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# Firms' green knowledge sharing and tourists' green electronic word-of-mouth intention: a two-wave time-lagged study of moderated mediation model

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## ABSTRACT

To address sustainable development goals in the tourism sector, this study sheds light on the importance of novel green marketing strategies as critical tools for promoting environmental sustainability. Anchoring on the service-dominant logic theory, this study's originality provides a framework that fundamentally reshapes our understanding of how value co-creation between companies and customers can occur in the green context. Specifically, the research indicates the novelty through the lens of service-dominant logic to clarify the impact of companies' green knowledge sharing on social media as a novel catalyst for tourists' green electronic word-of-mouth intention. Using a time-lagged study, data compiled from 799 tourists confirm that tourists' warm glow and green customer engagement behavior in sharing knowledge online with firms function as parallel mediators, thereby explaining the indirect influence of green knowledge sharing on green electronic word-of-mouth intention. Additionally, social network proneness significantly moderates this mediation *via* green customer engagement behavior. This research marks a seminal contribution by integrating service-dominant logic into green marketing, thereby articulating a nuanced framework that explains how green knowledge sharing can be leveraged to amplify green electronic word-of-mouth intention. By doing so, this study provides practical implications to orienting sustainable tourism through firms' green knowledge sharing, ultimately promoting tourists' green behavior.

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Service-dominant logic; green knowledge sharing; warm glow; green customer engagement behavior; social network proneness; green electronic word-of-mouth intention

## Introduction

In light of rising concerns regarding environmental sustainability, green tourism has become increasingly vital for promoting responsible travel practices (Font & McCabe, 2017). The strategic integration of green and digital marketing is crucial for achieving this goal, with several studies delving into this dynamic interplay (Zhang et al., 2021). However, despite calls for further investigation, research integrating green initiatives with marketing strategies in the tourism sector remains limited (Chandy et al., 2021). This gap is notable given the growing need for innovative approaches that encourage more green intentions and behaviors among consumers within the

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tourism industry. This study addresses this literature gap by investigating how companies' green knowledge sharing (GKS) on social media influences green electronic word-of-mouth (GEW) intention in tourism services. Specifically, GKS involves a reciprocal exchange of environmentally conscious insights between companies and customers on social platforms (Lee, 2001; Vargo & Lusch, 2004). Based on the service-dominant logic (S-DL) theory (Vargo & Lusch, 2004), companies should share relevant and credible green knowledge rather than advertise information that may induce skepticism (Ahearne et al., 2022; Font & McCabe, 2017; White et al., 2019). By doing so, GKS can become vital in changing customer behavior to become more environmentally conscious (Font et al., 2021; White et al., 2019). Meanwhile, GEW intention refers to the customer's intention to recommend green practices and experiences online, primarily targeting other consumers (Huy et al., 2022). However, current research on the role of GKS in promoting GEW intention is limited in the tourism industry (Fan et al., 2023), with most tourism studies examining GEW intention separately (Huy et al., 2022). To address this gap, our research uses S-DL to explore the relationship between businesses' GKS and tourists' GEW intention through mediating and moderating mechanisms.

In the context of S-DL, which emphasizes the importance of reciprocal exchanges, light is shed on the role of operant resources as parallel mediators, such as emotional and behavioral resources, and institutional resources as moderators in creating value with companies (Font et al., 2021; Vargo & Lusch, 2018). First, this study investigates two such customer resources – warm glow (WG) and green customer engagement (GCE) behavior in sharing knowledge online with firms – as mediators in the relationship between GKS and GEW intention. WG is the positive emotional experience gained from helping others (Andrews et al., 2014), and GCE behavior refers to customers' active participation in sharing and interacting with environmentally friendly content on online platforms alongside enterprises (Kumar et al., 2010). GKS, a strategic operant resource for organizations, can enhance these customer resources and, in turn, drive GEW intention, reflecting the reciprocal exchange principle central to S-DL (Font et al., 2021; Vargo & Lusch, 2018). Although GKS is gaining attention (Sun et al., 2022; Zhang et al., 2021), limited research has empirically examined its impact on GEW intention using the S-DL perspective. Also, extant studies overlook potential parallel mediation mechanisms through WG and GCE behavior underlying the GKS–GEW relationship, forming the rationale for the present investigation.

Second, there is a need to further explore the mediation mechanisms involved in the interactive utilization of institutional resources as moderation mechanisms, which previous research has underutilized (Vargo, 2021). This limitation has hindered scholars from forming comprehensive conclusions about the benefits of GKS (Zhang et al., 2021, 2022). One such institutional resource identified as critical for favorable co-creation outcomes is social network proneness (SNP) (Peters & O'Connor, 1980; Vargo, 2021), which describes individuals' inclination to interact online *via* social media platforms (Kumar et al., 2016). By increasing the use of GKS on social media among SNP customers, customers and organizations can enhance the value of other resources (Kumar et al., 2016), such as WG and GCE behavior, for sharing knowledge on social media. A better understanding of how to stimulate social media influence through SNP and explore the conditions that facilitate tourists' SNP engagement is essential for helping firms in tourism and hospitality assemble strategic marketing decisions in using social media (Scholl-Grissemann et al., 2020). Despite its importance in the industry and growing empirical SNP research (Kumar et al., 2016; Scholl-Grissemann et al., 2020), the sustainable tourism literature has not explored this issue, especially in the tourism sector.

By addressing those research gaps, this study's novelty is developing a comprehensive model that clarifies how tourism firms' GKS policies could stimulate tourists' GEW intention on online frameworks through the interference of customer resources (e.g. GCE behavior, WG) and the institutional resources (e.g. SNP). Thus, this study aims (1) to investigate the mediating roles of WG and GCE behavior in the GKS–GEW link, (2) to examine whether SNP, as an institutional

resource, strengthens these mediations, and (3) to provide strategic guidance on leveraging GKS to promote GEW intention. By doing so, this study contributes to the existing literature by extending the S-DL theory into the green tourism context. Specifically, based on the S-DL framework, this study figures out a novel finding on how GKS policy can stimulate GEW intention by providing empirical evidence regarding the mediating role of GCE behavior and WG and the moderated mediation role of SNP. The findings also provide practical insights into utilizing GKS to engender GEW intention. By investigating multi-stakeholder partnerships and resource integration in S-DL in sustainable tourism, as highlighted by Font et al. (2021), this study provides novel insights for tourism.

