

How consumer ecocentrism, altruism, and subjective norms drive green consumption behavior through the synergistic effect of value internalization

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Abstract: In the context of global ecological crises, promoting green consumption has become a vital issue for sustainable development. Existing research primarily emphasizes external factors, with limited exploration of the dual roles of endogenous consumer values and normative pressures. Particularly, there is a lack of systematic examination of the mediating pathways of green perceived value (GPV). This study, based on the Stimulus-Organism-Response (SOR) theory, models how consumer ecocentrism, altruism, and subjective norms influence green buying behavior (GBB) through the mediating role of GPV. Structural equation modeling was employed to analyze 1,076 valid questionnaires from Chinese consumers. The results indicate that ecocentrism, altruism, and subjective norms positively impact green consumption behavior and significantly enhance GPV. Moreover, GPV mediates the relationships between these three antecedents and GBB, while viral marketing moderates the link between GPV and GBB. This research provides strategic insights for businesses facing intense competition, extends the application of the SOR model and the Theory of Planned Behavior (TPB) in consumer behavior research, enriches the literature on consumer ecocentrism, and underscores the importance of governmental efforts to improve institutional environments and infrastructure to promote green consumption.

Keywords: *Altruism, Ecocentrism, Green consumption, Green perceived value, Subjective norms, Viral marketing.*

1. Introduction

In recent years, the Chinese government has vigorously promoted green living, advocated for green consumption, established and improved an economic system for green, low-carbon, and circular development, and facilitated a comprehensive green transformation of economic and social development. It has collaborated with countries worldwide to address issues related to resources, the environment, and ecology, aiming to meet the people's growing needs for a better life. In this process, accelerating the formation of green production and lifestyles is crucial. The state has emphasized the need to vigorously develop green consumption, enhance public awareness of conservation, oppose extravagance, waste, and excessive consumption, and foster a simple, moderate, green, and low-carbon lifestyle and consumption pattern [1]. Against this policy backdrop, consumers' green perceived value continues to rise, and the concept of green consumption is increasingly. Green products are gaining more recognition and popularity among consumers due to their outstanding features such as energy savings and environmental protection. However, in real life, factors such as higher prices and insufficient consumer awareness have led to inadequate motivation for green consumption, resulting in green products still occupying a relatively low market share [2]. Therefore, in this context, delving into the driving mechanisms behind consumers' green consumption behavior holds significant practical and theoretical importance for governments and businesses to guide and manage green consumption and enhance consumers' green consumption behaviors.

In the current field of green consumption research, studies on green consumption behavior primarily focus on three aspects: influencing factors, driving mechanisms, and subsequent consumption behaviors. Early research, largely based on the Theory of Planned Behavior, adopted an "attitude-intention" conversion perspective, positing that consumers' green consumption attitudes play a crucial role in the formation of green consumption behavior. As research deepened, some scholars analyzing the formation mechanisms of green consumption behavior identified a gap between "attitude" and "behavior," suggesting that establishing a positive green consumption attitude does not necessarily translate effectively into green consumption behavior [3]. A literature review revealed that not many scholars have incorporated the Stimulus-Organism-Response (S-O-R) model into the study of consumer behavior. This study contends that the S-O-R model offers unique explanatory power for understanding the formation mechanism of green purchase intention and can significantly reduce the "gap" between attitude and behavior. When stimulated internally and externally, consumers form consumption behaviors, and the time span until the behavior manifests is greatly reduced. Online shopping has become a mainstream consumption model today, and its methods of attracting consumers aptly illustrate the S-O-R theory. Numerous scholars have studied consumers' green consumption behavior in e-commerce environments under this framework. Under certain marketing stimuli (purchase environment, advertisements, textual and visual cues, etc.), consumers are more prone to impulsive consumption behavior [4, 5].

Some scholars have recognized in their research that behavior is influenced by consumers' perception levels, arguing that changes in behavioral intention follow a perception, belief, behavior model, where knowledge is the foundation. Consumers acquire relevant knowledge and engage in reflection, thereby elevating cognition to behavioral beliefs, which in turn drives changes in consumption intention [6]. Other scholars believe that external factors such as consumers' subjective norms and green perceived value also influence purchase intention [7]. Previous studies on green consumption behavior have rarely involved the simultaneous impact of both internal and external environmental factors on consumer behavior.

The price of green products is relatively higher compared to ordinary goods, which significantly dampens consumers' purchase desire. Furthermore, the attributes of green products from some companies are not flawless, and instances of selling ordinary products under the "green" label are numerous, which further diminishes consumers' willingness to purchase green products. In such a context, consumers' green perceived value and altruism become particularly important. Both are rooted in the consumer's own cognitive thinking and occupy a crucial position in purchasing behavior [2]. Once consumers judge a product to be highly risky based on their own cognitive level, even if the product has excellent quality, appealing appearance, and good after-sales service, it is difficult to generate purchase behavior.

Consumers' consumption behavior is also influenced by prevailing trends. For example, if water conservation is currently emphasized, related slogans will be ubiquitous in daily life. Today's concepts of "ecology, green, and harmony" are deeply ingrained, further awakening consumers' ecological awareness. Ecocentrism discusses the ethical relationship between humans and the natural environment from the perspective of the ecosystem as a whole, asserting that nature has its own intrinsic value and deserves human respect and moral consideration. It is a form of environmental ethics based on ecology [8]. Such ideological influences spread extremely rapidly in the information age and can therefore affect many potential green consumers. Coupled with the deep penetration of green consumption concepts, this is bound to impact consumers' green consumption behavior and, consequently, their purchasing decisions [9]. Altruism and subjective norms are inextricably linked in the context of green marketing. Altruism can influence specific consumer behaviors from within, while subjective norms represent the influence of important reference groups' opinions. Green consumption itself is a consumption pattern beneficial to the environment and society, and this extends to the individual level as well [10]. Once consumers possess traits of altruism and ecocentrism, they develop a strong identification with green environmental concepts and lifestyles, leading to a preference for

green products. Effective and positive external environmental stimuli can then trigger consumption behavior [11].

In summary, as green consumption gradually becomes mainstream, exploring green consumption behavior is urgently needed. Therefore, this study attempts to use the S-O-R model and the Theory of Planned Behavior as the foundational theories throughout. It integrates factors originating from the consumer's own conditions—altruism, ecocentrism, subjective norms, and green perceived value—along with the external environmental factor of viral marketing, to investigate the influencing mechanism on consumers' green consumption behavior.

2. Related Theories

2.1. Stimulus-Organism-Response (SOR) Theory

Mehrabian and Russell expanded the research on the "Organism" based on the S-R theory, subsequently constructing the "Stimulus-Organism-Response" (S-O-R) model [12]. This model indicates that "S" stands for stimulus, referring to internal or external environmental stimuli that can elicit an individual's reaction, which triggers individual perception and thereby influences individual behavior [13]. "O" represents the organism, which is the internal processing state between internal/external stimuli and the individual's final response, encompassing factors such as perception, thought, and emotion; it is the mediating state between stimulus factors and the individual's response [14]. "R" denotes the response, which is the outcome formed by the stimulated subject after this process, referring to the perceptual response generated by the individual after being influenced by the stimulus factors.

As the Stimulus-Organism-Response theory was continuously and deeply researched by various scholars, it was later widely applied in fields such as marketing, focusing on elucidating the internal connection between different stimulus factors and consumer behavior. Kotler and Armstrong [15] constructed a model of marketing stimuli, psychological responses, and consumer purchase intention and behavior, clearly illustrating the entire process from external marketing stimuli to triggering consumer psychological activities, which then influence the consumer's final behavioral actions. Subsequently, some scholars integrated S-O-R theory with research related to e-commerce, verifying the relationship between technological features of the virtual world (such as sociability, interactivity) and the formation of user virtual experience and purchase intention Almiron and Tafalla [9]. Eroglu, et al. [16] established an S-O-R model for the online shopping atmosphere and found that specific online atmospheres significantly affect consumers' internal psychological states, thereby stimulating their behavioral responses.

