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Can Green Consumption Be "Learned"? A Study on the Impact of Reference Group Type on Green Consumption Intentions

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Abstract: Green consumption represents the fundamental driving force behind the development of an ecologically sustainable society. Consequently, the analysis of green consumption behavior patterns has attracted significant attention from scholars. Nevertheless, there is a paucity of research addressing the impact of reference group type on consumers' intentions to consume in an environmentally responsible way. Building on previous reports, this study presents the concept of individual perceived efficacy and examines distinctions among the impacts of three reference groups on consumers' intentions to consume green products: member, secondary, and aspirational groups. Findings from our experimental analysis demonstrate that the reference group type has a notable effect on consumers' green consumption intentions. Additionally, the green consumption behaviors of different reference groups positively influence consumers' green product consumption intentions by affecting individual perceived efficacy. Moreover, the size of the reference group exerts a moderating influence on the effect of reference group type on green consumption intentions. Specifically, a larger group size exerts a greater positive effect on green consumption intentions. This study advances the theoretical research framework of green consumption and offers insights for manufacturers to refine their marketing strategies for green products. Furthermore, it provides recommendations for environmental organizations and governmental bodies to enhance the promotion of green consumption.

Keywords: reference group type, green consumption intention, perceived efficacy, the size of the reference group.

1. Introduction

Recent developments in modern technology have led to progress in various aspects of human society. However, the environment on which humans depend has been seriously polluted and damaged. Therefore, it has become increasingly important for people to adopt more responsible lifestyles and reduce the negative impact of technology and consumption on the environment. Green consumption, as a way to effectively reduce environmental damage without compromising the quality or quantity of consumption [1] , has gradually gained widespread attention from all areas of society. Peattie argues that green consumption reflects the consumers themselves and the environment in which they live, as well as their social relationships and obligations [2]. Similarly, Grønhøj claims that consumers

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participate in green consumption both as individuals and as members of their families, communities, and societies [3]. Griskevicius et al., on the other hand, maintain that when consumers act as part of a group, the behaviors of others also influence their understanding of and responses to the environment in which they live, leading to diverse consumption choices [4].

Previous research has extensively explored the influence of the behavior of others on consumers' consumption choices, and scholars such as Batra et al. have proposed the concept of the reference group in this area. Reference groups are individuals or groups to which people refer and compare their consumption decisions [5]. Although the reference group concept has already been introduced to the issue of green consumption, existing research primarily focuses on the influence of reference groups on green consumption. The question of whether there are dissimilarities in the influence of different types of reference groups on green consumption intentions has not been widely explored, and only a small number of studies have touched upon this subject. For instance, Tsarenko et al. compare the differences in consumers' green consumption behavior when retailers and peers are used as reference groups. They conclude that retailers have a stronger influence on consumers' green consumption behavior than peers [6]. Moreover, there are two aspects of research in this area that require further scrutiny. First, previous studies only briefly explore the differential impact of reference group type on green consumption based on a systematic division of reference group types. Consequently, the scope of the reference groups needs to be further expanded. Additionally, existing reports mainly focus on the influence of reference groups on green consumption behaviors rather than on green consumption intentions. The enrichment of research perspectives and content is crucial to the comprehensiveness of the green consumption theoretical system.

To address these issues, this study applies empirical analysis to investigate whether and how different reference groups influence green consumption intentions. The innovation of this study is principally reflected in the following three aspects. First, this study examines the factors that influence green consumption intentions according to differences in reference group types. This broadens the research perspective of the influence of reference groups on consumption decisions and the factors influencing green consumption intentions. Besides, this article examines the mediating effect of individual cognition on the influence of reference group types on green consumption intentions, deepening the interaction between the factors that affect green consumption intentions and the influence of reference groups. Finally, this report explores the moderating effect of reference group size on how significantly reference group type influences green consumption intentions. This approach excludes the possibility of alternative explanations for the mediating effect of individual perceived efficacy. By effectively deepening the theoretical system of green consumption, these innovations are of great value to consumers, green product manufacturers, and governments.

2. Literature Review

2.1. Green Consumption Intention

Green consumption intentions are the psychological basis for the emergence and persistence of green consumption [7], which is the willingness generated by consumers to purchase environmentally-friendly products or practice low-carbon living. Previous studies rely on the theory of planned behavior (TPB) [8], the values-beliefs-norms (VBN) theory [9], and the theory of rational behavior [10] to explain what influences the formation of green consumption intentions. The theory of rational behavior assumes that individuals are fully rational and considers intention as a predictor variable of behavior. It proposes that the more an individual wants to act, the greater the likelihood that they will. The theory also suggests that willingness is influenced by both attitudes and subjective norms. However, since the assumption that individuals are completely rational is unreasonable, Ajzen further proposes the theory of planned behavior. This concept supplements the theory of rational behavior

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with the assumption that an individual's willingness to act is also influenced by the variable of perceived behavior control [11].

