THE IMPACT OF ONLINE REFERENCE GROUPS ON SHARED GREEN CONSUMPTION BEHAVIOR: THE MEDIATING ROLE OF NATURAL EMPATHY

RUYI ZHANG

AN INDEPENDENT STUDY SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE
MASTER DEGREE OF ARTS
FACULTY OF LIBERAL ARTS
RAJAMANGALA UNIVERSITY OF TECHNOLOGY
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Independent Study	The Impact of Online Reference Groups on Shared Green Consumption Behavior: The Mediating Role of Natural Empathy
Author	Ruyi Zhang
Major	Master of Arts (English for Service Industry)
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Faculty of Liberal Arts, Rajamangala University of Technology Krungthep approved this independent study as partial fulfillment of the requirement for the degree of Master of Arts

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Abstract

With the development of China's economy and society, online interpersonal interactions have become increasingly prevalent, and more people have adapted to online social networking. Online reference groups, through information dissemination, demonstration effects, and social interactions, help promote green consumption concepts. This encourages more individuals to choose environmentally friendly and sustainable consumption methods, thereby advancing the popularization and development of green consumption. The attitudes, behaviors, and perspectives of members within online reference groups regarding shared green consumption exert significant referential effects on individuals' shared green consumption behaviors.

This research aims to investigate the influence of online reference groups on shared green consumption behavior, examine the impact of online reference groups on natural empathy, explore the influence of natural empathy on shared green consumption behavior, and study the mediating role of natural empathy between online reference groups and shared green consumption behavior.

The study surveyed Chinese internet users and collected 409 valid online questionnaires. Data analysis and hypothesis testing were conducted using SPSS 27.0 and Mplus 7. The statistical analysis results indicated that online reference groups positively influence shared green consumption behavior; online reference groups positively affect natural empathy; natural empathy positively influences shared green consumption behavior; and natural empathy mediates the relationship between online

reference groups and shared green consumption behavior.

Keywords: Online reference groups, natural empathy, shared green consumption behavior

บทคัดย่อ

ด้วยการพัฒนาเศรษฐกิจและสังคมของจีน การปฏิสัมพันธ์ระหว่างบุคคลทางออนไลน์ได้กลายเป็นที่แพร่หลายมากขึ้น และผู้คนจำนวนมากขึ้นได้ปรับตัวเข้ากับการสังคมออนไลน์ กลุ่มอ้างอิงออนไลน์ผ่านการเผยแพร่ข้อมูล ผลกระทบจากการสาธิต และการปฏิสัมพันธ์ทางสังคม ช่วยส่งเสริมแนวคิดการบริโภคที่เป็นมิตรกับสิ่งแวดล้อม ซึ่งกระตุ้นให้บุคคลเลือกวิธีการบริโภคที่เป็นมิตรกับสิ่งแวดล้อมและยั่งยืนมากขึ้น ส่งเสริมการแพร่หลายและการพัฒนาของการบริโภคสีเขียว ทัศนคติ พฤติกรรม และมุมมองของสมาชิกในกลุ่มอ้างอิงออนไลน์เกี่ยวกับการบริโภคสีเขียวแบบแบ่งปัน มีผลอ้างอิงอย่างมีนัยสำคัญต่อพฤติกรรมการบริโภคสีเขียวแบบแบ่งปันของบุคคล

การวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาผลกระทบของกลุ่มอ้างอิงออนไลน์ต่อพฤติกรรมการบริโภคสีเขียวแบบแบ่งปัน ตรวจสอบผลกระทบของกลุ่มอ้างอิงออนไลน์ต่อความเห็นอกเห็นใจธรรมชาติ สำรวจอิทธิพลของความเห็นอกเห็นใจธรรมชาติต่อพฤติกรรมการบริโภคสีเขียวแบบแบ่งปัน และศึกษาบทบาทสื่อกลางของความเห็นอกเห็นใจธรรมชาติระหว่างกลุ่มอ้างอิงออนไลน์และพฤติกรรมการบริโภคสีเขียวแบบแบ่งปัน

การศึกษานี้ได้สำรวจผู้ใช้อินเทอร์เน็ตชาวจีนและรวบรวมแบบสอบถามออนไลน์ที่ถูกต้องจำนวน 409 ชุด การวิเคราะห์ข้อมูลและการทดสอบสมมติฐานได้ดำเนินการโดยใช้ SPSS 27.0 และ Mplus 7 ผลการวิเคราะห์สถิติชี้ให้เห็นว่ากลุ่มอ้างอิงออนไลน์มีอิทธิพลเชิงบวกต่อพฤติกรรมการบริโภคสีเขียวแบบแบ่งปัน กลุ่มอ้างอิงออนไลน์มีผลเชิงบวกต่อความเห็นอกเห็นใจธรรมชาติ ความเห็นอกเห็นใจธรรมชาติมีอิทธิพลเชิงบวกต่อพฤติกรรมการบริโภคสีเขียวแบบแบ่งปัน และความเห็นอกเห็นใจธรรมชาติทำหน้าที่เป็นตัวกลางระหว่างกลุ่มอ้างอิงออนไลน์และพฤติกรรมการบริโภคสีเขียวแบบแบ่งปัน

คำสำคัญ: กลุ่มอ้างอิงออนไลน์, ความเห็นอกเห็นใจธรรมชาติ, พฤติกรรมการบริโภคสีเขียวแบบแบ่งปัน

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Chapter 1
Introduction

This chapter elaborates on the research background and research questions, introduces relevant concepts, and outlines the research framework.

1.1 Research Background and Retionale

According to the "China Ecological Environment Status Bulletin" released by the Ministry of Ecology and Environment of China in 2019, severe environmental pollution still exists in China, with air quality exceeding standards in 217 out of 338 cities at or above the prefecture level. The 2023 bulletin reveals a significant reduction in environmental pollution, with air quality exceeding standards in 126 out of 339 cities at or above the prefecture level. The water quality in the Yangtze River Basin, Pearl River Basin, rivers in the Zhejiang-Fujian area, rivers in Northwest China, and rivers in Southwest China is excellent. The Yellow River Basin, Huai River Basin, and Liao River Basin have good water quality, while the Songhua River Basin and Hai River Basin suffer from mild pollution. These changes indicate the Chinese government's commitment to environmental improvement, having implemented large-scale air pollution control measures such as shutting down highly polluting enterprises and promoting clean energy, which have improved air quality in many areas. Efforts to control water pollution have been intensified through measures such as strict industrial wastewater discharge regulations and promoting pollution control in agriculture. Additionally, conservation areas have been expanded to protect rare and endangered species, such as the giant panda. Investments in clean and renewable energy have been increased to shift the energy structure towards greener, low-carbon options. The Chinese government's construction of an ecological civilization meets the people's desire for a better life and a healthy environment. However, there is still room for improvement, and it is crucial to explore new models and channels to maintain progress.

The Chinese government and society have taken a series of proactive measures in green production and green consumption to promote environmental protection, sustainable development, and ecological balance.

In terms of policy support and regulatory frameworks, the Chinese government has introduced a range of policies and regulations to support green production and consumption. For example, policies on energy conservation and emission reduction, environmental protection tax laws, and support policies for renewable and clean energy have been launched to encourage businesses to adopt more environmentally friendly production methods. In terms of green industry development, the government actively promotes green industries, encouraging businesses to transition from traditional high-energy, high-emission industries to environmental industries. Significant progress has been made in the fields of clean energy, new energy vehicles, and environmental technologies.

Regarding resource recycling, governments at all levels encourage and support the classification, recycling, and reuse of waste to reduce resource wastage and environmental pollution. In some cities, mandatory waste sorting systems have been implemented. In terms of green finance, China is promoting green finance, encouraging the flow of funds towards environmental and sustainable projects, including supporting the issuance of green bonds and establishing green development funds.

In the area of publicity, education, and awareness enhancement, governments at all levels conduct educational campaigns to raise public awareness and understanding of green production and consumption. They advocate for a green lifestyle, encouraging people to reduce unnecessary consumption and choose environmentally friendly products. Regarding environmental standards and certification, the government is strengthening the formulation of environmental standards and encouraging companies to produce products that meet environmental requirements. Some environmental certification organizations also encourage businesses to participate in green certification to enhance their products' market competitiveness.

Shared green consumption behavior is an inevitable choice for green development because it helps to achieve effective resource use, reduce environmental burdens, promote social equity, and align with sustainable development goals. In terms of effective resource utilization, the sharing economy model emphasizes sharing and utilizing existing resources, reducing resource wastage. By sharing, an

item can be used by multiple people, thus reducing resource consumption in production and consumption processes. In terms of waste and pollution reduction, the sharing economy model can reduce the life cycle of products, thereby reducing waste generation and environmental pollution. Many single-use products can be reused multiple times under a sharing economy model, reducing waste volume. In promoting sustainable production, shared green consumption behavior encourages manufacturers to design durable, easy-to-repair, and reusable products, thus reducing resource consumption and environmental impact. This can push businesses towards more sustainable production methods. In terms of reducing energy consumption, the sharing model encourages resource sharing, reducing the need for repetitive production and thereby lowering energy consumption, which positively impacts greenhouse gas emissions and energy wastage. In promoting social equity, the sharing economy allows more people to enjoy certain levels of access, reducing inequality in resource distribution. This helps to promote social equity and inclusive development. In creating a sense of community and social interaction, the sharing economy model often requires people to cooperate and interact within their communities, fostering a sense of community and interpersonal relationships, contributing to a warmer social environment.

Overall, shared green consumption behavior, by reducing resource wastage, promoting sustainable production, lowering energy consumption, and promoting social equity, is highly consistent with the goals of green development. However, the sharing economy model also needs to consider issues of regulation, privacy protection, and resource redistribution to ensure its sustainable and equitable development.

Individuals inevitably interact with others in daily life, and these closely related groups often have an inspirational effect on their purchasing behavior or actions. This is especially true in China, where people place great importance on their social networks, making them easily influenced by others when evaluating products and forming purchase decisions. Additionally, scholars have pointed out that when discussing the relationship between reference group influences and shared green consumption behavior, consumers are significantly influenced by reference groups to reduce purchase risk, follow social norms, or enhance self-worth.

As mobile internet has risen, more and more people incorporate work, study, and entertainment into online communities. Simultaneously, many scholars have begun exploring the value of online communities in marketing. Okleshen (1998) affirmed the reference influence of online communities on consumers gathering information from the perspective of information dissemination. Leal (2014) conducted in-depth interviews with 21 members of virtual networks and found that, despite not being able to meet face-to-face, members were influenced by the normative impacts of the group due to their identification with the community. Thus, online communities play a reference role similar to real-life groups, impacting consumer purchasing behavior to some extent (Chih et al., 2017; Xu, 2012).

With the socio-economic development of China, more interpersonal interactions occur online, and face-to-face communication is not only decreasing but also increasingly characterized by people holding their phones without talking. This shows that more people are becoming accustomed to online socializing. Online reference groups, through information dissemination, demonstration effects, and social interactions, help promote the concept of green consumption, encouraging more people to choose environmentally friendly and sustainable consumption methods, thereby advancing the popularization and development of green consumption. Previous research has shown that online reference groups can enhance consumer loyalty to products, increase satisfaction with related products, and promote their purchasing and repurchasing behavior (Gruen et al., 2005; Li et al., 2013; Wu & Keysar, 2007).