## Literature review

### *The service-dominant logic theory*

S-DL represents the “grand theory” of marketing (Kotler et al., 2021, p. 37). Introduced by Vargo and Lusch (2004), S-DL positions service as central to economic exchange, suggesting that even tangible goods derive value from inherent services. Core to S-DL is value co-creation, unfolding within complex service ecosystems that synergistically integrate diverse resources and competencies. Building on the S-DL framework, the importance of collaborative value creation in tourism and hospitality is emphasized, identifying knowledge sharing as a key operant resource-generating value (Carvalho & Alves, 2022; Font et al., 2021). However, empirical evidence on GKS outcomes remains limited (Carvalho & Alves, 2022; Font et al., 2021). Other studies have explored emotional motivations like a WG in shaping experiences and driving intended responses, such as word-of-mouth (Danatzis et al., 2022). Despite their significance, the impact of emotional motivations, including WG, is underexplored (Danatzis et al., 2022). Additionally, S-DL emphasizes institutions’ role in guiding interactions and outcomes (Vargo & Lusch, 2018). Within service ecosystems, actors and institutions have complex, reciprocal interactions (Vargo & Lusch, 2018). As vital resources, institutions like values, beliefs, place, and time shape motivations, behaviors, interactions, and outcomes (Quero & Mele, 2022; Vargo & Lusch, 2018). However, institutional factors (e.g. SNP) have received minimal marketing attention (Kumar et al., 2016).

In extending the discourse on environmental sustainability, S-DL is positioned as a green alternative, referring to technologies, products, or processes that are less environmentally harmful than traditional methods (Vargo, 2021). Grounded in service-for-service exchanges, S-DL conceptualizes economic activities as reciprocal service exchanges, where all actors are providers and beneficiaries focused on exchanging services and benefits rather than producing and consuming goods (Vargo & Lusch, 2018). Unlike the traditional model, this exchange encourages more sustainable and collaborative practices (Vargo, 2021). Therefore, through the reciprocal exchange, S-DL can be applied to examine indirect relationships between GKS and GEW intention in tourism *via* emotional motivations (e.g. WG) and co-creation behaviors (e.g. GCE behavior) (Font et al., 2021). Additionally, based on S-DL, moderated mediation effects of institutional resources (e.g. SNP) on these connections could be studied (Vargo, 2021). Consequently, this theoretical approach seems highly relevant and suitable for addressing the research objectives (Font et al., 2021; Vargo, 2021).

### *Hypothesis development*

#### *Companies’ GKS*

Companies’ knowledge sharing is understood as “transferring or disseminating knowledge from one person, group, or organization to another” (Lee, 2001, p. 324). This sharing is critical as customers require guidance on using, maintaining, fixing, and customizing products and services

to suit their specific needs (Vargo & Lusch, 2004) rather than just a general understanding of the information. Firms could attract customers by developing online platforms for knowledge sharing so consumers can enhance their knowledge about companies' experiences and uses (Doorn et al., 2010). In the green context, companies' GKS on social media, which is developed from the definition of knowledge sharing, is understood as the reciprocal process of exchanging green knowledge between companies and customers to co-create green value (Font et al., 2021). Digitally, GKS is more important as two-way knowledge sharing on social media replaces one-way information from ads (Zhang et al., 2021). This is because green knowledge also requires multi-dimensional evidence (Kirkham, 1984).

Previous scholars have recently paid attention to GKS. The existing literature has indicated that due to the poor practices of the past and the present, GKS may help companies avoid greenwashing – misleading customers about positive green impacts on social media (Font & McCabe, 2017) as well as customers' green skepticism on most messages – whether they happen to be true or not (Font et al., 2021). Therefore, customers are more likely to acquire new green knowledge (Doorn et al., 2010) by embedding green messages into the shared experiential knowledge of sustainable tourism rather than explicit messages about sustainability itself (Hanna et al., 2018). This approach, in turn, encourages more green interactions and green emotions, leading to green intentions (Hanna et al., 2018; Huy et al., 2022). Empirically, several previous studies have investigated the role of GKS. For instance, Doorn et al. (2010) provide insights into the relationship between companies' knowledge exchange and customer engagement (CE) behaviors through a conceptual model, albeit untested empirically. Zhang et al. (2022) findings suggest that effective social media knowledge sharing can enhance engagement with social causes, albeit within the context of China. In the hospitality industry, GKS by tourism firms has become essential because when customers become partners, GKS is necessary for sustaining a competitive edge over the long term (Font et al., 2021). Zhang et al. (2022) also state that knowledge sharing through advertising on social media is needed for companies, as it can enhance the efficacy of firms' digital marketing. Despite the recognized importance of GKS, a significant research gap exists in understanding its role in educating and influencing tourists' green behaviors and attitudes (Font et al., 2021). Thus, an empirical study on the role of GKS toward tourists' green attitudes and behaviors, such as GEW intention, is needed.

**WG.** WG is the positive emotional state experienced by individuals when they voluntarily help others (Andrews et al., 2014). This phenomenon, also known as impure altruism (Andreoni, 1990), encompasses both altruistic and egoistic desires, providing an emotional reward for the individual. WG plays a crucial role in cause-related marketing, as customers can derive a sense of warmth and satisfaction through their purchases associated with a cause (Heidarian, 2019). In environmental conservation, WG refers to the emotional motivation to engage in eco-friendly activities (Clark et al., 2003). This emotional benefit is triggered by the desire to contribute to environmentally friendly endeavors (Font et al., 2021). The positive personal state resulting from pro-environmental behaviors and GCE behavior can enhance individuals' satisfaction (Giebelhausen et al., 2016). Consequently, WG has emerged as a vital factor in promoting long-term improvements in environmentally conscious behavior, encouraging customers to participate in green activities (Alhouti et al., 2021). In the existing literature, several studies (e.g. Giebelhausen et al., 2016; Taufik et al., 2015) found that pro-environmental behaviors led to WG, which increased customer satisfaction and warmth perception. Conversely, Tezer and Bodur (2020) and Taufik (2018) found that anticipated WG has a stronger positive relationship with green intentions to engage in sustainable behaviors. Despite the importance of WG, previous works still contain some limitations, including

reliance on single-item measures and the testing effects in diverse cultural contexts. Also, in the tourism context, there have been few empirical studies on the role of WG toward tourists' green behaviors. Building on the concept of WG, this study aims to examine how WG arising from GKS can influence customers' green intention, such as GEW intention.

*GEW intention.* New digital communication channels have increased the prominence of electronic word-of-mouth intention (eWOM), especially in the tourism sector (Fan et al., 2023). eWOM involves "any positive or negative statements made by potential, actual, or former customers about a product or company, which is made available to many people and institutions *via* the internet" (Hennig-Thurau et al., 2004, p. 39). Extending this concept into the green context, GEW intention refers to customer-generated recommendation intention related to environmentally friendly practices in online settings, primarily targeting other customers (Huy et al., 2022). Previous studies have recently paid attention to GEW intention. For instance, Zhang et al. (2018) examined the negative impact of greenwashing perceptions on GEW intention in China. As companies adopt circular economy principles, customers may share positive feedback regarding the firms' green initiatives, enhancing their social media reputation. However, the existing literature has overlooked the potential significance of eWOM in green contexts, including tourism, due to the disconnect between research on green and eWOM intention (Huy et al., 2022). Therefore, companies must establish both long-term and short-term green marketing strategies that cultivate positive GEW intention.