Based on the above theoretical foundations, existing studies concerning factors that affect green consumption intention mainly include: (1) Consumers' personal characteristics, including consumer values [12], internal response mechanisms to pain and empathy [13], and degree of environmental concern [14]; (2) Social influence factors such as reference group [15] and social beliefs [16]; (3) Marketing factors such as advertising design [17] and gamification [18]. In addition to the above studies, some interdisciplinary themes have also been introduced into the discussion of green consumption intentions. For instance, Halder et al. incorporated ethical concepts such as national culture and consumers' ethical ideologies into factors that influence individual and collective sustainable consumption. This study states that while long-term planning has a positive effect on green consumption values, the effect of traditional values is negative [19].

2.2. Reference Group Type

The reference group refers to individuals or groups that influence the personal views, opinions, interests, and perceptions of consumers. The reference group generally has the three following basic characteristics. First, the reference group has an impact on an individual's attitudes, beliefs, decisions, and behavior through normative and comparative mechanisms. Next, the influence of the reference group is meaningful rather than accidental. Finally, within a specific context, the reference group can be genuine or imaginary, a certain group or an individual. According to the theory of planned behavior, subjective norms have a direct effect on behavioral intentions. Existing research agrees that reference groups affect intentions, attitudes, and behaviors. For instance, group-affirmation increases conformity. Non-discriminatory group fosters pro-minority collective action while discriminatory group fosters anti-minority collective action [20]. Different reference groups influence an individual's willingness to strive for achievement [21], while reference groups also have an impact on the persuasive power of a message [22], such as the propagation of certain stereotypes [23]. Some studies focus on the influence of reference groups on consumer behavior. Park and Lessig subdivided the effect of consumer reference groups and extended it to three dimensions, namely informational, utilitarian, and value-expressive influences [24]. Informational influence refers to the influence on consumer purchasing behavior through searching for product-related information from relevant sources to reduce risk or gain more knowledge and competence in a given consumption situation, i.e., the consumer has risk-averse motives. Utilitarian influence represents an individual's attempt to conform to the preferences and expectations of other individuals or groups to gain appreciation or avoid punishment, thereby influencing their purchasing decisions, i.e., the consumer conforms to societal norms or group pressure. Expressive influence is reflected in an individual's motivation to enhance their self-image by associating with positive references and disassociating with negative references, and to express their values by aligning with the reference group, i.e., the consumer is focused on self-enhancement. Kelman et al. suggest that the influence of a reference group on a consumer is achieved through the three pathways of internalization, identification, and conformity. Internalization signifies the extent to which a reference group instructs consumers to achieve their goals and maximize their values. Identification denotes the individual's acceptance of self-identity-related ideas or behaviors from the reference group. Obedience represents the individual's compliance with the expectations of the reference group to receive rewards or avoid punishments from the reference group [25]. Bettman et al. further propose the normative influence of the reference group, which is when the reference group allows consumers to express their values, i.e., they are motivated to improve themselves. Thus, when the reference group offers consumers some significant rewards or penalties, consumers obey the positive expectations of the reference group in their consumption

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decisions to gain appreciation or avoid punishment [26] This reveals that the reference group has a multifaceted effect when influencing consumption behavior.

Escalas and Bettman's study delineated three typical types of reference groups: the member, secondary, and aspirational groups [27]. Member groups are informal groups such as family, friends, co-workers, and neighbors. These groups have frequent contact, thereby exerting a greater effect on consumption and a direct influence on consumers. Secondary groups are more formal but less frequently assembled groups to which individuals belong, such as occupational groups, religious groups, and academic organizations. Aspirational groups include film and TV stars, sports personalities, social celebrities, and dignitaries. Although consumers do not belong to these groups, they nevertheless admire them and desire to belong to them. As a result, consumers often emulate the lifestyles and consumption behaviors of these aspirational groups. In a subsequent study, Escalas and Bettman further separate the reference groups into two categories: member and non-member groups [28]. In this paper, we adopt Escalas and Bettman's approach of categorizing reference groups into member, secondary, and aspirational groups.

The above studies verify that the concept of reference group types has been thoroughly explored and widely implemented in the field of consumer behavior. Furthermore, the classification of reference group types has been enhanced by continually updated research results that present more systematic definitions of clusters.

2.3. Perceived Efficacy

The concept of perceived efficacy was introduced by the sociologist Albert Bandura in 1977 [29]. It characterizes the degree of confidence that a person possesses to perform a specific task or achieve a specific goal. Any mental process influences perceived efficacy, while the cognitive processing of information, either active or passive, affects the level of perceived efficacy. Ahn et al. argues that individual perceived efficacy is an overall evaluation of perceived benefits compared to costs [30]. Sweeney and Soutar suggest that individual perceived efficacy is composed of two components, perceived quality value and perceived price value. Perceived cognitive and situational values merge into other values, ultimately resulting in a four-dimensional perceived value consisting of perceived quality value, perceived price value, perceived emotional value, and perceived social value [31].

