What keeps users loyal to ride-hailing? Insights from the sharing economy

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Abstract

Purpose – Integrating value–belief–norm (VBN) theory and self-determination theory (SDT), this study aims to examine how environmental values and psychological motivations influence users loyalty in the evolving ride-hailing industry.

Design/methodology/approach – A quantitative approach was used using a nonprobabilistic purposive sampling technique, yielding 350 valid responses from experienced ride-hailing users. Data were analyzed using partial least squares structural equation modeling (PLS-SEM), a method for examining and predicting complex relationships among variables, to test the proposed hypotheses.

Findings – The results reveal that security perception exerts the strongest influence on word-of-mouth (WOM), followed by environmental consciousness, personal innovativeness and perceived value. WOM significantly influences repurchase intention (RPI). Surprisingly, environmental consciousness negatively moderates the relationship between WOM and RPI.

Originality/value – This study contributes to the literature on the sharing economy by applying the perspectives of SDT and VBN theory. The study also sheds light on the attitude–behavior gap in ride-hailing by examining the moderating role of environmental consciousness.

Keywords Attitude–behavior gap, Customer loyalty, Environmental consciousness, Ride-hailing, Self-determination theory, Value–belief–norm theory

Paper type Research paper

是什么让用户对网约车保持忠诚？来自共享经济的洞察

摘要

研究目的 – 本研究整合价值—信念—规范（VBN）理论与自我决定理论（SDT），探讨环境价值与心理动机如何影响不断发展的网约车行业中的用户忠诚。

研究设计/方法/路径 – 研究采用定量方法，通过非概率目的抽样获得350名具有网约车使用经验的有效样本， 并运用偏最小二乘结构方程模型（PLS-SEM）检验变量之间的复杂关系与研究假设。

Conflict of interest: The authors declare that there are no conflicts of interest regarding the publication of this paper.

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研究发现 – 结果表明, 安全感知对口碑传播（WOM）的影响最强, 其次为环境意识、个人创新性与感知价值。口碑传播显著促进再购买意向 (RPI)。值得注意的是, 环境意识在口碑与再购买意向之间发挥负向调节作用, 体现出一定的态度—行为不一致现象。

创新性/价值 – 本研究通过引入SDT与VBN理论视角, 丰富了共享经济背景下用户忠诚的研究。同时, 通过揭示环境意识的调节作用, 深化了对网约车领域中态度—行为差距的理解。

关键词 态度—行为差距, 顾客忠诚, 环境意识, 网约车, 自我决定理论, 价值—信念—规范理论

文章类型 研究型论文

1. Introduction

The sharing economy model is emerging as a new economic model where individuals and organizations share resources, services and information through online platforms or collaborative communities (Böcker and Meelen, 2017). Prominent among these sectors is transportation, which is a well-known manifestation of this model (Chalermpong *et al.*, 2023). By connecting passengers with independent drivers, ride-hailing services have become deeply embedded in contemporary urban life (Tirachini, 2020).

Currently experiencing remarkable growth, ride-hailing has become a cornerstone of this transition. The global ride-hailing market was valued at US$191.3bn in 2024 and is projected to reach US$381.3bn by 2033, with significant growth concentrated in the Asia-Pacific region (Research and Markets, 2024). Specifically, China is expected to grow around 36% annually (Huang *et al.*, 2025). In emerging markets, growth is projected starting in 2025: Indonesia is expected to increase from US$3.77bn to US$5.34bn by 2030 (Mordor-Intelligence, 2026); Vietnam is forecast to rise from US$1.05bn to US$2.56bn by 2030 (Mordor-Intelligence, 2025); and India, most impressively, is projected to grow from US$2.51bn to US$11.06bn by 2033 (Grand View Research, 2026). Alongside conventional fuel-based fleets, global sustainable mobility strategies are driving the electrification of ride-hailing platforms (Kumar *et al.*, 2025; Wang *et al.*, 2024). This transition is evident in the electric vehicles adoption of Uber and Lyft in developed markets (Tirachini, 2020), autonomous fleets in China (Wu and Mvondo, 2025) and emerging electric taxi services like Xanh SM or Grab's partnerships in Southeast Asia (Hakam and Jumayla, 2024; Nguyen *et al.*, 2025).

Accordingly, the expansion of ride-hailing services has been driven by technological innovations, evolving consumer motives and urban mobility challenges (Tham *et al.*, 2023). The widespread adoption of smartphones and global positioning systems has enabled the efficient operation of platform-based mobility services (Hamari *et al.*, 2016; Wu and Mvondo, 2025). Consumers, particularly younger generations, are shifting from vehicle ownership to access-based and on-demand mobility (Fauzi and Sheng, 2021; Jeon and Hwang, 2025), reflecting a growing sense of environmental responsibility (Lu and Shi, 2025), perceived as a personal moral obligation (Nguyen *et al.*, 2025). In highly congested megacities such as Jakarta and Ho Chi Minh, motorcycle-based ride-hailing services are widely used because they can navigate traffic congestion and reduce travel time (Chalermpong *et al.*, 2023).

Loyalty research is a topic deserving consideration in the sharing economy (Lee *et al.*, 2024; Tham *et al.*, 2023). Specifically, Rossmannek and Chen's (2023) meta-analysis shows that loyalty has become considerably more complex in digitally intensive service settings. Earlier studies have applied self-determination theory (SDT) to explain users' behavioral intentions (Ryan and Deci, 2000). For instance, Hamari *et al.* (2016) and Oliveira *et al.* (2022) integrated SDT to examine behavioral intentions. However, these studies primarily focused on the sharing economy in general, which may overlook the unique characteristics of specific sectors. Responding to this limitation, Tussyadiah (2016) examined guests' intention to use peer-to-peer (P2P) accommodation, highlighting the importance of sector-specific investigations.

Based on personal value orientation, recent studies by Bretter *et al.* (2024), Jha and Kumar (2025) and Nguyen *et al.* (2025) have applied the value–belief–norm (VBN) theory to investigate users' intentions and behaviors in the ride-hailing context. These studies consistently suggest that values influence behavior through mediating mechanisms, particularly via attitudes (Nguyen *et al.*, 2025). However, beyond mediation, it remains unclear whether values also play a moderating role in shaping the strength of the attitude–behavior relationship. This issue is particularly relevant given the well-documented attitude–behavior gap in sustainable consumption (Bretter *et al.*, 2024; Hamari *et al.*, 2016). This gap suggests that the translation of attitudes into behavior may depend on underlying value orientations. Therefore, to extend this line of research, the present study not only integrates VBN theory (Stern, 2000) with SDT to provide a more comprehensive motivational explanation but also examines the moderating role of values (e.g. environmental consciousness) in the attitudinal-behavioral loyalty relationship. In doing so, this study aims to offer a deeper understanding of how and when attitudes translate into user loyalty in the ride-hailing context.