1.2 Statement of the Problem

To promote green consumption behaviors that are essential for building an ecological civilization society, understanding how to advocate for shared green consumption, a concept even more advanced than green consumption itself, is crucial. Given China's strong collective culture and the rise of new social media, this study explores the concept based on reference group theory:

Role of Online Reference Groups: Does the role of online reference groups mirror that of in-person groups in influencing consumer behavior? According to

the "social being" theory, an individual's behavior is inevitably influenced by their surrounding environment. Reference groups, which are closely associated with individual social interactions, impact consumer behaviors. This study introduces online reference groups, investigating whether their reference impacts similarly affect shared green consumption behavior.

Influence of Online Reference Groups on Shared Green Consumption Behavior: This study employs the Stimulus-Organism-Response (SOR) theory to explore whether natural empathy, a variable considered within this framework, influences shared green consumption behavior. The hypothesis is that the empathy consumers feel towards nature could trigger behaviors that align with shared green consumption, influenced by the norms and behaviors observed within their online reference groups.

1.3 Research Objectives

Objective 1: To investigate the influence of online reference groups on shared green consumption behavior.

Objective 2: To examine the impact of online reference groups on natural empathy.

Objective 3: To explore the influence of natural empathy on shared green consumption behavior.

Objective 4: To study the mediating role of natural empathy between online reference groups and shared green consumption behavior.

1.4 Research Questions and Hypotheses

1.4.1 Research Questions

1. Do the online reference groups influence shared green consumption behavior?

2. Does the online reference group affect natural empathy?

3. Does natural empathy influence shared green consumption behavior?

4. Does natural empathy play a mediating role between online reference groups and shared green consumption behavior?

1.4.2 Research Hypotheses

H1: Online reference groups have a positive effect on shared green consumption behavior.

H2: Online reference groups have a positive effect on natural empathy.

H3: Natural empathy has a positive effect on shared green consumption behavior.

H4: Natural empathy mediates the relationship between online reference groups and shared green consumption behavior.

1.5 Scope and Delimitations

1.5.1 Scope of Contents

In this study, the independent variable is online reference groups, the dependent variable is shared green consumption behavior and the mediating variable is natural empathy. The primary focus of the research is to investigate the impact of online reference groups on natural empathy and shared green consumption behavior and the mediating role of natural empathy between online reference groups and shared green consumption behavior. This study aims to explore how these factors influence shared green consumption behavior within this specific context, potentially offering insights for enhancing marketing strategies in this rapidly evolving field.

1.5.2 Population and Sampling

Population

The population of this study is Internet users in China. According to the 53rd "Statistical Report on Internet Development in China" released by the China Internet Network Information Center (CNNIC), as of December 2023, the number of Internet users in China reached 1.092 billion.

Sampling

The sample size required is approximately 400 internet users in China in the study.

1.5.3 Research Area

Internet users in China, 2023.

1.5.4 Time Frame

The research is expected to be conducted during May – June 2024.

1.5.5 Delimitations

Geographical and Contextual Limits

In the field of green consumption, studies on online reference groups are not very common. While this research has achieved certain results, there are limitations in the surveyed subjects. The sample generally consists of active internet users, among whom it is challenging to distinguish economic foundation, social status, and progressive consumption concepts. Therefore, there is room for improvement in the selection of research subjects. Future studies could expand the range of sample subjects to more thoroughly explore the impact of green consumption behaviors across various age groups and consumption levels.

1.6 Conceptual Framework

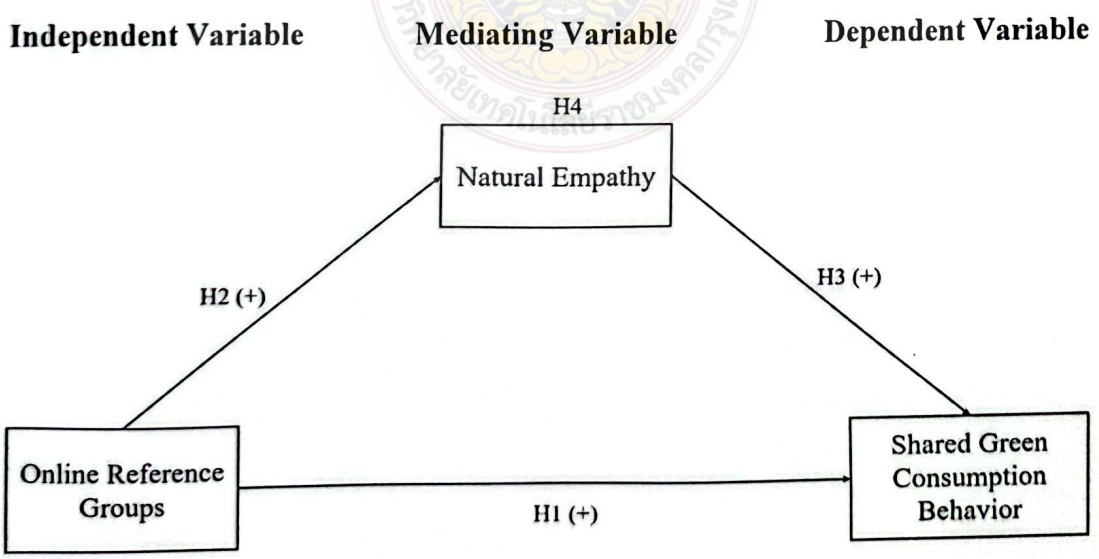

Figure 1.1 Conceptual Framework of Research

1.7 Definition of Key Terms

Online Reference Groups

With the rapid advancement of mobile internet, the public's dependency on online networks has increasingly grown. Individuals use these networks to establish virtual personal, group, and societal relationships, forming online community organizations. These virtual organizations share common characteristics with real-world groups, including shared goals and values, stable interaction frequencies, and group norms and standards, garnering the attention of numerous scholars. Western scholars, Schiffman and Hawkins, view online communities as virtual groups that individuals can perceive, playing a role similar to reference groups for consumers. Chinese scholars, in their empirical research on factors influencing online shopping among college students, have noted that online communities significantly impact consumer attitudes and decision-making processes. As members of these online communities, individuals inevitably experience the influence of such virtual groups during communication and interaction (Sheng et al., 2010; Xu, 2012).

Natural Empathy

Natural empathy is the emotional experience of empathizing with nature that people feel while interacting with and enjoying natural environments. It includes both positive and negative emotional experiences (Hoffman, 2008).

Shared Green Consumption Behavior

Shared green consumption behavior is a type of green consumption that relies on the internet for comprehensive information interaction and data sharing. In this model, consumers share resources, either by efficiently sharing the right to use products or by reintroducing idle resources back into the consumption cycle for secondary shared consumption, with the goals of conserving resources, reducing pollution, and reusing products.

1.8 Summary

1.8.1 Recapitulation of Key Points

This chapter primarily discusses the research background of three variables: online reference groups, natural empathy, and shared green consumption behavior. It

also outlines the research objectives and questions related to these variables. Additionally, hypotheses and a conceptual model regarding the relationships among these three variables are proposed. This research aims to offer new insights and ideas for green marketing.

1.8.2 Transition to the Literature Review

This section outlines the background of three key variables: online reference groups, natural empathy, and shared green consumption behavior. The following section will conduct a comprehensive review of the literature focusing on these variables. It will encompass defining each variable, examining methods for their measurement, and investigating their interrelationships. This endeavor will culminate in the development of research hypotheses pertinent to the study.

Chapter 2
Literature Reviews

In this chapter, a comprehensive literature review is conducted on the variables pertinent to the study. It offers clear definitions for each variable, explores methods for their measurement, and scrutinizes the interconnections among them.

2.1 Theoretical Foundation

2.1.1 Stimulus-Organism-Response (SOR) Theory

Pavlov (1928) introduced the classic Stimulus-Response (S-R) theory. However, this theory only explored the relationship between stimulus and response, without considering the internal states and experiences of organisms (O), thus revealing certain deficiencies in the S-R theory. Consequently, Woodworth (1929) expanded on Pavlov's S-R theory by proposing the SOR model. The SOR model posits that various aspects of the environment (both physical and non-physical elements) (S) can influence people's internal states and organismic experiences (O), such as perception, physiological reactions, sensations, and cognitive activities, which in turn drive their behavioral responses (R). Albert Mehrabian and James A. Russel (1974) further developed the SOR model through their studies on consumer behavior, demonstrating how external environmental stimuli influence individual emotional experiences and thereby affect behavioral intentions. Bitner, based on the SOR model, proposed an environmental-user relationship framework within service organizations.

The Stimulus-Organism-Response (SOR) theoretical model indicates that an individual's internal state or the organism mediates between environmental stimuli and behavioral responses. This means that environmental stimuli alter an individual's internal state, which then triggers their behavioral response. The model comprises three main components: environmental stimuli, the internal state of people, and behavioral responses. Stimuli refer to the environmental factors that people encounter during interactions with the environment, transmitted through various senses, evoking emotional and cognitive states. The internal state is an intermediary process between

stimuli and behavioral responses, including a three-dimensional emotional state composed of pleasure, arousal, and dominance, as well as cognitive states.

Bagozzi et al. (2001) elaborated on the SOR model, which consists of stimuli (S) formed by marketing variables and environmental factors, the individual (O), and consumer responses (R). Based on research by Eroglu et al. (2001), the SOR model has been widely applied in the context of e-commerce to explore how technological characteristics of the e-commerce environment influence consumers' psychological states and behaviors, thus becoming an essential framework for studying consumer behavior in e-commerce settings. For example, Parboteeah et al. (2009) suggested that a website's environmental cues consist of task-related and mood-related cues, and used the model to validate their effects on customers' perceptions of usefulness and entertainment, as well as on online impulsive buying behavior. Assael (1998) noted that environmental conditions and characteristics, products, and consumers influence each other, where environmental conditions or products can impact the consumer's internal state, thereby altering consumer decisions and behaviors. Animesh et al. (2011) applied the model to virtual environments, confirming the significant effects of the social and interactive technological features of virtual environments on users' virtual experiences and product purchasing behaviors.

Overall, the SOR model asserts that external stimuli acting on an organism inevitably produce a corresponding response. This resultant response depends both on the external stimuli and the internal state of the organism. Correspondingly, consumer reference groups can induce specific emotional states in the organism, leading to corresponding consumer behavior.