Individual perceptions of efficacy have a considerable impact on whether group members develop cooperative attitudes. Kerr's research proposes that group members are more likely to cooperate when they believe that their cooperative behavior effectively benefits the group. Individual perceptions of efficacy are crucial in determining whether group members believe that their behavior has an impact on the group's interests [32]. Furthermore, the study of Rabinovich et al. assesses the willingness of individuals to share natural resources and the factors that influence their willingness. They found that individual perceived efficacy also interacts with group members' expectations of cooperative behavior. When individual perceived efficacy is low, individual cooperative attitudes mainly rely on the expectations of other group members to engage in cooperative behavior. In contrast, when individual perceived efficacy is high, individual cooperative attitudes are less influenced by the expectations of other group members [33].

The above studies show that individual perceived efficacy is a key indicator of environmental influence on the decision-making process of an individual. It also plays a vital role in determining whether an individual chooses to cooperate when faced with collective action.

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3. Research Hypothesis

3.1. Reference Group Type and Green Consumption Intentions

Numerous studies examine the influence of different reference groups on consumer willingness. For instance, Park and Lessing assess two distinct groups of homemakers and students and suggest that there is considerable variance in the influence of the three different types of reference groups on the consumer brand choices of the two sample groups [24]. Childers and Rao discovered that the influence of family members and peers on purchasing decisions regarding private consumer goods and public consumer goods varies. Differences in the influence of peers on purchasing decisions for consumer goods are more significant when peers serve as the reference group for consumers' public necessity purchasing decisions. However, family members have a significant influence on consumers' private necessity purchasing decisions [34]. Escalas and Bettman's study indicates that the use of a specific brand by a member group or a desire group further enhances consumers' willingness to purchase that brand [27]. Some studies also reveal the influence mechanism of reference groups on green consumption behavior. The study of Tsarenko et al. compares the differences in consumers' green consumption when retailers and peers are used as reference groups. They concluded that retailers have a stronger influence on consumers' green consumption behavior than peers [35]. Based on the above literature, we make the hypothesis that various reference group types differentially influence green consumption. Regarding continuous green consumption, the green consumption behavior of the reference group encourages consumers to make the same decisions due to herd motivation or self-improvement motivation, subsequently increasing green consumption. Since there is a difference in the motivation provided to consumers by different reference groups, the influence of reference groups on green consumption varies. This leads to the following hypothesis:

Hypothesis 1: The green consumption behaviors of different reference group types have distinct impacts on consumers' green consumption intentions. The green consumption behaviors of member groups have the greatest positive impact on consumers' green consumption intentions, while the green consumption behaviors of aspirational groups have the smallest positive impact.

By conducting relevant experiments, we hope to ascertain the groups of people that correspond to the three reference group types, thereby simplifying the experimental process. According to the results of existing research, we use consumers' close friends as the model member group, staff of the consumer's local community council as the model secondary group, and the consumer's idols as the model aspirational group. Additionally, a study by Wang et al. analyzes the differences in consumer purchase decisions when one, two, or three people are used as references. They established that consumers are willing to spend significantly more in the presence of a reference group than alone. However, there is no significant difference between a two-person reference and a three-person reference. Therefore, according to their findings, we apply "one person" and "one group" as the quantitative benchmarks for distinguishing small-scale groups from large-scale groups.

3.2. Mediating Effect of Individual Perceived Efficacy

In this study, individual perceived efficacy refers to the impact of the subject’s green consumption behaviors on the environment. It represents the extent to which individuals are confident that their green consumption behaviors will improve the environment in which they live. Kerr's research indicates that the reference group type affects individual perceived efficacy differently and that variations in the identities of the reference group constituents affect the self-perceived efficacy of consumers [32]. Subsequently, the level of individual perceived efficacy determines whether the corresponding behavior is initiated, how much effort is expended, and how long it persists in the face of difficulties and obstacles. In the field of consumption, the individual perceived efficacy level

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governs whether or not consumption behavior occurs. Zhang et al. suggest that consumers with higher individual perceived efficacy in life control are more inclined to consume green [36]. Besides, Hanss and Böhm's study shows that the impacts of individual perceived efficacy include encouraging others to take sustainable actions and contributing to environmental preservation through one's own actions and consumption decisions, thus promoting environmental protection [37]. Kim et al.'s study shows that the perceived efficacy and perceived market sentiment of the reference group have a significant positive effect on green consumption behavior. However, green consumption attitudes and socio-demographic characteristics exert a negligible influence on green consumption behavior [38]. Simão et al.'s study concludes that individual perceived efficacy plays a mediating role in the demand for natural rights on sustainable consumption [39].