2. Theoretical background

2.1 Value–belief–norm and self-determination theory

Stern (2000) proposed that environmentally responsible behavior develops through a sequential causal chain linking personal values, beliefs and moral norms. It is rooted in underlying values (e.g. biospheric or altruistic values) and leads individuals to accept the view that human activities can seriously disrupt the balance of nature (Khan *et al.*, 2025). In green consumption, users behavior is often viewed as a cognitive hierarchy of values, attitudes or norms, intentions and behaviors (e.g. Lee *et al.*, 2023). These perceptions reflect the belief components emphasized in VBN and contribute to individuals' environmental motive (Nguyen and Dekhili, 2024). Such awareness subsequently facilitates the development of personal norms that support environmentally friendly transportation choices (Jha and Kumar, 2025; Lee *et al.*, 2023). However, as noted by Stern (2000), the model pays limited attention to the motivational mechanisms underlying participation in consumption activities. SDT complements this perspective by emphasizing intrinsic motivation as a key driver of behavior (Hamari *et al.*, 2016).

Ryan and Deci (2000, p. 55) define intrinsic motivation as "doing something because it is inherently interesting or enjoyable," whereas extrinsic motivation refers to behavior that is performed "because it leads to a separable outcome." Accordingly, SDT changes the focus of marketing from simple transactions to building high-quality relationships (Deci and Ryan, 2014). In the ride-hailing context, when passengers feel autonomous in choosing the mode, route and service options that satisfy their personal needs, they experience intrinsic motivation through autonomy (Tirachini, 2020). Passengers also feel competent when they can use the app effectively, reflecting confidence and understanding of the system (Oliveira *et al.*, 2022). Moreover, when platforms facilitate social interactions among passengers, drivers and user communities, relatedness emerges through a sense of belonging and mutual support (Zhang *et al.*, 2020). In line with theory, intrinsic motivation is regarded as personal innovativeness (PI) (Elnadi and Gheith, 2022) and environmental consciousness (Aktan and Kethüda, 2024; Kumar *et al.*, 2025), whereas extrinsic motivation reflects instrumental evaluations such as security perception (Menard *et al.*, 2017) and perceived value (Fauzi and Sheng, 2021).

2.2 Research concepts and hypotheses development

2.2.1 Environmental consciousness. Environmental consciousness (EC) refers to an aspect of an individual's belief system that reflects the psychological influences driving their tendency to engage in pro-environmental behaviors (Kollmuss and Agyeman, 2002). It entails an enhanced awareness of the detrimental environmental consequences caused by

irresponsible human activities, including those of businesses, products and brands (Bocken and Short, 2021). Such awareness affects individuals' attitudes and behaviors, motivating them to act in ways that reduce environmental harm (Schlegelmilch *et al.*, 1996).

Individuals with higher EC thus tend to act in alignment with autonomy, competence and relatedness needs, often viewing sustainable consumption as an extension of their moral and social identity (Aktan and Kethüda, 2024; Garg *et al.*, 2022). Kumar *et al.* (2025) argued that consumers with high environmental propensity exhibit stronger intentions to adopt green vehicles and are likely to influence the decisions of others. Moreover, consumers with strong biospheric values often acutely recognize the importance of protecting the environment and preserving the landscape (Jeon and Hwang, 2025; Nguyen and Dekhili, 2024). This belief also increases their awareness of the environmental consequences of conventional transportation and strengthens their sense of personal responsibility to mitigate such harm (Khan *et al.*, 2025). Consequently, personal norms are activated, increasing their willingness to adopt environmentally friendly transportation options and support collaborative consumption models (e.g. paying a higher price) (Sanchez-Garcia *et al.*, 2021). Accordingly, Nguyen *et al.* (2025) found that users' value orientations shape their attitudes toward environmentally friendly ride-hailing services. Accordingly, the following hypotheses are proposed:

H1a. Environmental consciousness positively impacts word-of-mouth.

H1b. Environmental consciousness strengthens the positive relationship between word-of-mouth and repurchase intention.

2.2.2 Personal innovativeness. Innovation is associated with an individual's tendency to seek novelty and embrace new experiences (Hirschman, 1980), reflecting openness to trying new things. This propensity predicts new product adoption across domains, reflecting a willingness to experiment with emerging technologies (Agarwal and Prasad, 1998). Innovative individuals are thus more likely to be early adopters of technology (Wang *et al.*, 2020).

Individuals with an innovative mindset tend to feel dissatisfied with conventional modes of mobility or consumption, which motivates them to explore more modern, convenient and efficient solutions (Elnadi and Gheith, 2022). Innovativeness also encourages users to appreciate both utilitarian values (e.g. cost savings and efficiency) and hedonic values (e.g. enjoyable and novel experiences) offered by digital platforms (Fauzi and Sheng, 2021; Wang *et al.*, 2020). Previous studies further indicate that innovativeness not only influences initial adoption intentions but also sustains continued usage due to the attractiveness of new features that are regularly introduced on these platforms (Elnadi and Gheith, 2022). Moreover, Lu and Shi (2025) found that PI negatively influences discontinuance intention, suggesting that more innovative individuals are less likely to stop using new technologies. Hence, the following hypothesis is proposed:

H2. Personal innovativeness positively impacts word-of-mouth.

2.2.3 Security perception. Security perception (SP) refers to individuals' subjective assessment of their personal safety and the safety of their belongings (Wu and Mvondo, 2025). In the sharing economy, customers are conscious of the potential risks associated with their consumption experiences (Agag and Eid, 2019). This evidence underscores the central role of SP in the adoption of sharing economy services (Kong *et al.*, 2020). Ride-hailing platforms rely heavily on collecting and using personal data for essential tasks such as communication, navigation and payments (Elnadi and Gheith, 2022). Consequently, transparency in these practices is positively correlated with user trust and their willingness to disclose information (Cheng *et al.*, 2021). Despite ongoing challenges, enhanced security measures (e.g. secure payment systems) aim to minimize risks and strengthen trust (Jeon and

Hwang, 2025). Cheng *et al.* (2021) found that users tend to disclose personal information when they perceive sufficient benefits and when perceived risks are relatively low. Accordingly, when customers perceive a higher sense of warmth and weigh benefits more heavily than risks, their willingness to share personal information increases (Li *et al.*, 2025). Nguyen-Phuoc *et al.* (2021) found that privacy and security are associated with word-of-mouth (WOM). Therefore, the following hypothesis is proposed:

H3. Security perception positively impacts word-of-mouth.

2.2.4 Perceived value. According to Zeithaml (1988), perceived value (PV) entails the comprehensive evaluation of what customers receive as well as what they contribute to the product or service usage process. In the sharing economy, Zhang *et al.* (2019) argue that PV, encompassing technical, economic, social and emotional factors, is a key determinant of the success of innovative technologies. Through a meta-analysis, Ertz and Sarigöllü (2022) found that emotional and flexibility utilities have the strongest influence on users' intentions to use collaborative economy platforms, while functional and social utilities more strongly increase the willingness to pay a premium price. Thus, customer choices in ride-hailing services are largely driven by their PV (Herjanto *et al.*, 2024).

