

The Influence of Multi-Dimensional Interaction in E-Commerce Platform Service Systems on Customer Loyalty in China: A Customer Psychology Perspective

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Chunlin Hua

Doctoral Candidate of Philosophy Program in Business Administration,
Graduate School, Stamford International University
(Corresponding Author)

Dr. Lu Suo

Lecturer of Doctor of Philosophy Program in Business Administration,
Graduate School, Stamford International University

ABSTRACT

This study develops and tests a multi-dimensional interaction framework to explain how interaction quality translates into customer loyalty through psychological and behavioral mechanisms. Drawing on Social Cognitive Theory, Social Identity Theory and Value Co-Creation Theory, the model examines the effects of interpersonal interaction, perceived ease of use, and interactional emotions on psychological ownership, customer engagement, and customer loyalty. Data were collected through an online survey administered via convenience sampling to Chinese consumers aged 18 years or above who have completed at least one purchase within the past three months on Alibaba, JD.com, or Pinduoduo. Data were analyzed with structural equation modeling. The results indicate that all three interaction dimensions significantly enhance psychological ownership and customer engagement. Psychological ownership positively influences both engagement and loyalty, while engagement further strengthens loyalty. Importantly, psychological ownership mediates the effects of interpersonal interaction, perceived ease of use, and interactional emotions on engagement, and engagement mediates the relationship between psychological ownership and loyalty. In contrast, perceived ease of use and interactional emotions do not directly predict loyalty, suggesting that functional and affective interaction elements influence loyalty primarily through internalization and participatory mechanisms.

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The findings contribute to multi-dimensional marketing literature by specifying the psychological and behavioral mechanisms through which interaction quality translates into loyalty. The study demonstrates that sustainable loyalty in multi-dimensional environments is achieved not through isolated technological or emotional enhancements, but through the systematic cultivation of psychological ownership and sustained customer engagement across integrated touchpoints.

Keywords: Multi-dimensional Interaction, Psychological Ownership, Customer Engagement, Customer Loyalty

อิทธิพลของปฏิสัมพันธ์หลายมิติในระบบบริการ แพลตฟอร์มอีคอมเมิร์ซต่อความภักดีของลูกค้าในประเทศไทย : มุมมองจิตวิทยาผู้บริโภค

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ชุนหลิน ฮัว

นักศึกษาปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาบริหารธุรกิจ
บัณฑิตวิทยาลัย มหาวิทยาลัยนานาชาติสแตมฟอร์ด
(ผู้ประสานงานหลัก)

ดร.สุ ลี

อาจารย์ประจำหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาบริหารธุรกิจ
บัณฑิตวิทยาลัย มหาวิทยาลัยนานาชาติสแตมฟอร์ด

บทคัดย่อ

การศึกษานี้ได้พัฒนาและทดสอบกรอบแนวคิดของปฏิสัมพันธ์หลายมิติ เพื่ออธิบายว่าคุณภาพของปฏิสัมพันธ์แปรเปลี่ยนไปสู่ความภักดีของลูกค้าได้อย่างไร ผ่านกลไกทางจิตวิทยาและพฤติกรรม โดยอาศัยทฤษฎีการรับรู้ทางสังคม (Social Cognitive Theory) ทฤษฎีอัตลักษณ์ทางสังคม (Social Identity Theory) และทฤษฎีการร่วมสร้างคุณค่า (Value Co-Creation Theory) แบบจำลองนี้ตรวจสอบอิทธิพลของปฏิสัมพันธ์ระหว่างบุคคล การรับรู้ถึงความง่ายในการใช้งาน และอารมณ์จากปฏิสัมพันธ์ ที่มีต่อความเป็นเจ้าของเชิงจิตวิทยา ความผูกพันของลูกค้า และความภักดีของลูกค้า ข้อมูลถูกเก็บรวบรวมผ่านแบบสอบถามออนไลน์โดยใช้การสุ่มตัวอย่างแบบสะดวกจากผู้บริโภคชาวจีนอายุ 18 ปีขึ้นไป ซึ่งได้ทำการซื้อสินค้าอย่างน้อยหนึ่งครั้งภายในช่วงสามเดือนที่ผ่านมา บนแพลตฟอร์ม Alibaba, JD.com หรือ Pinduoduo และนำข้อมูลมาวิเคราะห์ด้วยแบบจำลองสมการโครงสร้าง