Existing reports also reveal the mediating effect of individual perceived efficacy in the process by which the type of reference group influences consumers' intentions to consume green. Wiener's study demonstrates that reference groups influence the expectations of reference members to adopt green consumption behaviors by affecting their perceived efficacy. When the perceived efficacy of individuals is low, the reference group generally allows consumers to adopt low expectations of green consumption behavior [40].

Hypothesis 2: The reference group type affects consumers' green consumption intentions by influencing individual perceived efficacy. Higher perceived efficacy of individuals brought about by the green consumption behavior of the reference group leads to stronger green consumption intentions among consumers.

3.3. Moderating Effect of Group Size

Dawes put forward the social dilemma theory, which states that consumers, as members of a reference group, are faced with two behavioral choices: to cooperate and maximize the interests of the group or not to cooperate and maximize their personal interests [41]. Mayes notes that herd mentality is an important influencing factor that determines whether an individual chooses whether or not to cooperate with the group. Moreover, when the role of herd mentality is stronger, the likelihood that an individual chooses to follow the group's decision is greater [42]. Chierchia et al.'s research shows that group size is an important factor that influences individual herd mentality. Within a certain range, the individual's herd behavior increases with larger group sizes [43]. The above theories confirm the correlation between group size and the choices of individuals.

Conversely, Wiener's study explores the correlation between the two in the context of green consumption. When the reference group is large, the individual perceived efficacy of consumers is high and reference group members tend to adopt low expectations of green consumption behavior. In large groups, increased access to social information makes individuals more susceptible to information-based social influences. At the same time, large groups also generate a scaling effect, which encourages individuals to be consistent with the group, thereby encouraging individuals to follow the herd. However, Wiener's study selects specific groups of people as representatives of the reference group. Therefore, a larger population strengthens the representativeness of the group to the reference group, thereby enhancing individual motivation to establish connections with the group and boosting their motivation for self-improvement [40].

Consequently, this study proposes that the size of the reference group should be considered when examining differences in the influence of various types of reference groups on green consumption decisions. We theorize that the influence of large groups on green consumption decisions is higher than the influence of small groups. Based on the above theoretical and empirical research we propose the following hypothesis:

Hypothesis 3: The green consumption behavior of large reference groups has a greater positive impact on consumers' green consumption intentions than small reference groups.

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Based on the above analysis, Figure 1 presents the framework of this study. Two experiments are designed to test the above hypotheses. Experiment 1 assesses the mediating role of the reference group's influence mechanism on green consumption decision-making with respect to individual perceived efficacy. Furthermore, Experiment 2 evaluates the moderating benefits of group size while excluding potential alternative explanations.

