavior of college students' low-carbon consumption, and discusses the factors affecting college students' low-carbon consumption through empirical analysis. This survey shows that the social atmosphere of low-carbon consumption of college students is not enough, and the objective environment needs to be strengthened; College students' awareness and behavior of low-carbon consumption need to be improved and enhanced. In addition, the low-carbon consumption behavior of college students is significantly affected by product credibility, group norms and government policies, and climate and environmental events have no significant impact on them.

4.2 Countermeasure recommendations

4.2.1 The government leads low-carbon consumption

First, the government should improve relevant laws and policies to encourage society to implement low-carbon consumption, such as taxing or fining high-carbon products that bring negative externalities to curb high-carbon consumption. Formulate certain incentives for low-carbon products that bring positive externalities, and give preferential policies in terms of loans and taxation to encourage low-carbon consumption behavior. In addition, the government should increase low-carbon publicity to create a good atmosphere for low-carbon consumption. Through public service announcements, news, promotional videos and other media publicity, influence public behavior, spread the dual carbon goal and low-carbon consumption, encourage them to accept low-carbon technologies, and advocate low-carbon life.

4.2.2 Enterprises lead low-carbon consumption

Enterprises are the key to the whole society to achieve low-carbon consumption, production determines consumption, enterprises are the main body of production and provision of low-carbon products, only enterprises provide low-carbon products to the society, and then consumers purchase and use low-carbon products, can we further promote low-carbon consumption methods. On the one hand, enterprises should actively carry out technological innovation, reduce energy consumption and carbon emissions, accelerate transformation and upgrading, improve the level of scientific and technological innovation, produce low-carbon products with high quality, green environmental protection, and increase the supply of low-carbon products. On the other hand, enterprises should make efforts in the quality, price and recognizability of low-carbon products, improve the recognizability of low-carbon products, enable consumers to buy consumer products, improve the quality of products, reduce prices, and make consumers willing to buy low-carbon products.

4.2.3 Society promotes low-carbon consumption

With the prevalence of the Internet and the Internet celebrity economy, the role of consumer atmosphere and consumer psychology in consumption is becoming more and more obvious. The social consumption atmosphere also plays an increasingly important role in promoting low-carbon consumption. The society can rely on its wide distribution and penetration into all social strata to carry out low-carbon environmental protection education and publicity activities more widely and deeply. The first is to carry out low-carbon education practice activities through some environmental protection organizations, advocate college students to actively participate in environmental protection volunteer activities, improve college students' low-carbon awareness and low-carbon ability, and promote low-carbon consumption. Second, schools should strengthen low-carbon education, enter the campus through low-carbon education, hold low-carbon knowledge competitions and low-carbon innovation competitions to help college students increase their low-carbon knowledge and understand the relationship between low-carbon and life. Help college students raise low-carbon awareness and improve low-carbon consumption behavior.

4.2.4 University students are widely involved in low-carbon consumption

College students widely participate in low-carbon consumption, mainly to do the following, one is cognition, that is, college students should improve their understanding and awareness of low-carbon consumption through various educational activities, not only pay attention to the international and national advocacy policies for low-carbon, but also understand the close connection between low-carbon and daily life. Adhere to the practice of low-carbon consumption mode that keeps pace with the times, give full play to the subjective initiative of consciousness, strive to learn low-carbon knowledge, and improve theoretical learning. The second is practice, that is, college students should actively implement the concept of sustainable development in their daily study and life, adhere to self-examination, establish a rational consumption concept, and put an end to comparison; Travel green, save resources, pay attention to the details of life, and practice low-carbon consumption.

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