2.1.2 Empathy-Altruism Hypothesis

For a long time, psychologists have believed that all intentional behaviors, including those aimed at benefiting others, are motivated by self-interest. People are willing to help others primarily because it benefits themselves. The empathy-altruism hypothesis challenges this view, suggesting that empathy can evoke genuine altruistic motives, where the ultimate goal is to benefit others rather than oneself. According to this theory, when an individual experiences empathy, they help others for purely

altruistic reasons rather than for any expected return. Empathy leads individuals to emotionally respond to the difficulties faced by others, activating their altruistic motives to satisfy the needs of others. However, some researchers have pointed out that while empathy can generate altruistic motives, it may also include selfish motives. Empathetic individuals may experience a range of emotions directed towards themselves, such as personal distress and sadness. In such cases, individuals may choose to engage in altruistic behavior to alleviate their own negative emotions (Stocks et al., 2009). To substantiate the scientific validity of the empathy-altruism hypothesis, scholars have also proposed the aversive arousal reduction hypothesis. This hypothesis suggests that an individual's empathetic emotions are sometimes negative, and engaging in altruistic behavior can reduce unpleasant emotional experiences (Schwartz et al., 2012).

Years of exploration by scholars have demonstrated that the empathy-altruism hypothesis operates through two mechanisms: either empathic concern or personal distress toward an individual in difficulty can trigger altruistic behavior. Empathic concern leads to altruistic behavior by triggering altruistic motives, while personal distress leads to altruistic behavior by triggering selfish motives. The empathy-altruism hypothesis provides theoretical support for scholars exploring helping behavior in different contexts. Chen and Liu (2016) found that the level of empathy directly affects helping behavior; the higher the level of empathy, the more helping behavior is exhibited by individuals. Li et al. (2018) found that the more harmonious the neighborhood relationships among college students, the higher their empathy levels, and correspondingly, the more altruistic behavior they engaged in, with empathy mediating the relationship between the two. Zhao et al. (2010) found through regression analysis that empathic responses have a complete mediating effect between perceived needs and helping behavior. In helping behaviors, empathy serves the function of transmitting information, enabling individuals to recognize the needs of others and calming their own emotions. Through this process, empathy evokes emotional resonance with the empathic object, thereby triggering helping behavior (Batson et al., 1995). In online virtual environments, the empathy-altruism hypothesis is also applicable. In such environments, when individuals adopt the perspective of

others and experience their pain, they are more likely to offer help, thus engaging in online altruistic behavior (Zheng & Zhao, 2015).

Therefore, empathy can prompt individuals to engage in altruistic behaviors, and correspondingly, the higher the level of empathy, the more altruistic behavior individuals are willing to undertake. In the context of this study, shared green consumption behavior is a typical pro-social behavior, and thus, the altruistic behavior here can manifest as actions beneficial to nature or the flora and fauna within it.

2.1.3 Social Interaction Theory

Social interaction involves mutual actions between people within a society, leading to positive changes for each other (Jing, 2014). Individuals frequently engage with a variety of people in different forms within society and react accordingly. During these interactions, individuals realize that their actions continually affect others, and conversely, the expectations and behaviors of others similarly influence their own thoughts, emotions, and actions. Social interaction encompasses a series of interactive and dependent social activities, where information is exchanged between individuals, between individuals and groups, and between groups within society (Jin, 2003). The main requirement of social interaction is the involvement of at least two individuals, based on information transmission, arising in specific situations, and influencing the relationships and the interacting parties.

There is yet no unified theory of social interaction. There are many schools of thought on social interaction theory worldwide, each presenting different views. Notably representative theories include Symbolic Interactionism, Dramaturgical Theory, and Social Exchange Theory. Social Exchange Theory, in particular, suggests that people engage in interactions and exchange rewards or accept punishments during their social lives, also highlighting the process of personal value demonstration. Individual interactions aim to maximize rewards or minimize punishments, with notable theorists in this area including George Homans and Peter M. Blau.

The social interaction effects on behavioral decision-making also carry significant policy implications. Behavioral spillover effects, and the impacts of exogenous shocks, affect not just an individual but can propagate through interactions

between individuals, creating a social multiplier effect that enhances the efficacy of certain policies or behaviors (Becker & Murphy, 2009). Given the importance of social interactions, many scholars have explored their effects in various fields. In the consumption domain, social interaction effects are primarily explained from two perspectives: conspicuous consumption and social learning. Conspicuous consumption, a behavior that signifies wealth and power, is influenced by an individual's need to maintain their status relative to others within their reference group. Leibenstein (1950) explored the externalities of consumption and found that the bandwagon effect and the snob effect also explain the mutual influence of consumption behaviors among different individuals. Additionally, social learning is another significant theory explaining the presence of interaction effects in consumption.

Interaction effects in consumption become more pronounced when there is asymmetry in information about the quality or attributes of goods. Consumers refer to information from other consumers to improve their decision-making quality. This information may come from friends who have purchased the product or from observations of others' consumption behaviors. When individual behavior tends to follow others' decisions, it results in a herding effect (Banerjee, 1992). Extensive empirical research indicates that interaction effects in consumption behavior are common. Angelucci and De Giorgi (2009) found that assistance programs for impoverished populations in Mexico not only directly increased the consumption levels of assisted families but also indirectly boosted the consumption levels of non-assisted families. Welsch and Kühling (2009) observed interaction effects among individuals participating in environmentally friendly consumption activities such as installing home solar systems, buying organic agricultural products, and participating in green electricity programs. Lucas et al. (2018) found that a peer effect exists among consumers in their payment behaviors for green seafood products.

Social Interaction Theory provides a deep understanding of the intrinsic motivations behind the mutual influences between people. Research has shown that social interaction can generate a certain multiplier effect, which theoretically supports

the impact of online reference groups on shared green consumption behaviors in this study.

2.2 Overview of Online Reference Groups

2.2.1 Concept of Online Reference Groups

1) Concept of Online Communities

An online community is an emotive group formed by social relationships that bring different people together and serve as a platform for entertainment, work, study, and communication in daily life. With the advancement of mobile internet, online communities such as forums, WeChat Moments, Weibo Super Topics, Douban Groups, Zhihu Topic Circles, and QQ Groups have gradually become more visible.

The original concept of the online community was first introduced by Howard and Rheingold in 1993. They termed it as "Virtual Community", highlighting that it still possesses the attributes of a social group but without the constraints of physical space. Members of this community interact, analyze, and discuss through a virtual environment, forming a networked social aggregation based on similar interests and hobbies (Howard & Rheingold, 1993; Romm et al., 1997). In essence, focusing on common interests and the medium of the internet, an online community is a social assembly where people with similar interests communicate through electronic media.

In the current era, as mobile internet reshapes real-life scenarios, online communities are penetrating various aspects of society. Increasingly, scholars are considering their value and significance across different fields. From a commercial perspective, online communities are platforms built to bring people from different geographical locations together through common interests, goals, and topics, supported by specific norms and network technology. This setup allows individuals with common hobbies to interact within the community, fulfilling the shared needs of its members and creating significant social and commercial value (Armstrong & Hagel, 1997; Fan, 2007).

From the perspective of media and culture, influenced by both social and technological factors, online communities have transformed from rigid, organized

traditional communities to those based on networking, forming the basic social units of the new media era (Cai, 2016; Zhang, 2014). This transformation achieves a breakthrough from technical connections to emotional resonance among individuals, providing a fresh platform for the transmission of information and culture.

From the perspectives of space and social relationships, online communities replicate physical social relationships in a virtual space. Users gather on these platforms based on consensus, breaking away from the previously dispersed state of network users. This structure links network users, creating a "civic collective" with a sense of belonging in the online space (Zhou, 2020). Members not only share and exchange similar interests or needs but are also guided and regulated by community norms (Preece, 2000), constructing a "realistic" online social space.

2) Concept of Reference Groups

The concept of reference groups was first defined by the sociologist Hyman in 1942 as "groups or individuals with whom an individual compares themselves." This concept spurred extensive research and interest among scholars. Sherif (1953) expanded this definition by proposing that reference groups could be the groups that individuals actually interact with in real life or psychologically communicate with in indirect relationships. Park and Lessig (1977) discovered through their exploration of reference groups that these could exist in both real and virtual life, impacting individuals' attitudes, views, and behaviors. Escalas and Bettman (2003) further defined the concept within the consumer context, stating that reference groups are significant groups with whom consumers compare themselves and use as a basis for reference.

Subsequent research in China has also yielded rich results. Chen et al. (2006) simulated individual purchasing decisions in scenarios involving reference groups, indicating that these groups are where individuals often compare opinions and that this comparison significantly influences their purchasing behaviors. Du et al. (2009) and Jiang et al. (2009) considered reference groups as entities that consumers refer to or emulate during decision-making processes, significantly affecting their views, values, and even behaviors.

From the definitions provided by these scholars, it is clear that reference groups are capable of influencing consumer purchasing decisions and possess several basic characteristics: (1) Reference groups can refer to both groups and individuals; (2) Reference groups exist both in real and virtual environments; (3) Reference groups are significant social entities that impact an individual; (4) Reference groups affect various aspects of an individual's life, including interests, behaviors, attitudes, and concepts.

3) Concepts Related to Online Reference Groups

With the rapid advancement of mobile internet connectivity, public dependency on the internet has significantly increased. Individuals interact online to establish virtual personal, group, and social relationships, forming online group organizations. These virtual organizations share commonalities with real-life groups, including shared goals and values, stable interaction frequencies, and group norms and standards. The emergence of online communities as reference groups has garnered significant attention from scholars. Western scholars Schiffman and Hawkins view online communities as virtual groups that individuals can perceive, which also serve as reference groups for consumers. Chinese scholars, in their empirical studies on the factors influencing online shopping among college students, have noted that online communities significantly impact consumers' attitudes and decision-making processes. As members of these online communities, individuals inevitably experience the influence of such virtual groups (Sheng et al., 2010; Xu, 2012).

Building on this, the present study, within the context of marketing, further elaborates on online reference groups: Online reference groups are virtual online communities that influence individuals' views, beliefs, and values, and play a significant role in their consumer decision-making and behaviors. These groups are akin to online communities but focus more on their online presence and influence.

2.2.2 Measurement of Online Reference Groups

The concept of reference groups has been applied in sociology, psychology, and marketing, where scholars have extensively studied their influence on individuals. This has led to the development of the "reference group influence" concept, which

refers to the multifaceted impact that reference groups have on individuals, forming a multidimensional construct. Deutsch and Gerard (1955) were among the first to categorize reference group influences into informational and normative types. Building on this, Kelman (1961) integrated research on reference group influences and suggested that individual attitude changes undergo three stages: internalization, identification, and compliance. Expanding on this foundation, Park and Lessig (1977) conducted research on the influence of reference groups on American students and housewives, differentiating the effects into three dimensions: informational influence, utilitarian influence, and value-expressive influence. They developed a 14-item scale to measure these dimensions, which has been widely accepted in academia.

Unlike previous studies, this study explores the influence of reference groups on consumers from the perspective of online reference groups. Interactional information is a fundamental element that sustains the existence and development of online reference groups, serving as the glue for communication among members (Guan, 2015). Thus, compared to traditional communities, online reference groups inherently function as information exchange systems that emphasize the interactive effects among members. The interactional activities generated during communication among members of online reference groups inevitably impact each other (Zhou & Zuo, 2012).

Considering the above research perspectives, this study posits that online reference groups influence individuals in terms of informational, utilitarian, value-expressive, and interactional aspects.