ผลการวิจัยพบว่า ปฏิสัมพันธ์ทั้งสามมิติช่วยเสริมสร้างความเป็นเจ้าของเชิงจิตวิทยาและความผูกพันของลูกค้าอย่างมีนัยสำคัญ ความเป็นเจ้าของเชิงจิตวิทยามีอิทธิพลเชิงบวกต่อทั้งความผูกพันและความภักดี ขณะที่ความผูกพันยิ่งช่วยเสริมสร้างความภักดีเพิ่มเติม ที่สำคัญ ความเป็นเจ้าของเชิงจิตวิทยาทำหน้าที่เป็นตัวแปรส่งผ่านอิทธิพลของปฏิสัมพันธ์ระหว่างบุคคล การรับรู้ถึงความง่ายในการใช้งาน และอารมณ์จากปฏิสัมพันธ์ที่มีต่อความผูกพัน และความผูกพันยังทำหน้าที่เป็นตัวแปรส่งผ่านความสัมพันธ์ระหว่างความเป็นเจ้าของเชิงจิตวิทยากับความภักดีอีกด้วย ในทางตรงกันข้าม การรับรู้ถึงความง่ายในการใช้งานและอารมณ์จากปฏิสัมพันธ์ไม่ได้ทำนายความภักดีโดยตรง ซึ่งสะท้อนให้เห็นว่า องค์ประกอบของปฏิสัมพันธ์ด้านหน้าที่การใช้งานและด้านอารมณ์มีอิทธิพลต่อความภักดีเป็นหลักผ่านกลไกของการยอมรับภายในและการมีส่วนร่วม

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ผลการศึกษานี้มีส่วนช่วยต่อวรรณกรรมด้านการตลาดแบบหลายมิติ โดยระบุอย่างชัดเจนถึงกลไกทางจิตวิทยาและพฤติกรรมที่เชื่อมโยงคุณภาพของปฏิสัมพันธ์กับความภักดี การศึกษานี้แสดงให้เห็นว่า ความภักดีอย่างยั่งยืนในสภาพแวดล้อมแบบหลายมิติ มิได้เกิดจากการปรับปรุงด้านเทคโนโลยีหรือด้านอารมณ์เพียงลำพัง หากแต่เกิดจากการปลูกฝังความเป็นเจ้าของเชิงจิตวิทยาอย่างเป็นระบบ และการรักษาความผูกพันของลูกค้าอย่างต่อเนื่องผ่านจุดสัมผัสที่บูรณาการกัน

คำสำคัญ: ปฏิสัมพันธ์หลายมิติ ความเป็นเจ้าของเชิงจิตวิทยา ความผูกพันของลูกค้า ความภักดีของลูกค้า

INTRODUCTION

Digital platforms have fundamentally redefined how value is created, exchanged, and sustained. In traditional markets characterized by information asymmetry, firms exercised primary control over value creation, while customers acted largely as passive recipients of products and services (Pralhad & Ramaswamy, 2000). However, as consumers increasingly prioritize personalized experiences and emotional value, competitive advantage has shifted toward the orchestration of customer experience (Pine & Gilmore, 1999). Concurrently, advances in digital technology have enabled customers to participate directly in product development, service improvement, and content generation. Value creation has thus evolved from a firm-centric model to collaborative value co-creation involving multiple stakeholders (Vargo & Lusch, 2008). This transformation is especially visible in e-commerce platform ecosystems. Platforms such as Alibaba, JD.com, and Pinduoduo do not merely facilitate transactions; they coordinate a broader service environment in which customers interact with sellers, customer service agents, platform interfaces, recommendation systems, and other users. These interactions are not homogeneous (Pralhad & Ramaswamy, 2004). Rather, customers experience the platform through multiple interactional conditions, including interpersonal exchanges, system usability, and emotional tone. In such environments, loyalty is unlikely to be shaped by transactional evaluation alone. Instead, loyalty increasingly depends on how customers interpret and internalize their interactional experiences within the platform service system.