2.2. Theory of Planned Behavior

The multi-attribute attitude theory proposed by Fishbein [17] provided the theoretical foundation for the Theory of Planned Behavior. He posited that an individual's behavioral attitude determines their behavioral intention, while behavioral outcomes and the evaluation of those outcomes determine behavioral attitude. However, as many factors in real life can interfere with an individual's control over their behavioral volition, and the Theory of Reasoned Action was based on the assumption that individual volition can control behavior, a contradiction with actual situations arose. This flaw meant the theory could not withstand scrutiny, limiting its applicability. Through research, Ajzen [18] discovered that people's control over attitudes and behaviors is not entirely autonomous. Consequently, he added a "perceived behavioral control" variable to the Theory of Reasoned Action, thus forming the Theory of Planned Behavior. After its introduction, the Theory of Planned Behavior was proven to significantly improve the prediction and explanation of behavior, particularly regarding behavioral intention. As a result, this theory has been widely applied in research across various social domains.

The Theory of Planned Behavior posits that the generation and change of human behavior involve a complex psychological process and are the result of deliberate consideration [19]. Internal

influencing factors in tourist environmental behavior, such as attitude, subjective norms, and perceived behavioral control, do not directly influence the behavior itself; instead, they exert influence through behavioral intention [20]. Specifically, the more positive an individual's attitude is toward a behavior, the greater the normative pressure from their surroundings, and the more control they perceive over the behavior, the stronger their intention to perform the behavior will be, and the greater the likelihood of taking action. Apart from being influenced by behavioral intention, an individual's specific behavior is also constrained by actual control conditions, such as personal ability, opportunities, and resources available. Behavioral intention is the decisive factor for behavior when actual control conditions are sufficient [21].

3. Literature Review and Hypothesis Raising

3.1. Consumer Ecocentrism and Green Consumption Behavior

As a relatively radical stream of thought within the realm of environmental ethics, consumer ecocentrism aligns with modern ecological consciousness, environmental protection, and green ideologies. Its proponents generally believe that humans, as part of the ecosystem, have a moral obligation to maintain the sustainable development of the ecosystem. From the perspective of consumer ecocentrism, the focus tends to be on a holistic view. Ecocentrism differs from biocentrism by considering the ecosystem as an integral entity, including its abiotic components [9]. Therefore, the core idea of consumer ecocentrism is that the importance of the ecosystem far surpasses all else. As a relatively radical environmentalist ideology, ecological awareness and attitude thus become particularly crucial.

Consumers with higher environmental awareness are more inclined to purchase green products, as they view this as a personal responsibility [20, 22]. Environmental awareness and concern for environmental protection have a positive impact on the willingness to purchase green products. Environmental awareness indirectly promotes individual green consumption behavior through other variables [23]. Consumers' green literacy and their attitude toward green consumption can positively influence their green consumption intentions, with green literacy having a stronger effect [24]. Deeper ecological awareness is more likely to stimulate green consumption behavior, and purchasing behavior tends to follow intention. For instance, young consumers with strong ecological awareness often choose eco-friendly food products, which serves as a clear example [25].

Furthermore, consumers' green consumption behavior is also influenced by a product's environmental impact. If using a product causes environmental consequences, regardless of the severity, supporters of ecocentrism—i.e., environmentalists—are less inclined to purchase such products. Environmental issues caused by certain products indirectly affect consumers' purchasing decisions. The more strongly consumers perceive a product's environmental consequences, the more it influences their green purchasing behavior [26, 27]. Consumers' environmental commitment and their perception of eco-friendly products are the strongest determinants of green consumption behavior [28, 29].

Based on this, the following hypothesis is proposed:

H1: Consumer ecocentrism has a positive impact on green consumption behavior.

3.2. Altruism and Green Consumption Behavior

Altruism approaches environmental issues from the perspective of societal benefits, meaning that individuals choose to sacrifice their own interests to protect the environment when personal interests conflict with those of the social group [30, 31]. Altruistic motivation is triggered by empathy and is goal-oriented towards the well-being of others and society; individuals make behavioral decisions based on the principle of maximizing social welfare [32]. Consumer altruism places greater emphasis on emotional and social benefits, making consumers more easily driven by altruistic motives to engage in stronger pro-environmental behaviors. In other words, altruism possesses pro-environmental characteristics, i.e., it is associated with pro-environmental behavior [33]. The altruistic attribute of

green consumption means that purchasing green products or services can bring more benefits to society and others [34].

The direct manifestation of consumer altruism is green consumption behavior. Individuals with strong altruism will pay more attention to ecological environmental and species protection in their product or service purchase decisions Varah, et al. [35]. Liobikienė, et al. [36] believe that the starting point of consumers' green consumption behavior is environmental protection and greenness, with the aim of benefiting society, the environment, and others. Consumer altruism influences their outcome awareness primarily through the following aspects: firstly, during travel and consumption, tourists will pay more attention to the impact of their own behavior on the environment, society, and other tourists; secondly, altruism is associated with a higher moral consciousness, which further strengthens consumers' awareness of the outcomes of their green purchasing behavior; finally, altruism promotes a higher level of cognition regarding sustainable development and win-win cooperation, leading individuals to contemplate more the impact of their own behavior on the ecological environment, social culture, and economic development [37].

Green consumption that emphasizes social and others' benefits better aligns with consumers' psychological desire to improve the environment. This means that when purchasing green products, consumers pay more attention to the environmental benefits of the consumption behavior rather than personal gains Davis [38]. Sun, et al. [27] also agree that consumers who focus on environmental and ecological benefits will have a more positive attitude towards green products. When purchasing green products, the relative importance of altruism significantly influences consumer decision-making [39]. Individuals with a strong perception of altruism, whether driven by intrinsic or extrinsic motives, will enhance their sense of environmental responsibility and promote green consumption [40]. Individuals who hold altruistic values, when making consumption decisions, consider more the interests of social groups and environmental issues, are willing to change their lifestyle to protect the environment, and thus exhibit green consumption behavior [39]. Altruism can be effectively translated into actual environmental protection behaviors; it has a positive effect on the purchase of green products, and altruism positively and significantly influences eco-consumption behavior [41].

Based on this, this study proposes the following hypothesis:

H₂: Altruism has a positive impact on green consumption behavior.

3.3. Subjective Norms and Green Consumption Behavior

Subjective norms refer to the social pressure perceived by an individual when performing a certain behavior, reflecting the institutional mechanism of trust formation based on informal systems within the network environment [42]. Based on the product life cycle theory, Jansson, et al. [43] introduced the important concept of green perceived value, defining it as the value consumers derive from a product that does not harm the environment, causes minimal environmental damage, reduces energy consumption, facilitates recycling or resource regeneration, and is harmless to human health.

Emekci [44] suggests that as environmental problems like pollution become increasingly severe, consumers are influenced by public opinion pressure and the evaluations of others. The resulting subjective norms can positively impact green product consumption behavior. Using structural equation modeling, Pacho [45] found that attitudes and subjective norms positively influence consumers' perceived value of green agricultural products and their consumption behavior. Zhang, et al. [46] introduced psychological variables such as marketing stimuli and psychological responses as external factors, establishing a Logistic model of consumers' purchase intention and behavior regarding organic agricultural products to study the key influencing factors. Gao and Sheng [47] used structural equation modeling to study how consumers' approach motivation affects their purchasing behavior for agricultural products, finding that different levels of approach motivation have varying impacts. Kumar and Pandey [41] empirically verified that consumers' subjective norms regarding green purchasing positively influence their green consumption behavior. Research by Xu Y. et al [48] found that, based on the Theory of Planned Behavior, subjective norms have a positive and significant impact on

consumption intention. Chi T. et al [49] empirically demonstrated that subjective norms positively influence consumers' trust in the safety of online purchases of green agricultural products. The more positive the attitude towards green consumption, the stronger the intention to engage in green consumption behavior. This compels various sectors of society to large-scale initiatives such as ecological enlightenment and awareness campaigns to stimulate residents, strengthen individual understanding of the harms of pollution and waste, popularize the benefits and value of green consumption, and foster a positive atmosphere for green consumption throughout society [50].

