

From Green Consumption Intention to Actual Behavior: An Integrated Framework Based on the Theory of Planned Behavior, Moral Norms and Digital Empowerment

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Abstract: Green consumption is critical for sustainable development and China's "dual carbon" goals. The Theory of Planned Behavior (TPB) explains green intentions well, yet many consumers with positive attitudes and strong intentions still fail to act—a gap this study addresses. We propose an integrated framework combining TPB, the Norm Activation Model, habit theory, and digital empowerment. In it, green intention is shaped by behavioral attitude, subjective norms, and perceived behavioral control, while moral norms and environmental responsibility reinforce internal motivation. Digital tools—personal carbon accounts, eco-labels, platform feedback, and social media—enhance perceived control and lower barriers. Habit formation and implementation planning further facilitate converting intention into stable behavior. This work shifts focus from intention formation to intention-behavior conversion and incorporates digital governance into green behavior research. Practical implications are offered for policy design, green marketing, and platform-based carbon governance.

Keywords: Green Consumption; Theory Of Planned Behavior; Intention-Behavior Gap; Moral Norm; Digital Empowerment; Personal Carbon Account.

1. Introduction

With the increasing pressure of climate change, resource constraints and environmental degradation, green consumption has become an important issue in both academic research and public policy. Green consumption refers to consumers' purchase, use and disposal behaviors that take environmental protection, resource conservation and sustainable development into consideration. It includes purchasing green products, reducing excessive consumption, choosing low-carbon transportation, participating in waste sorting and supporting environmentally responsible enterprises.

In China, the proposal of the "dual carbon" goals has further highlighted the importance of green consumption. Promoting green consumption is not only a matter of individual lifestyle transformation, but also a key component of national carbon reduction strategy [1]. However, in practice, consumers' green consumption behavior remains insufficient. Many consumers express positive environmental attitudes and claim that they are willing to purchase green products, but their actual consumption behavior often does not match their stated intentions. This phenomenon is known as the attitude-behavior gap or intention-behavior gap in green consumption [2, 3].

The Theory of Planned Behavior, proposed by Ajzen, has been one of the most influential theoretical frameworks for explaining individual behavioral decision-making [4]. According to this theory, behavioral intention is determined by behavioral attitude, subjective norm and perceived behavioral control, and behavioral intention further predicts actual behavior [4]. Previous studies have widely applied this theory to green consumption, low-carbon consumption, green travel, waste sorting, green hotel consumption and other environmental behaviors [5-11]. These studies generally

confirm that the Theory of Planned Behavior has strong explanatory power for consumers' green behavioral intention.

However, the traditional TPB framework also has limitations. First, it emphasizes rational decision-making, but green consumption is not only a rational behavior; it also contains moral, social and symbolic meanings. Consumers may engage in green consumption because they feel moral responsibility for environmental protection, rather than simply because they evaluate green products positively. Second, the Theory of Planned Behavior explains behavioral intention more effectively than actual behavior. Meta-analytic and longitudinal studies have shown that intention does not always lead to behavior, especially when external constraints, habits or situational barriers exist [12-14]. Third, with the development of digital platforms, personal carbon accounts, green labels and social media, consumers' green behavior is increasingly shaped by digital environments. Traditional TPB studies have not fully incorporated these new digital governance mechanisms. Personal carbon accounts, for example, provide a new tool for visualizing and reinforcing low-carbon behavior [15].

Therefore, this paper attempts to answer the following research question:

How can consumers' green consumption intention be effectively transformed into actual green consumption behavior?

To answer this question, this paper constructs an integrated framework based on the Theory of Planned Behavior, moral norms and digital empowerment. The framework argues that consumers' green consumption behavior is formed through four mechanisms: rational decision-making, moral activation, digital empowerment and habit formation. This paper aims to make three contributions. First, it extends the traditional TPB model by incorporating moral norms and environmental responsibility. Second, it introduces digital empowerment as

an important contextual factor in green consumption behavior. Third, it highlights the role of habit and implementation planning in bridging the intention-behavior gap.

2. Literature Review

2.1. Theory of Planned Behavior and Behavioral Decision-Making

The Theory of Planned Behavior was developed from the Theory of Reasoned Action. Ajzen argued that individual behavior is directly influenced by behavioral intention and perceived behavioral control, while behavioral intention is determined by attitude, subjective norm and perceived behavioral control [4]. Behavioral attitude refers to an individual's positive or negative evaluation of performing a behavior. Subjective norm refers to the perceived social pressure from important others or reference groups. Perceived behavioral control refers to an individual's perception of the ease or difficulty of performing a behavior [4, 16].