Despite the rapid growth of research on value co-creation and service ecosystems, several theoretical gaps remain. First, although recent studies have advanced ecosystem-level understanding of value creation, much of this work still emphasizes governance arrangements, orchestration, and structural coordination, while giving comparatively less attention to the customer-side mechanisms through which interaction is translated into loyalty (Ranjan & Read, 2021; Li et al., 2022; Re et al., 2026). In e-commerce settings, customers do not merely respond to isolated service attributes; rather, they interpret interpersonal, functional, and emotional interactional conditions and gradually transform these experiences into psychological attachment and participatory behaviors. Accordingly, the key research problem is not simply whether interaction matters, but how customer-perceived interaction dimensions within platform ecosystems are internalized and enacted to produce loyalty (Roy et al., 2023; Tuan & Doan, 2025). Second, recent service ecosystem and platform studies have moved beyond simple dyadic assumptions by highlighting multi-actor constellations, interaction diversity, and ecosystem-level experience formation. However, empirical evidence remains limited regarding how these multidirectional interactions shape customers' internal psychological states in digitally networked environments (Monferrer Tirado et al., 2024; Chen et al., 2023; Wang et al., 2024). This lack of conceptual precision makes it difficult to understand whether loyalty emerges directly from interaction quality, from accumulated experience, or from deeper forms of psychological internalization. A third gap relates to the conceptualization of loyalty itself in digital platform environments. Traditional loyalty research has often emphasized repeat purchase, continued usage, satisfaction, perceived value, or service quality

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as its main antecedents (Ye et al., 2023; Zhang & Hu, 2024; Herzallah et al., 2025; Rahman et al., 2025). While these perspectives remain useful, they are less sufficient in contexts where customers actively participate in content generation, review exchange, service interaction, and platform-based co-creation. In digitally networked service systems, customers may remain loyal not only because a platform performs well functionally, but also because they feel psychologically connected to it, invest themselves in it, and continue to enact that connection through participation. Loyalty in such settings is therefore better understood not only as a direct response to service features, but also as the outcome of a deeper process of internalization and enactment.

To address these gaps, this study is grounded primarily in value co-creation theory, while also drawing on social cognitive theory and social identity theory to explain how customer-perceived interactional experiences are translated into loyalty within e-commerce platform service systems (Tajfel & Turner, 1979). Value Co-creation Theory provides the broader contextual foundation by viewing platform ecosystems as collaborative environments in which value emerges through ongoing interaction and resource integration among multiple actors rather than being delivered unilaterally by firms. However, although platform ecosystems are multi-actor in nature, the present study adopts a customer-centered analytical lens. Specifically, it focuses on how customers perceive, interpret, and internalize the interactional conditions generated within such systems. From this perspective, Social Cognitive Theory explains how interactional conditions function as environmental inputs that shape customers' internal psychological states and subsequent behavioral responses. Repeated interaction within platform environments influences how customers evaluate the platform, how much control and emotional meaning they perceive, and whether they are motivated to remain involved. Social Identity Theory further complements this perspective by explaining how meaningful and repeated interaction may strengthen customers' sense of self-relevance, belonging, and attachment to the platform. Together, these theories support a customer-level explanation of loyalty formation in which interactional experiences are not assumed to produce loyalty automatically, but instead influence loyalty through internal psychological mechanisms.

Accordingly, this study conceptualizes loyalty formation in e-commerce platform service systems as an interaction–internalization–enactment process. Multi-dimensional interaction represents the external interaction context perceived by customers; psychological ownership reflects the internalization of these experiences into a sense of personal connection and “mine-ness”; customer engagement captures the active enactment of that internalized attachment; and customer loyalty represents the downstream relational outcome (Rahman et al., 2025; Herzallah et al., 2025). Framed in this way, the model does not attempt to explain the entire platform ecosystem. Rather, it explains a specific customer-level mechanism through which interactional experiences in platform-based service systems are translated into sustained loyalty. Consistent with this logic, the present study does not treat interaction as a single

undifferentiated construct. Instead, it conceptualizes interaction as a multi-dimensional customer experience consisting of complementary interpersonal, functional, and affective aspects.