Based on this, this study proposes the following hypothesis:

H₃: Subjective norms have a positive impact on green consumption behavior.

3.4. Consumer Ecocentrism and Green Perceived Value

The three doctrines in the development of ecocentrism—land ethics, the theory of natural value, and deep ecology—all share the core idea of harmonious coexistence between humans and nature. Interpreting this with terminology closest to our contemporary era, this paper posits that it can be understood as possessing ecological and environmental awareness and practicing green, environmentally friendly methods in daily life. Ecocentrism is a relatively radical doctrine centered on ecological and environmental protection; therefore, most of its supporters are practitioners of green and environmental concepts. In the 1960s, the International Consumer Association emphasized that consumers should bear corresponding environmental obligations and proposed the concept of green and environmentally friendly consumption, which aligns with the requirements of ecocentrism. Green consumption can enhance consumers' environmental protection awareness, foster a friendly and harmonious relationship with the environment, and shift consumption patterns towards renewable energy and green products [51, 52]. Later scholars Steg [53] argued that environmentally friendly consumption behavior is an action that brings humans closer to nature, reduces one's own damage to the environment, thereby protecting the ecological environment to a greater extent and enabling harmonious coexistence with nature. In 2001, the China Consumers' Association defined the concept of "environmental consumption," identifying three aspects: first, encouraging consumers to actively purchase products beneficial to environmental protection; second, emphasizing proper waste disposal during environmental consumption and autonomously protecting the surrounding environment; third, establishing a consumption concept that advocates for nature and pursues health. Thus, ecocentrism can also be understood as a form of environmentalist ideology that guides consumers towards ecological and green consumption.

Furthermore, studies have shown that the environmental protection ethos represented by consumer ecocentrism can influence consumers' consumption values. Hotel operations often require substantial resources, making them known as resource-intensive industries. Consumers' green perceived value prompts them to choose green and environmentally friendly hotels, which in turn influences hotels to continue practicing green environmental practices. Research by Wang, et al. [3] indicates that customers' environmental awareness positively affects their willingness to consume green hotel services. Consumers themselves possess a high green perceived value, which can be directly reflected in their consumption patterns. Some studies suggest that compared to the feeling of environmental indebtedness generated from consuming environmentally damaging products, the level of consumers' ecological moral thought has a greater impact on choosing products with green attributes. This is because the research points out that green perceived value plays a partial mediating role between environmental indebtedness and green purchase intention, with emotional perception having a stronger mediating effect, indicating that ideological, moral, and environmental awareness levels have a deeper impact on consumption intention and behavior [48]. On the other hand, in ecological consumption, consumers believe that purchasing green and ecological products can save energy, reduce consumption, protect the environment, and fulfill their self-worth and social responsibility. Although high costs may create some contradictions, genuine ecological consumers recognize the importance of personal participation in environmental protection [49].

Based on this, this study proposes the following hypothesis:

H₄: Consumer ecocentrism has a positive impact on green perceived value.

3.5. Altruism and Green Perceived Value

A growing number of consumers are realizing that their consumption patterns and methods are severely damaging the environment, leading them to shift towards pro-social consumption models that benefit future generations [54]. As explained previously, altruism is a behavioral tendency driven by pro-social motivation; thus, this shift can also be understood as an increasing number of consumers turning towards altruistic behaviors, focusing on the social impact of their consumption patterns and methods. This transition towards pro-social consumption models is referred to as green consumerism [55] and green consumption is identified as a pro-environmental behavior because products with green attributes do not pollute the environment and are recyclable and reusable [56]. Even if these consumers do not constitute the vast majority of society, they still exhibit a tendency towards green consumption driven by altruistic traits, leading them to prefer products with green attributes in their daily consumption.

Recent marketing research has identified a cognitive phenomenon: consumers are increasingly concerned about the environmental impact of consumer goods, and this trend is gradually spreading across various industries such as food, services, apparel, and cosmetics [39]. This trend indicates that consumers are paying growing attention to the environmental benefits of green products. Furthermore, companies' green brand image can communicate the green features of their products. The stronger the perception of a green brand, the more likely green altruism is to influence consumers' consumption choices, ultimately attracting them to product categories under green brands [57].

Consumers' awareness of environmental protection also drives them to switch to products with lesser environmental impact, such as green products, organic products, and eco-friendly products. Organic products, including organic food, are defined as environmentally friendly and beneficial to health. Azzurra, et al. [58] argue that organic food is advantageous for the environment and contributes to environmental sustainability. Precisely because green products and organic products are categories that benefit the environment and possess protective features, consumers' perceived value of organic products or food can also be understood as their perceived value of green products. Altruism is known to be a pro-environmental, pro-social behavior. Consumers choose organic products out of altruistic considerations because they care about environmental protection and animal welfare Wei, et al. [10]. Czudec [59] also believes that consumers, based on altruism, will opt for organic products or food that cause minimal environmental damage, aiming to protect the environment. Some scholars have explored how consumers, driven by altruism, focus on the environmental impact of product packaging. Consumers increasingly prefer products with eco-friendly packaging, and results show that altruistic values have a more significant influence on the choice of such packaging [60]. This evidence collectively indicates that during green consumption, consumers' altruistic values lead them to prefer ecological and environmentally friendly products, thereby deepening their perception of green value.

Based on this, this study proposes the following hypothesis:

H₅: Altruism has a positive impact on green perceived value.

3.6. Subjective Norms and Green Perceived Value

Subjective norms refer to the social pressure perceived by an individual when deciding whether to perform a certain behavior, stemming from others or groups [7]. The values of members within an organization can serve as external factors for an individual's subjective norms, conveying the negative outcomes of long-term resource-wasting consumption behaviors, thereby internally curbing environmentally harmful consumption practices and reducing residents' subjective norms towards traditional consumption patterns. The deeper the residents' subjective norms regarding green consumption, the more susceptible they are to the constraints and incentives of these norms, which in turn changes consumption habits and promotes the practice of green consumption concepts Jansson, et

al. [43]. Koller, et al. [60] argue that as the impact of green marketing on social and environmental development becomes increasingly prominent, green perceived value has become a crucial foundation for conducting green marketing activities.

Using structural equation modeling, Pacho [45] found that attitudes and subjective norms positively influence consumers' perceived value of green agricultural products and their purchase intention. Consumers' subjective norms regarding green products originate from their perception of various social norms and pressures related to green consumption behavior, reflecting their awareness of the social rules and relationships governing such behavior. Subjective norms can positively influence consumers' green perceived value. Past high-energy, high-input consumption patterns and their associated environmental pollution and damage can draw questioning from others, and behavioral change inevitably results from a value trade-off between old consumption habits and green consumption behaviors [61]. Applying the Theory of Planned Behavior to research on agricultural product consumption, Li, et al. [62] not only confirmed the direct impact of consumption attitude, subjective norms, and perceived behavioral control on purchasing behavior but also found interactions among these three factors. Based on the Theory of Planned Behavior, Moon [63] discovered that consumers' environmental and innovation tendencies have significant indirect effects on their intention to purchase electric vehicles, mediated by attitude, subjective norms, and perceived behavioral control.

Based on the above literature and analysis, this study proposes the following hypothesis:

H₁: Subjective norms have a positive impact on green perceived value.

3.7. Green Perceived Value and Green Consumption Behavior

Consumers' perceived value can influence their consumption behavior; therefore, consumers' perceived value of green products should also be able to influence their green consumption behavior. This inference can be drawn from several studies. Green values can predict green consumption behavior, and environmental attitude can mediate the relationship between green values and green consumption behavior. Green value exists within the perceived value of green products and can significantly influence customer perceived value, exerting the greatest impact Liang and Le [63]. Fan, et al. [64] pointed out in their research that consumer preferences can have an impact effect on the purchase intention of green new energy vehicles. As a highly popular green consumer product today, new energy vehicles see this preference strengthened by fiscal policies like subsidies, still providing support for the idea that green product preferences prompt green consumption behavior. Although consumers are most concerned about the price of green products, they are still willing to pay a premium exceeding that of ordinary products. This consumption behavior explains that consumers' green perceived value can influence their consumption behavior and that they are willing to sacrifice more benefits to purchase products with green attributes, conforming to the characteristic of value being higher than price [2].