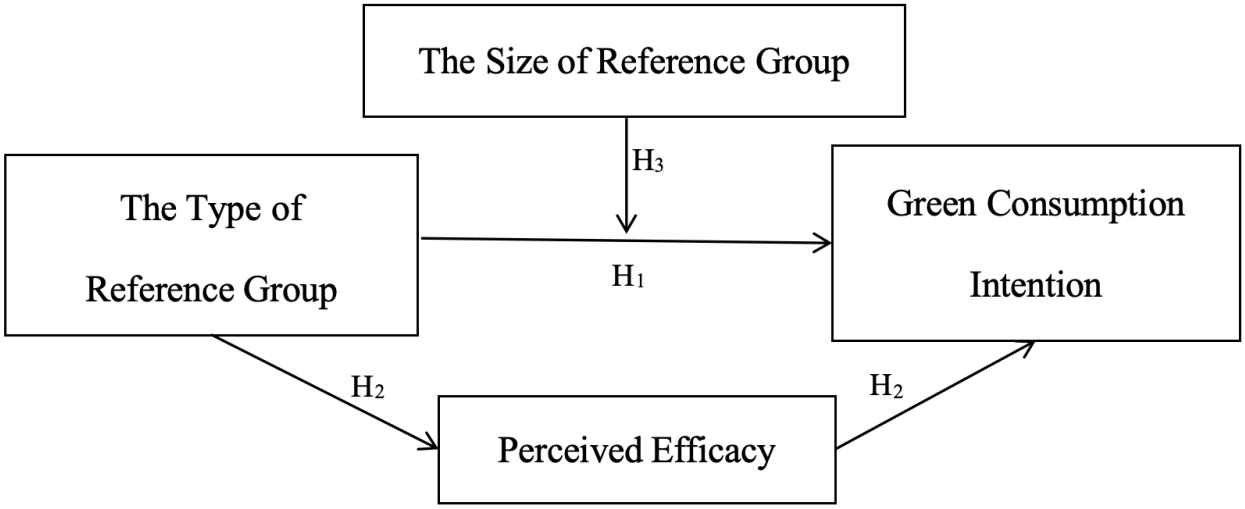

Figure 1: Research model

4. Experimental Manipulation and Hypothesis Testing

4.1. Main Effects and Mediation Effects Tests

4.1.1. Pre-experimentation

The pre-test was designed to determine the validity of modeling groups using close friends, community workers, and idols as member groups, secondary groups, and aspirational groups. First, the subjects were asked to read the definitions of each of the three classifications of the reference group, in which the primary group was defined as "informal groups that have more frequent daily contact with consumers, play a greater role in consumer demonstration, and have a direct impact on consumer behavior"; the secondary group was defined as "formal but relatively low contact groups such as professional groups, churches, academic organizations, etc., that consumers belong to"; and the aspirational group was defined as "formal but relatively low contact groups such as friends, community workers, and idols". Secondary groups are defined as "formal but relatively low contact groups such as professional groups, churches, and academic organizations that consumers belong to"; and aspirational groups are defined as "groups that consumers do not belong to but admire and expect to belong to, and emulate their lifestyles and consumption behaviors". Thereafter, the subjects were asked to match the three groups of close friends, community workers and idols with the types of reference groups according to the definitions of member groups, secondary groups and aspirational groups. In this study, 100 subjects were randomly recruited to participate in this quiz on the Wind Chime questionnaire platform, and the results showed that 94% of the subjects considered close friends to be the primary group, 91% considered community workers to be the secondary group, and 70% considered idols to be the aspirational group.

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The results of the pre-experimental data support the representativeness of the concepts of member group, secondary group, and aspirational group by close friends, community workers, and idols, and they will be applied to Experiment 1 and Experiment 2.

4.1.2. Experimental design

The purpose of Experiment 1 is twofold: one is to test the main effect of different reference group types on consumers' green consumption intention (H1); the other is to test the mediating effect of individual perceived efficacy in the two effects (H2). The whole experiment adopts the method of one-way between-groups experiment. The experimental scenario was "When you learn that your friends (vs. community workers vs. idols) choose green bamboo pulp paper towels when they buy paper towels, you find out that your own paper towels are green when you get home. Upon returning home, you realize that you have run out of your own paper towels and need to purchase new ones." To avoid interference from stimuli other than the reference group, the content and word count of the three experimental scenarios were identical except for the type of reference group.

The experimental procedure was "fill in the four basic information of gender, age, education level, and average monthly disposable income→read one of the three scenarios randomly→answer the questions in the test scale". Among them, the test scale mainly consists of a main scale and a mediator variable measurement scale, and the main effect scale refers to the four-item 7-point Likert "Green Consumption Intention Measurement Scale" used by Spears and Singh (including "I am very likely to buy this bamboo pulp tissue paper"; "I am interested in buying this bamboo pulp tissue"; "I am willing to buy this bamboo pulp tissue"; "I am very sure that I will buy this bamboo pulp tissue") (Spears and Singh). ") [44]. The mediating effects scale was adapted from the three-item, 7-point Likert "Individual Perceived Efficacy Measurement Scale" used by Jugert et al. (including "Purchasing bamboo pulp paper towels will make the environment around this study better"; "I would be concerned about my environment when I buy paper towels. When purchasing paper towels I am concerned about the environmental impact of my purchasing choices"; and "My friends have already purchased bamboo pulp paper towels, so even if I don't purchase bamboo pulp paper towels there is little impact on the environment") [45]. A total of 187 subjects were recruited in this study on the Wind Chime questionnaire platform from January 12-20, 2024, of which 37 subjects were excluded for reasons such as inattentive responses (e.g., answering the type of reference group in the wrong scenario or answering the question with a length of less than 10s), and the final effective subjects had the largest proportion of the 30-39 year old age group (32.4%), with a gender ratio of 72 males/88 females.

4.1.3. Experimental result

Main effect test. In this study, a one-way ANOVA was conducted on the green consumption intention of the three groups of subjects, and the mean values of Friends & Community & Idol on green consumption intention were obtained as 5.482/5.095/4.796, respectively, and a one-sample ANOVA test could be used due to the fulfillment of variance chi-square. The ANOVA results show a p-value of 0.019**, which is statistically significant and indicates that there is a significant difference in green consumption intention among different subject groups. This result indicates that the green consumption behavior of different types of reference groups will have different degrees of positive influence on consumers' green consumption intention, and the strength of the influence of different types of reference groups on consumers' green consumption intention is ranked as follows: primary group > secondary group > aspirational group. Hypothesis H1 is verified.

Mediation effect test. In this study, the parallel mediated effect test proposed by Hayes and Rockwood (Hayes & Rockwood, 2020) was used to run the regression model with the standardized

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reference group type, green consumption intention, and perceived efficacy of individualsincluded. The test results showed (Table 2) that the mediation effect value was -0.099 (95% BootCI= [-0.228, -0.014], excluding 0), and the mediation path of "type of reference group → individual perceived efficacy → green consumption intention" was significant. This result supports Hypothesis H2. In addition, the results of the parallel mediation model also show that the total effect is still significant after controlling for the mediating variables (β = -0.245, 95% BootCI = [-0.356 , -0.134], excluding 0), which indicates that perceived efficacy only plays a partial mediating role, and the mediating effect accounts for about 28.78% of the total effect.