Building on the WG concept, this study posits that GKS influences GEW intention through WG, particularly in the tourism sector. First, based on S-DL theory, Danatzis et al. (2022) and Vargo and Lusch (2018) suggest that when consumers acquire companies' knowledge, it fosters emotional motivation, such as WG. This emotional connection arises from sharing competencies between service providers and customers (Carvalho & Alves, 2022), which may inspire clients' intentions or behaviors (Andrews et al., 2014). In the green context, increased awareness of environmentally friendly practices through GKS enhances customers' green capabilities and fosters WG toward green intentions and purchases (Andrews et al., 2014; Zhang et al., 2021). Thus, customers interacting with eco-conscious companies may experience WG and improved green capabilities (Taufik et al., 2015). This study proposes that GKS positively influences WG.

At the same time, based on S-DL, company-customer co-creation may foster an affective state, such as WG, which boosts positive customer intentions or behaviors (Carvalho & Alves, 2022). When a firm employs an effective green marketing strategy that shares green knowledge, it can enhance customers' green values, leading to eco-friendly intentions (Carvalho & Alves, 2022). Similarly, customers' WG, stemming from social and environmental responsibility through green campaigns, can influence their behavioral intentions, such as GEW intention (Habel et al., 2016). In the hospitality industry, nature-inclined visitors may disseminate green knowledge when participating in online activities, experiencing joy from benefiting others. Their repeated exposure to environmental protection experiences on social media increases GEW intention's likelihood of a cost-effective marketing approach. Drawing upon the S-DL literature, the importance of emotional connections (Font et al., 2021), such as WG, as mediators that co-create value through customer-provider interactions is highlighted (Carvalho & Alves, 2022). This is because WG embodies positive emotions as an operative resource in beneficial interactions, which are crucial in S-DL's experiential exchanges (Font et al., 2021). This enhancement of customer satisfaction and loyalty further reinforces the service relationship (Font et al., 2021; Vargo & Lusch, 2018). According to this theory, Andrews et al. (2014) identified the mediating role of WG between cause-marketing campaigns and behavioral intentions.

Thus, it is argued that WG could mediate the relationship between GKS and GEW intention. Despite its importance and the increasing role of emotional motivation (e.g. WG), the role of WG toward firms' green marketing programs and customer's green behaviors, such as GEW intention, remains underexplored, especially in the sustainable tourism context (Font et al., 2021). Therefore, investigating the influence of GKS on GEW intention *via* the mediating role of WG is needed.

H1: Companies' GKS has a positive indirect effect on green eWOM intention via WG.

### ***GCE behavior in sharing knowledge online with firms***

Examining CE is crucial, especially in the travel sector (Shin & Perdue, 2022). CE involves interactions between customers and firms, employing both operant and operand resources within service systems (Hollebeek et al., 2019). Specifically, customers integrate their cognitive, affective, and behavioral competencies and institutional resources (e.g. time and place) to co-create value with firms (Hollebeek et al., 2019; Vargo & Lusch, 2004). Kumar and Pansari (2016) posited that engagement in sharing knowledge with firms can be considered CE behavior by providing feedback and suggestions to co-create value. CE in sharing knowledge with firms stems from "customer knowledge behavior *via* feedback provided to the firm for ideas for innovations and improvements, and contributing to knowledge development" (Kumar et al., 2010, p. 299). Shin and Perdue (2022) distinguished between the behavioral and psychological dimensions of CE, noting that psychological engagement cannot always predict behavioral engagement (Greene & Dolnicar, 2024). The work aims to build upon Shin and Perdue (2022) work by focusing on the green context and examining the behavioral aspects of CE in interactions with firms. In the green context, GCE behavior for sharing knowledge online with firms is defined as providing feedback and suggestions on green knowledge to co-create green value with a firm on online platforms (Kumar et al., 2010). This online behavior is accessible and increasingly easier to measure (Greene & Dolnicar, 2024), but it has not yet been fully researched. For example, Hollebeek et al. (2019) proposed an integrative conceptual framework linking CE and S-DL, yet this framework still requires empirical validation. Meanwhile, Shin and Perdue (2022) utilized netnography to identify types of co-created value and engagement drivers within an online hotel community. However, the qualitative nature of their approach presents limited generalizability in their study. Consequently, investigating GCE behavior remains critical, as the extant literature on engagement dimensions and constructs lacks comprehensive empirical research (Shin & Perdue, 2022). Moreover, the mediation role of customer-brand engagement behavior on social media has become important (Hollebeek et al., 2019) because it functions as a co-creation behavior (Doorn et al., 2010). However, the mediating function of GCE behavior, particularly in the tourism sector, remains underexplored (Shin & Perdue, 2022). Hence, this study posits that GCE behavior is vital in mediating the association between GKS and GEW intention.

The S-DL framework suggests that reciprocal benefits emerge when customers appreciate the value of companies' contributions and feel compelled to reciprocate (Vargo & Lusch, 2004). By sharing green knowledge, companies foster green customer capabilities and stimulate customers' reciprocal behavior in collaboration with them (Vargo & Lusch, 2004). In essence, S-DL posits that an actor is more likely to voluntarily share operant resources when anticipating mutually rewarding resource exchanges (Vargo & Lusch, 2004). Therefore, when firms effectively share valuable operant resources, such as green knowledge, enhancing the overall value proposition, customers are more inclined to engage with company representatives (Kumar & Pansari, 2016) for co-creating value. This is also because GKS helps reduce ambiguity about green quality and proper usage (Zhang et al., 2021). Green marketing practices focusing on raising consumer environmental awareness have effectively motivated customers to engage in eco-friendly activities with firms (Zhang et al., 2022). Consequently, GKS is expected to have a positive influence on GCE behavior.

Building on this foundation, the present study will establish a hypothesis regarding the outcomes of GCE behavior, such as GEW intention, which refers to consumers' intention to express positive or negative thoughts about a firm's green practices and suggest the brand to others. According to S-DL (Vargo & Lusch, 2004), GKS is crucial in stimulating GCE behavior to co-create green value. We posit that cultivating GCE behavior may lead to reciprocal consequences, including elevated GEW intention, as customers may engage in green co-creation activities by applying their green competencies obtained through GKS efforts, which in turn could enhance their GEW intention. In tourism specifically, CE transforms customers into loyal advocates (Ahn & Back, 2018). Thus, engagement can positively influence eWOM by eliciting feedback and suggestions and may also significantly impact the success of brand collaboration initiatives. Consequently, this study proposes that GCE behavior will influence GEW intention.