Although prior research has not established a universally accepted taxonomy that exactly classifies interaction into interpersonal interaction, perceived ease of use, and interactional emotion, the literature provides sufficient support for treating these three dimensions as distinct yet complementary components of customer-perceived interaction experience in digital platform settings (Chen et al., 2023; Ye et al., 2023; Zhang & Hu, 2024). Interpersonal interaction captures relational exchange, responsiveness, and social connectedness; perceived ease of use reflects usability, convenience, and customer control (Ling et al., 2024, Qu et al., 2023); and interactional emotion represents the affective quality of the interaction experience (Herzallah et al., 2025; Rahman et al., 2025). By synthesizing these three streams, this study develops an integrative interaction framework that is better aligned with the realities of customer experience in contemporary e-commerce platforms.

Based on this framework, the purpose of this study is to examine how customer-perceived multi-dimensional interaction within e-commerce platform service systems influences customer loyalty through psychological ownership and customer engagement. Specifically, the study investigates the effects of interpersonal interaction, perceived ease of use, and interactional emotion on psychological ownership and customer engagement, and further examines how these two mechanisms translate interactional experiences into loyalty.

LITERATURE REVIEW

Social Cognitive Theory

Social Cognitive Theory (SCT; Bandura, 1986) conceptualizes human behavior as the product of triadic reciprocal determinism, whereby environmental conditions, personal cognitive factors, and behavior mutually influence one another. Unlike stimulus–response models, SCT emphasizes human agency: individuals actively interpret environmental cues, regulate their actions, and shape their surroundings through feedback loops. Central to SCT is the proposition that environmental stimuli influence behavior primarily through cognitive mediation. Individuals evaluate contextual signals, form efficacy beliefs, and regulate subsequent action accordingly. Self-efficacy, defined as confidence in one’s capability to perform behaviors, is particularly critical because it influences effort allocation, persistence, and goal-directed behavior. Thus, behavior is not directly caused by environmental inputs, but by individuals’ cognitive appraisal of those inputs (Zhai et al., 2023). Digital platform ecosystems represent highly interactive environments in which customers are continuously exposed to structural cues, social feedback, and affective signals. These environmental features shape customers’ psychological experiences, which in turn drive behavioral outcomes such as continued participation and loyalty. Recent empirical studies support this mechanism in digital contexts. For example, in multitouch service

encounters, different forms of customer interaction have been shown to influence loyalty through intervening psychological dependence (Chen et al., 2023). In social commerce, platform attributes such as content informativeness, service quality, webpage attractiveness, and word-of-mouth significantly enhance customer engagement, which subsequently increases repurchase intention (Herzallah et al., 2025). In e-commerce live streaming, user-generated content cues significantly influence purchase intention through psychological ownership and communicative presence, indicating that interactive and emotional platform signals affect behavior through internal psychological states (Zhang & Hu, 2024). Related research also shows that omnichannel customer experiences affect customer engagement and repurchase intentions, while digital touchpoint usage experience influences customer loyalty through digital engagement and satisfaction (Rahman et al., 2025; Nanta et al., 2025). SCT therefore provides a dynamic framework for modeling value co-creation as an environment-to-cognition-to-behavior process. In this view, multi-party interaction constitutes the environmental driver; psychological ownership and engagement represent cognitive-affective mediators; and loyalty reflects the behavioral manifestation. Although psychological ownership and engagement are not original SCT constructs in a strict sense, positioning them as context-specific personal factors and mediating psychological states is consistent with SCT's broader logic that environmental influences are translated into behavior through internal appraisal and self-regulatory processes (Zhai et al., 2023).