Regarding technical aspects, a functional and easy-to-use booking app is essential to enhance PV and drive customer loyalty through continuous usage and positive WOM (Nguyen-Phuoc *et al.*, 2021). The economic aspect refers to the cost of using the product or service, particularly its affordability and perceived fairness (Hakam and Jumayla, 2024). It also includes value from promotions and discounts (Fauzi and Sheng, 2021). Concerning the social aspect, passengers can benefit from participating in ride-hailing services and become part of a broader user community (Oliveira *et al.*, 2022). Sharing personal experiences and subjective meanings within this community is common (Lu and Shi, 2025). Furthermore, social approval from peers and a safe, supportive environment enhance customer trust and long-term commitment to the sharing practice (Tham *et al.*, 2023). Finally, emotional aspects include personalized experiences and satisfaction with the service (Cheng *et al.*, 2021). Fauzi and Sheng (2021) found utilitarian value and hedonic value have a positive influence on continuance intention to use ride-hailing apps. Based on the above arguments, the following hypothesis is proposed:

H4. Perceived value positively impacts word-of-mouth.

2.2.5 Loyalty. Early loyalty research predominantly operationalized the construct through behavioral indicators such as repeat purchase (Back and Parks, 2003). However, Bandyopadhyay and Martell (2007) argued that behavioral loyalty alone is insufficient, as repeat usage may result from habit, convenience or limited alternatives rather than genuine commitment. Consequently, subsequent studies conceptualized loyalty as a two-dimensional construct comprising attitudinal loyalty (e.g. WOM) and behavioral loyalty (e.g. repurchase intention [RPI]) (Lee *et al.*, 2024).

In the sharing economy, loyalty becomes increasingly complex due to dynamic experiential interactions (Rossmannek and Chen, 2023; Tham *et al.*, 2023). WOM refers to the voluntary expression of positive evaluations through recommendations and favorable communication about sharing economy services to others (Do and Pereira, 2023). In addition, RPI captures customers' future commitment to reuse the service and is widely recognized as a behavioral outcome of WOM (Kudeshia and Kumar, 2017). Elnadi and Gheith (2022) found that positive attitudes toward ride-hailing apps increase users' reuse intention. Drawing on this reasoning, we proposed the hypothesis as follows:

H5. Word-of-mouth positively impacts repurchase intention.

Figure 1 outlines our research design.

3. Research methodology

3.1 Design, procedures and participants

Ho Chi Minh City was selected as the empirical context due to its dynamic and digitally advanced urban economy. With about 9.54 million inhabitants (Statista, 2025), the city has the country's largest urban population and leads the ride-hailing market with a 28% share in 2023 (Mordor-Intelligence, 2025).

The study used purposive sampling to recruit individuals with previous ride-hailing service experience. This approach is effective for studying emerging phenomena, such as eco-friendly consumption, where informed user perspectives ensure data relevance (e.g. Aktan and Kethüda, 2024; Garg *et al.*, 2022; Kumar *et al.*, 2025). In line with Kock *et al.* (2021) and Zickar and Keith (2023), the study used a dual-mode approach. About 70% of responses were collected online via google forms and social media (e.g. Messenger, Zalo), while 30% of responses were obtained through paper questionnaires at high-traffic locations. To encourage offline participation, anonymity was assured and small tokens were provided. The survey took about 8 min to complete.

We obtained a total of 390 completed questionnaires. After eliminating invalid responses (e.g. straight-lining, zig-zagging or Christmas-treeing), 350 usable responses were retained, yielding a valid-response rate of 89.74%. This final sample size exceeded the minimum required sample size of 166, which was calculated using G*Power (version 3.1.9.7). We then profiled respondents' sociodemographic characteristics. Regarding gender, 59.43% were female. The largest age group was 31–44 years (49.71%), followed by 26–30 years (20.00%) and 18–25 years (13.14%). In terms of educational attainment, most respondents held a bachelor's degree (55.43%) or a postgraduate degree (24.57%). The majority were office workers (82.29%). In terms of monthly income, 53.71% earned between VND 10 and 20 million. Regarding usage frequency, 37.71% used these services one to two times per month, while 29.14% used it more than twice per week. Overall,

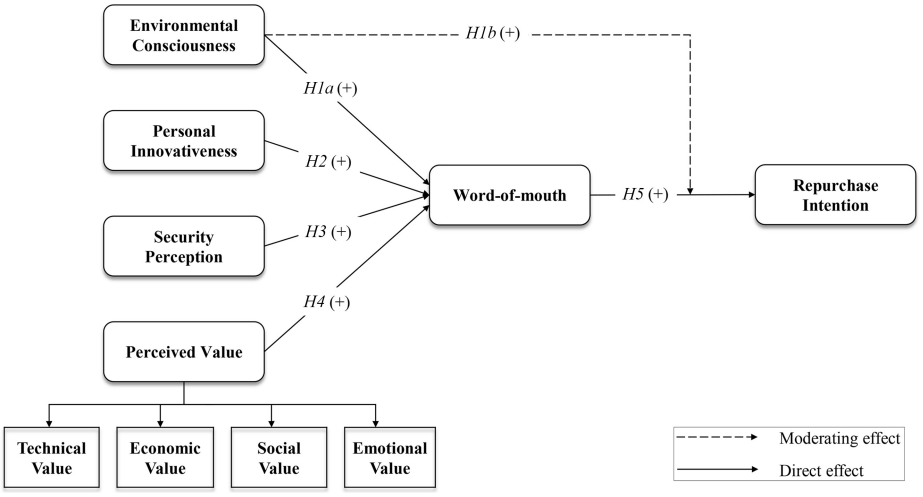

Figure 1. Research model
Source: Authors' own work

these characteristics suggest that the sample broadly reflects the typical profiles of users (see Table 1).