Additionally, the literature highlights that customer–brand engagement behavior is a crucial strategic marketing component and mediates the relationship between firm-based factors (e.g. GKS) and intentions (e.g. GEW intention) (Hollebeek et al., 2019). Following the above arguments, GKS leads to enhanced GCE behavior for sharing knowledge, resulting in increased GEW intention. In other words, GCE behavior in sharing knowledge mediates the relationship between GKS and GEW intention. Based on insights from previous research and the conceptual framework, we postulate the subsequent conjecture:

H2: Companies' GKS has a positive indirect effect on green eWOM intention via GCE behavior in sharing knowledge with firms.

### **SNP**

SNP refers to consumers spending more time online interacting with other actors to share their operand and operant resources (Kumar et al., 2016). Consumers who focus more on engaging *via* social media may value communicating more effectively with others who share similar views and knowledge (Schulze et al., 2014). Furthermore, individuals with SNP are characterized by dedicating more time to social media to support a firm, impacting focal consumer behaviors (Kumar et al., 2016). Consequently, these consumers may be more receptive to participating in digital channels with companies. Considering the institutional environment of the service ecosystem (Vargo & Lusch, 2018), it is essential to understand the "social networking prone" consumers who regularly use social media (Kumar et al., 2016, p. 11) as an institutional resource variable (Peters & O'Connor, 1980). Whereas previous studies have sequentially applied SNP as a control variable influencing customers' eWOM and attitudes toward travel destinations (Scholl-Grissemann et al., 2020), this study is novel for examining SNP as a moderating variable in the context of sustainable tourism. We further argue that, according to S-DL, the indirect effect of GKS on GEW intention through customers' motivation (e.g. WG) and GCE behavior (Danatzis et al., 2022) could be contingent on SNP. Despite this, previous studies on GKS and tourists' green behaviors have indicated a research gap in clarifying the role of SNP in connecting GKS to GEW intention (Font et al., 2021; Sun et al., 2022). Therefore, this study aims to expand on Kumar et al.'s (2016) research by investigating the time-frequency factor as a moderator from a green hospitality perspective.

Based on the S-DL, institutions play a crucial role in understanding service ecosystems, as they contribute to the complexity of ecosystems through interactions among institutional resources and actors (Vargo & Lusch, 2018). Sharing institutional resources, such as time and technology, can create value for all actors (Vargo & Lusch, 2018). Specifically, the interaction between GKS and SNP as an institutional resource can boost WG's feelings. Consequently, customers with higher SNP may experience positive interactive effects with GKS, leading to stronger relationships with companies and heightened environmental commitment (Kumar et al., 2016). These feelings, in turn, amplify GEW intention's desire to share green knowledge. Conversely, customers with low time-frequency resources may perceive their GKS as insufficient for



environmental protection. This perception may lead to low interactive effects with GKS on social media, decreasing their sense of self-worth and WG feelings (Tezer & Bodur, 2020), ultimately weakening their GEW intention. Therefore, we expect the following hypothesis:

H3: SNP moderates the indirect effect of companies' GKS on GEW intention via WG so that the indirect effect is stronger when the level of SNP is high and weaker when the level of SNP is low.

Building on this moderated mediation, we examine SNP as a moderator of the relationship between GKS and GEW intention *via* GCE behavior. Drawing on the S-DL, institutions, such as time and cognitive resources, can enhance service exchange and value co-creation among actors, such as firms and customers (Vargo & Lusch, 2018). The more interactions occur among institutions and actors, the greater the outcomes from service ecosystems (Vargo & Lusch, 2018). Specifically, we posit that SNP, considered an institutional resource from customers, may moderate the impact of GKS on GCE behavior, subsequently affecting GEW intention. Customers with high SNP perceive that they have sufficient time and view green knowledge shared by a firm as essential for strengthening their environmental awareness and belief in engaging in value co-creation with the firm. In contrast, when SNP is low, the effect of GKS on GCE behavior weakens, as customers lack the time-frequency resources to internalize the green knowledge. Their low confidence may lead to reduced engagement with the firm. Kumar et al. (2016) suggested that SNP customers are more likely to obtain green knowledge through GKS and connect with other customers, making them receptive to sharing green knowledge for the firm on social media. Consequently, we propose that the relationship between GKS and GEW intention *via* GCE behavior would be stronger among customers with higher SNP. Therefore, we hypothesize that (Figure 1):

H4: SNP moderates the indirect effect of companies' GKS on GEW intention via GCE behavior in sharing knowledge with firms so that the indirect effect is stronger when the level of SNP is high and weaker when the level of SNP is low.

## Methodology

### Research design

This study chose Vietnam, an emerging market in the Asia-Pacific region, to collect data for several main reasons: (1) more tourists, especially young customers, like to visit green tourism destinations, enforcing tourism firms to develop sustainable environmental strategies, (2) the travel and hospitality sectors in Vietnam have experienced remarkable expansion and show potential for advancing long-term, green performance, (3) globalization and the enforcement

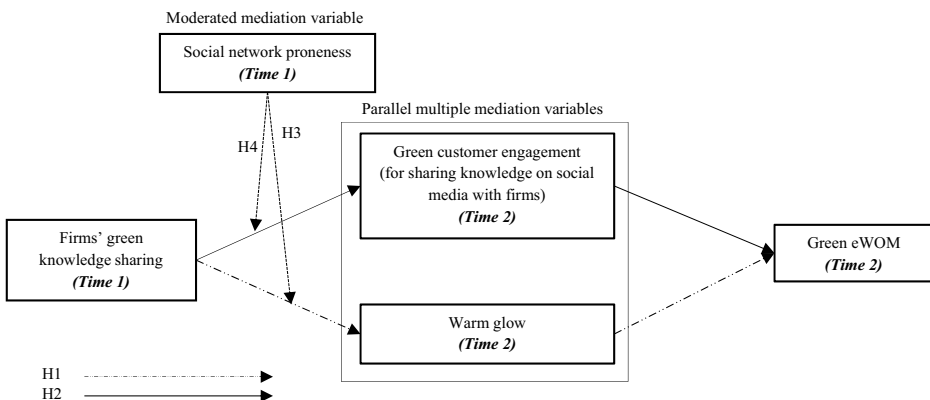


Figure 1. Conceptual framework.

of environmental law have introduced green behavior concerns to Vietnamese companies, particularly in tourism, (4) tourism businesses are increasingly prioritizing environmentally sustainable practices, as they can enhance customer loyalty and provide a competitive edge, (5) local governing bodies have led to increased compliance with environmental policies and regulations in Vietnam's tourism industry (Pham et al., 2023).

To collect data, we recruited tourists who met specific screening criteria. First, participants had to demonstrate a certain level of environmental awareness and concern through filtering questions. Second, respondents were required to voluntarily provide consent to share their email addresses. This allowed the matching of responses across survey rounds. Third, respondents were asked about engagement in sustainable and eco-friendly travel practices. To be included in the survey, participants had to select at least one of the following: purchasing/booking eco-friendly tours, staying at green hotels, participating in sustainable tourism activities, or reducing environmental impact when traveling. Those who selected "none of the above" sustainable travel practices were excluded. Fourth, participants were evaluated based on their daily social media habits across platforms, considering factors like time spent and frequency of use. Individuals whose social media activity significantly deviated from average usage were excluded.