Furthermore, according to the Theory of Planned Behavior, values are one of the important factors influencing consumer behavior, capable of directly guiding and predicting human behavior. In green consumption, there is a significant positive relationship between perceived value and consumer consumption behavior [65]. Consumers who perceive higher value in green hotel models often have higher booking intentions. Green perceived value is primarily reflected in consumers' green consumption attitudes, which significantly influence green product purchase intention [66]. The stronger the perceived value of green products, the stronger the decision to purchase them. Research indicates that green consumption values are a major influencing factor of green consumption behavior [67] as they can directly influence purchase intention. . From the angle of consumers' green consumption value, Hu, et al. [68] argue that green consumption perceived value has a significant positive impact on the purchase intention of new energy vehicles; the deeper the level of green consumption perceived value, the stronger the purchase intention for green products.

Based on the above literature and analysis, this study proposes the following hypothesis:

H₂: Green perceived value has a positive impact on consumers' green consumption behavior.

3.8. The Mediating Role of Green Perceived Value

This paper posits that ecocentrism is a comprehensive, overarching ideology that includes beneficial cognitive concepts for environmental and ecological protection such as ecological awareness, environmental protection awareness, and environmental consciousness. Environmental concern is part of ecological and environmental awareness. Some research suggests that environmental concern positively influences consumers' purchasing behavior, with consumers' perceived value of green products playing a mediating role, exerting a positive influence on green consumption behavior [9] thereby also supporting its positive impact on green purchasing behavior. Du and Xu [69] believe that consumers' green perceived value plays a mediating role in the impact of environmental indebtedness on green purchase intention, with the mediating effect of values towards green products being stronger. The stronger the consumer's intrinsic willingness to protect the environment, the deeper their commitment to green consumption and the more likely they are to engage in consumption behavior. This willingness to protect the environment can be understood as a practical manifestation of ecocentrism. A green lifestyle is the concrete embodiment of the influence of ecological and environmental awareness on an individual's life.

Consumers express their concern for the ecological environment by purchasing green products. Green perceived value is an overall evaluation of the green utility of a specific product or service formed by consumers from the perspectives of environmental protection and sustainable development, through a trade-off between benefits and costs [59]. It emphasizes the environmental attributes and benefits consumers derive from green products, directly helping them discern the green utility of environmentally friendly products and prompting green purchasing decisions.

Green education, also known as environmental education, aims to promote environmental protection through education. It is not merely a single activity but a gradual process that enhances people's understanding of the environment, fosters pro-environmental values, and motivates action under environmental awareness to balance social, economic, and ecological relationships. This concept aligns well with the previously introduced ecocentrism, which advocates for harmonious coexistence between humans and nature, encourages green consumption, and avoids environmental damage. To support this, Varela-Candamio, et al. [70] confirmed through meta-analysis this relationship and role of green education and green consumption value in green marketing, finding that green education gives people a stronger green perceived value and promotes a stronger willingness for green consumption. Thus, green education not only directly affects green consumption intention but also exerts an indirect influence through green perceived value.

Based on the above analysis, this study proposes the following hypothesis:

H_{3a}: Green perceived value mediates the relationship between consumer ecocentrism and green consumption behavior.

Exploring the mediating role of green perceived value between altruism and consumer green consumption behavior from a corporate perspective. In today's society, consumers are increasingly aware of the significant impact of their consumption patterns on the environment. Companies can leverage this caution by offering green products or brands to gain a competitive advantage. Research by Panda, et al. [34] suggests that consumer altruism can enhance positivity towards green products or brands, thereby influencing green consumption behavior. Studies have found that consumer altruism positively influences consumers' value concepts regarding green products, which in turn affects their green purchasing behavior, playing a mediating role between the two.

From the consumer's perspective, altruism is an intrinsic willingness; green consumption behavior stems from the heart, not from coercion or enticement. Research indicates that consumers choose to purchase organic products or food based on altruism, opting for these products due to their lesser environmental impact, thus showing willingness to buy organic products [59]. This paper argues that in this research, consumers' value of organic products mediates the relationship between altruism and purchasing behavior. Green perceived value increases consumers' acceptance of green products, leading to corresponding green consumption behaviors. After analysis, the study by Prakash et al. [79]

concluded that altruistic values positively influence consumers' attitudes towards eco-friendly packaged products, resulting in a stronger purchase intention for green products. This research shows that consumer altruism can positively influence green perceived value, and after consumers recognize the value of green products, they are more willing to purchase them, with green perceived value playing a mediating role. Using the Bootstrap confidence interval method on 650 samples, Gao and Sheng [47] empirically demonstrated that altruistic values have a significant positive impact on green perceived value. They proposed that consumers with altruistic values care more about environmental issues, focus more on environmental protection, are more likely to recognize and prefer green products, can experience more environmental utility from them, strengthen the perceived benefits of green products, and thus enhance their green perceived value.

Based on the above literature and analysis, this study proposes the following hypothesis:

H_{st}: Green perceived value mediates the relationship between altruism and green consumption behavior.

Subjective norms are behavioral norms internalized by consumers based on others' attitudes and evaluations towards green products, which can stimulate their preference and demand for green products and constrain them to consistently regard environmental protection and sustainable development as their behavioral guidelines during the search, purchase, and use of green products Paul, et al. [61]. Cao, et al. [21] proposed that subjective norms are the social pressure perceived by an individual from others or groups when deciding whether to perform a behavior. Sometimes the influence dominating behavioral intention can be greater than personal attitude. In social life, an individual's behavior is influenced by the surrounding environment and the behaviors of other individuals, making cognition and choice more likely to align with others' decisions.

Environmental values are people's beliefs that can change attitudes towards green consumption when facing environmental problems, thereby transforming into green consumption behavior [3]. Environmentally oriented green perceived value indirectly influences people's green consumption attitudes and behaviors through their beliefs about behavioral outcomes, making them recognize that the results of green consumption are positive—improving the current living environment and enhancing personal health—prompting residents to form positive green consumption attitudes and achieve satisfactory green consumption goals [71]. Green perceived value indirectly functions by permeating individual behavior and influencing other factors; that is, it further influences green consumption behavior through two mechanisms: residents' green consumption attitude and subjective norms [21]. Subjective norms are an important channel for consumers to obtain external information, enabling those with high value perception of green agricultural products and high perception of food safety risks to build confidence in them and enhance their purchase intention [62]. Strongly connected groups for subjective norms primarily include family, friends, colleagues, and neighbors. As relationships with high trust and strong emotional attachment, they have an extremely significant impact on consumers' purchase intention for green agricultural products [42]. Green perceived value can influence individual behavior through subjective norms. The orientation of environmental perceived value affects the sensitivity of consumers to the social pressure arising from perceived environmental damage; the greater the perceived social environmental pressure, the greater the likelihood of proactive environmental behavior [22].

H_{sc}: Green perceived value mediates the relationship between subjective norms and green consumption behavior.

3.9. The Moderating Role of Viral Marketing

Consumers' green perceived value positively influences green consumption behavior; when consumers' perceived value of green products reaches a certain level, consumption behavior occurs. However, perceived value can be influenced by the surrounding environment and other people. Is the perceived value at this point strong enough to generate consumption behavior? This paper argues that viral marketing can moderate the relationship between the two. By receiving and viewing information about green product attributes contained in viral marketing, consumers can enhance their perceived value of green products, thereby strengthening their consumption behavior.

Green marketing typically refers to marketing content that highlights the environmentally friendly attributes of products [72]. It summarizes some common green marketing appeals, such as promoting the environmentally friendly features of products or production processes, directly calling on consumers to enhance environmental awareness, or describing specific environmental problems (e.g., endangered species, air pollution) to attract consumer attention. Numerous studies have shown that using green appeals in advertising can evoke consumers' environmental concern and make them view the marketing ads and products favorably. Research by Li, et al. [22] indicates that the stronger consumers' acceptance of green product marketing ads, the stronger their green purchase intention. The study analyzed that green marketing ads act on consumer purchase intention through utility perception; the positive effect of green product marketing ads influences consumers' interest in the products featured in the ads. That is, green product marketing can influence consumer preferences, thereby affecting their purchase intention.