3.2 Measures

All measurement scales were adapted from previous studies and translated from English into Vietnamese using a forward–backward translation procedure that prioritized conceptual equivalence over literal accuracy (Maneesriwongul and Dixon, 2004). Two expert panel members (one academic and one industry specialist) conducted the forward translation, after which another academic who was not involved in the initial translation performed the back translation. The full panel of five experts (two academics and three transportation specialists) then reviewed the back-translated and original versions to assess semantic equivalence, clarity and contextual relevance. Based on their feedback, only minor linguistic adjustments were required, mainly related to technical terms (e.g. carbon footprint), indicating adequate content validity of the adapted

Table 1. Demographic details of respondents

Sample characteristics	Frequency	Rate (%)
Gender		
Male	142	40.57
Female	208	59.43
Age (years)		
Under 18	8	2.29
From 18 to 25	46	13.14
From 26 to 30	70	20.00
From 31 to 44	174	49.71
From 45 to 55	46	13.14
Over 55	6	1.71
Education		
High school	28	8.00
Intermediate/college	42	12.00
Graduate	194	55.43
Postgraduate	86	24.57
Occupation		
Office staff	288	82.29
Student	18	5.14
Freelance	20	5.71
Others	24	6.86
Income (VND)		
No income (dependent)	16	4.57
Less than 10m	64	18.29
From 10m to less than 20m	188	53.71
From 20m to less than 30m	46	13.14
Over 30m	36	10.29
Frequency of service usage		
More than two times per week	102	29.14
One to two times per week	66	18.86
One to two times per month	132	37.71
One to two times per year	50	14.29

Source(s): Authors' own work

measures. Before the main data collection, the survey was pilot-tested with 40 regular ride-hailing users to evaluate and refine the measurement scales. The constructs assessed included EC (Do Paco *et al.*, 2019); PI (Shaikh *et al.*, 2024); SP (Park and Kim, 2006); PV (Zhang *et al.*, 2019); WOM (Nguyen-Phuoc *et al.*, 2021); RPI (Fauzi and Sheng, 2021; Shaikh *et al.*, 2024). The study used a five-point Likert scale from 1 strongly disagree to 5 strongly agree (see Appendix).

This study utilized partial least squares structural equation modeling (PLS-SEM) for methodological reasons. First, it is particularly suitable for analyzing complex structural models that involve multiple latent variables relationships (i.e. latent interaction – EC × WOM) (Hair *et al.*, 2022). Second, it is robust in situations with limited sample sizes and non-normally distributed data, which aligns with the characteristics of the present data set (Hair *et al.*, 2017). Third, PLS-SEM is widely recommended for predictive, variance-based modeling and for contexts where theory is being extended rather than strictly confirmed (Hair *et al.*, 2019). Finally, this method remains preferred in consumer research for its simplicity, precision and agility (Becker *et al.*, 2023).

4. Data analysis and results

4.1 Measurement model

4.1.1 Common method bias assessment. To address concerns regarding common method bias (CMB) inherent in self-reported measures, two distinct statistical diagnostic tests were used (Kock *et al.*, 2021). First, Harman's one-factor test was executed; the results indicated that the first factor explained 29.19% of the variance, satisfying the criterion that no single factor should account for more than 50% of the total variance (Podsakoff *et al.*, 2003). Second, a full collinearity test was performed (Kock, 2015). All resulting VIFs (ranging from 1.433 to 2.694) fell below the conservative threshold of 3.33. The convergence of these two tests provides robust evidence that the data is free from substantial CMB (see Table 2).

4.1.2 Reliability and validity. The assessment of the measurement model followed (Hair *et al.*, 2022). Indicator loadings were first examined, all exceeding 0.708, except for items EC06 (0.520) and SP04 (0.439). Internal consistency and convergent validity were then evaluated. Results showed that all constructs demonstrated satisfactory internal consistency (Cronbach's alpha and CR > 0.70) and convergent validity, with AVE values above 0.50. According to Hair *et al.* (2022, p. 118), indicators with outer loadings between 0.40 and 0.70 should only be removed if their deletion significantly increases internal consistency or AVE; otherwise, they should be kept to preserve content validity. In this study, EC06 reflects users' pro-environmental commitment and willingness to trade off convenience, capturing attitudinal dimension that is theoretically important for sustainable transportation adoption (Nguyen *et al.*, 2025; Jha and Kumar, 2025). SP04 reflects users' privacy-related risk concerns, capturing a critical absence of concern facet that is theoretically integral to SP. This aligns with Park and Kim (2006) and Kong *et al.* (2020), who conceptualize security not only as confidence in technical protection but also as the mitigation of anxieties regarding unauthorized personal data use. Therefore, retaining EC06 and SP04 ensures the conceptual completeness of the security construct without compromising the model's overall psychometric adequacy, as presented in Table 2.

Discriminant validity was assessed using cross-loadings, the Fornell–Larcker criterion, and the heterotrait–monotrait ratio (HTMT), which represents the ratio of between-trait correlations to within-trait correlations (Hair *et al.*, 2022). All loadings exceeded their respective cross-loadings by at least 0.10, satisfying the criterion suggested by Gefen and Straub (2005) (see Table 3). The Fornell–Larcker criterion was also met, as the square root of the AVE for each construct exceeded its correlations with other constructs. Given the limited sensitivity of traditional criteria, HTMT was further examined (Henseler *et al.*, 2015). All HTMT values were below the conservative threshold of 0.85, providing additional evidence of discriminant validity. Detailed results are reported in Table 4.

Table 2. Construct, item, reliability, convergent validity, and collinearity

Construct	Item	Outer loading	Full collinearity	Alpha	CR	AVE	VIF outer
Environmental consciousness (EC)	EC01	0.793	1.441	0.874	0.907	0.624	1.927
	EC02	0.803					2.068
	EC03	0.857					2.631
	EC04	0.848					2.471
	EC05	0.863					2.574
	EC06	0.520					1.209
Personal innovativeness (PI)	PI01	0.876	1.433	0.842	0.904	0.759	2.048
	PI02	0.882					2.120
	PI03	0.856					1.865
Security perception (SP)	SP01	0.845	1.455	0.748	0.842	0.585	1.817
	SP02	0.848					1.841
	SP03	0.845					1.892
	SP04	0.439					1.108
Technical value (TV)	TV01	0.814	1.745	0.838	0.891	0.672	1.821
	TV02	0.827					1.846
	TV03	0.817					1.820
	TV04	0.823					1.796
Economic value (EV)	EV01	0.834	1.716	0.847	0.896	0.684	1.927
	EV02	0.833					1.966
	EV03	0.798					1.736
	EV04	0.846					1.991
Social value (SV)	SV01	0.804	1.941	0.838	0.890	0.671	1.850
	SV02	0.804					1.793
	SV03	0.877					2.109
	SV04	0.789					1.691
Emotional value (EMV)	EMV01	0.833	1.444	0.845	0.895	0.681	1.975
	EMV02	0.836					2.040
	EMV03	0.816					1.838
	EMV04	0.820					1.879
Word-of-mouth (WOM)	WOM01	0.890	2.694	0.875	0.923	0.800	2.340
	WOM02	0.907					2.571
	WOM03	0.886					2.244
Repurchase intention (RPI)	RPI01	0.891	1.836	0.858	0.914	0.779	2.213
	RPI02	0.884					2.237
	RPI03	0.873					2.044

Note(s): Alpha = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted; VIF = outer variance inflation factor