This study adopted a dual-channel approach to optimize cost-efficiency and data integrity in questionnaire distribution. First, social media platforms were utilized for their rapid reach and engagement capabilities, which was crucial for targeting diverse participants quickly (Wiśniowski et al., 2020). This strategy is particularly effective for subjects like green tourism and marketing, as evidenced by previous research (Ahn & Back, 2018; Taufik, 2018; Tezer & Bodur, 2020). Secondly, a professional online service was employed for national probability sampling. Although this method is more expensive, it significantly reduces selection bias and ensures a more structured data collection process (Wiśniowski et al., 2020). By combining online questionnaires with a professional service, the study may achieve a balance between speedy data collection, geographical diversity, and data reliability (Wiśniowski et al., 2020).

A time-lagged approach makes the research model suitable by reducing response bias (Podsakoff et al., 2003), especially for tourism research (Peng et al., 2022; Safavi & Bouzari, 2020). The time-lagged survey method mitigates response and shared method biases (Peng et al., 2022; Safavi & Bouzari, 2020). Such biases, characterized by inaccurate participant responses, are effectively reduced through delayed recall of the predictor variable, thus diminishing response bias (Podsakoff et al., 2003). However, a mere day's gap has minimal impact on method variance control (Min et al., 2016). The time-lagged approach also addresses shared method bias, which is common in studies using identical response methods for independent and dependent variables. This bias, often inflating perceived correlations, is mitigated by staggering the measurement times of predictor and outcome variables, minimizing common method variance from similar scale endpoints, and anchoring effects (Chang et al., 2010). Moreover, time-lagged panel data analysis provides a robust framework for assessing within-subject correlations, reducing shared method bias (Falkenström et al., 2020).

Specifically, starting in September 2022, this study utilized a two-week interval. Five constructs were central to this investigation, with data collected in two rounds. Data on GKS and SNP were obtained in the first wave, while data on WG, GCE behavior, and GEW intention were obtained in the second wave. In Round 1, participants provided their email addresses and answered survey questions. For Round 2, participants from Round 1 were invited *via* email to answer additional questions and provide their email addresses again. Non-responders received a reminder email after one week. Questionnaires from both waves were matched (100%) using email IDs. Faulty questionnaires with missing data were removed, resulting in a final sample of 799 participants and a response rate of 59.2%.

This study on Vietnamese tourism demographics analyzing a sample of 799 participants presents a nearly equal gender distribution with 52.065% men and 47.935% women, aligning

well with the General Statistics Office of Vietnam's (2021) report. The age distribution spans a broad range, with 33.792% aged 18–20, 41.802% aged 21–25, 16.771% aged 26–41, and 7.635% over 41, mirroring the diverse age range of Vietnamese tourists as suggested by Outbox (2023). In terms of education, the sample encompasses all levels, including 4.631% below high school, 9.011% high school graduates, 14.143% with intermediate education, 28.035% with some college, 29.036% university graduates, 12.891% holding a master's degree, and 2.253% with doctorates, reflecting the varied educational background expected of Vietnamese tourists.

### **Measurement**

To enhance the translation's precision, an English-to-Vietnamese forward translation was performed by a linguist, reviewed by a focus group, refined by bilingual academics, and back-translated by a language expert. Discrepancies were resolved collaboratively by bilingual scholars. The survey used validated five-point Likert scales and construct measures for reliability, including age, gender, and education as control variables.

GKS was measured using a seven-item scale adapted from Lee (2001), which is widely utilized in marketing and information systems research to assess firms' knowledge-sharing behaviors. This scale was deemed suitable for capturing firms' GKS activities (Gupta et al., 2009; Lin & Lee, 2004). For instance, some of the items included: "Tourism companies share green expertise obtained from green education and green training with customers on social media" (Average variance extracted [AVE]=0.649; Cronbach's alpha [CA]=0.910).

SNP was measured using a four-item scale from Kumar et al. (2016), which focuses on assessing individuals' inclination to spend time interacting on social media platforms. This established scale was relevant for examining SNP as a moderation variable (Scholl-Grissemann et al., 2020). For example, some questions included: "Social networking sites, such as Facebook, are a part of my daily activity" (CA = 0.831; AVE = 0.653).

WG was measured with a seven-item scale adapted from Giebelhausen et al. (2016), for example, "As I engage in travel, my participation in green activities often makes me feel: 'Selfish/Altruistic'" (CA = 0.935; AVE = 0.722). This scale captures the positive emotional experience gained from prosocial actions, making it appropriate for assessing the WG derived from green behaviors (Bezençon et al., 2020; Leisen Pollack, 2021).

For GCE behavior, Kumar and Pansari (2016) scale focuses on engagement behaviors related to knowledge sharing between customers and firms. Four items were utilized and adapted from Kumar and Pansari (2016) study, such as "I provide feedback/suggestions for developing new green goods and green services for this brand on social media" (CA = 0.907; AVE = 0.782). Since this study examined GKS and engagement on social media, adapting items from their engagement scale to reflect green engagement was relevant (Hashmi et al., 2021; Shin & Perdue, 2023).

For GEW intention, three items of Zeithaml et al. (1996) word-of-mouth intention scale are well-established in marketing and sustainable tourism research (Floh et al., 2013; Lee et al., 2014). However, most previous eWOM research has not examined it specifically in green contexts (Huy et al., 2022). By adapting items from this scale to reflect green eWOM, this study could leverage a validated scale while extending its application to assess intentions to share green recommendations and opinions on social media. For example, "I will recommend green travel destinations to someone who seeks advice on social media" (CA = 0.879; AVE = 0.805).

### **Analytical strategy**

In this study, we apply confirmatory factor analysis (CFA) and the partial least squares structural equation modeling (PLS-SEM) method for data analysis, utilizing JASP and SmartPLS4 software. According to Love et al. (2019), JASP eliminates complex syntax to enhance transparency and facilitate collaboration and publication, simplifying discriminant validity assessment. Furthermore,

Hair et al. (2022) emphasize the growing significance of PLS-SEM in tourism and marketing research, noting its robustness in conceptual measurement. This method excels in assessing discriminant validity, composite reliability, and convergent validity, outperforming traditional methodologies. Additionally, we used the PROCESS package in R to analyze interactive effects, following the proposal of Hair et al. (2022). This integration aligns with the established use of the PROCESS model in moderated mediation research, as demonstrated by Giebelhausen et al. (2016) and Taufik (2018). Therefore, the combination of JASP, SmartPLS4, and PROCESS provides a comprehensive analytical framework suitable for this study's needs.

In conclusion, while this research has been carefully designed and has multiple strengths, such as time-lagged design, key limitations, including reliance on self-reports, cross-cultural analyses, and diversifying sampling locations, will be discussed more in the limitations section.

