



# Analysis of the Influence of Intergenerational Ethics on the “Internet+” Recycling Intention of Renewable Resources—Based on Norm Activation Theory

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**Abstract.** The natural resources are consumed in large quantities, and sustainable economic development is seriously restricted by resources. The recovery of renewable resources has become an urgent environmental, economic and social problem. The “Internet +” recovery model provides a new solution. Based on the normative activation model, this paper constructs a hypothetical model of the relationship between intergenerational ethics and “Internet +” recycling intention. It is found that intergenerational ethics plays a significant role in promoting the recycling intention of “Internet +” of renewable resources, and its mechanism is that intergenerational ethics directly affects consumers’ consciousness of consequences and attribution of responsibility, and activates consumers’ personal standards, and then affects the “Internet +” recycling intention of renewable resources.

**Keywords:** Intergenerational ethics · “Internet +” recycling · normative activation theory

## 1 Introduction

With the rapid development of economy, a large number of natural resources are consumed, and the sustainable development of economy is seriously restricted by resources, so the recovery of renewable resources is extremely urgent. According to the China Renewable Resources Recycling Industry Development report, by the end of 2018, the total amount of renewable resources recovered in China’s top 10 categories reached 320 million t, an increase of 13.4% over 2017. However, at present, the recovery rate of renewable resources in China is less than 60%, which is a big gap with the recovery rate of 80% in some developed countries. With the rapid development and growth of information technology, Internet technology and logistics distribution system, the Internet and e-commerce have been fully integrated into social life. In May 2016, the National Development and Reform Commission, the Ministry of Commerce and other six ministries jointly issued the “*Opinions on promoting the Transformation and upgrading of*

*the Recycling Industry*”, emphasizing the need to promote the new model of “Internet + recovery”. Compared with the traditional recovery mode, this model has the advantages of high recovery efficiency and low recovery cost. How to guide consumers to recycle renewable resources has become a common problem faced by scholars, enterprises and the government.

In recent years, many scholars have paid attention to the relationship between intergenerational ethics and ecological civilization and sustainable development. However, the research stays at the macro-qualitative level, ignoring the moral activation of intergenerational ethics on micro-individual behavior. The “Internet +” recycling of renewable resources is a typical sustainable development behavior and moral behavior, and there may be an undiscovered moral and psychological mechanism. Therefore, based on the normative activation theory, this study aims to reveal the influence mechanism of intergenerational ethics on consumers’ intention to participate in the “Internet +” recycling of renewable resources.

## 2 Literature Review

### 2.1 Intergenerational Ethics

Intergenerational ethics is a kind of one-dimensional and unequal ethical relationship, which embodies the value demand of being responsible to future generations. From the “Careful Pursuit” advocated by Confucianism to the basic virtues of “*Filial piety*”, “*Respect*”, “*Kindness*” and “*Love*” advocated by Confucianism, intergenerational ethics has always been the main vein and foundation of Chinese traditional culture. Intergenerational ethics has become the unique cultural gene and code of conduct of the Chinese people, and it also makes the Chinese people’s thoughts contain the natural and instinctive altruistic tendency of parents. At the same time, as a vertical dimension of social ethical relations, intergenerational ethics is multifaceted. Existing studies have analyzed the impact of intergenerational ethics on ecological environment and sustainable development from the perspectives of intergenerational justice, intergenerational care, intergenerational storage, intergenerational innovation and intergenerational support. Xie [1] explains that intergenerational justice is an indispensable intrinsic value dimension of ecological civilization from the perspective of intergenerational ethics. Wan [2] believes that the consumption concept of intergenerational care is a kind of cognition that embodies the virtue of frugality and intergenerational fairness. Zhu [3] studies intergenerational storage from the perspective of practical cognitive theory, and discusses the basic path and action mode of implementing the strategy. To sum up, the existing studies on intergenerational ethics and ecological behavior are from the perspective of sociology, economics and ecology, exploring intergenerational ethics in a broad sense, but have not paid attention to the moral activation role of intergenerational ethics in the influence of individual behavior. In order to make up for this deficiency, this study discusses the moral mechanism of intergenerational ethics in the “Internet +” recycling intention of renewable resources based on the normative activation theory.