The Theory of Planned Behavior has been widely applied in different fields, such as health behavior, physical activity, technology adoption, environmental behavior and public participation [12, 17-19]. Armitage and Conner conducted a meta-analysis and found that the Theory of Planned Behavior explained a substantial proportion of variance in behavioral intention and actual behavior [12]. Hagger and Hamilton further showed that longitudinal studies generally support the predictive validity of TPB, but also reveal that the relationship between intention and behavior is not always stable overtime [13].

In China, scholars have introduced and applied TPB in multiple research fields. Duan and Jiang systematically reviewed the theory and pointed out that TPB provides a clear analytical framework for understanding individual behavioral intention and action [20]. Domestic studies have applied TPB to physical activity, vaccination, rural environmental governance, low-carbon consumption and green travel [6, 10, 21-23]. These studies show that TPB is highly adaptable in the Chinese context.

2.2. Application of TPB in Green Consumption Research

Traditional Green consumption has become one of the most important application fields of TPB. In green consumption research, behavioral attitude usually refers to consumers' evaluation of green products or environmentally friendly consumption patterns. If consumers believe that green products are beneficial to environmental protection, personal health or social responsibility, they are more likely to form positive green consumption intentions [24-26].

Subjective norm is also important. Green consumption is influenced by family members, friends, colleagues, communities, government publicity and public opinion. In the Chinese context, collectivist culture makes consumers more sensitive to social expectations and reference group pressure [27, 28]. Therefore, subjective norm often has a significant impact on consumers' green purchase intention and low-carbon behavioral intention.

Perceived behavioral control reflects consumers' perceived ability to perform green consumption behavior. If green products are expensive, difficult to identify or inconvenient to purchase, consumers may feel that green consumption is difficult, even if they have positive attitudes. Studies on green

packaging, new energy vehicles, green hotels and green travel show that perceived behavioral control is a key factor affecting green behavioral intention and actual behavior [6, 8, 9, 29, 30].

Although TPB has strong explanatory power, some studies have found that consumers' green attitudes and intentions do not always lead to actual behavior. Chen and Zhao analyzed the attitude-behavior gap in green consumption and pointed out that the transformation from attitude to behavior is affected by multiple situational and psychological barriers [2]. Liu et al. also found that Generation Z consumers show a moral consumption attitude-behavior gap, indicating that ethical cognition does not necessarily result in actual moral consumption [3].

2.3. Intention-Behavior Gap and Its Explanation

The intention-behavior gap refers to the inconsistency between what individuals intend to do and what they actually do. In the field of green consumption, this gap is particularly prominent. Consumers may support environmental protection in surveys, but choose ordinary products instead of green products in real purchase situations because of price sensitivity, convenience, habit or distrust of green claims.

International studies have also emphasized this issue. Gibson et al. examined the intention-behavior gap in social distancing behavior during the COVID-19 pandemic and found that behavioral intention alone could not fully explain actual behavior [31]. Hagger et al. found that habit and intention jointly influence behavior, and habit may weaken or strengthen the intention-behavior relationship [14]. Verplanken and Aarts argued that habit is an automatic behavioral tendency formed through repeated experience in stable contexts [32]. Once a behavior becomes habitual, it may occur without conscious deliberation.

Implementation intention is another important concept for explaining the intention-behavior gap. Gollwitzer argued that goal intention needs to be supplemented by implementation intention, which specifies when, where and how to act [33]. Sheeran and Orbell found that implementation intentions can improve the predictive validity of TPB, especially for repeated behaviors [34]. These studies suggest that green consumption research should not only focus on whether consumers have green intentions, but also on how intentions are transformed into actual actions.

2.4. Moral Norms and Green Consumption

Green consumption has strong moral attributes. Consumers' green behavior is often related to environmental responsibility, altruism and social obligation. The Norm Activation Model emphasizes that pro-social and pro-environmental behaviors are driven by personal norms, which are activated by awareness of consequences and ascription of responsibility.

Recent studies have increasingly integrated TPB with NAM to explain environmental behaviors. Cui et al. used the TPB-NAM framework to examine farmers' pesticide reduction behavior and found that both rational decision-making and moral norms significantly influence behavioral intention [35]. Qin et al. applied the TPB-NAM framework to marine aquaculture enterprises' pro-environmental behavioral intention and confirmed the importance of moral motivation [36]. Tang et al. found that public willingness to participate as informal river chiefs is influenced by both planned behavioral

factors and normative activation factors [37].

These studies suggest that green consumption cannot be fully explained by rational evaluation alone. Moral responsibility and personal norms should be incorporated into the explanatory framework.

2.5. Digital Empowerment and Green Consumption

With the rapid development of digital technology, green consumption is increasingly embedded in digital platforms and data-based governance systems. Digital empowerment refers to the process by which digital technologies improve consumers' ability, opportunity and motivation to perform green behavior. It includes personal carbon accounts, green product labels, carbon points, platform feedback, mobile applications and social media communication.