## Results

### Measurement models

As shown in Table 1, CFA results reveal that the five-factor model demonstrates an adequate fit with the data ( $\chi^2 = 368.533$ ,  $df = 265$ , comparative fit index (CFI) = 0.999, Tucker-Lewis Index (TLI) = 0.999, root mean square errors of approximation (RMSEA) = 0.022, standardized root mean squared residual (SRMR) = 0.033). The current model demonstrated a superior fit compared to more alternative models, which combined various constructs. This evidence supports the distinctiveness and validity of the proposed constructs. The correlation heterotrait-monotrait ratios – between 0.125 and 0.706 – are less than the threshold of 0.9 in Table 2, further endorsing the discriminant validity (Hair et al., 2022).

Composite reliability (CR) and Cronbach's alpha (CA) both exceeded the 0.7 cutoff point, providing support for the convergent validity of the constructs (Hair et al., 2022). In Table 2, AVE values ranged from 0.653 to 0.805 and surpassed the 0.50 threshold (Hair et al., 2022).

### Data bias controlling

Implementing a meticulous research design is essential in minimizing the potential for common method bias (Podsakoff et al., 2003). As indicated in Table 1, the data indicates a strong fit for the four-factor measurement model. However, the five-factor model demonstrates an even better fit than the four-factor and one-factor models. Third, we implemented Harman's single-factor analysis for further evaluation. A single construct explained 29% of the total variance, below the recommended 50% (Podsakoff et al., 2003). The findings indicated five factors created at eigenvalues exceeding 1.0, and the total bias described by the first element was less than 50%. Finally, we conducted a comprehensive collinearity analysis approach proposed by Kock (2015). The examination results revealed that none of the variance inflation factors exceeded the established threshold of four (O'Brien, 2007), signifying the lack of common method bias.

**Table 1.** Results of the confirmation factor analyses.

Model	$\chi^2$	df	$\Delta\chi^2$	RMSEA	SRMR	CFI	TLI
Five-factor model: GKS; SNP; GCE; WG; GEW	368.533	265		0.022	0.033	0.999	0.999
Four-factor model: GKS + SNP; GCE; WG; GEW	1961.274	269	1592.741***	0.089	0.069	0.989	0.987
Three-factor model: GKS; SNP + GCE + WG; GEW	9698.721	272	9330.188***	0.208	0.171	0.937	0.931
Two-factor model: GKS + SNP + GCE + WG; GEW	18329.082	274	17960.549***	0.287	0.244	0.879	0.868
One-factor model: All variables combined	19964.323	275	19595.790***	0.300	0.248	0.869	0.857

Note:\*\*\* $p < 0.001$ .

**Table 2.** Evaluation of the measurement model.

Constructs	Items	Convergent validity		Internal consistency reliability		HTMT				
		Loadings	AVE	CR	CA	GKS	SNP	WG	GCE	GEW
Firms' green knowledge sharing on social media (GKS)	GKS1	0.770	0.649	0.912	0.910					
	GKS2	0.793								
	GKS3	0.775								
	GKS4	0.826								
	GKS5	0.840								
	GKS6	0.809								
	GKS7	0.825								
Social network proneness (SNP)	SNP1	0.811	0.653	0.868	0.831	0.506				
	SNP2	0.843								
	SNP3	0.775								
	SNP4	0.801								
Warm glow (WG)	WG1	0.715	0.722	0.935	0.935	0.258	0.125			
	WG2	0.877								
	WG3	0.862								
	WG4	0.887								
	WG5	0.857								
	WG6	0.892								
	WG7	0.847								
Green customer engagement (GCE) behavior for sharing knowledge online with firms	GCE1	0.885	0.782	0.907	0.907	0.226	0.141	0.507		
	GCE2	0.875								
	GCE3	0.882								
	GCE4	0.895								
Green electronic word-of-mouth (GEW) intention	GEW1	0.891	0.805	0.880	0.879	0.232	0.148	0.595	0.706	
	GEW2	0.907								
	GEW3	0.894								

**Table 3.** Mediating effect.

Variable	Meditation models			Conclusion
	Model 1 Coff.(SE)	Model 2 Coff.(SE)	Model 3 Coff.(SE)	
Gender(C)->GEW(Y)	-0.115(0.060)	-0.096(0.055)	-0.088(0.052)	
Age(C)->GEW(Y)	-0.033(0.032)	-0.054(0.030)	-0.030(0.028)	
Education(C)->GEW(Y)	-0.062(0.032)	-0.020(0.030)	-0.021(0.028)	
GKS(X)->WG(M1)	0.240(0.034)***		0.240(0.034)***	
WG(M1)->GEW(Y)	0.537(0.030)***		0.313(0.029)***	
GKS(X)->GCE(M2)		0.206(0.035)***	0.206(0.035)***	
GCE(M2)->GEW(Y)		0.626(0.028)***	0.480(0.029)***	
SNP(W)->WG(M1)				
SNP(W)->GCE(M2)				
GKSxSNP(W)->WG(M1)				
GKSxSNP(W)->GCE(M2)				
R-sq of GEW(Y)	0.300	0.402	0.478	
F of GEW(Y)	85.129***	133.412***	145.219***	
Indirect effect of X on Y		Effect(BootSE) [Boot95%CI]		
H1:GKS->WG(M1)->GEW	0.129(0.021) [0.089;0.171]		0.075(0.014) [0.049;0.105]	Supported
H2:GKS->GCE(M2)->GEW		0.129(0.024) [0.083;0.178]	0.099(0.020) [0.062;0.140]	Supported

Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ ; C = control variable; X = independent variable; Y = independent variable; M = mediator variable; CI = confidence interval.

### Hypothesis testing

#### The parallel mediating analysis

Table 3 presents the results of the mediation models, which analyze the mediating effect of WG and GCE behavior on the relationship between GKS and GEW intention. Specifically, Model 3 of the table shows that GKS exhibits a statistically noteworthy and favorable effect on both WG ( $b = 0.240$ ,  $p < 0.001$ ) and GCE behavior ( $b = 0.206$ ,  $p < 0.001$ ). Furthermore, WG exerts a