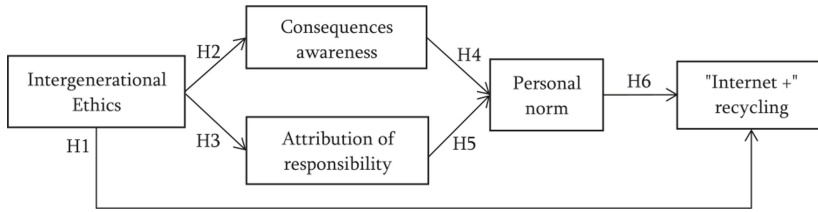
## 2.2 “Internet+” Recycling

The “Internet +” recycling model uses modern information technologies and means such as the Internet, big data and cloud computing to build a platform for information release, competitive procurement and logistics services for upstream recycling enterprises and downstream dismantling and utilization enterprises through an organic combination of online waste delivery and offline recycling. This model gathers consumers, recyclers and processing enterprises together, and has the characteristics of convenience, interaction and transparency. As the “Internet +” recycling industry has just sprung up, the research of Chinese scholars is mainly focused on how to introduce the e-commerce into the recycling process and apply Internet technology as a supporting factor to the construction of the recycling. However, there is little research on the “Internet +” recycling intention and behavior. The existing related researches are mainly based on single theories or integrated theoretical models, such as technology acceptance model (TAM), planned behavior theory (TPB), theory of reasoned action (TRA) and unified theory of acceptance and use of technology (UTAUT), to explore the factors that affect consumers’ “Internet +” recycling intention and behavior. It includes external situational factors such as economic factors, information publicity, convenience of recycling channels, information security, legal policies, as well as internal psychological factors such as attitude, beliefs, values, subjective norms, perceptual behavior control and so on. However, the influence of intergenerational ethics on the “Internet +” recycling intention of renewable resources has not been fully studied.

## 3 Conceptual Framework

### 3.1 Normative Activation Theory

Normative activation model is developed by Schwartz in the context of individual altruism and is used to explain altruistic and environmental behavior or intention. This theory is widely used in the study of environmental behavior. According to this model, individual norms are the reference of individual value system, which determines the moral behavior of individuals. The activation of individual norms requires individual consciousness of consequences and attribution of responsibility. Normative activation model has been widely used to predict consumers’ ecological behavior, such as recycling behavior, garbage sorting behavior and so on. Ebreo [4] analyzed the waste reduction behavior of Illinois residents using normative activation theory. The data show that responsibility attribution and its interaction with personal norms are important predictors of interviewees’ waste reduction behavior. LV [5] and others studied the energy-saving behavior of the public based on this theory, and concluded that the awareness of the consequences of non-energy-saving hazards and responsibility can positively affect the public energy-saving personal norms, and on this basis to stimulate the public to implement energy-saving behavior. Zheng [6] and others study the influencing factors of public participation in environmental protection based on normative activation theory, and come to the conclusion that responsibility attribution and consequence awareness can activate public personal norms and enhance public participation in environmental protection behavior. Therefore, this paper discusses consumers’ “Internet +” recycling intention of renewable resources, which is applicable to NAT theory.



**Fig. 1.** Study of model with hypotheses

### 3.2 Theoretical Model

Combined with the normative activation theory, this study constructs a theoretical model of the influence mechanism of intergenerational ethics on the “Internet +” recycling intention of renewable resources based on the explanation mechanism of consequence consciousness, responsibility attribution and individual norms (Fig. 1).