Table 1: Mediating effects of individual perceived efficacy

Effect Type	Mediating Variable	Effect Value	Standard Error	T-value	P-value	95% Confidence Interval	
						LLCI	ULCI
Direct Effect	—	-0.245	0.111	-2.204	0.029**	-0.356	-0.134
Mediating Effect	Perceived Efficacy	-0.099	0.055			-0.228	-0.014

The data results of Experiment 1 tested the validity of hypotheses H1 and H2. The experimental results show that the positive effects of green consumption behaviors of different reference groups on consumers' green consumption intention are ranked from high to low: primary group, secondary group, aspirational group. The corresponding individual perceived efficacy of different reference groups is ranked from high to low: member group, secondary group, aspirational group, and there is a positive correlation between individual perceived efficacy and green consumption intention.

It is worth noting that there still exists a potential alternative explanation in this experiment, i.e., the difference in the size of the reference groups may affect consumers' green consumption decisions. Therefore, in Experiment 2, this study manipulates the reference groups into different reference groups of the same size, and at the same time explores the moderating mechanism of reference group size in the main effect.

4.2. Moderating Effects Test

4.2.1. Experimental design

The main purpose of Experiment 2 was twofold: first, to rule out potential alternative explanations; and second, to test the moderating effect of reference group size on the main effect. Experiment 2 was a 3 (type of member group: primary vs. secondary group vs. aspirational group) x 2 (small vs. large reference group) between-groups factorial design. The experimental scenario was "When you and one of your friends (vs. a group of friends vs. a community worker vs. a group of community workers vs. an idol vs. a group of idols) have purchased an environmentally friendly bag, you happen to need to purchase a bag as well". All groups were identical except for the type of reference group and the size of the reference group.

The experimental procedure was "fill in the four basic information of gender, age, education level, average monthly disposable income → randomly read one of the six scenarios → answer the questions in the test scale". The scales for the dependent and mediating variables were the same as those used in Experiment 1. A total of 314 subjects were recruited in three batches on the Windchime system from January 27 to February 6, 2024, of which four subjects' responses were excluded due to the short response time. The final number of valid subjects was 300, of which the largest age group

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was 18-29 years old (38.6%), and the gender ratio was 153 male/147 female. Meanwhile, each experimental situation corresponded to 50 responses.

4.2.2. Experimental results

In this study, a one-way ANOVA was conducted to analyze the subjects' green consumption intention under the reference group of the same size, and the mean values of close friends, community workers and idols on green consumption intention were 5.205/4.78/4.19 respectively; due to the satisfaction of variance chi-square, a one-sample ANOVA test was used, and the P-value of the ANOVA result was 0.000***, so the statistical result was statistically significant, which indicated that under the same sizeThere is a significant difference in green consumption intention among different groups, i.e., after controlling the variable of size, the type of reference group still has an effect on green consumption intention, and this result further proves the validity of hypothesis H1.

In addition, this study conducts the parallel mediation effect test again for the variable green consumption intention, reference group and the mediating variable individual perceived efficacy under the same size of reference group, and the results show that individual perceived efficacy has a partial mediation effect in the model, and the effect share is about 25.46%. Parametric analysis of the mediating effect three types of regression model, the results show that the reference group corresponding to the individual perceived efficacy from high to low for the primary group, secondary group, aspirational group; the higher the individual perceived efficacy, the higher the green consumption intention of consumers. The results support H2.

Moderating effect analysis. Using two-factor ANOVA to analyze the mutual influence of reference group size and reference group type on green consumption intention, the results show that reference group size shows significance (F=13.986, P=0.000***), which means that reference group size will have a significant effect on green consumption intention; reference group type shows significance (F=7.568, P=0.001***) At the same time, the interaction term between reference group size and reference group type shows significance (F=3.499, P=0.032**), indicating that reference group size has an important positive moderating effect on "reference group type → green consumption intention", and the larger the reference group size, the greater the positive moderating effect on "reference group type → green consumption intention". The larger the size of the reference group, the more significant its moderating effect on the main effect. The results of simple effect analysis show that in the aspirational group, the green consumption intention of the subjects in the large-scale group is significantly higher than that of the subjects in the small-scale group (t=4.077, P=0.000***); in the secondary group, the green consumption intention of the subjects in the large-scale group is significantly higher than that of the subjects in the small-scale group (t=2.061, P=0.040**); in the primary group, the green consumption intention of the subjects is not significantly different from the subjects in the small-scale group (t=0.340, P=0.734). This result supports hypothesis H3.