Table 3. Discriminant validity – cross-loadings

Construct/Item	EC	EMV	EV	PI	RPI	SP	SV	TV	WOM
EC01	*0.794*	0.128	0.212	0.368	0.223	0.268	0.220	0.173	0.408
EC02	*0.799*	0.072	0.168	0.227	0.263	0.282	0.241	0.180	0.376
EC03	*0.856*	0.110	0.135	0.304	0.254	0.284	0.181	0.172	0.431
EC04	*0.847*	0.134	0.223	0.293	0.261	0.316	0.246	0.167	0.422
EC05	*0.863*	0.105	0.230	0.312	0.273	0.358	0.247	0.163	0.472
EC06	*0.527*	0.079	0.213	0.217	0.134	0.213	0.222	0.156	0.284
EMV01	0.140	*0.845*	0.372	0.191	0.187	0.148	0.432	0.361	0.290
EMV02	0.106	*0.858*	0.345	0.198	0.154	0.159	0.385	0.330	0.304
EMV03	0.120	*0.788*	0.375	0.166	0.145	0.138	0.393	0.349	0.218
EMV04	0.073	*0.808*	0.358	0.120	0.173	0.138	0.403	0.314	0.246
EV01	0.174	0.378	*0.811*	0.160	0.112	0.223	0.493	0.483	0.242
EV02	0.192	0.304	*0.830*	0.092	0.186	0.210	0.446	0.452	0.274
EV03	0.189	0.341	*0.803*	0.194	0.194	0.176	0.437	0.415	0.277
EV04	0.294	0.414	*0.864*	0.213	0.264	0.257	0.480	0.456	0.342
PI01	0.295	0.133	0.139	*0.876*	0.370	0.222	0.186	0.133	0.435
PI02	0.338	0.212	0.184	*0.882*	0.378	0.329	0.222	0.152	0.435
PI03	0.325	0.197	0.206	*0.856*	0.408	0.301	0.252	0.194	0.423
RPI01	0.300	0.154	0.215	0.393	*0.889*	0.312	0.182	0.168	0.592
RPI02	0.255	0.165	0.227	0.401	*0.885*	0.329	0.203	0.226	0.562
RPI03	0.243	0.210	0.184	0.376	*0.874*	0.325	0.182	0.221	0.579
SP01	0.304	0.187	0.243	0.238	0.295	*0.845*	0.310	0.238	0.449
SP02	0.315	0.161	0.228	0.328	0.307	*0.848*	0.275	0.277	0.461
SP03	0.311	0.138	0.187	0.275	0.324	*0.845*	0.234	0.215	0.450
SP04	0.164	−0.003	0.141	0.108	0.160	*0.439*	0.098	0.083	0.203
SV01	0.186	0.351	0.353	0.133	0.120	0.215	*0.790*	0.320	0.247
SV02	0.210	0.402	0.422	0.199	0.198	0.249	*0.818*	0.348	0.329
SV03	0.245	0.450	0.569	0.195	0.214	0.297	*0.876*	0.759	0.398
SV04	0.284	0.380	0.448	0.294	0.149	0.260	*0.788*	0.376	0.303
TV01	0.221	0.315	0.439	0.159	0.204	0.209	0.426	*0.839*	0.352
TV02	0.188	0.356	0.455	0.166	0.177	0.279	0.492	*0.820*	0.299
TV03	0.137	0.285	0.451	0.131	0.201	0.218	0.471	*0.818*	0.302
TV04	0.139	0.394	0.441	0.143	0.175	0.220	0.526	*0.802*	0.278
WOM01	0.488	0.265	0.277	0.417	0.593	0.459	0.291	0.286	*0.887*
WOM02	0.427	0.273	0.325	0.464	0.628	0.485	0.339	0.352	*0.907*
WOM03	0.458	0.331	0.329	0.445	0.537	0.479	0.435	0.372	*0.890*

Note(s): The italicized values indicate the highest factor loadings of each indicator on its corresponding construct
Source(s): Authors' own work

Table 4. Discriminant validity using the criterion by Fornell–Larcker criterion and HTMT method

Construct	EC	EV	EMV	PI	RPI	SP	SV	TV	WOM
EC	*0.790*	0.288	0.155	0.427	0.346	0.449	0.336	0.248	0.584
EV	0.247	*0.827*	0.515	0.236	0.268	0.330	0.650	0.648	0.397
EMV	0.134	0.436	*0.825*	0.243	0.234	0.210	0.574	0.490	0.371
PI	0.366	0.202	0.207	*0.871*	0.521	0.396	0.299	0.218	0.576
RPI	0.302	0.236	0.200	0.442	*0.883*	0.449	0.245	0.273	0.755
SP	0.367	0.264	0.177	0.325	0.365	*0.765*	0.379	0.343	0.640
SV	0.284	0.559	0.488	0.252	0.214	0.315	*0.819*	0.661	0.453
TV	0.212	0.544	0.409	0.183	0.231	0.281	0.580	*0.820*	0.436
WOM	0.511	0.348	0.325	0.495	0.655	0.531	0.398	0.377	*0.894*

Note(s): Diagonal and italicized elements are the square roots of the AVE. Above the diagonal elements are the HTMT values. Below the diagonal elements are the correlations between the constructs
Source(s): Authors' own work

4.1.3 Validating higher-order construct. As part of the measurement model evaluation, the reliability and validity of the higher-order construct PV were assessed. Following the guidelines of Sarstedt *et al.* (2019), Table 5 presents the analysis results for each lower-order construct of PV. The assessment involved examining key statistical indicators, including outer weights, outer loadings, *t*-statistics and *p*-values. These metrics ensure that each component of PV meets the necessary measurement criteria, reinforcing the robustness of the model.

4.1.4 Goodness of model. To evaluate how well the model fits the data, we used the standardized root mean square residual (SRMR). A value below 0.08 is generally considered a good fit (Henseler *et al.*, 2016). In this study, the SRMR value is 0.052, indicating that the model fits the data well. We also assessed how well the model explains and predicts key outcomes using R^2 and Q^2 values. The R^2 values show how much of the variation in the outcomes is explained by the model. Here, the model explains 50.4% of WOM and 44.6% of RPI, which indicates a moderate level of explanatory power (Hair *et al.*, 2019). In addition, Q^2 values were used to evaluate predictive relevance. As all Q^2 values are greater than zero (0.399 for WOM and 0.338 for RPI), the model demonstrates good predictive ability (Hair *et al.*, 2022). Overall, the model fits the data well and demonstrates a moderate ability to explain and predict the key outcomes (see Table 6).