## 4 Hypotheses Development

The “Internet +” recycling of renewable resources is a tradeoff between self-interest and environmental interests, and intergenerational ethical awareness will weaken self-concept. Besides, the “Internet +” recycling model is based on advanced technology and has new functions and features, while the cognition of intergenerational innovation can promote people to deeply process information and stimulate people’s desire to explore. There is a close relationship between intergenerational ethics and moral behavior. Renewable resources recycling occupies the commanding height of the moral system and belongs to the category of moral behavior. Therefore, intergenerational ethics can improve consumers’ tendency to recycle by network. Based on this, the following hypothesis is considered:

*Hypothesis 1: Intergenerational ethics has a positive impact on the “Internet +” recycling intention of renewable resources.*

Consequence consciousness means that consumers are aware of the adverse consequences of their actions. Renewable resources recycling means less harm to the environment and the welfare of future generations. Intergenerational ethics is regarded as a kind of caring cognition, which will prompt individuals to think deeply about the impact of their own behavior and reduce automatic and convenient heuristic behavior. Therefore, consumers who are deeply influenced by Chinese traditional culture and have intergenerational ethical awareness are more likely to realize the environmental consequences of non-recycling behavior and the harm to the welfare of future generations. Based on this, the following hypotheses are suggested:

*Hypothesis 2: Intergenerational ethics positively affects consumers’ awareness of consequences.*

Responsibility attribution means that individuals feel responsible for the adverse consequences caused by their actions. Relevant studies have shown that intergenerational ethics can extend self-concept and make people feel that they are not isolated individuals, but members of the natural world. This will give consumers an unshirkable sense of responsibility for the existing environmental consequences, and then make them realize that they should actively prevent the waste of environmental damage and resources when necessary. Therefore, this paper deduces that intergenerational ethics can stimulate consumers’ sense of responsibility for the consequences of their actions. Based on this, the following hypothesis is suggested:

*Hypothesis 3: Intergenerational ethics positively affects the attribution of consumer responsibility.*

Personal norms are rooted in the self-expectations, constraints and obligations, and it is a sense of moral obligation for individuals to perform specific environment-friendly behaviors and resource-saving behaviors. According to the normative activation theory, consumers’ awareness of consequences is a prerequisite for activating individual norms. If individuals are aware of the adverse consequences of the non-recycling state of renewable resources, it is easier to activate personal norms, because if consumers do not understand the consequences of their actions, it is difficult for consumers to think that they have a responsibility to do something. When consumers know that not participating in the “Internet +” recycling of renewable resources will have adverse consequences on the environment, they are more likely to have a sense of moral obligation to use the online recycling platform. Based on this, the following hypothesis is suggested:

*Hypothesis 4: Awareness of consequences positively affects consumers’ personal norms.*

According to the normative activation theory, consumers’ responsibility for adverse consequences is another important factor affecting personal norms. If consumers think they are responsible for the consequences of renewable resources, it will be easier to activate their personal norms. The reason is that if an individual thinks that respect for norms may harm his personal interests, he will adopt a defensive strategy and refuse to bear the consequences of his own bad behavior in order to eliminate norms. Therefore, when consumers believe that they are responsible for the consequences of specific actions, their sense of moral responsibility for altruistic behavior increases. Based on this, the following hypothesis is suggested:

*Hypothesis 5: Personal norms in which the attribution of responsibility positively affects consumers.*

In the framework of normative activation model, individual norms play a core role, and the activation of personal moral obligations (personal norms) will encourage prosocial behavior and pro-environmental behavior. Consumers’ recycling behavior can not only demonstrate their awareness of environmental protection, but also win the recognition and respect of the public, so recycling behavior is a typical pro-social and pro-environmental behavior. And a large number of studies have shown that personal norms

can promote environmental protection and recycling behavior. Therefore, the activation of personal norms can make people more willing to participate in recycling behavior. Based on this, the following hypothesis is suggested:

*Hypothesis 6: Personal norms are affecting consumers' "Internet +" recycling intention of renewable resources.*

## 5 Method

### 5.1 Measures

Intergenerational ethics, consciousness of consequences, attribution of responsibility, personal norms and "Internet +" recovery intention are the key variables of this study. In this paper, all the variable items in the questionnaire are based on the existing maturity scale, and combined with "Internet +" recycling of renewable resources scene and Chinese traditional cultural background to modify and improve. The details are as follows: (1) Intergenerational ethics not only refers to the relevant literature, but also draws lessons from the measurement scale designed by Dunlap [7] and compiles three related measurement items combined with the purpose of this paper, which mainly investigates the degree of intergenerational care and parental altruistic tendency that the public is willing to provide for the survival and development of their offspring. (2) The consciousness of consequences and the attribution of responsibility mainly draw lessons from the measurement scale designed by Steg [8], and set up three measurement items respectively. Among them, the title of the consequence awareness scale is such as "I think renewable resources will cause a waste of resources and do harm to future generations." The title of the responsibility attribution scale, such as "I think it is the responsibility of every citizen to recycle renewable resources". Personal norms mainly investigate consumers' sense of responsibility and moral obligation for renewable resources recycling. (3) "Internet +" recycling intention draws lessons from the measurement scale designed by Ajzen [9], and compiles three measurement items related to it. For example, "I prefer recycling websites or APP to traditional recycling methods."

### 5.2 Data Collection

The online survey platform was used to complete the data collection, 300 questionnaires were randomly distributed, 28 invalid questionnaires were eliminated, 272 valid questionnaires were obtained, and the effective questionnaire rate was 90.667%. Among them, male (140) accounted for 51.47%, female (132) accounted for 48.53%, other demographic characteristics accounted for a balanced proportion, with good representation.

## 6 Results

### 6.1 Reliability and Validity

The value of Cronbach alpha coefficient for all constructs was 0.815, indicating existence of internal reliability (see Table 1). The results of confirmatory factor analysis show

**Table 1.** Test indicators and fitting results of the model.

Variable	Item	Cronbach's $\alpha$	Estimate	C.R.	AVE	VIF	P
Intergenerational Ethics	IE1	0.844	0.761	0.850	0.654	1.254	***
	IE2		0.882				***
	IE3		0.778				
Consequences awareness	AC1	0.765	0.783	0.767	0.525	1.108	
	AC2		0.617				***
	AC3		0.763				***
Attribution of responsibility	AR1	0.775	0.793	0.777	0.541	1.205	***
	AR2		0.782				***
	AR3		0.617				
Personal norm	PN1	0.888	0.834	0.889	0.728	1.370	***
	PN2		0.844				***
	PN3		0.881				
“Internet +” recycling intention	RI1	0.821	0.752	0.820	0.603	1.206	
	RI2		0.793				***
	RI3		0.783				***

Note. \*\*\* means  $P < 0.001$

that the standardized estimated values of three observation variables corresponding to intergenerational ethics, responsibility attribution, personal norms and behavior intention and four observation variables corresponding to consequence consciousness are all more than 0.5. And all the estimated variables are significant at the level of  $p < 0.001$ . At the same time, the amount of average variance extracted of each construct exceeded the overall validity of 0.5. The overall validity of KMO and Bartlett's is 0.785, which was higher than the standard of 0.7. The significant test level of  $P < 0.001$  showed that the latent variable had good aggregate validity.

In this paper, the value of VIF are all less than 3, and there is no collinearity problem. Through the method of Harman single factor to test the common method deviation problem, the verification results show that the explanation amount of one factor is only 29.855%, the explanation strength is not strong, it can be considered that the common method deviation problem has no significant impact on the results of this study. To sum up, the scale used in this study has good reliability and validity, and can well measure the construct in the model.