2.2.3 Related Research on Online Reference Groups

As online communities have evolved to reflect the varied preferences of their members, many scholars have identified different types of these communities based on their characteristics and the needs they serve. Early on, Armstrong and Hagel (1997) categorized communities into transactional, interest-based, fantasy, and relationship-based types based on individuals' fundamental needs. Today, with the maturation of community development in the e-commerce environment and the prevalence of real-time communication, communities have rapidly gained prominence, leading to an increased diversity of types. Kong (2015), from a business practice

perspective, classified online communities into product-based, interest-based, brand-based, knowledge-based, and tool-based communities.

The year 2015 was dubbed the "Year of the Community" by Wu, who famously stated, "No community, no future in business." This sentiment caught the attention of major cities like Beijing, Shanghai, Guangzhou, and Shenzhen, marking the beginning of a rapid development trend for online communities. In 2016, iResearch Consulting released a report on online communities, the "2016 China Online Community Research Report," which delved deep into the development trends of online communities in China and garnered significant interest from both businesses and individuals, sparking a nationwide proliferation of various types of online communities. By 2020, the COVID-19 pandemic had completely severed offline foot traffic, forcing retail, education, and work to move online, prompting attempts to tap into the significant value of online communities, which reached a peak during this period.

In recent years, online communities have been the subject of extensive research across different fields. In the information module, Yu et al. (2018) explored the synergistic evolution of online communities in information exchange, resulting in a coupled domain operational model for the community ecosystem, which expanded and deepened the theoretical research on the development and evolution of online communities. In social governance, She and Nie (2018) approached online community research from a social innovation governance perspective, revealing how the differentiation of online communities could lead to new types of communication models, providing suggestions for government guidance of online communities in public domains. In organizational behavior, Yan et al. (2020) conducted empirical analyses on corporate employees to explore the mechanisms through which online communities affect employee satisfaction and loyalty, offering practical suggestions for internal employee relationship management within organizations. Additionally, marketing scholars have recognized the commercial value of online communities, noting that in the context of consumer upgrading and transformation, building strong, dynamic online communities to meet consumer pursuits can greatly stimulate

consumer buying behavior (Jiang & Xu, 2020), providing logic and strategies for the development of new retail community marketing.

This comprehensive integration of online communities into every aspect of individuals' lives, including their interest circles, social circles, and shopping circles, has drawn the attention of scholars and experts from various fields, underscoring the vast potential of online communities that remains to be tapped. This research aims to explore the significance of online communities in the field of green consumption by combining their current development status and characteristics.

2.3 Overview of Natural Empathy

2.3.1 Concept of Natural Empathy

Empathy, also translated as "sympathetic understanding" or "sympathy," is the ability or emotional state that enables one to put oneself in someone else's shoes, to deeply feel, and understand others' emotions. The concept has philosophical and aesthetic origins and was first applied in the realm of aesthetics. German philosophers introduced the term "Einfühlung" to express the projection of one's genuine inner feelings onto observed objects (Zheng & Li, 2006). Theodor Lipps (1897) brought this concept into psychology, explaining the mechanisms through which individuals understand and react to others, suggesting that empathy involves a passive imitation of the empathized subject to gain feelings. Edward B. Titchener (1909) translated it into English as "empathy," defining it as the concept of projecting oneself onto the perceived object. He argued that understanding others' consciousness through analogous reasoning, from one's own behavior to another's, is impossible, achievable only through an intrinsic motor mimicry. Thus, he described empathy as the process by which an individual actively forms mental intentions through inner simulation, humanizing the object. In his 1915 book "A Beginner's Guide to Psychology," Titchener further developed the concept, proposing two types of empathy—one as a means to understand others' emotions and the other as a social cognitive bond.

Although empathy is a long-standing concept, it lacks a unified definition. Its connotations can be categorized into three main types:

(1) Cognitive and Emotional State: Empathy involved putting oneself in another's place to understand their thoughts, a kind of emotional state that included cognitive understanding of another person (Hogan, 1969). Hoffman (1996) viewed empathy as starting from another's perspective, a cognitive recognition of their inner state that leads to an emotional experience related to the other.

(2) Ability: Feshback (1978) saw empathy as a combination of cognitive and emotional abilities. Ickes (1993) defined it as the ability to accurately infer specific thoughts and feelings of others.

(3) Emotional Response: This form of empathy depends on the interaction between trait abilities and situational contexts. It arises automatically but is also shaped by external situations affecting individual traits. The resulting emotions are akin to perceiving and understanding (cognitive empathy) emotions stimulated by either direct experience or imagination, recognizing that these emotions originate not from oneself but from the stimulus (Cuff et al., 2016).

Empathy is the emotional response that an individual experiences after understanding another's emotional state, an attempt by a self-aware self to understand another self's positive and negative experiences without judgment (Wispé, 1986). As Rogers (1975) indicated, these emotions and responses are often not clearly understood by the other party, making accuracy an essential aspect of the empathetic process, intended to provide understanding for one or both parties. Empathy relies on the use of imagination and imitation abilities, often a strenuous process (Wispé, 1986). Liu et al. (2009) argued that these definitions do not clearly articulate the essential characteristics of empathy, defining it instead as a psychological process in which an individual, upon facing or imagining another individual's emotional state, first shares interest with others. Upon recognizing differences between oneself and others, they cognitively assess the overall situation, subsequently generating corresponding emotional and behavioral responses, directing these emotional and behavioral outputs toward the object.

The various scholarly perspectives on empathy define it from different angles. Some see it as an emotional state triggered by specific situations, others as a personal

trait, and still others as an emotional response produced by the interaction of personal traits and situational contexts. Despite these differences in expression, empathy fundamentally describes an individual's understanding of others' feelings and thoughts, leading to an emotional state and response of shared feeling.

2.3.2 Measurement of Natural Empathy

After initially defining the concept of empathy in the literature, further exploration into the dimensions of empathy has been undertaken. Scholars generally divide empathy into emotional empathy, cognitive empathy, and a multidimensional perspective that includes both emotional and cognitive aspects.

From the perspective of emotional empathy, empathy is an emotional contagion, characterized by a passive perception of another's emotions, including empathic concern directed towards others and personal distress directed towards oneself (Chen et al., 2014). The earliest emotional empathy experienced by an individual is personal distress, a self-focused emotional reaction. As individuals mature and their ability to control their emotions strengthens, they can distinguish between their own experiences and those of others, shifting their focus to others, thus transitioning to empathic concern. The Emotional Response Scale developed by Mehrabian and Epstein (1972) included seven dimensions such as sensitivity to emotional contagion, tendency to be emotionally moved, and propensity for sympathy, measuring stable empathic responses to others in general situations. Later, Batson's (1987) empathy scale primarily assessed the emotional components of empathy through six affective terms—sympathetic, compassionate, tender, considerate, warm, and moved—measuring empathic responses in specific situations.

Cognitive empathy is based on cognition, involving the recognition, acceptance, and processing of others' emotional information, thus enabling the ability to judge and understand others' emotions. Perspective-taking is therefore a necessary condition for cognitive empathy (Yu & Liu, 2006). Perspective-taking is the cognitive skill that allows an individual to put themselves in someone else's position to understand their thoughts and desires and select their viewpoints. Oswald (1996) differentiated between cognitive and affective perspective-taking, where the former refers to the

ability to foresee others' thoughts, intentions, and behaviors, and the latter refers to the ability to infer others' experiences and emotional responses. These scholars consider empathy as the differentiation and recognition of others' emotional states based on cognitive processes.

Researchers with a multidimensional approach believe that empathy includes both emotional and cognitive dimensions. Gladstein (1983) argued that cognitive empathy forms a major part of empathy, involving the ability to recognize other individuals' emotions and viewpoints; however, alongside the recognition and understanding of emotions, emotional resonance, or emotional empathy, also occurs. Increasingly, scholars are embracing the two-dimensional theory of empathy (Cui et al., 2008). While cognitive empathy focuses on reasoning and judging emotional states, emotional empathy primarily involves feeling and experiencing the emotional states of others. Thus, emotional empathy can be seen as an extension of cognitive empathy, an emotional response resulting from the reasoned judgment of emotional states. In recent years, some researchers have proposed a new structure of empathy that includes not only cognitive and emotional components but also a behavioral component (Liu et al., 2009; Schulte-Rüther et al., 2008).

2.3.3 Related Research on Natural Empathy

In many previous studies, empathy has been used to describe the experience of feeling what another person is feeling, understanding their emotions, and is often applied to altruistic helping behaviors. The concept of natural empathy extends empathy from interpersonal relationships to the relationship between humans and nature, exploring the relationship between natural empathy and green consumption behaviors. As environmental disasters become more severe and environmental issues gain more attention, environmental psychologists have utilized various models and theories to explore the factors and mechanisms influencing pro-environmental behaviors. For instance, Schwartz (1977) used the norm activation model, and Stern and Dietz (1994) applied the value-belief-norm theory model. However, these studies have primarily focused on the cognitive aspects of individuals and have not deeply explored the emotional dimensions. As research progresses, Schultz (2001) found that

the emotional dimension of individuals significantly impacts pro-environmental behaviors.

Natural empathy is an emotional experience felt by people when they come into contact with and enjoy nature, encompassing both positive and negative emotions (Hoffman, 2008). Some scholars suggest that research on pro-environmental behaviors could consider the perspective of natural empathy (Sobel, 1995). Sevillano et al. (2007) found that college students became more concerned about the environment after seeing pictures of injured animals, with natural empathy playing a mediating role. Preylo and Arikawa (2008) found that an individual's compassion correlated positively with their attitude towards pets, demonstrating the promotive effect of natural empathy on pro-social behavior. Batson (2011) discovered that animals and plants in nature, when attributed with human consciousness and emotions, could evoke natural empathy in individuals. That is, anthropomorphizing animals and plants promotes empathy towards these beings. Chinese scholar Zong and Wang (2017) was the first to explore the mediating role of natural empathy between anthropomorphism in nature and pro-social behavior. Through surveys of college students, the study found a significant positive correlation between anthropomorphism and pro-environmental behaviors, with natural empathy playing a significant positive mediating role.

Overall, existing empirical research on empathy has primarily focused on the influence of individual and situational factors on empathic responses and the tendency for individuals to engage in altruistic behaviors after experiencing empathy, mostly in the context of human-to-human relationships. Chinese scholar Zong and Wang (2017) first extended the concept of empathy from interpersonal to human-nature relationships, proposing that natural empathy could impact pro-social behavior. This paper applies the concept of natural empathy to the field of green consumption, positing that a profound feeling of empathy towards nature could significantly influence shared green consumption behaviors. This approach supplements and expands upon previous research on empathy, enriching related empirical studies.

Moreover, in the current era of digital economy and sharing economy, interactions among people with similar values or interests often produce positive

spillover effects, making individuals more willing to share experiences and information actively. In the process of sharing, individuals feel a stronger sense of group belonging, which in turn promotes the practice of shared consumption.

Combining the studies on the factors affecting green and shared consumption, it is worth further exploration to determine whether integrating the concept of sharing into green consumption can effectively drive the practice of shared green consumption behaviors.