4.2 Hypothesis testing

Following Hair *et al.* (2022), we followed the steps below. First, all inner VIF values were below 3, indicating that multicollinearity is not a concern in the structural model (see Table 7). Next, all path coefficients corresponding to the relationships between the latent constructs were statistically significant at the 5% level. Table 8 presents the analysis results, showing that all hypothesized relationships in the structural model are statistically significant. Specifically, EC ($\beta = 0.254$, $t = 5.417$, $p < 0.001$), PI ($\beta = 0.251$, $t = 4.718$, $p < 0.001$), SP ($\beta = 0.283$, $t = 7.842$, $p < 0.001$) and PV ($\beta = 0.222$, $t = 3.860$, $p < 0.001$) positively impact WOM. Similarly, WOM

Table 5. Outer loadings, outer weights for higher-order construct

Lower-order construct	Outer loadings	Outer weights	*t*-statistics	*p*-values
TV ← PV	0.807	1.871	35.240	0.000
EV ← PV	0.807	1.866	36.974	0.000
SV ← PV	0.836	2.315	46.028	0.000
EMV ← PV	0.722	1.087	20.488	0.000

Note(s): PV = perceived value; TV = technical value; EV = economic value; SV = social value; EMV = emotional value
Source(s): Authors' own work

Table 6. Results of R^2 and Q^2 measures

Endogenous latent variable	R^2 value	Q^2 value
Word-of-mouth	0.504	0.399
Repurchase intention	0.446	0.338

Note(s): R^2 = coefficient of determination; Q^2 = predictive relevance
Source(s): Authors' own work

Table 7. Effect size and VIF values among model predictors

	Dependent variables			
	WOM		RPI	
Predictors	f^2	VIF	f^2	VIF
EC	0.102	1.277		
PI	0.103	1.235		
SP	0.126	1.279		
PV	0.085	1.179		
WOM			0.606	1.353
EC × WOM			0.027	1.168

Note(s): f^2 = effect size; VIF = inner variance inflation factor
Source(s): Authors' own work

Table 8. Significance testing results of the structural model path coefficients

	Hypothesized path	Path coeff.	SD	*t*-Statistics	*p*-Values	95% BCa CI	Decision
H1a	EC → WOM	0.254	0.047	5.417***	0.000	[0.159, 0.343]	Supported
H1b	EC × WOM → RPI	−0.120	0.040	3.024**	0.002	[−0.199, −0.040]	Supported
H2	PI → WOM	0.251	0.053	4.718***	0.000	[0.140, 0.350]	Supported
H3	SP → WOM	0.283	0.036	7.842***	0.000	[0.206, 0.349]	Supported
H4	PV → WOM	0.222	0.058	3.860***	0.000	[0.120, 0.347]	Supported
H5	WOM → RPI	0.674	0.050	13.498***	0.000	[0.571, 0.764]	Supported

Note(s): **Significant at $p < 0.01$ ($t > 2.57$); ***Significant at $p < 0.001$ ($t > 3.29$); path coeff. = path coefficient; SD = standard deviation; BCa CI = bias-corrected and accelerated confidence interval
Source(s): Authors' own work

had a direct significant positive impact on RPI ($\beta = 0.674$, $t = 13.498$, $p < 0.001$). To provide additional evidence of the stability of the coefficient estimates, we examined the confidence intervals, which did not include zero. Hence, hypotheses *H1a*, *H2*, *H3*, *H4* and *H5* are supported. In addition, we evaluated the moderating effect of EC. To accomplish this, we used the two-stage approach recommended by Hair *et al.* (2022). Following Becker *et al.* (2018), standardized latent variable scores for EC and WOM were obtained from the main-effects model in the first stage. These standardized scores were then multiplied to construct the interaction term (EC × WOM) and incorporated into the structural model. The two-stage procedure implemented in SmartPLS software helped optimize the stability of the interaction term while effectively reducing multicollinearity (Cheah *et al.*, 2024). The results indicate that EC negatively moderates the WOM-RPI relationship ($\beta = -0.120$, $t = 3.024$, $p < 0.01$). Therefore, hypothesis *H1b* is supported.

Moreover, effect sizes (f^2) were examined to assess the significance of the relationships, with thresholds of 0.02, 0.15 and 0.35 representing small, medium and large effects, respectively (Cohen, 2013). The results indicate that EC (0.102), PI (0.103), SP (0.126) and PV (0.085) all exert small effects on WOM. In contrast, WOM has a large effect on RPI (0.606), while the moderating effect of EC (0.027) on the WOM-RPI relationship is small (see Table 7). To evaluate the sensitivity of the moderation analysis, a sensitivity power analysis was conducted using G*Power. The analysis indicated that the study could detect a minimum effect size of $f^2 = 0.023$ with 80% statistical power. This suggests that the study had adequate sensitivity to detect small moderation effects.

Figure 2 shows the relationship between the latent constructs, which was confirmed by performing a bootstrapping routine on the complete sample.

Following Murphy and Aguinis (2022), we simulate the moderation effect with greater credibility. To achieve this, we used the interactive R Shiny app developed by McCabe *et al.* (2018). Specifically, this approach enables displaying effects across a continuous range of moderator values, providing precise percentile information and illustrating the relative size of prediction errors. Building on this framework, the visualization illustrates the relationship between WOM and RPI under the moderating effect of EC. As shown in the analysis, the conditional effect is very strong at −2 SD ($\beta = 1.11$, 5.14th percentile), decreases to $\beta = 0.82$ at the mean (0SD, 48.29th percentile) and drops to $\beta = 0.53$ at + 2SD (100th percentile). Furthermore, the 95% confidence intervals (the gray-shaded areas) tend to widen as the moderator reaches higher values (i.e. at +2SD). This trend indicates larger prediction errors and reduced precision within this range. Nevertheless, across all five panels, the confidence intervals do not contain zero. Consequently, this demonstrates that the relationship between WOM and RPI remains statistically significant across the entire displayed range of the moderator, EC, as shown in Figure 3.

5. Discussion, limitations and future lines of research

5.1 Theoretical implications

The research findings provide context-specific insights into the sharing economy. From the perspective of VBN, EC has a positive effect on WOM ($\beta = 0.254$). The results indicate that

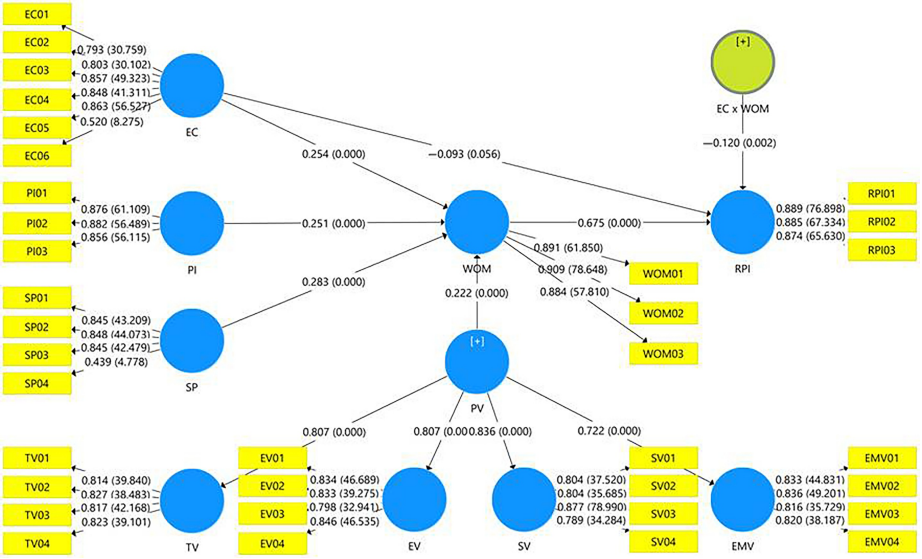

Figure 2. Assessing structural model result

Note(s): EC = environmental consciousness; PI = personal innovativeness; SP = security perception; PV = perceived value; TV = technical value; EV = economic value; SV = social value; EMV = emotional value; WOM = word-of-mouth; RPI = repurchase intention