The mode of viral marketing has an extremely important impact on consumer behavior. Taking the e-commerce platform Pinduoduo as an example, [73] detailed how viral marketing attracts consumers, showing that even if such marketing methods are somewhat annoying and the information might be misleading, the resulting purchase intention and behavior incidence are remarkable. From the perspective of e-commerce platforms, merchants' promotional methods fall within the advertising, using exaggerated slogans and images to attract consumer attention and induce consumption behavior.

H₅: Viral marketing positively moderates the relationship between green perceived value and consumer green consumption behavior.

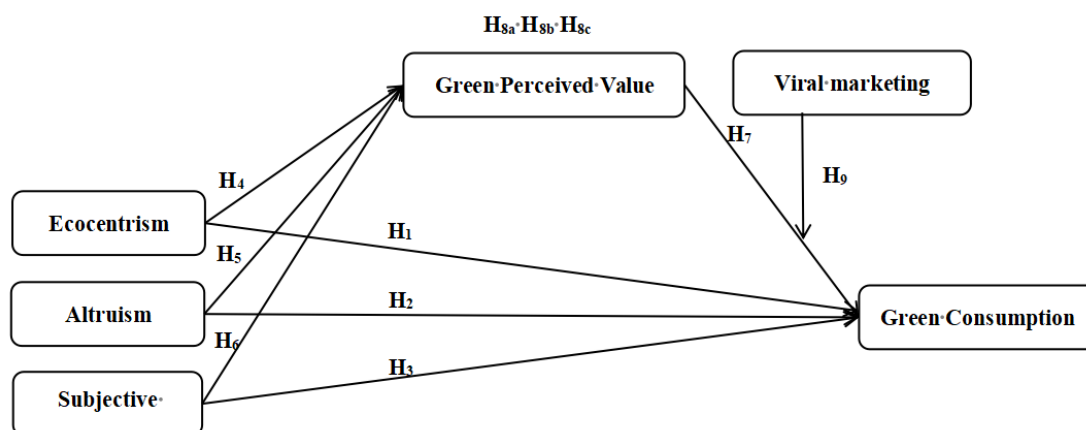


Figure 1.
Research Framework.

4. Sampling Methods and Data Collection

4.1. Data Collection

The data for this study were collected through a questionnaire survey. To enhance the representativeness of the questionnaire, this study employed purposive sampling. This method involves researchers selecting individuals who can provide rich information or possess specific characteristics based on the research objectives and questions. This quantitative study examined the drivers of green consumption in Beijing, Shanghai, Shenzhen, Chengdu, and Zhengzhou. These cities were selected based on the National Bureau of Statistics' Green Consumption Index Report: Chengdu (Western China; major green industries), Zhengzhou (Central China; agricultural/mineral resources), Beijing (political/cultural/international/scientific center), Shanghai (economic/financial/scientific center), and Shenzhen (economic zone; new energy vehicle center).

Purposive sampling targeted consumers of green products. The field survey was conducted from December 2024 to January 2025 at green product retailers, experience centers, and electric vehicle owner clubs in the five cities. The online survey, also conducted from December 2024 to January 2025, targeted purchasers of low-carbon dairy/meat products, food with recyclable packaging, and dual-certified (China E-label + Grade 1 energy efficiency) appliances. This was done through e-commerce collaborations with Bright Dairy & Food Co., Ltd., Shuanghui Group, and Haiyi E-commerce Group.

For a nationwide study, a sample size of 1500-2500 respondents is recommended. Furthermore, the statistical requirements for sample size in survey research necessitate a sufficiently large number to ensure the reliability of analysis results and compensate for the drawbacks of online distribution. Questionnaires were distributed proportionally based on the population of each city, aiming for a total sample size of 1500: 330 for Beijing, 370 for Shanghai, 270 for Shenzhen, 330 for Chengdu, and 200 for Zhengzhou. Ultimately, 1076 valid questionnaires were collected, resulting in a valid response rate of 70.23%. Additionally, to mitigate non-response error, we continuously attempted to contact non-respondents via obtained email addresses or phone numbers, offering incentives to encourage their participation in the survey.

4.2. Measurement

This study utilized mature scales published in authoritative journals, measured using a 7-point Likert scale. The scale was designed with 1 indicating "Strongly Disagree" and 7 indicating "Strongly Agree." This design provides more detailed data while effectively reducing respondents' subjectivity. To ensure the validity and reliability of the questionnaire, a pre-survey was conducted with 150 consumers. When analyzing the data using SPSS 25.0 statistical software, the reliability and validity of the questionnaire were tested. Reliability was assessed using Cronbach's α coefficient, and internal consistency was verified using CITC indicators and the " α if item deleted" coefficient.

The questionnaire on green consumption was designed according to the scales of Minton, et al. [74] and Wang, et al. [75] with ten questions. The total Cronbach's α of value creation was $0.965 > 0.8$, and the CITC was >0.4 . The questionnaire on ecocentrism was designed according to the scales of Stern, et al. [76] with six questions. The total Cronbach's α of value creation was $0.974 > 0.8$, and the CITC was >0.4 . The questionnaire on altruism was designed according to the scales of Zhang, et al. [37] and Czudec [59] with eight questions. The total Cronbach's α of value creation was $0.953 > 0.8$, and the CITC was >0.4 . The questionnaire on subjective norm was designed according to the scales of Lao [77] with four questions. The total Cronbach's α of value creation was $0.950 > 0.8$, and the CITC was >0.4 . The questionnaire on green perceived value was designed according to the scales of Sweeney and Soutar [78] with 19 questions. The total Cronbach's α of value creation was $0.980 > 0.8$, and the CITC was >0.4 . The questionnaire on viral marketing was designed according to the scales of Taylor and Todd [79] with seven questions. The total Cronbach's α of value creation was $0.941 > 0.8$, and the CITC was >0.4 .

The reliability coefficients for all the aforementioned variables were above 0.8, indicating good stability and credibility of the questionnaire survey results. For each variable, the mean Corrected Item-Total Correlation (CITC) was greater than 0.4, suggesting that the scales are reliable and that the items within them are correlated. Comparing the "Cronbach's Alpha if Item Deleted" values for each analytical item with the overall scale alpha value, it was found that deleting any single item did not result in a significant increase in reliability. This indicates that no items within any scale require revision or deletion, the internal consistency is good, and the reliability meets the requirements for formal investigation.

After completing the questionnaire collection, a basic analysis of the sample data was conducted based on education level, monthly salary, and occupational category. In terms of education: high school or below accounted for 8.2%, associate degree for 33.5%, bachelor's degree for 43.7%, and postgraduate degree or above for 14.7%. Regarding monthly salary: 4,000 RMB and below accounted for 7.4%, 4,001-

5,000 RMB for 11.3%, 5,001–6,000 RMB for 36.2%, 6,001–7,000 RMB for 28.7%, and over 7,001 RMB for 16.4%. In terms of occupational category: personnel in agriculture, forestry, animal husbandry, fishery, and water conservancy accounted for 11.9%; personnel in production, transportation equipment operation, and related fields accounted for 21.8%; personnel in commercial and service industries accounted for 34.5%; personnel working in state organs, party-mass organizations, and enterprises/institutions accounted for 23.7%; and others accounted for 8.1%. These statistical results indicate that the sample collected for this study is relatively comprehensive and suitable for further research.

5. Analysis and Results

This study employed Structural Equation Modeling (SEM) to assessing the reliability and validity of the measurement data through the evaluation of the measurement model. Multiple research hypotheses were tested to examine the associative relationships among variables in the population. First, SPSS 25.0 software was used for a comprehensive assessment of descriptive statistics, correlation analysis, and common methods. Second, Mplus 8.3 software was employed to conduct Confirmatory Factor Analysis (CFA) to test the research hypotheses.