Personal carbon accounts are an important digital tool for promoting low-carbon behavior. Hu and Li discussed the theoretical basis, practical exploration and improvement path of personal carbon accounts, arguing that they can transform abstract carbon reduction into visible and measurable personal behavior records [15]. Through carbon points, rankings and feedback, personal carbon accounts may enhance consumers' perceived behavioral control and encourage repeated green behavior.

Social media also plays an important role in green consumption. Nekmahmud et al. found that social media can transform consumers' intention to purchase green products by providing information, strengthening social influence and improving consumer engagement [38]. Digital platforms can reduce information asymmetry, improve green product accessibility and provide behavioral feedback, thereby narrowing the gap between green intention and actual behavior.

Therefore, digital empowerment should be regarded as an important contextual factor in explaining modern green consumption behavior.

3. Theoretical Framework and Research Propositions

Based on the above literature, this paper proposes an integrated framework for green consumption intention-behavior conversion. The framework consists of four mechanisms: rational decision-making mechanism, moral activation mechanism, digital empowerment mechanism and habit formation mechanism.

3.1. Rational Decision-Making Mechanism

The rational decision-making mechanism is mainly derived from TPB. Consumers form green consumption intention through attitude, subjective norm and perceived behavioral control.

First, behavioral attitude affects green consumption intention. When consumers believe that green consumption can protect the environment, improve health, reduce carbon emissions and reflect personal values, they are more likely to form green consumption intention [24-26].

Second, subjective norm affects green consumption intention. Consumers may be influenced by family members, friends, communities, government publicity and social media. In collectivist cultures, subjective norm may have stronger influence because individuals care more about social

expectations and group evaluation [27, 28].

Third, perceived behavioral control affects both intention and actual behavior. When consumers believe that green products are affordable, available, reliable and easy to purchase, they are more likely to engage in green consumption [29, 30].

Therefore, the following propositions are proposed:

Proposition 1: Behavioral attitude has a positive effect on consumers' green consumption intention.

Proposition 2: Subjective norm has a positive effect on consumers' green consumption intention.

Proposition 3: Perceived behavioral control has a positive effect on both green consumption intention and actual green consumption behavior.

3.2. Moral Activation Mechanism

Green consumption is not only a rational choice, but also a moral choice. Consumers may engage in green consumption because they believe that they have responsibility for environmental protection. Moral activation includes environmental awareness, ascription of responsibility and personal norm.

When consumers are aware of the negative environmental consequences of traditional consumption and believe that individuals should take responsibility for environmental protection, their personal norms are activated. Once personal norms are formed, consumers may experience moral obligation to perform green consumption.

Previous TPB-NAM studies have confirmed that moral norms are important in environmental behavior [35-37]. Therefore, this paper argues that moral norms can strengthen green consumption intention and promote actual behavior.

Proposition 4: Environmental responsibility has a positive effect on consumers' personal norms toward green consumption.

Proposition 5: Personal norms have a positive effect on green consumption intention.

Proposition 6: Personal norms strengthen the relationship between green consumption intention and actual green consumption behavior.

3.3. Digital Empowerment Mechanism

Digital empowerment plays an increasingly important role in the green consumption process. In traditional consumption contexts, consumers may face barriers such as information asymmetry, high search costs, lack of feedback and low convenience. Digital tools can reduce these barriers.

First, personal carbon accounts can visualize consumers' carbon reduction contributions. By recording low-carbon consumption, green travel and energy-saving behavior, personal carbon accounts help consumers understand the environmental value of their daily behavior [15]. This can increase perceived behavioral control and enhance behavioral feedback.

Second, green labels and platform recommendations can reduce information search costs. Consumers often have difficulty identifying whether a product is truly green. Digital green labels can improve product transparency and consumer trust.

Third, social media communication can strengthen subjective norm. When consumers observe others' green

consumption behavior on social media, they may perceive stronger social pressure and become more willing to engage in green consumption [38].

Fourth, platform rewards such as carbon points, coupons and rankings can strengthen behavioral reinforcement and encourage repeated green behavior.

Therefore, digital empowerment can both promote intention formation and facilitate intention-behavior conversion.

Proposition 7: Digital empowerment positively influences consumers' perceived behavioral control in green consumption.

Proposition 8: Digital empowerment strengthens subjective norm through social media communication and peer influence.

Proposition 9: Digital empowerment weakens the green consumption intention-behavior gap by reducing information, cost and convenience barriers.

3.4. Habit Formation Mechanism

Green consumption needs to become a stable and repeated behavior. If consumers only occasionally choose green products, the environmental effect is limited. Habit formation is therefore critical.