Source: Authors' own work

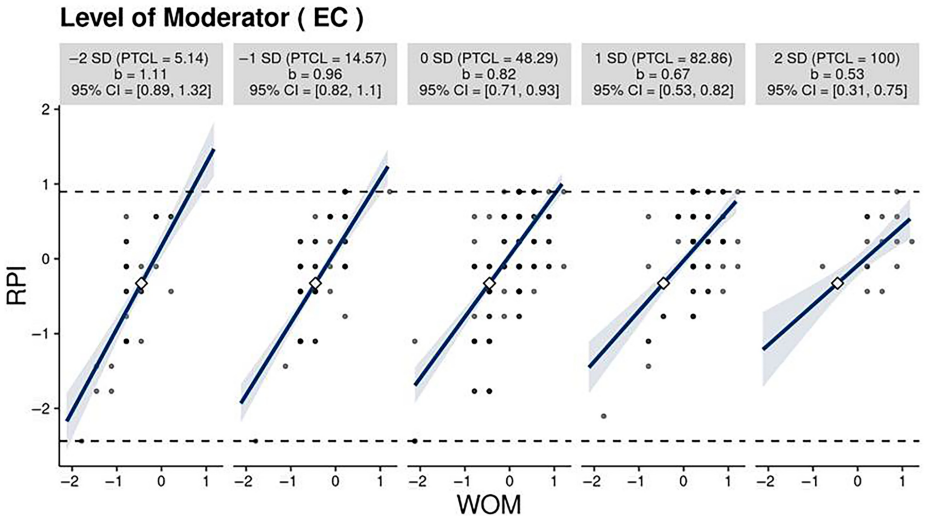

Figure 3. EC and WOM interact to predict RPI

Note(s): SD = standard deviation; PTCL = percentile; *b* = coefficient/slope; CI = confidence interval; EC = environmental consciousness; WOM = word-of-mouth; RPI = repurchase intention

Source: Authors' own work

users with higher levels of EC in this study are more likely to recommend sharing services. This finding is consistent with previous studies by Bretter *et al.* (2024), Jha and Kumar (2025) and Nguyen *et al.* (2025). Regarding intrinsic motivations, this finding contrasts with previous research indicating that users often perceive sharing services as commercially driven and self-interest-oriented activities, such as in P2P accommodation (Do and Pereira, 2023; Tussyadiah, 2016) and bike-sharing (Si *et al.*, 2020). However, given their potential environmental benefits (Huang *et al.*, 2025), a higher level of EC can still motivate users to engage more actively in sharing services and to share their experiences with others (Garg *et al.*, 2022; Kumar *et al.*, 2025). These contrasting results were also explained by Böcker and Meelen (2017), who argued that accommodation sharing is mainly driven by economic motivations, whereas ride-sharing is more strongly driven by environmental motivations. Regarding PI, the results also indicate a positive effect on WOM ($\beta = 0.251$), consistent with previous studies in Egypt, Indonesia and China (Elnadi and Gheith, 2022; Fauzi and Sheng, 2021; Lu and Shi, 2025). In addition, research in the P2P accommodation context shows that innovativeness is not merely a control variable but an important factor explaining why some customers respond more positively and adopt new technologies more quickly (Fan *et al.*, 2023).

Next, regarding extrinsic motivations, the findings indicate that SP have a positive impact on WOM ($\beta = 0.283$). This result extends the findings of Elnadi and Gheith (2022) in the ride-hailing context by examining WOM as a specific attitudinal outcome. It also complements the work of Agag and Eid (2019) in the P2P accommodation context by highlighting the role of security in encouraging recommendation behavior, beyond its traditional role in building trust. As frequent passengers, current users are willing to provide information in this context to receive tailored benefits and convenience. Regarding PV ($\beta = 0.222$), the result is consistent with previous studies showing that PV is a key driver of customer preferences and behavioral responses in P2P services (Zhang *et al.*, 2019). Sharing

platforms often provide flexible and personalized experiences, which can generate positive or hedonic sentiments toward the platform (Ertz and Sarigöllü, 2022). Meta-analytic evidence also suggests that PV plays a particularly important role in ride-sharing services (Rossmannek and Chen, 2023). Such positive experiences increase users' willingness to share their experiences with others, thereby stimulating WOM (Fauzi and Sheng, 2021). Finally, the study finds a strong positive effect of WOM on RPI ($\beta = 0.674$), consistent with previous studies (Elnadi and Gheith, 2022; Hamari *et al.*, 2016). Previous empirical research consistently shows that positive service attitudes increase the likelihood of stronger RPI.

To the best of our knowledge, this study provides the first empirical evidence of the moderating role of EC in the relationship between WOM and RPI within the sharing economy. Contrary to our expectation, the results reveal a negative moderating effect, indicating that higher levels of EC weaken the influence of WOM on RPI ($\beta = -0.120$; $p < 0.01$; $f^2 = 0.027$). Although the effect size is relatively small, it remains meaningful when considered from the perspective of green consumption (Aguinis *et al.*, 2005). Individuals with higher EC are generally more inclined to participate in the sharing economy, particularly in collective consumption practices (Aktan and Kethüda, 2024; Rossmannek and Chen, 2023). However, as noted by Hamari *et al.* (2016), collaborative consumption often exhibits an attitude–behavior gap, meaning that favorable attitudes do not necessarily translate into actual behavior (Bretter *et al.*, 2024; Carrington *et al.*, 2010). Consequently, recommendation behavior may not always lead to RPI among individuals with high EC after previous experience (Lai and Ho, 2020; Li *et al.*, 2024). One explanation lies in the nature of sustainable consumption, which emphasizes "refusing and reducing" consumption (Oliveira *et al.*, 2022). A further explanation can be drawn from Festinger's (1957) cognitive dissonance theory. Individuals with high EC often critically evaluate their consumption and the usefulness of the products they purchase because they are aware that consumption depletes natural resources and generates waste (Parguel *et al.*, 2017). Although survey participants may recognize that ride-hailing services can contribute to traffic congestion and air pollution, the reality in many developing countries is that public transportation systems remain underdeveloped. In such contexts, ride-hailing services may still represent a relatively better mobility solution (Chalermpong *et al.*, 2023; Elnadi and Gheith, 2022). Therefore, environmentally concerned users may continue to use these services, but in a more restrained manner, limiting their usage to situations of necessity (Cairns *et al.*, 2022).