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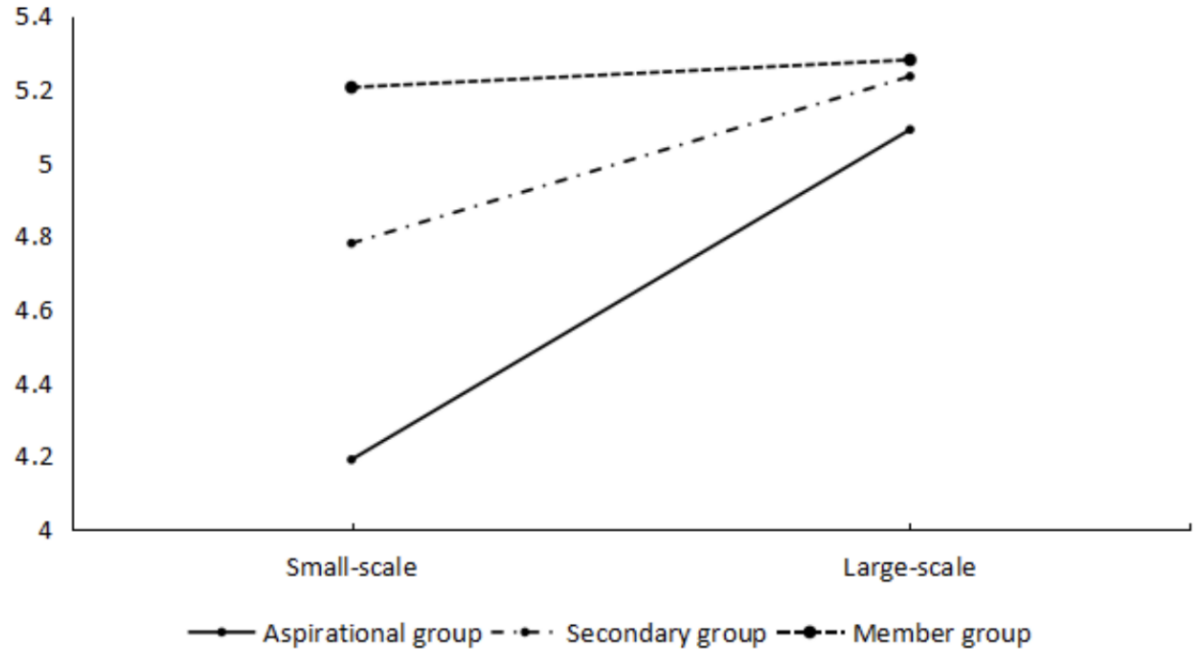

Figure 2: Moderating effect of reference group size on main effect

The results of Experiment 2 further support Hypothesis H1 and Hypothesis H2, and also verify the validity of Hypothesis H3, i.e., the larger the size of the reference group, the more positive the moderating effect on the main effect. The experimental results also show that there is a significant difference in the influence of different sizes of reference groups on the main effects of aspirational group types and secondary group types, while the influence on the main effects of primary group types is less significant.

5. Conclusion

5.1. Research Findings

The reference group type affects consumers' green consumption intentions, while individual perceived efficacy plays a mediating role. In Experiment 1, green bamboo pulp tissue paper is used as the experimental product. The results reveal that among the three types of reference group, green consumption by the primary group has the strongest positive effect on consumers' green consumption intentions, while the aspirational group has the weakest positive effect. At the same time, individual perceived efficacy corresponding to the primary group is the strongest, while that associated with the aspirational group is the weakest. Individual perceived efficacy plays a minor mediating role and only partially leads to the strongest green consumption intentions in the primary group. The results suggest that when the four reference group effects proposed by Hyman are at work in a green consumption scenario, the "common man effect" is stronger than the celebrity effect, expert effect, and economic spokesperson effect in driving individual green consumption [46]. The conclusion that the celebrity effect does not promote consumer consumption has been confirmed by empirical studies in other consumer fields. For instance, Evans et al. studied the effect of American actor Angelina Jolie on consumers' preventive medical consumption after receiving preventive cancer treatment. They noted that her consumption behavior not only failed to motivate consumers to choose preventive medical consumption, but may have had a negative impact [47]. Lopes and Goulart-da-Silva' research shows that high skepticism regarding advertisements cancels the celebrity effect of the endorsement, which

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means the power of celebrity effect can be weakened by People's distrust of advertising [48]. These study verify that the celebrity effect on green consumption is minimal.