2.4 Overview of Shared Green Consumption Behavior

2.4.1 Concept of Shared Green Consumption Behavior

Shared green consumption behavior, relying on the comprehensive interaction and sharing of information and data via the internet, involves consumers sharing in ways that include efficiently sharing the right to use products or reintroducing idle resources into the consumption stream for reuse. This behavior aims to save resources, reduce pollution, and reuse materials. Compared to traditional green consumption, which typically involves choosing to purchase environmentally friendly products and services to reduce resource use and pollution during consumption, shared green consumption retains these characteristics but also emphasizes the sharing of green products among individuals, or achieving green consumption through sharing.

In contrast to traditional green consumption that mainly manifests as individuals purchasing eco-friendly products and services to reduce resource consumption and pollution emissions, shared green consumption not only includes individual enjoyment of green products but also emphasizes sharing green products with others, or achieving green consumption through shared methods. It is under the current digital economy and sharing economy that society can achieve comprehensive information interaction and data sharing, thereby enriching the concept of green consumption with new era characteristics and giving rise to a higher level of consumption form—shared green consumption. This evolution highlights the unique features of our era in the practice of green consumption.

2.4.2 Measurement of Shared Green Consumption Behavior

Shared green consumption behavior represents a higher level of green consumption integrated with the sharing concept. This behavior encapsulates aspects of both shared consumption and green consumption, which suggests that exploring the factors influencing shared green consumption could involve examining the determinants of both shared and green consumption behaviors to identify precise entry points for detailed exploration.

Previous studies on the factors influencing shared consumption have identified several key drivers, including economic benefits (Mont, 2004; Lamberton & Rose, 2012), environmental awareness and knowledge (Hamari et al., 2016; Belk, 2014), a sense of social belonging (Albinsson & Yasanthi Perera, 2012), transaction costs (Moeller & Wittkowski, 2010; Slee, 2013), trend affinity (Botsman & Rogers, 2010; Moeller & Wittkowski, 2010), changes in consumer attitudes (Chang, 2017), and the ability to communicate effectively with all parties (Morgan & Hunt, 1994). These factors influence consumers' decisions to engage in shared consumption behaviors.

Analysis of these factors reveals that sharing can lead to the optimal use of society's idle resources and holds positive implications for individual economic benefits. As a new trend, shared consumption, coupled with shifts in consumer attitudes, emphasizes that ownership of a product is less important than its utility and experiential value, which has fostered the flourishing development of shared consumption. Moreover, in the context of the digital economy and the sharing economy, the continuous interactions between people are bringing them closer together. Communications with like-minded or similarly interested individuals often result in numerous positive spillover effects, encouraging people to actively share experiences and information. During this sharing process, individuals may feel a stronger sense of group belonging, which in turn promotes the practice of shared consumption.

Combining the research on the factors affecting green and shared consumption, it is worth further exploration to determine whether integrating the concept of sharing into green consumption can effectively drive the practice of shared green consumption behavior, particularly in the context of diverse online social platforms where individuals interact through online information and emotional exchanges.

2.4.3 Related Research on Shared Green Consumption Behavior

The concept of shared consumption was first proposed by Felson and Spaeth (1978), highlighting a consumption model where goods and services are shared without the need for ownership. This form of consumption, facilitated by the internet, extends beyond traditional ownership to sharing usage rights, transforming traditional one-way purchasing into a scenario where an individual can both consume and provide products.

As highlighted by Kara et al. (2018), shared consumption involves resource transaction behaviors, albeit related to sharing. Belk (2014) positioned shared consumption between outright sharing, where individuals are inclined to share and focus on others' welfare, and market transactions, where exchanges are made with self-interest in mind. This duality encompasses elements of both sharing and economic exchange.

Despite often being viewed as a mere economic transaction, shared consumption does involve the sharing of idle resources, reflecting a spirit of sharing, as discussed by Belk (2014). Shared consumption repurposes individual idle resources for societal circulation, thus reducing unnecessary resource wastage and enhancing overall resource utilization. This not only fosters closer connections between individuals but also reflects a spirit of sharing and community.

With the dual drivers of economy and technology, the domain of shared consumption has continuously expanded into traditionally non-collaborative consumption areas. The internet plays a crucial role in this expansion by facilitating data-sharing platforms with minimal transaction costs, as noted by Bardhi and Eckhardt (2012) and Belk (2014). The shared consumption movement is increasingly characterized by C2C sharing, whether through redistribution markets or shared lifestyles, with examples including shared lodging and vehicle sharing.

Shared consumption disrupts the traditional asset ownership model through internet technologies, increasing the utilization of existing assets and fostering sustainable societal growth by creating consumer value (Zheng, 2016). Shared platforms consolidate and manage idle resources, build credible systems, and optimize

risk management, addressing the asymmetry in traditional consumption and precisely matching the needs of suppliers and consumers (Tang & Wu, 2015).

The emergence of new shared products like shared power banks and umbrellas indicates an evolution in shared consumption beyond merely utilizing idle resources. It has become a strategic tool for businesses seeking profit, leading to potential resource wastage, such as the oversupply of shared bicycles resulting in environmental pollution.

Thus, while shared green consumption behavior intersects with shared consumption behavior, it distinctively aims at conserving resources, reducing pollution, and reusing products. Shared green consumption emphasizes achieving green consumption through the sharing of products—broadly including both green and conventional products. The connection between shared green consumption and shared consumption lies in their use of the internet to facilitate sharing among consumers, whether it's sharing product usage rights or reintroducing idle resources into the consumption cycle, allowing multiple consumers to share the same product.

Chapter 3
Research Methodology

This chapter offered an in-depth elucidation of the process for selecting research subjects and the methodologies employed for data collection. It concluded with a description of the data analysis techniques to be utilized in this study. The presentation of this chapter was as follows:

3.1 Population and Sample

The China Internet Network Information Center (CNNIC) released its 53rd "Statistical Report on Internet Development in China" in Beijing. The report indicated that as of December 2023, the number of internet users in China had reached 1.092 billion, with an internet penetration rate of 77.5%.

Therefore, the population of this study was internet users in China, 2023, the total number are 1.092 billion internet users in China. So, the sample of this study was selected from internet users in China.

3.2 Sample Size Determination

Because the total number of the population of internet users in China were 1.092 billion, so the sample size required in this study was approximately 400 internet users.

3.3 Sample Selection

Table 3.1 Sample size for ±3%, ±5%, ±7% and ±10% Precision Levels Where Confidence Level is 95% and P=.5.

Size of Population	Sample Size (*n*) for Precision (*e*) of:			
	±3%	±5%	±7%	±10%
15,000	1,034	390	201	99
20,000	1,053	392	204	100
25,000	1,064	394	204	100
50,000	1,087	397	204	100
100,000	1,099	398	204	100
>100,000	1,111	400	204	100

According to Israel (1992), as shown in Table 3.1, the table displayed the required sample sizes for precision levels of ±3%, ±5%, ±7%, and ±10% when the confidence level is 95% and P=0.5. In the context of this study, which focused on internet users in China, a population totaling 1.092 billion, previous research commonly utilized a sample size for a ±5% precision level with a 95% confidence level, assuming a probability (P) of 0.5.

From Table 3.1, it was observed that for a population size exceeding 100,000, the required sample size was approximately 400 individuals. Given the vast population of internet users in China in 2023, which significantly exceeded 100,000, the sample size for this study was determined to be 400 individuals. This size was considered sufficient to adequately represent the population, taking into account the specified confidence and precision levels while also balancing the practical aspects of conducting the survey efficiently and economically.

3.4 Research Instruments

3.4.1 Construction of Research Instruments

In this research, data collection was conducted using the simple random sampling technique. Simple random sampling, often referred to as pure random sampling, is the fundamental form of probability sampling. It entails selecting n elements randomly from a population of N elements ($N > n$), adhering to the principle of equal probability. The key idea was that each member of the population has an identical chance of being included in the sample. This uniform probability ensures that the sample accurately reflects the entire population, thereby enhancing the reliability and generalizability of the conclusions and inferences made from the study.

3.4.2 Research Instruments Measurements: Validity and Reliability

Reliability Analysis

In this research, SPSS 27.0 was utilized to confirm the reliability of the questionnaire. Reliability determines if the data are consistent, stable, and dependable.

This evaluation was performed using Cronbach's Alpha coefficient, where typically, a value above 0.7 was considered to indicate good reliability of the sample.

Validity Analysis

Validity analysis evaluates the extent to which a scale accurately measures the theoretical concept or trait it was intended to measure. Construct validity was examined through two types:

(1) Convergent Validity: This type of validity was confirmed using three metrics: standardized factor loadings for the items, average variance extracted (AVE), and composite reliability (CR) of the variables. Following Lam's findings, factor loadings above 0.5, AVE values exceeding 0.36, and CR values over 0.7 suggested acceptable convergent validity for the research model.

(2) Discriminant Validity: Although not elaborated here, it generally involved comparing the AVE of each construct to the squared correlation coefficients among the constructs. Discriminant validity was achieved when the AVE for each construct is higher than the squared correlations between it and any other construct.

These statistical assessments ensure that the instrument not only measures what it was supposed to measure with consistency but also distinguishes effectively from other variables in the study.

3.5 Pilot Survey

Although the questionnaire for this study was developed through an extensive literature review and by referencing established scales from prior research, the reliability and validity of the adapted questionnaire remained uncertain. Therefore, after finalizing all questionnaire content, a pilot survey was conducted to ensure the content and face validity of the measurement items. Three experts and scholars in relevant fields were engaged to assess the questionnaire's Item-Objective Congruence (IOC) index. They evaluated each item by assigning ratings of 1 (conforms to the measurement objective), 0 (uncertain about conformity), or -1 (does not conform to the measurement objective). The IOC index for all aspects of the questionnaire achieved a perfect score of 1.00, as detailed in Table 3.1.

Table 3.2 IOC Evaluation Form for Questionnaire Items

	Online Reference Groups	Item Score
1	The brand preferences of e-commerce platform hosts influence my purchasing decisions.	1
2	Purchasing and using the same products and brands as they do gives me a sense of belonging.	1
3	I seek information and user experiences about products or brands from them.	1
4	I refer to information and user experiences about green products posted by others on platforms like Taobao and WeChat.	1
5	I can interact with them through the Weibo posts, videos, or social platforms they use.	1
	Natural Empathy	**Item Score**
1	I can empathize with the difficult situations faced by these animals and plants.	1
2	I can understand the feelings of these animals and plants from their perspective.	1
3	I am concerned about the harm suffered by these animals and plants.	1
4	I can comprehend what these animals and plants must be feeling.	1
	Shared Green Consumption Behavior	**Item Score**
1	I choose to use shared products to conserve resources and protect the environment.	1
2	I recommend others to use shared products to conserve resources and protect the environment.	1
3	I am open to using shared products recommended by others to conserve resources and protect the environment.	1

3.6 Data Collection

This study employed a questionnaire survey method, using Wenjuanxing, a widely-used online crowdsourcing platform in mainland China, to distribute questions and collect data from participants. The survey conducted entirely online, targeting Chinese internet users. The questionnaire was sent out to these users, who was selected based on specific criteria to ensure the validity of their responses.