Habit refers to automatic behavior formed through repeated practice in stable contexts [32]. Once green consumption becomes habitual, consumers no longer need to make complex decisions each time. For example, bringing reusable bags, choosing public transportation, checking green labels and sorting waste can become daily routines.

Implementation planning can help consumers transform intention into action. Gollwitzer emphasized that specifying when, where and how to act can increase the probability of goal achievement [33]. Sheeran and Orbell found that implementation intention can enhance the predictive validity of TPB [34]. In green consumption, consumers who make specific plans are more likely to perform actual behavior.

Digital tools can also support habit formation. For example, mobile applications can send reminders, provide feedback and reward repeated green actions. These mechanisms can help consumers form stable green routines.

Proposition 10: Green consumption habit has a positive effect on actual green consumption behavior.

Proposition 11: Implementation planning strengthens the relationship between green consumption intention and actual behavior.

Proposition 12: Digital feedback promotes green consumption habit formation through repeated behavioral reinforcement.

4. Discussion

The integrated framework proposed in this paper extends existing green consumption research in several ways.

First, this paper shifts the focus from intention formation to intention-behavior conversion. Many previous studies based on TPB mainly examine how attitude, subjective norm and perceived behavioral control influence intention. However, the key challenge in green consumption is not only how to make consumers willing to act, but also how to make them actually act. By incorporating habit and implementation planning, this paper provides a more complete explanation of

actual behavior.

Second, this paper integrates rational and moral mechanisms. Green consumption is both a planned behavior and a morally meaningful behavior. Consumers may evaluate green products rationally, but they may also act out of environmental responsibility and personal moral norms. The integration of TPB and NAM helps explain the dual motivation behind green consumption.

Third, this paper introduces digital empowerment into the green consumption framework. In the digital economy, consumers' green behavior is increasingly shaped by platforms, algorithms, carbon accounts and social media. Digital tools can increase perceived behavioral control, reduce behavioral costs and provide immediate feedback. Therefore, digital empowerment is not merely an external condition, but an important mechanism for bridging the intention-behavior gap.

Fourth, this paper highlights the dynamic nature of green consumption. Green consumption is not a one-time decision, but a repeated behavioral process. Consumers may gradually form green habits through repeated practice, feedback and reinforcement. This dynamic perspective can better explain the sustainability of green behavior.

5. Practical Implications

5.1. Implications for Government Policy

Governments should design policies that not only enhance consumers' environmental awareness, but also reduce the difficulty of green consumption. Public campaigns can strengthen environmental responsibility and moral norms, while subsidies, green certification and information disclosure can improve perceived behavioral control. In addition, governments should accelerate the development of personal carbon account systems and promote carbon-inclusive mechanisms [15].

5.2. Implications for Enterprises

Enterprises should improve both the environmental value and consumer value of green products. If green products are expensive, inconvenient or unreliable, consumers' green intention may not lead to purchase behavior. Therefore, enterprises should improve product quality, reduce green premium, strengthen green labeling and provide positive consumption experience [25]. Green marketing should not only emphasize environmental protection, but also communicate personal benefits such as health, safety and cost savings.

5.3. Implications for Digital Platforms

Digital platforms can play an important role in promoting green consumption. Platforms can provide green product recommendations, carbon footprint information, carbon points and social sharing functions. These tools can improve consumers' perceived behavioral control and strengthen social norms. Platform-based feedback can also encourage repeated behavior and support habit formation.

5.4. Implications for Consumers

Consumers should transform general green intention into specific behavioral plans. For example, instead of simply saying "I want to consume green," consumers can make concrete plans such as "I will bring a reusable bag when

shopping,” “I will check green labels before buying household products,” or “I will choose public transportation three times a week.” Such implementation planning can improve the probability of actual behavior.

6. Conclusion

This paper proposes an integrated framework to explain the transformation from green consumption intention to actual behavior. Based on the Theory of Planned Behavior, Norm Activation Model, digital empowerment perspective and habit theory, the framework argues that consumers’ green behavior is shaped by rational decision-making, moral activation, digital empowerment and habit formation.

Behavioral attitude, subjective norm and perceived behavioral control provide the rational basis for green consumption intention. Environmental responsibility and personal norms provide moral motivation. Digital empowerment reduces behavioral barriers and strengthens perceived behavioral control. Habit and implementation planning help transform green intention into stable actual behavior.

Compared with traditional TPB-based studies, this paper emphasizes that the core problem of green consumption is not only whether consumers have green intention, but whether such intention can be effectively transformed into actual and sustained behavior. This perspective provides new theoretical insights for green consumption research and practical guidance for government policy, enterprise marketing and digital platform governance.

Acknowledgements

The author received no financial support for the research, authorship, and/or publication of this article.

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