**Table 4.** Moderated mediation effect.

Variable	Moderated mediation models			Conclusion
	Model 4 Coff.(SE)	Model 5 Coff.(SE)	Model 6 Coff.(SE)	
Gender(C)->GEW(Y)	-0.115(0.059)	-0.096(0.055)	-0.088(0.052)	
Age(C)->GEW(Y)	-0.033(0.032)	-0.054(0.030)	-0.030(0.028)	
Education(C)->GEW(Y)	-0.062(0.032)	-0.020(0.030)	-0.021(0.028)	
GKS(X)->WG(M1)	0.235(0.039)***		0.235(0.039)***	
WG(M1)->GEW(Y)	0.537(0.030)***		0.313(0.029)***	
GKS(X)->GCE(M2)		0.196(0.039)***	0.196(0.039)***	
GCE(M2)->GEW(Y)		0.626(0.028)***	0.480(0.029)***	
SNP(W)->WG(M1)	0.017(0.038)		0.017(0.038)	
SNP(W)->GCE(M2)		0.051(0.039)	0.051(0.039)	
GKSxSNP(W)->WG(M1)	0.015(0.030)		0.015(0.030)	
GKSxSNP(W)->GCE(M2)		0.064(0.030)*	0.064(0.030)*	
R-sq of GEW(Y)	0.300	0.402	0.478	
F of GEW(Y)	85.129***	133.412***	145.219***	
Index of moderated mediation		Index(BootSE) [Boot95%CI]		
H3:SNP moderates (GKS->WG->GEW)	0.008(0.017) [-0.026;0.043]		0.005(0.010) [-0.015;0.025]	Rejected
H4:SNP moderates (GKS->GCE->GEW)		0.040(0.020) [0.001;0.079]	0.030(0.015) [0.001;0.061]	Supported

Note:\*\*\* $p < 0.001$ ;\*\* $p < 0.01$ ; $p < 0.05$ ; W = Moderating variable.

considerable beneficial impact on GEW intention ( $b = 0.313, p < 0.001$ ), and GCE behavior also had a substantial positive influence on GEW intention ( $b = 0.480, p < 0.001$ ). The results of Model 3 indicate that both hypotheses, H1 and H2, which posited that GKS has a positive indirect effect on GEW intention through WG and GCE behavior, respectively, were supported. The indirect effects of GKS on GEW intention through WG and GCE behavior were 0.075 (Boot95%CI = [0.049; 0.105]) and 0.099 (Boot95%CI = [0.062; 0.140]), respectively.

### Moderated mediation analysis

Table 4 presents the results of the moderated mediation models. Model 6 of the table shows that GKS displays a significant positive impact on both WG ( $b = 0.235, p < 0.001$ ) and GCE behavior ( $b = 0.196, p < 0.001$ ). Furthermore, the interaction effect of GKS and SNP did not exhibit a significant beneficial influence on WG ( $b = 0.015, p > 0.05$ ), whereas it was observed to have a considerable positive impact on GCE behavior ( $b = 0.064, p < 0.05$ ). The results of the moderated mediation models indicate that SNP does not significantly moderate the relationship between GKS and GEW intention through WG (H3: Index = 0.005, Boot95%CI = [-0.015; 0.025], rejected) but substantially moderates the relationship between GKS and GEW intention through GCE behavior (H4: Index = 0.030, Boot95%CI = [0.001; 0.061], supported). These findings suggest that SNP plays a significant role in the relationship between GKS and GEW intention when GCE behavior mediates it.

Figure 2 illustrates that with increased levels of SNP, the slope of the line depicting the relationship between GKS and GEW intention mediated by GCE behavior also rises, resulting in a significantly steeper slope compared to lower levels of SNP. Consequently, SNP moderates the indirect effect of GKS on GEW intention via GCE behavior, thereby confirming H4.

### Discussion

Based on the research findings, WG was found to mediate the effect of GKS on GEW intention, supporting H1. This aligns with past research on the positive relationships between

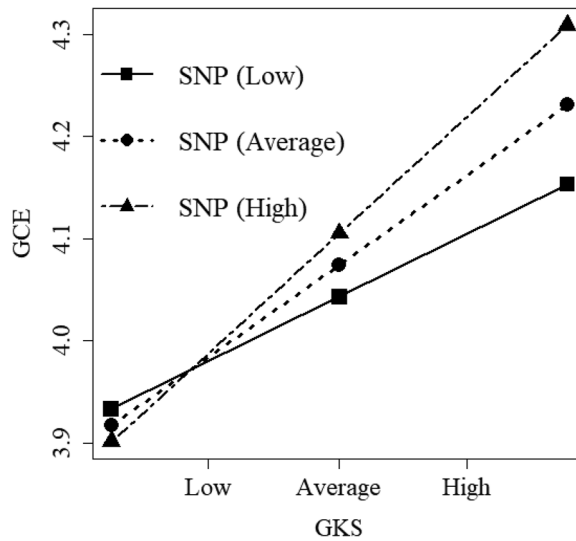


Figure 2. The moderating effect of SNP on the association that connects GKS and GCE behavior.

pro-environmental programs and WG (Giebelhausen et al., 2016) and between WG and eco-friendly intentions/behaviors (Habel et al., 2016). Specifically, our results provide empirical evidence that GKS can enhance customers' WG in tourism, subsequently driving GEW intention. This highlights the integral role of emotional motivations like WG arising from voluntary sustainability efforts in converting GKS into a viral propagation of green messages (Andrews et al., 2014; Habel et al., 2016). This is a departure from previous research, which primarily focused on internal organizational factors, such as employees' GKS as the main drivers of green intentions/behaviors in the tourism sector.

Additionally, GCE behavior was found to mediate the GKS–GEW link, supporting H2. This finding corroborates past studies, underscoring online engagement as a pivotal intermediary mechanism connecting company green initiatives to customer eco-conscious behaviors across digital contexts (Hollebeek et al., 2019). Our findings demonstrate that GKS can boost participation in reciprocal GKS, which in turn enhances GEW intention. This indicates that engaged co-creation represents a critical pathway through which GKS fosters the viral transmission of environmental messages (Hollebeek et al., 2019; Kumar & Pansari, 2016). Hence, the current study distinguishes itself from previous research in green marketing within the tourism sector by employing a dual mediation mechanism, supporting both H1 and H2, in contrast to the prevalent focus on single mediation mechanisms, such as CE (Hollebeek et al., 2019) and perceptions of greenwashing (Majeed & Kim, 2023).

Interestingly, SNP positively moderated the mediating effect of GCE behavior on the GKS–GEW link, supporting H4. This finding aligns with past research underscoring the integral role of social media engagement in enhancing the effectiveness of green marketing initiatives (Kumar et al., 2016). Specifically, our results reveal that frequent social networking strengthens the impact of hospitality firms' GKS on promoting participation in eco-conscious knowledge exchange, subsequently boosting GEW intention. This indicates the need to account for customers' digital habits when leveraging online platforms for green marketing efforts (Kumar et al., 2016). However, diverging from H3, SNP did not significantly moderate the indirect GKS–WG–GEW relationship. One potential explanation is that while SNP may amplify general social media engagement with firms (Kumar et al., 2016), it does not necessarily strengthen the WG emotion arising specifically from green actions. This contrasts with hypotheses based on previous links between social media use and environmental commitment (Kumar et al., 2016). Further investigation

incorporating additional individual and contextual factors could provide greater insight into these nuanced relationships.

### ***Theoretical implications***

This study adds significant value to the current research on green tourism, particularly by enhancing novel insights into content marketing practices within the tourism domain.