The research focused on three main variables: online reference groups, natural empathy, and shared green consumption behavior. These variables were self-reported by the internet users in China. This direct method streamlined the questionnaire distribution process. To ensure data consistency and reliability, responses were gathered anonymously, and participants were assured that their information will remain strictly confidential.

The questionnaire was structured into three sections: the first section introduced the survey's goals and reassures participants about the anonymity of their responses. The second section collected demographic information such as gender, educational background, age, occupation, and monthly income. The final section explored the core research variables, gathering participants' perspectives on online reference groups, natural empathy, and shared green consumption behavior.

3.7 Data Analysis

After collected data from 409 respondents, this research utilized SPSS 27.0 software for comprehensive data analysis:

3.7.1 Demographic Details of Samples

Table 3.3 Basic Demographic Information of Survey Respondents

Variable	Group	Frequency	Percentage
Gender	Male	226	55.3
	Female	183	44.7
Age	18-24	88	21.5
	25-34	155	37.9

	35-44	109	26.7
	45-54	42	10.3
	55 and above	15	3.6
Education	High school or below	90	22
	Associate degree	118	28.8
	Bachelor's degree	127	31.1
	Graduate degree or above	74	18.1
Occupation	Student	51	12.5
	Ordinary worker or service staff	73	17.8
	Government employee	62	15.2
	Manager	47	11.5
	Engineering technician	50	12.2
	Research, education, health, and environmental sectors	52	12.7
	Self-employed	55	13.5
	Other	19	4.6
Monthly Income	Below 3500 RMB	63	15.4
	3501-5000 RMB	97	23.7
	5001-6500 RMB	119	29.1
	6501-8000 RMB	82	20
	Above 8000 RMB	48	11.8
Online Community Participation	WeChat groups	235	57.5
	QQ groups	204	49.9
	Taobao	315	77.0
	Friends Circle	124	30.3
	Online forum communities	105	25.7
Number of Online Communities Joined	1-5 groups	223	54.5
	6-10 groups	146	35.7

	More than 11 groups	40	9.8

As indicated by Table 3.3, in terms of gender, male participants constitute 55.3% and female participants 44.7%, suggesting a reasonable gender distribution within the sample. In terms of age, the largest proportion falls within the 25-34 age group. Individuals in this age bracket typically have some experience with online shopping and established behavioral patterns, which aligns with the actual situation. In terms of educational attainment, those with a bachelor's degree form the largest group, followed by those with an associate degree, reflecting the educational distribution of China's population. In terms of occupation, ordinary workers and government employees form the largest groups, fitting the profile that people from various social strata in China commonly engage in online shopping. The salary distribution shows that the majority earn between 5001-6500 RMB, followed by 3501-5000 RMB and 6501-8000 RMB, with the smallest proportion earning over 8000 RMB, mirroring the income distribution conditions in China. Regarding participation in online communities, the Taobao/Tmall community has the highest participation, followed by WeChat and QQ groups. Most respondents belong to 1-5 online community groups, followed by 6-10 groups.

3.7.2 Research Instruments

This study utilized three measurement tools: the Online Reference Groups Scale, the Natural Empathy Scale, and the Shared Green Consumption Behavior Scale. The measurement of online reference groups was adapted from the scales developed by Guan (2015) and Zhou and Zuo (2012), consisting of five questions. The measurement of natural empathy was revised based on the scales provided by Fan (2014) and Zhang et al. (2016), consisting of four questions. The measurement of shared green consumption behavior was adapted from the scale developed by Wang (2021), consisting of three questions. The scoring method for all three measurement tools employed a Likert five-point scale, where the level of agreement for each item ranged from 1 (strongly disagree) to 5 (strongly agree), with scores accordingly assigned from 1 to 5.

3.7.3 Reliability Analysis

The reliability analysis primarily serves to verify the stability and consistency of the measurement scales within the questionnaire. In this study, Mplus 7 statistical software was used to assess the reliability of the scales through Cronbach's alpha and composite reliability. The Cronbach's alpha coefficient for each item evaluates the truthfulness and reliability of the collected data. Higher values of Cronbach's alpha indicate greater reliability of the scales. Furthermore, composite reliability is used to analyze the internal consistency of the latent variable structure, with higher values indicating greater internal consistency. According to the research standards set by Nunnally and Bernstein (1994), both the alpha values and composite reliability should exceed 0.7 to reach an acceptable level of reliability. According to the results presented in Table 3.4, the alpha values in this study range between 0.85 and 0.96, and the composite reliability (CR) values range between 0.79 and 0.88, indicating high reliability of the study variables and good internal consistency among the measurement items.

Table 3.4 The Reliability Analysis of Each Measurable Variable

Dimension	Item	Mean	CR	Cronbach's α
ORG	ORG 1	4.34	0.79	0.96
	ORG 2	4.56		0.93
	ORG 3	4.37		0.85
	ORG 4	4.64		0.93
	ORG 5	4.16		0.92
NE	NE1	4.35	0.88	0.95
	NE2	4.57		0.85
	NE 3	4.26		0.94
	NE 4	4.14		0.87
SGCB	SGCB 1	4.71	0.84	0.95
	SGCB 2	4.26		0.90
	SGCB 3	4.58		0.86

Note: ORG=Online Reference Groups, NE=Natural Empathy, SGCB=Shared Green Consumption Behavior.

3.7.4 Validity Analysis

Validity testing assesses the effectiveness and accuracy of the questionnaire scales, specifically examining the rationality of the questionnaire item design. In this study, following the research recommendations of Anderson and Gerbing (1988) and Fornell and Larcker (1981), both convergent validity and discriminant validity were used to evaluate the questionnaire's validity. The criterion for convergent validity requires that the standardized factor loadings of the questionnaire items exceed 0.5, and that the *p*-values are significant (Anderson & Gerbing, 1988). The criterion for discriminant validity stipulates that the square root of the average variance extracted (AVE) for each latent variable should be greater than the correlation coefficients between different variables (Fornell & Larcker, 1981).

According to the results presented in Table 3.5, analysis of the collected questionnaire data revealed that the standardized factor loadings for all items in this study ranged between 0.76 and 0.92, and each item's *p*-value was significant, indicating good convergent validity for the study variables. Furthermore, the square root values of the AVE for each variable ranged from 0.79 to 0.84, demonstrating that each research variable also possesses good discriminant validity.

Table 3.5 The Convergent Validity Analysis of Each Measurable Variable

Dimension	Item	Mean	Factor loading	*P*-Value	AVE
ORG	ORG 1	4.34	. 0.78	***	0.84
	ORG 2	4.56	0.86	***	
	ORG 3	4.37	0.83	***	
	ORG 4	4.64	0.86	***	
	ORG 5	4.16	0.79	***	
NE	NE1	4.35	0.81	***	0.81
	NE2	4.57	0.92	***	

	NE 3	4.26	0.79	***	
	NE 4	4.14	0.78	***	
SGCB	SGCB 1	4.71	0.89	***	
	SGCB 2	4.26	0.76	***	0.79
	SGCB 3	4.58	0.85	***	

Note: ORG=Online Reference Groups, NE=Natural Empathy, SGCB=Shared Green Consumption Behavior. ***=p<0.001.

Chapter 4
Research Results

In the data analysis section of this study, statistical software SPSS 27.0 and Mplus 7 were utilized to analyze the collected data from 409 respondents. Correlation analysis, path analysis, and mediation effect analysis were conducted to validate the theoretical hypotheses and models.

4.1 Correlation Analysis

Correlation analysis assesses the relationships between variables or factors, examining the closeness of their associations. This study employed the Pearson Correlation Coefficient (r) to test whether independent variables are correlated with dependent variables and to determine the degree of association. A correlation coefficient closer to 1 indicates a stronger relationship. A threshold of 0.7 is commonly used as a standard; if the correlation value between two variables is less than 0.7, it suggests that there is no multicollinearity issue between them, which means that the independent variables in the model are not highly correlated with each other. This lack of multicollinearity implies that each variable provides unique information and is not redundant, which makes the statistical analysis more reliable and ensures more accurate estimation of the effects of each independent variable on the dependent variable.

According to the results presented in Table 4.1, the correlation coefficients for each variable in this study are below 0.7, indicating that there are no issues of multicollinearity among the related variables.

Table 4.1 Correlation Analysis

	ORG	NE	SGCB
ORG	1		
NE	0.599	1	
SGCB	0.652	0.683	1

4.2 Model Fit Analysis

Following the reliability and validity analyses, an analysis of the structural model's fit is necessary to assess the degree of fit or consistency between the data and the hypothesized model. Model fit indices can be used to evaluate whether the data and the hypothesized model are well-matched. The model fit indices used in this study and their results are shown in Table 4.2: χ^2 = 1465.12, df = 728, χ^2/df = 2.01, p = 0.000, CFI = 0.95; TLI = 0.91; RMSEA = 0.06; SRMR = 0.05. These results indicate that the model fit of this study meets the recommendations by Browne and Cudeck (1992), demonstrating good model fit.

Table 4.2 Model Fit Indices

Fit Index	Recommended Criteria	Model Result	Compliance
ML χ^2	Lower is better	1465.12	
Df	Higher is better	728	
χ^2/ Df	1<χ^2/ Df <3	2.01	Complies
CFI	>0.9	0.95	Complies
TLI	>0.9	0.91	Complies
RMSEA	<0.08	0.06	Complies
SRMR	<0.06	0.05	Complies

4.3 Testing of Research Hypotheses

This study aimed to address four primary research questions: 1) Do online reference groups influence shared green consumption behavior? 2) Do online reference groups affect natural empathy? 3) Does natural empathy impact shared green consumption behavior? 4) Does natural empathy mediate the relationship between online reference groups and shared green consumption behavior? After analyzing the collected data, the study obtained findings pertinent to each of these questions, which are elaborated upon below:

4.3.1 Direct Effects Testing

Path analysis was employed to examine the causal relationships within the research model, focusing on the direct effects between variables corresponding to Research Questions 1 through 3. Mplus 7 software facilitated the path analysis to test the hypotheses and determine if they were supported by the data.

The results, presented in Table 4.3, indicate that all unstandardized regression estimates for the variables are significant ($p < 0.001$). This signifies that: For Research Question 1, the finding that online reference groups have a positive impact on shared green consumption behavior supports Hypothesis H1. The standardized path coefficient from online reference groups to shared green consumption behavior was 0.61, with a P-value < 0.001. This significant positive relationship indicated that individuals engaged with online reference groups are more likely to participate in shared green consumption behaviors. This suggests that online reference groups serve as influential platforms where environmental values and sustainable practices are promoted, leading to increased adoption of shared green consumption behaviors among members.

Regarding Research Question 2, the significant positive effect of online reference groups on natural empathy validates Hypothesis H2, with a standardized path coefficient from online reference groups to natural empathy was 0.65, with a P-value < 0.001. This significant positive effect implies that participation in online reference groups enhances individuals' natural empathy. This indicates that engagement in online communities focused on environmental issues may foster a deeper emotional connection to nature among members, as these groups often share content that highlights environmental concerns and the importance of sustainability.