5.1. Descriptive Statistics of Variables

The mean values of the various variables generally ranged between 4.3 and 4.7, indicating a moderate to high level of scores. The absolute values of the skewness coefficients did not exceed 2, and the absolute values of the kurtosis coefficients did not exceed 4, meeting the prerequisite for an approximately normal distribution of the data and allowing for subsequent analysis.

Table 1.
Descriptive Statistics.

| | N | Min. | Max. | Mean | SD | Skewness | Kurtosis |
|-----------------------|------|-------|-------|-------|-------|----------|----------|
| Green Buying Behavior | 1076 | 1.000 | 7.000 | 4.511 | 0.853 | 2.869 | -0.781 |
| Ecocentrism | 1076 | 1.000 | 7.000 | 4.336 | 0.872 | 1.101 | -0.537 |
| Altruism | 1076 | 1.000 | 7.000 | 4.427 | 0.932 | 1.528 | -0.962 |
| Subjective Norms | 1076 | 1.000 | 7.000 | 4.547 | 0.999 | 0.697 | -0.768 |
| Perceived Green Value | 1076 | 1.000 | 7.000 | 4.521 | 0.526 | 3.273 | -0.521 |

5.2. Validity Analysis

The Composite Reliability (CR) values for all variables were above 0.8, and the Average Variance Extracted (AVE) was no less than 0.5. Therefore, the questionnaire survey results demonstrate strong convergent validity.

Furthermore, the correlation coefficients between any two variables were all lower than the square root of the AVE (the values located on the diagonal for the corresponding variables), indicating that the model possesses good discriminant validity.

Table 2.
Convergent/Discriminant Validity.

| | Green Buying Behavior | Ecocentrism | Altruismr | Subjective Norms | Perceived Green Value |
|-----------------------|-----------------------|-------------|-----------|------------------|-----------------------|
| Green Buying Behavior | 0.773 | | | | |
| Ecocentrism | 0.266*** | 0.755 | | | |
| Altruism | 0.277*** | 0.358*** | 0.752 | | |
| Subjective Norms | 0.268*** | 0.346*** | 0.314*** | 0.785 | |
| Perceived Green Value | 0.311*** | 0.347*** | 0.374*** | 0.274*** | 0.728 |
| CR | 0.937 | 0.888 | 0.912 | 0.865 | 0.955 |
| AVE | 0.597 | 0.570 | 0.565 | 0.616 | 0.530 |

5.3. Common Method Bias Test

The calculation results indicate that the variance explained by the first factor in this questionnaire survey was only 26.412%, which is significantly lower than the critical threshold of 40%. Therefore, common method bias is not a serious concern in this study.

Table 3.
Common Method Bias.

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|-----------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 14.262 | 26.412 | 26.412 | 14.262 | 26.412 | 26.412 |
| 2 | 5.616 | 1.401 | 36.812 | 5.616 | 1.401 | 36.812 |
| 3 | 5.179 | 9.591 | 46.403 | 5.179 | 9.591 | 46.403 |
| 4 | 3.277 | 6.068 | 52.472 | 3.277 | 6.068 | 52.472 |
| 5 | 2.826 | 5.233 | 57.705 | 2.826 | 5.233 | 57.705 |

5.4. Structural Equation Modeling

Based on the results of reliability and validity tests, correlation analysis, and other assessments, Mplus 8.3 software was used to construct a structural equation model (SEM), comprising both a measurement model and a structural model, to validate the influence relationships between variables.

5.4.1. Measurement Model

The standardized factor loadings of all indicators were above 0.5, justifying the retention of all indicators. The calculated model fit indices were as follows: $\chi^2/df < 5$, CFI > 0.9, TLI > 0.9, RMSEA < 0.08, and SRMR < 0.08. These results indicate that the measurement model meets the required standards.

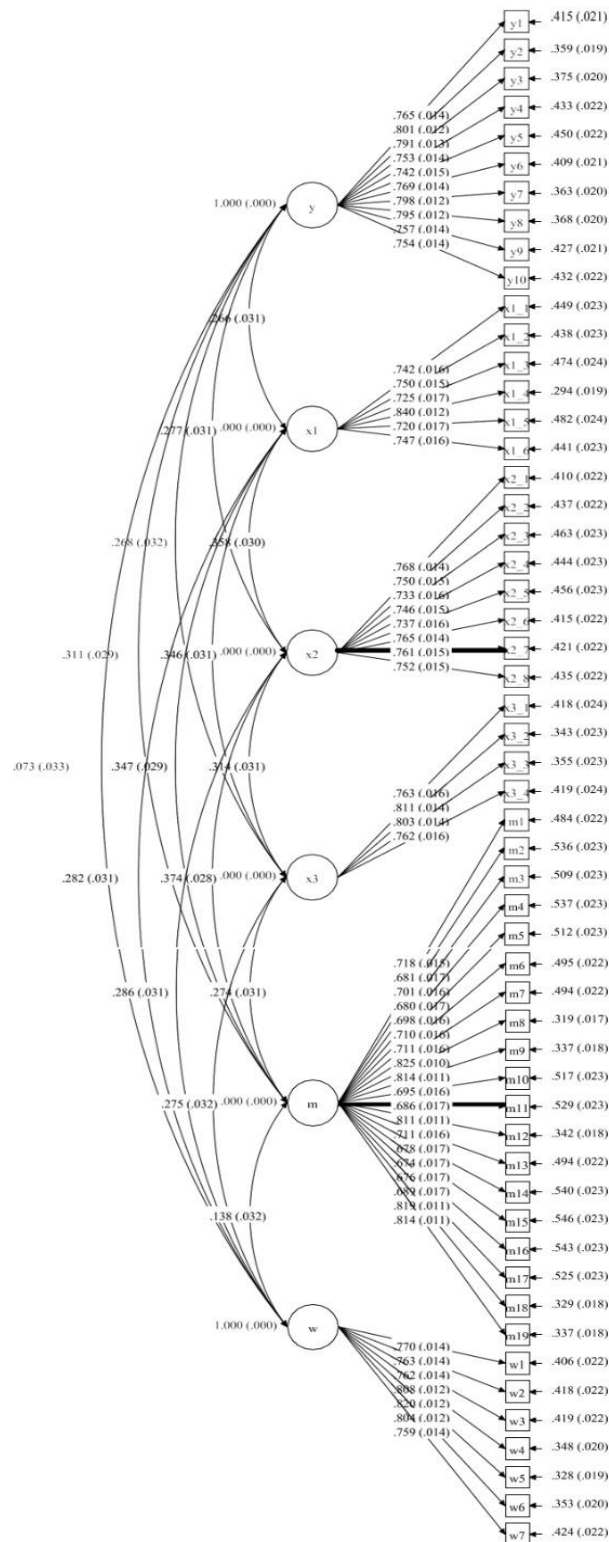


Figure 2.
The CFA Model.

Table 4.
Confirmatory Factor Analysis Results.

| | Items | Factor Loadings | χ^2/df | CFI | TLI | RMSEA | SRMR |
|-----------------------|--------|-----------------|--------------------|-------|-------|-------|-------|
| Green Buying Behavior | Y1-Y10 | 0.765-0.798 | 4.115 | 0.984 | 0.980 | 0.054 | 0.018 |
| Ecocentrism | X1_1-6 | 0.720-0.845 | 1.300 | 0.999 | 0.999 | 0.017 | 0.009 |
| Altruism | X2_1-8 | 0.733-0.769 | 2.960 | 0.991 | 0.988 | 0.043 | 0.016 |
| Subjective Norms | X3_1-4 | 0.759-0.813 | 2.892 | 0.998 | 0.994 | 0.042 | 0.008 |
| Perceived Green Value | M1-M19 | 0.673-0.825 | 2.289 | 0.984 | 0.982 | 0.035 | 0.019 |

5.4.2. Structural Model

Building upon the results of the measurement model test, a structural model illustrating the influence relationships between variables was further constructed to analyze the causal relationships among them. The test results for the structural model are shown in Figure 3.