## 6.2 Testing Structural Equation Model

In this paper, the structural equation model was analyzed by AMOS 24.0. The fitting results showed that the value of  $\chi^2/df = 2.206 < 3$ , RMSEA = 0.067 < 0.08, and CFI = 0.943, IFI = 0.943, TLI = 0.928 and NFI = 0.901. Therefore, the fitting degree of

the model is good, and the final structural equation model reveals that all the regression coefficients were statistically significant. It can be used for related hypothesis testing.

**6.2.1 Main Effect**

The main effect test results show that intergenerational ethics has a significant positive impact on the recycling intention, consequence consciousness, responsibility attribution and personal norms of renewable resources recycling. Therefore, H1, H2 and H3 are certified. In addition, the awareness of consequences and the attribution of responsibility have a significant positive impact on individual norms, so H4 and H5 are certified. At the same time, personal norms have a positive impact on the “Internet +” recycling intention of renewable resources, so H6 is certified (see Table 2).

**6.2.2 Mediating Effect**

According to the results of standardized mediating test, intergenerational ethics can positively affect the “Internet +” recycling intention of renewable resources. As shown in Table 3, the indirect effects of consequence awareness and personal norms are significant in 95% confidence interval (excluding 0); the indirect effects of responsibility attribution and personal norms are significant (excluding 0), and the difference between them is not

**Table 2.** Results of tested mode.

Hypotheses		Estimate	P
H1	IE → RI	0.251	***
H2	IE → AC	0.256	***
H3	IE → AR	0.345	***
H4	AC → PN	0.259	***
H5	AR → PN	0.471	***
H6	PN → RI	0.308	***

Note. \*\*\* means P < 0. 001

**Table 3.** Results of tested mode.

Mediating effect	Estimate	SE	Bias-corrected 95%CI		Percentile 95%CI	
			Lower	Upper	Lower	Upper
IE → AC → PN	0.066	0.033	0.014	0.15	0.01	0.137
IE → AR → PN	0.162	0.053	0.072	0.282	0.069	0.276
IE → AC → PN → RI	0.02	0.01	0.005	0.049	0.003	0.041
IE → AR → PN → RI	0.05	0.022	0.019	0.111	0.017	0.103

Note. 2000 Bootstrap sample



significant (including 0). Therefore, the consequences awareness and personal norms, responsibility attribution and personal norms play a continuous intermediary role.

## 7 Conclusion

The results of this paper show that: (1) Intergenerational ethics has a positive impact on consumers' intention to participate in the “Internet +” recycling of renewable resources; (2) The intermediary effect of consequence consciousness and personal norm is significant. That is, intergenerational ethics can improve consumers' awareness of the adverse consequences, and then activate individuals' sense of moral obligation to engage in altruistic behavior, and finally enhance consumers' intention to participate in the “Internet +” recycling of renewable resources; (3) The intermediary role of responsibility attribution and personal norms is significant. The intergenerational ethics of consumers can enhance the individual's sense of responsibility for the consequences of their own actions, and then activate the individual's sense of moral obligation, and finally improve consumers' intention to use the online recycling platform.

This study has certain practical significance. Adding ethical elements to the construction and design of “Internet +” recycling platform and advertising can effectively improve consumers' intention to recycle renewable resources on the network, and at the same time help enterprises to assume environmental ethical responsibility and create intergenerational technology. The government and environmental protection organizations can improve the public's awareness and responsibility for the negative consequences by cultivating the public's ethics and morality, so as to promote the public to establish a consumption concept that embodies intergenerational care. There are still some shortcomings and limitations in this study.

This paper only pays attention to the “Internet +” recycling intention of renewable resources, and does not measure consumers' behavior about the use of the network recycling platform. Future research can include the “Internet +” recycling behavior of renewable resources into the model. In addition, this paper does not explore the boundary conditions of the relationship between intergenerational ethics and the “Internet +” recycling intention of renewable resources, which provides a direction for future research.

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