For Research Question 3, the positive influence of natural empathy on shared green consumption behavior confirms Hypothesis H3, with a standardized path coefficient from natural empathy to shared green consumption behavior was 0.57, with a P-value < 0.001. This significant positive relationship indicates that higher levels of natural empathy are associated with increased participation in shared green consumption behaviors. This suggests that individuals who feel a stronger emotional connection to nature are more motivated to engage in behaviors that protect the

environment, such as participating in the sharing economy and adopting sustainable consumption practices.

Moreover, the Coefficient of Determination (R^2) values indicate substantial explanatory power of the variables within the model. Specifically, the R^2 for natural empathy was 0.57, and for shared green consumption behavior, it was 0.63, both exceeding the acceptable threshold of 0.33. This implies that the model effectively explains a significant proportion of variance in these constructs.

These results directly address the research questions by demonstrating significant relationships between the variables. The findings suggest that online reference groups, such as eco-conscious influencers and green lifestyle communities, play a crucial role in promoting shared green consumption behavior, partly by enhancing individuals' natural empathy.

Table 4.3 Analysis of Research Model Hypotheses

DV	IV	Std. Est.	S.E.	Est./S.E.	*P*-Value	R^2	Hypothesis Support
NE	ORG	0.65	0.04	16.25	***	0.57	Supported
SGCB	NE	0.57	0.02	28.5	***		Supported
	ORG	0.61	0.05	12.2	***	0.63	Supported

Note: DV=Dependent Variable, IV=Independent Variable, NE=Natural Empathy, ORG=Online Reference Groups, SGCB=Shared Green Consumption Behavior.
***=p<0.001.

4.3.2 Mediation Effect Testing

Mediation effect testing examines whether an independent variable influences a dependent variable through a mediator. The bootstrap method is a common approach for testing mediation effects. In this study, Mplus 7 software was used, and bootstrapping with at least 1000 resamples was performed. If the analysis results show that the confidence interval's lower and upper limits do not include zero, it can be concluded that the indirect effect within that confidence interval is not zero, indicating the presence of a mediation effect (Andrew, 2009).

Thus, to address Research Question 4, the study examined whether natural empathy mediates the relationship between online reference groups and shared green

consumption behavior. The bootstrap method, a robust approach for testing mediation effects, was utilized with 1,000 resamples in Mplus 7 software.

As shown in Table 4.4, the analysis indicates that natural empathy significantly mediates the relationship between online reference groups and shared green consumption behavior. The standardized indirect effect of online reference groups on shared green consumption behavior through natural empathy was 0.53, with a P-value < 0.001. The 95% confidence interval did not include zero, confirming the presence of a mediation effect and supporting Hypothesis H4. This result indicates that natural empathy partially mediates the relationship between online reference groups and shared green consumption behavior. In other words, online reference groups not only directly influence shared green consumption behavior but also enhance natural empathy, which in turn promotes such behaviors.

Table 4.4 Analysis of the Indirect Effect of Natural Empathy

Path	Estimate	Product of Coefficients			BOOTSTRAP 1000 TIMES 95%CI			
					Percentile		Bias corrected	
		S.E.	Est./S.E.	*P*-Value	Lower	Upper	Lower	Upper
ORG→SGCB	0.53	0.04	13.25	***	0.54	0.71	0.58	0.76

Note: ORG=Online Reference Groups, SGCB=Shared Green Consumption Behavior.
***=$p<0.001$.

Chapter 5
Conclusion, Discussions, and Recommendations

This chapter first concludes the findings based on the data analysis results, then discusses implications for management practice, and finally, outlines the limitations of this study and offers recommendations for future research.

5.1 Conclusion of the Findings

Based on the data analysis results, all four hypotheses of this study are supported. The following provides a systematic analysis of the results for each research hypothesis tested:

1. Online Reference Groups Have a Positive Impact on Shared Green Consumption Behavior

According to the results of the data analysis, the standardized path coefficient for online reference groups on shared green consumption behavior is 0.61, with a *P*-value less than 0.001, indicating a significant path coefficient. Therefore, online reference groups have a significant positive impact on shared green consumption behavior, thus validating Hypothesis H1. The results indicate that online communities, fully integrated into various aspects of people's lives, can promote shared green consumption behavior by leveraging the comprehensive interaction and sharing of internet information and data, enabling consumers to efficiently share rights to use products or reintroduce idle resources into the consumption stream for reuse (Yu et al., 2018).

2. Online Reference Groups Have a Positive Impact on Natural Empathy

According to the data analysis results, the standardized path coefficient for online reference groups on natural empathy is 0.65, with a *P*-value less than 0.001, indicating a significant path coefficient. Therefore, online reference groups have a significant positive impact on natural empathy, thus validating Hypothesis H2. With the rapid development of mobile internet, the public's dependency on the internet has significantly increased. Individuals, through online interactions, form network group organizations. Online reference groups are virtual network communities that influence

individuals' opinions, beliefs, and values. As members of an online community, individuals inevitably are influenced by these virtual groups (Sheng et al., 2010; Xu, 2012). Thus, online community reference groups significantly impact consumers' natural empathy.

3. Natural Empathy Positively Influences Shared Green Consumption Behavior

According to the data analysis, the standardized path coefficient for natural empathy on shared green consumption behavior is 0.57, with a *P*-value less than 0.001, indicating a significant path coefficient. Therefore, natural empathy has a significant positive impact on shared green consumption behavior, thus validating Hypothesis H3. The results suggest that in the era of digital and sharing economies, interactions among individuals with similar values or interests tend to produce positive spillover effects, making individuals more willing to actively share experiences and information. During the sharing process, individuals experience a stronger sense of group belonging, which in turn promotes the practice of shared consumption. Hence, natural empathy fosters shared green consumption behavior.

4. Natural Empathy Mediates the Relationship Between Online Reference Groups and Shared Green Consumption Behavior

According to the data analysis, the standardized path coefficient for the mediating effect of natural empathy between online reference groups and shared green consumption behavior is 0.53, with a *P*-value less than 0.001. After 1000 bootstrap resamples, the results show that the confidence interval's lower and upper limits do not include zero, confirming that natural empathy has a mediating influence between online reference groups and shared green consumption behavior, thus validating Hypothesis H4. The comprehensive interaction and sharing of internet information and data make individuals more willing to actively share experiences and information. During the sharing process, individuals feel a stronger sense of group belonging, which further promotes shared consumption practices. Therefore, online reference groups can enhance shared green consumption behavior through natural empathy.

5.2 Discussions

The present study explored the influence of online reference groups on shared green consumption behavior, with natural empathy serving as a mediating factor. The findings corroborate and extend existing literature, offering insights into how online social interactions and emotional connections to nature can promote sustainable consumer practices.

Firstly, the research finding that online reference groups positively impact shared green consumption behavior aligns with recent research emphasizing the role of social influence in environmental practices. For instance, Ghahtarani et al. (2020) found that online social support significantly enhances individuals' green consumption behaviors by providing informational and emotional resources.

However, some studies suggest that the influence of online reference groups may vary depending on individual differences. Zhang et al. (2022) indicated that the effectiveness of online social influence on green behavior is moderated by personal values and environmental awareness. This suggests that while online reference groups are influential, their impact may not be uniform across all individuals.

When specifically in the context of the internet culture in China, characterized by a high engagement with online platforms, may amplify this positive impact. A substantial portion of the Chinese population actively follows influencers and participates in online communities across various age groups. Platforms like WeChat, Weibo, Xiaohongshu (Little Red Book), and Douyin (TikTok) are ubiquitous, and users frequently engage with content from eco-conscious influencers, green lifestyle communities, and environmentally focused forums.

For example, influencers such as Li Ziqi, who promotes a sustainable and traditional lifestyle, have garnered millions of followers. These influencers often share content related to sustainable living, encouraging followers to adopt practices like recycling, reducing waste, and participating in the sharing economy. Such online reference groups can significantly influence followers' attitudes and behaviors toward shared green consumption.

When turns to the tools used by online reference groups, these online reference groups utilize various tools to reach and engage with audiences:

1) Social Media Platforms: WeChat is used for creating group chats and sharing articles; Weibo allows for public discussions and following trending topics related to environmentalism; While Xiaohongshu combines social media and e-commerce, allowing users to be influenced by content and make immediate purchasing decisions, amplifying the impact on consumption behavior. Green lifestyle communities like "Zero Waste Lifestyle" on Xiaohongshu encourage plastic-free living.Users trust peer reviews and recommendations on Xiaohongshu, which can sway them towards eco-friendly products and services.

2) Live-Streaming Apps: Apps like Douyin and Kuaishou enable influencers to host live sessions, demonstrating sustainable practices in real-time and interacting with viewers.

3) Discussion Forums: Platforms such as Zhihu and Baidu Tieba host forums where users can ask questions and share knowledge about green consumption and environmental protection.

4) Mobile Apps: For instance, Apps like Ant Forest within Alipay gamify environmental actions, encouraging users to reduce their carbon footprint by offering virtual rewards for eco-friendly behaviors. Moreover, a person who feels a strong emotional connection to nature may choose to participate in car-sharing services like mobile apps Didi Chuxing's Hitch service to reduce carbon emissions. They might also use mobile apps like "Idle Fish" (Xianyu) to buy and sell second-hand items, promoting reuse and reducing waste.

Secondly, the positive relationship between online reference groups and natural empathy identified in this study is supported by recent literature. Engagement in online environmental communities can enhance individuals' emotional connection to nature. Tam (2013) introduced the concept of "dispositional empathy with nature," highlighting that increased exposure to environmental content online can foster a stronger empathetic bond with the natural world. Additionally, Richardson et al. (2016) found that virtual experiences of nature can elicit feelings of connectedness and empathy toward the environment.

Contrastingly, some researchers argue that online interactions might not fully substitute for direct experiences with nature in developing natural empathy. Mayer et al. (2019) suggested that while online platforms can initiate interest in environmental issues, direct contact with nature has a more profound impact on fostering genuine empathy. This highlights the need to complement online interactions with real-world experiences to cultivate deeper natural empathy.

Third, the study's finding that natural empathy positively influences shared green consumption behavior is consistent with recent empirical evidence. A meta-analysis by Mackay and Schmitt (2019) revealed that a strong emotional connection to nature is a significant predictor of pro-environmental behaviors, including green purchasing and resource sharing. Furthermore, Whitburn et al. (2020) demonstrated that individuals with higher levels of nature connectedness are more likely to engage in sustainable consumption practices.

Nevertheless, other studies suggest that natural empathy's effect on behavior may be mediated by factors such as environmental knowledge. Otto and Pensini (2017) found that environmental knowledge strengthens the relationship between nature connectedness and pro-environmental behavior, implying that empathy alone may not suffice to motivate action without adequate understanding. This suggests a more complex interplay between affective and cognitive factors in promoting shared green consumption behavior.

Last, the mediating effect of natural empathy between online reference groups and shared green consumption behavior adds a novel contribution to the literature. Previous research has hinted at this relationship but has not explicitly tested it. For example, Wang et al. (2011) discussed how online social interactions can influence environmental behaviors indirectly by shaping environmental attitudes and emotional responses, which aligns with our findings.