5.2 Practical implications

5.2.1 For ride-hailing service providers. First, strengthening service quality and trust is critical for converting positive attitudes into continued usage. Platforms should ensure effective communication channels between customers and drivers (e.g. in-app messaging and calling), while also investing in driver training programs focused on professionalism and communication skills. Safety-enhancing features, such as trip sharing and emergency buttons, can further reinforce users' trust and perceived control, which are key drivers of behavioral consistency. Second, integrating ride-hailing services with public transportation systems can improve overall travel convenience and encourage habitual usage. For example, integrated booking systems can enable users to plan multimodal journeys more efficiently. Finally, promoting sustainable travel behavior is increasingly important, particularly to reduce reliance on fossil fuels. The transition toward electrified mobility (e.g. Xanh SM) can be supported through financial incentives for drivers to adopt electric vehicles and by expanding charging infrastructure in high-demand areas. In addition, flexible pricing strategies, such as discounts or priority booking for shared electric vehicle rides, can encourage greener choices. Providing users with in-app information about their environmental contributions (e.g. estimated emission reductions).

5.2.2 For policymakers and government agencies. First, in relation to service providers, governments should facilitate the transition toward a more sustainable and integrated mobility ecosystem. Given that ride-hailing vehicles operate at high frequency, electrifying these fleets can generate emission reduction benefits significantly greater than those of private cars (Wang *et al.*, 2024). To support, policymakers can allocate land for fast-charging infrastructure at major transport hubs and provide regulatory incentives. In addition, ride-hailing should be positioned as a complementary service to public transportation. Measures such as designated pick-up and drop-off areas near transit stations and integrated booking systems can enhance first- and last-mile connectivity. Moreover, governments should establish transparent data governance policies that protect consumer privacy while enabling data sharing for urban mobility optimization (Jiang *et al.*, 2026). For instance, initiatives such as GrabShuttle, integrated into Singapore's Beeline platform, illustrate how public–private collaboration and open APIs can support more efficient, data-driven transport services (GovTech Singapore, 2017). At the same time, regulations must ensure fair competition among mobility platforms.

Second, in relation to citizens, the government considers creating privileges for the public transport system, such as priority policies for electric bus lanes (Hakam and Jumayla, 2024). Educational initiatives, such as establishing a virtual laboratory to simulate complex interactions between passengers and drivers as part of school programs (see Huang *et al.*, 2025). Incorporating ethical framing to emphasize how shared transportation protects the environment and supports the well-being of others and the community. In addition, reflective practices, such as encouraging users to recall and evaluate their experiences with electric mobility, can strengthen intrinsic motivation (Li *et al.*, 2024). Beyond awareness, behavioral interventions should reinforce the translation of pro-environmental attitudes into actual usage. Public communication campaigns can use influencers or brand ambassadors to promote a "green" lifestyle, activating social norms and peer support. At the same time, real-time environmental information, such as air quality indicators displayed on transport apps, digital signboards or media channels, can increase users' awareness of local conditions. Recognizing sustainable practices through green certificates or badges may further incentivize continued participation and foster a stronger alignment between personal values and travel behavior.

5.3 Limitations and future research directions

This study has several limitations that provide avenues for future research. First, in terms of methodological limitations, the use of purposive sampling may constrain the representativeness of the sample, as noted by Zickar and Keith (2023). This limitation may affect the generalizability of the findings, particularly across different user segments and urban contexts. Future research could be conducted by using probability-based or stratified sampling techniques. In addition, replicating the study across multiple cities would help strengthen the external validity of the proposed model. Another methodological concern relates to the use of self-reported data, which may be subject to measurement artifacts (Hini *et al.*, 1995) or social desirability bias (Carrington *et al.*, 2010). Such biases may inflate the observed relationships between attitudes and behaviors. To mitigate these concerns, future studies could adopt procedural and statistical remedies (see Kock *et al.*, 2021), such as the marker-variable technique (e.g. Miller and Simmering, 2023), or incorporate qualitative approaches to triangulate findings and provide deeper insights into user behavior (e.g. Trinh *et al.*, 2026).

Second, from a theoretical perspective, the negative moderating effect identified in this study represents a novel and somewhat unexpected finding. While this result contributes to the literature, it also calls for further investigation into the underlying mechanisms. Future research could examine specific dimensions of EC, such as environmental concern,

environmental knowledge and environmental value to better understand how these factors shape the attitude–behavior relationship and contribute to the persistence of the attitude–behavior gap (Laheri *et al.*, 2024).

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Appendix

Table A1. Questionnaire

Constructs	Items	Questionnaires
Environmental consciousness	EC01	It is important to me that the transportation services I use are environmentally friendly
	EC02	When I make my transportation decisions, I consider their impact on the environment
	EC03	My choice of transportation is influenced by my concern for the environment
	EC04	I am concerned about the carbon footprint and resource consumption associated with transportation
	EC05	I would describe myself as someone who cares about the environmental impact of transportation
	EC06	I am willing to prioritize environmentally friendly transportation options, even if it means facing inconvenience
Personal innovativeness	PI01	I like to explore new ride-hailing applications
	PI02	I often look for reasons to try it out, when I learn about a new ride-hailing application
	PI03	I am often the first among my colleagues to test new ride-hailing applications
Security perception	SP01	This ride-hailing service manages my information securely
	SP02	I believe that the ride-hailing service I use will keep my payment information secure
	SP03	The ride-hailing service I use provides detailed information about their security measures
	SP04	I am worried that my personal information may be used by the ride-hailing service for purposes I don't want (R)
Technical value	TV01	The ride-hailing service functions are quite convenient
	TV02	The ride-hailing service meets my needs
	TV03	The ride-hailing service offers a variety of choices
	TV04	The drivers of the ride-hailing service promptly respond to my inquiries
Economic value	EV01	The pricing of the ride-hailing service is suitable for the provided service
	EV02	I can find rides with good prices through the ride-hailing service
	EV03	The ride-hailing service is a cost-effective solution compared to traditional transportation means
	EV04	The ride-hailing service has reasonable pricing
Social value	SV01	The ride-hailing service helps me make new friends
	SV02	My friends recommend using the ride-hailing service
	SV03	My friends/family prefer booking rides through the ride-hailing service over traditional taxi services
	SV04	Talking about the ride-hailing service is a common topic among my friends and me
Emotional value	EMV01	The ride-hailing service provides an enjoyable experience
	EMV02	I have pleasant surprises through the ride-hailing service
	EMV03	I have a favorable impression of the ride-hailing service
	EMV04	I feel enjoyment when using the ride-hailing service
Word-of-mouth	WOM01	I recommend ride-hailing service to anyone who seeks my advice
	WOM02	I encourage my friends and my relatives to travel by ride-hailing service
	WOM03	I say positive things about ride-hailing service
Repurchase intention	RPI01	As a user, I would keep on using ride-hailing service in the future
	RPI02	I will frequently use ride-hailing apps in the future
	RPI03	My intentions are to continue using ride-hailing service rather than use any alternative means

Note(s): (R) denotes reversed scale item
Source(s): Authors' own work

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