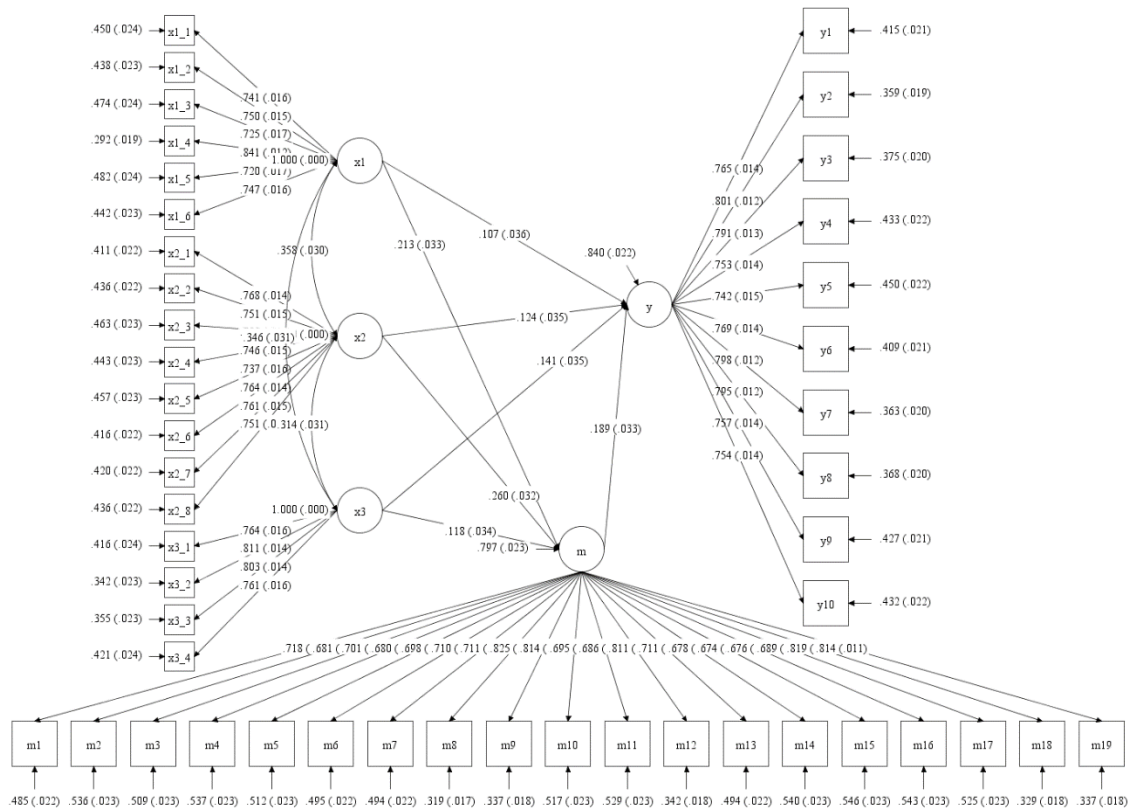


Figure 3.
The Effect Model.

5.4.3. Analysis of Direct Effect Empirical Results

As shown in the results in Figure 2, consumer ecocentrism ($\beta = .148$, $p < .001$), altruism ($\beta = .174$, $p < .001$), and subjective norms ($\beta = .163$, $p < .001$) significantly and positively influence green consumption behavior ($\chi^2/\text{df} = 1.539$; CFI = .989; RMSEA = .022). Hypotheses H₁–H₃ are supported.

Consumer ecocentrism ($\beta = .213$, $p < .001$), altruism ($\beta = .260$, $p < .001$), and subjective norms ($\beta = .118$, $p < .001$) significantly and positively influence green perceived value ($\chi^2/\text{df} = 1.439$; CFI = .988; RMSEA = .020). Hypotheses H₄–H₆ are supported.

Green perceived value positively influences consumption behavior ($\beta = .311$, $p < .001$; $\chi^2/df = 1.817$; CFI = .984; RMSEA = .028). Hypothesis H₇ is supported.

5.4.4. Analysis of Mediating Effect Empirical Results

As shown in the test results of variable influence relationships in Figure 2, consumer ecocentrism has a significant positive regression effect on green perceived value (standardized regression coefficient $\beta = 0.213$, $p = 0.000 < 0.001$). Therefore, the first half of the mediating path is established. Altruism has a significant positive regression effect on green perceived value (standardized regression coefficient $\beta = 0.260$, $p = 0.000 < 0.001$). Therefore, the first half of the mediating path is established. Subjective norms have a significant positive regression effect on green perceived value (standardized regression coefficient $\beta = 0.118$, $p = 0.000 < 0.001$). Therefore, the first half of the mediating path is established.

Green perceived value has a significant positive regression effect on green consumption behavior (standardized regression coefficient $\beta = 0.189$, $p = 0.000 < 0.001$). Therefore, the second half of the mediating path is established. In summary, the original hypotheses H8a, H8b, and H8c are verified.

Furthermore, consumer ecocentrism has a significant positive direct regression effect on green consumption behavior (standardized regression coefficient $\beta = 0.107$, $p = 0.003 < 0.01$). Altruism has a significant positive direct regression effect on green consumption behavior (standardized regression coefficient $\beta = 0.124$, $p = 0.000 < 0.001$). Subjective norms have a significant positive direct regression effect on green consumption behavior (standardized regression coefficient $\beta = 0.141$, $p = 0.000 < 0.001$). The direct path coefficients for the three sets of mediation models are established, indicating that the mediation models exhibit a partial mediation effect.

Table 5.
Mediation Model Results.

| Pathway | | | β | SE | t | p | R ² |
|-----------------------|---|-----------------------|---------|-------|-------|-------|----------------|
| Ecocentrism | → | Green Perceived Value | 0.213 | 0.033 | 6.400 | 0.000 | 0.203 |
| Altruism | → | Green Perceived Value | 0.260 | 0.032 | 8.112 | 0.000 | |
| Subjective Norms | → | Green Perceived Value | 0.118 | 0.034 | 3.530 | 0.000 | |
| Green Perceived Value | → | Consumption | 0.189 | 0.033 | 5.664 | 0.000 | 0.160 |
| Ecocentrism | → | Consumption | 0.107 | 0.036 | 3.003 | 0.003 | |
| Altruism | → | Consumption | 0.124 | 0.035 | 3.536 | 0.000 | |
| Subjective Norms | → | Consumption | 0.141 | 0.035 | 4.032 | 0.000 | |

5.5. Moderating Effect Analysis

Using green perceived value as the predictor variable and viral marketing as the moderator variable, Mplus 8.3 software was used to establish a latent variable moderating effect analysis model as shown in Figure 4, to test whether viral marketing plays a moderating role in the influence of green perceived value on green consumption behavior. The model fit indices were as follows: $\chi^2/df = 1.468 < 5$, CFI = 0.985 > 0.9, TLI = 0.984 > 0.9, RMSEA = 0.021 < 0.08, SRMR = 0.024 < 0.08, indicating acceptable model fit.

Table 6.
Summary of Moderating Effect Analysis Results.

| | | | β | SE | t | p | R ² |
|---------------------------------------|---|-------------|---------|-------|--------|-------|----------------|
| Green Perceived Value | → | Consumption | 0.325 | 0.028 | 11.669 | 0.000 | 0.256 |
| Viral Marketing | → | Consumption | 0.061 | 0.030 | 2.045 | 0.041 | |
| Green Perceived Value×Viral Marketing | → | Consumption | 0.400 | 0.029 | 13.900 | 0.000 | |

In the simple slope plot results, when the moderator variable (viral marketing) score is low (M-SD, dashed line), the curve of green perceived value on green consumption behavior slopes downward (negative slope). When the moderator variable score is high, the curve slopes upward (positive slope). This means that as the level of viral marketing score increases, the influence of green perceived value on green consumption behavior shifts from negative to positive, confirming a positive moderating effect.