In Experiment 2, bags made of environmentally friendly materials are used as the experimental goods. The results further indicate that reference group size is not an alternative explanation for the main and mediating effects in Experiment 1. However, reference group size plays a moderating role in the effect of reference group size on green consumption intentions. The results of Experiment 2 indicate that larger reference group sizes lead to a more significant moderating effect on the main effect. However, the moderating strength of reference group size on the impact of different reference group types on green consumption intentions varies. The moderating effect of reference group size has a more significant positive influence on the green purchasing behavior of the aspirational group and the secondary group on consumers' green consumption intentions. Conversely, there is no moderating effect on the positive influence of green purchasing behavior of the primary group on consumers' green consumption intentions. This finding echoes Myers's theory regarding the factors that influence followership, which suggests that the group factors that influence an individual's decision to follow a group can be categorized into five factors: group congruence, group size, group cohesion, the individual's status within the group, and whether or not they have to deal with group pressure [42]. In the Experiment 2 scenario, the three factors of group coherence, individual's status in the group, and whether they face group pressure are controlled. However, in different types of reference groups, the primary group is closer to the individual consumer in terms of psychological and physical distance. Besides, the secondary group is second, and the aspirational group is furthest away from the individual consumer. In this case, group size expansion has a weaker moderating effect on member groups that already play a strong role in driving green consumer behavior due to their strong indivisibility from individuals. However, it has a stronger moderating effect on the secondary and aspirational groups, which do not have a strong sense of belonging to an individual or have a convincing role in driving green consumer behavior.

5.2. Study Significance

The theoretical significance of this study is mainly reflected in three aspects. Firstly, existing research on the effect of reference groups on green consumption mainly focuses on the different influences of reference groups on green consumption. This study shifts the perspective and examines differences in the influence of various types of reference groups on green consumption intentions. This approach effectively expands the research perspective in this field. Additionally, previous studies on the influence of reference groups on green consumption concentrate more on the influence of reference groups on behavioral differences in green consumption intentions and less on green consumption intentions themselves. Thus, this study helps to develop research outlooks in the field of green consumption intentions. The second aspect is that a small number of existing studies also discuss the mediating role of reference groups and individual perceived efficacy between reference groups on green consumption behavior. Nevertheless, they do not reveal the mediating role of individual perceived efficacy in the differentiated part of green consumption intentions under different types of reference groups. Instead, they only analyze the mediating effect of individual perceived efficacy under fixed reference groups. This study provides a more flexible explanation of the mediating role of perceived efficacy. The third aspect is that there is a lack of research on the moderating role of reference group size in the mechanism of "reference group type - green consumption intentions". To date, there are no conclusive research findings regarding this issue, so our study fills a gap in this research field.

Furthermore, this study is instructive for real-life management. Firstly, consumers need to recognize the herd mentality of green purchasing due to the perceived efficacy of the surrounding reference groups and themselves when making green purchasing decisions. At the same time, it is

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also necessary to acknowledge that the influence of the primary group on their own purchasing decisions is greater than that of the aspirational group. Also, the influence of large groups is greater than that of small groups. Subsequently, consumers should consciously reconsider their decisions and ultimately make more rational choices when making their final purchase. Additionally, for manufacturers, the member and secondary groups have a greater positive influence on consumers' green purchasing intentions than aspirational groups. As a result, manufacturers should consider applying the green consumption behaviors of friends, local council officers, and other groups in promotions, or use social media to publicize promotions among acquaintances [49], rather than pursuing the celebrity effect. Moreover, because of the significant impact of product packaging design on consumers' purchasing intentions [50], manufacturers should try to emphasize the attributes of the reference group of green products in product packaging design. This creates a situation where the reference group has already made a purchasing decision, thereby strengthening consumers' individual perceived values and enhancing their green consumption intentions.

Furthermore, in green product advertising design, advertisers should consider the use of "sea of people tactics". This method conveys green product signals to a large number of consumers, fully mobilizing the large-scale reference group of green consumption behavior and exerting a positive regulatory effect on the green consumption intentions of consumers. Finally, environmental protection organizations and the government should increase environmental protection publicity and green consumption publicity in schools, families, communities, and other areas close to the consumers. This approach realizes the "contagion" effect of green consumption from point to point and from point to surface. At the same time, members of environmental protection organizations and government employees themselves should play a positive role concerning the green consumption intentions of consumers around them as members of the main or secondary groups.

5.3. Limitations and Prospects

With regard to the limitations of this study, this study analyzes the shortcomings and gives directions for future research. First, this study explores the influence of green consumption behaviors of different reference groups on consumers' green consumption intention, but a large number of previous studies show that there is a gap between green consumption intention and behavior. The question of how to further transform the positive influence of green consumption behaviors of different types of reference groups on green consumption intention into green consumption behaviors remains to be explored. Secondly, this study chose to use a specific group of people as a representative of the reference group, and there may be other more representative groups. In the future, more general conclusions can be drawn through a more complex experimental design that allows subjects to determine the nature of the group on their own. Third, the present study used "one person" and "a group" as quantifiers to define the size of the reference group, and although the size comparison is more intuitive, its accuracy needs to be explored in depth empirically. In the future, the size of the reference group corresponding to different numbers of people in consumers' perceptions needs to be further clarified.

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