First, to mainstream sustainability, this research draws on S-DL theory to explain multi-partner collaborations in tourism services that lead to addressing environmental issues (Font et al., 2021). For example, using a user-centered design process to identify shared sustainability values, researchers co-created tailored sustainable tourism prototypes within the multi-stakeholder partnership, a collaboration involving academics, a non-governmental organization, a city center, and travel agencies (Font et al., 2021). Our research paves a fresh trail by delving into the dynamics of multi-partner interactions, illuminating the crux role of collaboration and resource exchange, such as green knowledge, in fostering a mutually beneficial ecosystem within the tourism sector, thereby amplifying existing literature (Font et al., 2021; Vargo, 2021). Based on S-DL, this study emphasizes the importance of collaboration and exchanging resources to create value that benefits all ecosystem parties. We contribute to the sustainable tourism literature by shifting the focus onto operant resources, proposing a novel predictor (e.g. GKS) for green marketing within the tourism industry. Uniquely based on S-DL in the tourism sector (Font et al., 2021), this study is the first to probe into the operant resource within the green context of multi-partner co-creation rather than active tourist–firm collaboration in prior studies like Song et al. (2022).

Second, our research contributes to the evolution of green marketing within the tourism sector by emphasizing the importance of GKS. Instead of limiting itself to eco-centric advertisements, this approach actively involves stakeholders in sustainability practices. For instance, by educating through social media, companies like a Chinese nanotechnology lab have significantly increased stakeholder engagement with their new eco-friendly pesticide in rural China (Zhang et al., 2021). This interactive strategy not only strengthens brand relationships but also allows for insight-driven transparency, targeted guidance, and stakeholder transformation into brand advocates, all while disseminating messages cost-effectively (Font et al., 2021; Zhang et al., 2021). This study, a novel academic endeavor, pioneers the empirical association of GKS with green behavioral intentions (e.g. GEW intention). Specifically, it highlights the crucial role of GKS as a preferable alternative to traditional advertising methods, which can often be both-ersome and misleading to tourists (Majeed & Kim, 2023).

Third, based on S-DL theory, this paper is essential to contributing to the existing literature on sustainable tourism by adding a dual mediation pathway, where WG and GCE behavior function as mediators linking GKS to GEW intention. Existing research has highlighted the role of knowledge sharing in facilitating CE on social media (Zhang et al., 2022). However, limited attention has been given to the impact of GKS on GEW intention through the parallel mediation role of WG and GCE behavior. Moreover, previous studies have primarily focused on a single mediation path (Andrews et al., 2014; Hollebeek et al., 2019), whereas this research proposes a parallel mediation mechanism, which includes WG and GCE behavior as key mediators (Ahmed et al., 2016). Proposing a novel parallel mediation mechanism embracing WG and GCE behavior uncovers the nuanced pathways through which GKS influences GEW intention, enriching the S-DL grounded narrative around environmental management and marketing–customer outcomes (Ahmed et al., 2016; Vargo & Lusch, 2004).

Fourth, examining SNP as a moderated mediation factor represents a novel contribution to the tourism/hospitality literature, diverging from previous studies that merely focused on its role as a moderator (Kumar et al., 2016) or a control variable (Scholl-Grisseemann et al., 2020). Research on green marketing has primarily overlooked the moderating role of SNP (Kumar et al., 2016) on the indirect effect of GKS on GEW intention through GCE behavior. This investigation



focuses on the interactional effects of SNP (Kumar et al., 2016) and GKS, highlighting the moderated effect of SNP on the indirect effect of GKS on GEW intention through GCE behavior. Our exploration of SNP's moderating role unveils an intricate layer of how online social networks, interwoven with GKS, influence CE and experiential word-of-mouth, accentuating the need for further inquiry into this interaction (Peters & O'Connor, 1980; Quero & Mele, 2022).

### **Practical implications**

In line with the mission of sustainable tourism, businesses in the tourism sector must reconceptualize their GKS initiatives. Rather than viewing GKS as merely a channel for distributing knowledge about sustainable practices, tourism firms should strategize it as a cornerstone for building a community of environmentally conscious tourists. By doing so, they can significantly amplify GEW intention among tourists. Specifically, they can take an interactive, engaging approach by responding to queries, providing guidance, and featuring user stories to stimulate customer dialogue. This allows companies to collaborate with customers to co-create tailored green knowledge. For instance, firms can conduct interviews and surveys to understand specific user needs regarding sustainability (Font et al., 2021). By exchanging insights on green practices, tourism enterprises can spark positive tourist intentions and eco-friendly behaviors.

Furthermore, the findings reveal two pivotal pathways – WG and GCE behavior – through which GKS influences GEW intention. Accordingly, tourism managers must nurture WG by enabling clients to derive emotional fulfillment from sustainability efforts. For example, travel agencies could highlight carbon offsetting opportunities, allowing customers to voluntarily support environmental projects that provide personal satisfaction. Additionally, tourism enterprises should cultivate active GCE behavior by consistently sharing green insights and knowledge. For instance, hospitality brands can launch multimedia campaigns featuring sustainability challenges to inspire engaged dialogues regarding environmental protection. Overall, strategies stimulating WG and GCE behavior can activate these mediating mechanisms, thereby converting GKS into viral GEW intention propagation.

Moreover, recognizing the increase in tourists' propensity to spend more time on social media, tourism businesses should craft personalized, platform-specific strategies. This tailored approach ensures that the green messaging of the tourism firm deeply resonates with tourists, fostering a digitally engaged, eco-conscious community characterized by a pronounced SNP. Simultaneously, this strategy enhances the influence of GKS on GEW intention through the outlined mediating mechanisms.

### **Limitations and further studies**

This research offers valuable insights into the dynamics of green marketing in the sustainable tourism sector. However, its reliance on self-reported measures, while providing valuable subjective insights, may also introduce response biases and inaccuracies in capturing actual green intentions/behaviors (Podsakoff et al., 2003). Additionally, the focus on the Vietnamese tourism context offers in-depth local insights but simultaneously narrows the study's applicability to broader, more diverse cultural landscapes. Moreover, although the study has provided unique theoretical contributions regarding co-collaboration in a multi-actor context of S-DL in the tourism sector, it is limited to examining the impact of GKS on GEW intention through the dual mediation mechanisms of WG and GCE behavior, along with the moderated mediation of SNP.

Future research avenues should, therefore, include a multifaceted approach. First, future research might employ an experimental research design, which could reduce biases and enhance reliability (Podsakoff et al., 2003). Second, comparative studies across different cultural contexts are essential to discern universal versus culture-specific green behavior patterns. This approach

will enrich the academic discourse on green tourism and offer pragmatic, cross-cultural insights for industry stakeholders aiming to promote sustainable tourism globally. Last, future studies should analyze contextual mechanisms like institutional work (Vargo, 2021) and other mediating mechanisms related to emotional value (Font et al., 2021), further extending the current research model.

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