However, the strength of the mediating effect may vary across contexts. Ghazali et al. (2019) reported that cultural factors influence the extent to which natural empathy mediates the relationship between social influence and green behavior. This suggests that the effectiveness of online reference groups in promoting shared green

consumption through natural empathy may be context-dependent, highlighting the importance of considering cultural and societal factors in future research.

5.3 Recommendations

5.3.1 Research Limitations

Previous scholars have conducted in-depth studies on the factors influencing green consumption behavior, but these studies have mostly focused on individual-exclusive green consumption behaviors, such as the purchase of green products. However, in the context of the new era, green consumption has taken on a deeper meaning and is gradually evolving from individual-exclusive to socially intensive shared green consumption. This study, guided by the "online reference groups—shared green consumption behavior" framework, attempts to explore the relationships among online reference groups, natural empathy, and shared green consumption behavior, as well as the impact of natural connectivity within this framework. Although this study has yielded some conclusions with theoretical and practical implications, it still has the following limitations:

(1) Limitations of the Research Sample

The subjects of this study include individuals who engage in online information and emotional interactions regarding sharing idle products, conserving resources, and addressing environmental issues on social platforms, without targeting specific platforms. Therefore, the study lacks a certain degree of specificity. Since the number of people engaging in relevant online green interactions on a specific social platform is not large, to better collect survey data, the study expanded to include interactions across all social platforms. However, there may be differences between different social platforms, thus introducing certain limitations.

(2) Limitations of the Research Method

The study mainly utilized questionnaires for quantitative data analysis and did not conduct more precise research through experimental methods. Due to the difficulty in simulating online reference groups, which requires considerable human

and material resources, the study was limited to having respondents recall their past interaction behaviors and fill out questionnaires, which presents certain limitations.

(3) Limitations of the Research Content

The independent variables studied are online reference groups, primarily exploring online information without delving into the forms of online green interactions. Since online green interactions are diverse, the study did not expand on this aspect. Moreover, the study of shared green consumption behaviors primarily focused on the sharing of idle products, which may not have wide applicability.

5.3.2 Future Research Suggestions

As internet technology continues to evolve and the forms of shared green consumption expand, along with a growing consumer awareness of resource conservation and environmental protection, researchers can conduct more in-depth studies in the field of shared green consumption. Considering the limitations identified in this study, future research could be further expanded and explored in the following areas:

(1) Selecting More Representative Samples

To obtain more reliable and accurate results in the field of shared green consumption behaviors influenced by online reference groups, and to reduce the discrepancy between theory and practice for more effective guidance, it is essential to conduct in-depth studies on consumers' online green interactions on specific platforms. By selecting more representative samples, it would also be possible to identify the differences in the impact of online green interactions across different social platforms on behavior.

(2) Choosing More Optimized Research Methods

As research in the field of green consumption deepens, experimental methods are increasingly being used by scholars as an important research technique. Therefore, where resources permit, future studies on online green interactions could also employ experimental methods. By using simulated experimental scenarios that allow participants to engage in simulated online information and emotional interactions,

followed by long-term tracking, a deeper understanding of participants' behavioral changes can be achieved.

(3) Enriching the Research Content on Shared Green Consumption

This study primarily focused on the shared green consumption behavior of sharing idle products. As shared green products continue to emerge, exploring other forms of shared green consumption can enrich the field's related research, broadening the scope and implications of shared green consumption studies.

5.4 Implications

Theoretical Implications

First, this study explores the impact of online reference groups on shared green consumption behaviors. Although the influence of reference groups has been widely studied, most research has been limited to the impact of groups within the consumer's real social circle. Few studies have utilized mobile internet to explore the reference effects of online groups on consumer behaviors. With the rapid rise of new media, the influence of online reference groups has become increasingly significant and cannot be ignored. This study, by incorporating the characteristics of online reference groups, discusses their mechanism on shared green consumption behavior, thus broadening the existing perspectives on reference group influence and providing theoretical outcomes for subsequent studies.

Second, this research enriches the theory of online reference group platforms and expands their application in the green consumption field in the digital economy era. Previous studies on online reference groups were mostly limited to social platforms. However, with societal diversification and the development of digital technologies, the platforms for online reference groups have diversified, showing dual functions as social information and economic operation platforms, such as Xiaohongshu, Douyin, and Ctrip. Previous studies on network group platforms focused either on the interaction within product or brand communities or on the use of social software for information exchange. This study examines network reference group activity

platforms that combine social information and economic operations, focusing on their impact on shared green consumption behavior, which is both cutting-edge and timely.

Third, this study refines the concept of green consumption behavior, providing foundational research for further promoting shared green consumption behavior. The concept of green consumption behavior has evolved with the new era; traditionally, it was based on individual consumers purchasing environmentally friendly products for personal use. However, as internet technologies have advanced, comprehensive information exchange and data sharing have promoted the development and evolution of green consumption patterns, gradually forming high-level green consumption behavior that are shared among individuals and society at large. While the academic community has maturely studied the factors and mechanisms influencing traditional green consumption behavior, few have examined the impact of online reference groups on these behaviors. This study not only refines the concept of green consumption behavior but also delves into shared green consumption behavior, making it significantly meaningful for exploring the mechanisms and effects of online reference groups on such behaviors and laying a theoretical foundation for their realization.

Fourth, this research deepens the study of empathy theory and explores its application in the field of green consumption. Empathy theory, originating from social psychology, has traditionally focused on the psychological state of feeling empathy towards others, which in turn motivates altruistic behavior. Introducing the concept of natural empathy, this study extends the application of empathy from interpersonal relationships to the relationship between humans and nature. By considering online reference groups as a factor influencing natural empathy (i.e., empathetic feelings towards nature) and using natural empathy as a mediating variable, this study explores the relationship between online reference groups and shared green consumption behavior, which will facilitate the further development of empathy theory.

Practical Implications

First, enhance the development of platforms for the sharing economy to promote green shared consumption marketing models. Shared green consumption offers a

rapid and sustainable development opportunity for platforms in the sharing economy. Promoting online reference groups' participation in shared green consumption is crucial for the development of these platforms. This approach not only leverages the influence of online reference groups on social media and the internet to spread environmental ideals and create a demonstration effect but also promotes the concept of green consumption, stimulates market demand for green products, and enhances platform value and user experience. Integrating green consumption into the sharing economy helps platforms achieve sustainable development, fulfill social responsibilities, and promote environmental, social, and sustainable development goals. By guiding online reference groups to choose green consumption on sharing economy platforms, these platforms benefit not only commercially but also make a positive impact on environmental and social aspects, aligning with the social responsibility and sustainable development missions of the sharing economy.

Second, encourage relevant green businesses to recognize the importance of online reference groups and to utilize and participate in green shared consumption marketing models. With China's strong support for the green industry, related green businesses face an increasingly competitive market. However, gaining market share requires a forward-looking perspective. Given the diversified communication forms of online reference groups, such as peer-to-peer and many-to-many, future marketing trends will likely involve a deeper integration of shopping and virtual social interaction. Therefore, marketers need to deeply understand the mechanisms of these trends to seize opportunities. This study uses online reference groups as a starting point to explore their reference role in shared green consumption behavior, offering strategies for businesses and marketers on how to conduct online marketing. It also benefits businesses in leveraging these influences to effectively utilize online sales channels, allowing continuous progress and enhanced market competitiveness for related green businesses.

Third, provide suggestions for government and relevant regulatory agencies to promote shared green consumption. The unsustainability of the extensive economic development model has led to increasingly acute contradictions between humanity and nature. After China proposed the construction of an ecological civilization, local

governments have been promoting green development by influencing the supply and demand of the green market. However, such promotional public policies have diminished the government's regulatory functions, and their role in guiding public green consumption remains weak. Therefore, for government and related regulatory bodies, strengthening the advocacy and enforcement of green development policies and stimulating the public's enthusiasm for green consumption are crucial. This helps implement green development policies, making it significant for the realization of an ecological civilization in China.

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Questionnaire

Dear Sir/Madam,

Thank you sincerely for taking the time out of your busy schedule to assist in filling out this survey. This questionnaire is conducted anonymously and the data collected will be used solely for academic research purposes and will not be utilized for any other purposes. Please answer the following questions based on your own experiences. We will strictly maintain the confidentiality of the research data. Thank you sincerely for your cooperation and participation!

Do you have your own online social circles (such as WeChat groups, Moments, brand communities, Weibo, etc.)? If you select "Yes," please continue with the following questions.

☐ Yes ☐ No

Part I: Demographics

1. Your Gender

☐[1] Male ☐[2] Female

2. Your Age

☐[1] 18-24 years old ☐[2] 25-34 years old ☐[3] 35-44 years old ☐[4] 45-54 years old ☐[5] 55 years old or above

3. Your Academic Degree

☐[1] High school or below ☐[2] Associate's degree ☐[3] Bachelor's degree ☐[4] Graduate degree or above

4. Your Occupation

☐[1] Student ☐[2] General worker or service staff ☐[3] Government department

employee ☐[4] Manager ☐[5] Engineering technician ☐[6] Professional in research, education, or health and environment ☐[7] Self-employed ☐[8] Other

5. Your Monthly Income

☐[1] 3500 RMB or less ☐[2] 3501-5000 RMB ☐[3] 5001-6500 RMB ☐[4] 6501-8000 RMB ☐[5] Over 8000 RMB

6. Which of the following online communities have you participated in? **(Multiple choices)**

☐[1] WeChat groups ☐[2] QQ groups ☐[3] Taobao/Tmall communities ☐[4] Moments (WeChat) ☐[5] Online forum communities (such as Tieba, Zhihu, etc.)

7. How many QQ groups, WeChat groups, or other online communities are you involved in?

☐[1] 1-5 groups ☐[2] 6-10 groups ☐[3] More than 11 groups

Part II: Relevant Scales

Please, based on your understanding and experience, select your answers with the following questions. Mark a "√" under the number that best corresponds to your view. The scale is as follows: 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree, 5 for strongly agree.

(1) Question for Online Reference Groups

The online communities mentioned below refer to circles formed through interactions on the internet, such as WeChat groups, Moments, brand communities, Weibo, etc. Please choose the option that best fits your understanding and actual

situation.

No.	Items	1	2	3	4	5
1	The brand preferences of e-commerce platform hosts influence my purchasing decisions.					
2	Purchasing and using the same products and brands as they do gives me a sense of belonging.					
3	I seek information and user experiences about products or brands from them.					
4	I refer to information and user experiences about green products posted by others on platforms like Taobao and WeChat.					
5	I can interact with them through the Weibo posts, videos, or social platforms they use.					

(2) Question for Natural Empathy

No.	Items	1	2	3	4	5
1	I can empathize with the difficult situations faced by these animals and plants.					
2	I can understand the feelings of these animals and plants from their perspective.					
3	I am concerned about the harm suffered by these animals and plants.					
4	I can comprehend what these animals and plants must be feeling.					

(3) Question for Shared Green Consumption Behavior

No.	Items	1	2	3	4	5

1	I choose to use shared products to conserve resources and protect the environment.					
2	I recommend others to use shared products to conserve resources and protect the environment.					
3	I am open to using shared products recommended by others to conserve resources and protect the environment.