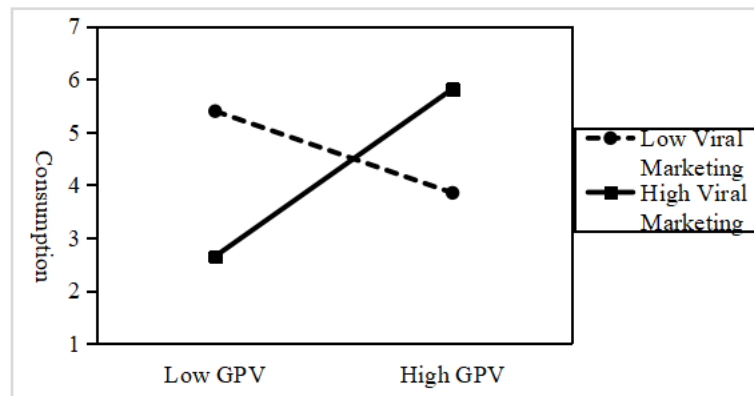


Figure 5.
Simple Slope of Moderating Effect.

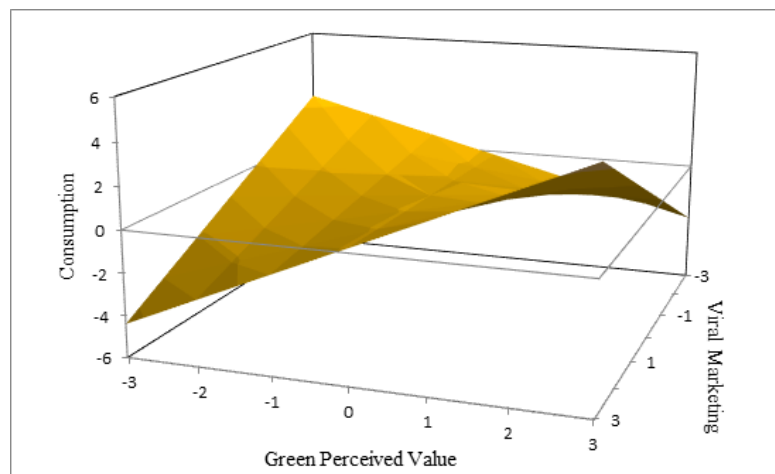


Figure 6.
Surface Plot of Moderating Effect.

Figure 6 is the surface plot of the moderating effect. In this plot, the X-axis represents the independent variable (green perceived value), the Y-axis represents the moderator variable (viral marketing), and the Z-axis represents the dependent variable (green consumption behavior). When the combination of the independent and moderator variables is "low independent variable - low moderator

variable" or "high independent variable - high moderator variable", the score for green consumption behavior is higher. When the combination is "high independent variable - low moderator variable" or "low independent variable - high moderator variable", the score for green consumption behavior is lower. Therefore, at low levels of the moderator variable, the influence of the independent variable on the dependent variable is negative, while at high levels, it is positive, further verifying the significant moderating effect in the model.

6. Research Applications

At the macro level, the government, as the institutional designer and policy guide of the green consumption system, can promote the transmission of green value by building a multi-level, networked governance system. For example, establishing a unified green product certification and supervision platform can standardize market order and promote industrial chain collaboration, while integrating online and offline channels to create a green consumption ecosystem. Addressing differences in environmental awareness across regions and consumer groups requires establishing flexible and diverse education mechanisms, strengthening public green value identity through socialized communication, and activating potential environmental awareness resources.

For enterprises, as the main creators of value at the market level, deepening the construction of green supply chain networks not only reduces compliance costs but also forms a buffer mechanism against market fluctuations. When facing sudden policy adjustments or changes in consumer demand, long-established green partnerships can provide quick resource support and market response. Meanwhile, companies need to practice full life cycle management, optimizing product design and recycling systems to transform waste into renewable resources, achieving both environmental and economic benefits. Facing rapidly changing green consumption trends, enterprises should establish continuous knowledge update mechanisms, absorbing and integrating internal and external innovation resources to accelerate green product iteration and service upgrade, and timely seize business opportunities brought by sustainable development.

From the individual perspective, consumers' green value cognition and behavioral changes constitute the most dynamic market power source, which needs to be continuously strengthened through education and socialized communication, laying the micro-foundation for the development of the green consumption market.

7. Research Recommendations

These results provide insights for academia, industry, and subsequent researchers. At the academic level, it enriches the entry points for studying consumer behavior. This research shows that consumer ecocentrism, subjective norms, and altruism are essentially attitudes of dedication towards others and the environment, making consumers more willing to purchase green and environmentally friendly goods, revealing that all three have a positive impact on green consumption behavior. Furthermore, by introducing viral marketing as a moderator variable from the perspective of enterprises reaching consumers with low cost and high efficiency, it reveals the significant effectiveness of cleverly stimulating the communication power of social networks in promoting green products, extends social network theory, expands the research scope of viral marketing in the field of sustainable consumption, and enriches the theoretical connotation of viral marketing driving green consumption. Finally, the research reveals the important role of green perceived value in consumer attitudes and green consumption behavior, deepens the triadic reciprocal determinism in social cognitive theory, enriches research in the field of consumer behavior, and enhances scholars' understanding of the individual-environment-behavior trinity in exploring consumer behavior mechanisms.

This study primarily targets managers of enterprises producing green products. First, correct strategic decision-making is the premise for sustainable enterprise development. Companies need to optimize their green strategy: Firstly, the synergistic driving mechanism of consumer ecological values and external social norms suggests that enterprises need to concurrently strengthen the design of

product environmental attributes and the penetration of group influence, establish a trustworthy green image by enhancing supply chain transparency, and amplify the communication effect of subjective norms using community networks to reduce decision-making resistance for high-premium products. Secondly, deepen green value communication content, transforming green product attributes (e.g., carbon footprint reduction, biodegradable materials) into quantifiable consumer benefits (e.g., "each purchase saves 10 liters of water"), enhancing green perceived value through visual data. Simultaneously, activate the lever of viral spread, design social content utilizing the moderating effect of viral marketing, create green mechanisms (e.g., "7-day zero plastic challenge"), encourage user-generated content and invite friends to participate, diffuse using the bandwagon effect of subjective norms, stimulate the desire for social display, and promote the community penetration of ecocentrism values. Finally, strengthen user behavior data feedback; enterprises can establish personalized environmental report systems (e.g., annual "carbon footprint savings list"), automatically generate short videos summarizing user green consumption contributions, preset social platform sharing templates, and enhance the credibility of green perceived value using data evidence.

Meanwhile, at the government level, there is a need to improve the institutional environment and infrastructure, amplifying the effectiveness of corporate viral marketing through policy tools and overcoming the green premium obstacle. Firstly, reduce green communication costs; provide communication subsidies to enterprises adopting social fission-style green marketing, incentivizing SMEs to invest in creative content production. Also, reduce value-added tax for SMEs employing viral green marketing, encouraging them to allocate resources to socialized communication. Secondly, design scenarios to empower green consumption; embed green behavior recording modules in public service systems, integrate municipal service APPs with retail data to automatically generate citizen green consumption points, and display regional user emission reduction rankings, creating social comparison pressure using subjective norms. Finally, regulate the ethical risks of viral marketing; introduce policies explicitly prohibiting "pseudo-environmental" rhetoric, establish green complaint channels on social platforms to strictly control false environmental propaganda, and impose high fines for pseudo-environmental advertising.

8. Limitations

This study has the following limitations. Firstly, the sample structure lacks representativeness. The research subjects were concentrated among urban middle-to-high-income groups, lacking coverage of rural, low-income, and elderly consumers. This makes it difficult to explain the deep-seated influences of economic constraints or cultural differences on green consumption decisions. Future research needs to expand and include more diverse samples to verify the model's universality. Secondly, the sample of this study only covers consumers from five Chinese cities. Future studies should enrich the sample source and expand the geographical scope to make the sample more representative. Finally, this cross-sectional study can only confirm instantaneous relationships between variables, lacking research on dynamic mechanisms. Cross-sectional data cannot capture the dynamic impact of exogenous variables like policy adjustments, technological iterations, or environmental crises on consumer psychology and behavior. Future longitudinal studies could further clarify the dynamic process of changes in variable relationships. Introducing time series analysis or policy simulation models could enhance predictive efficacy.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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