Social Identity Theory

Social Identity Theory (SIT; Tajfel & Turner, 1979) explains how individuals incorporate group membership into their self-concept through processes of categorization, identification, and comparison. Individuals seek positive self-definition and are motivated to maintain favorable social identity. When identification with a group or organization strengthens, individuals are more likely to engage in behaviors that support that entity. In platform ecosystems, customers participate in communities characterized by shared norms, symbolic meaning, and interactive exchange. Repeated interaction fosters self-platform integration, whereby the platform becomes psychologically incorporated into the individual's identity structure. Such identification mechanisms enhance relational commitment and behavioral persistence. Psychological ownership has been shown to enhance organizational attitudes, organizational citizenship behavior, and extra-role behavior (Van Dyne & Pierce, 2004), while participation strengthens psychological ownership and subsequent commitment-related outcomes (Han et al., 2010). In the consumer context, identity-based attachment has also been found to promote brand loyalty through value, trust, and satisfaction (He et al., 2012). SIT thus clarifies why psychological states reflecting self-object integration, such as psychological ownership and customer engagement, produce durable behavioral outcomes. While SCT explains how environmental interaction shapes cognition and behavior, SIT explains how identification-based processes deepen relational commitment.

Value Co-Creation Theory

Value Co-Creation Theory (Vargo & Lusch, 2008) reconceptualizes value as emerging through interaction and resource integration among multiple actors rather than being unilaterally produced by firms. Within service ecosystems, value is co-created through reciprocal exchange, dialogue, and participation. Digital platforms intensify these dynamics by embedding customers within continuous interaction networks involving platforms, merchants, and other users. Customers contribute knowledge, feedback, and social influence, thereby becoming active co-creators rather than passive consumers. Consequently, understanding co-creation requires attention not only to structural interaction mechanisms but also to customers' psychological experiences during participation. Prior research increasingly adopts a customer-dominant perspective, recognizing that relational outcomes such as loyalty are shaped by customers' experiential and psychological processes rather than by transactional exchanges alone (Fan et al., 2020; Mathis et al., 2016). Accordingly, identifying the cognitive mechanisms that translate interaction into sustained relational commitment is central to advancing co-creation theory (Nadeem et al., 2021).

Psychological ownership refers to the state in which individuals feel as though a target is “theirs,” reflecting perceived control, self-investment, and intimate knowledge (Pierce, Kostova, & Dirks, 2001). In digital consumption contexts, psychological ownership emerges when users perceive autonomy, participation, and relational embeddedness within a platform (Peck & Shu, 2018). Interpersonal interaction within platform ecosystems facilitates knowledge exchange and social participation, thereby enabling self-investment in the focal platform. Value co-creation research suggests that participatory interactions increase customers' perceived contribution and attachment (France et al., 2016; Busser & Shulga, 2019). When customers actively interact with other users, they embed personal meanings into the platform experience, strengthening ownership perceptions. Recent digital platform research further confirms that interactive participation enhances users' psychological attachment and sense of belonging (Zhang et al., 2022; Harrigan et al., 2020). Therefore:

H1: Interpersonal interaction positively affects psychological ownership.

Perceived ease of use enhances individuals' sense of control and efficacy when navigating digital environments. Technology acceptance research consistently demonstrates that usability increases perceived competence and autonomy (Venkatesh et al., 2016). From an ownership perspective, perceived control is a primary antecedent of psychological ownership (Peck & Shu, 2018). When platforms are easy to use, customers experience lower cognitive friction and greater mastery, which reinforces ownership feelings. Empirical studies in digital service settings confirm that user-friendly system design strengthens psychological attachment and perceived personal relevance (Hsieh & Chang, 2016; Cheung, Xiao, & Liu, 2021). Thus:

H2: Perceived ease of use positively affects psychological ownership.

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Emotional exchanges between customers and sellers foster relational warmth and identity-based attachment. Affective experiences are central to ownership formation because they create symbolic and relational meaning (Kirk et al., 2015). Positive emotional interaction enhances perceived belongingness, which is a core dimension of ownership (Pierce et al., 2001). Some research demonstrates that emotional brand experiences in digital environments significantly enhance psychological ownership and attachment (Yim, Tse, & Chan, 2019; Xu, Jin, & Chan, 2023). Therefore:

H3: Interactional emotion positively affects psychological ownership.

Customer engagement is a multidimensional construct reflecting cognitive, emotional, and behavioral investment in a focal object (Hollebeek, Srivastava, & Chen, 2019). Engagement represents an activated motivational state emerging from interactive experiences. Interactive communication fosters social presence and co-creation experiences, both of which are foundational drivers of engagement (Dessart, Veloutsou, & Morgan-Thomas, 2015). In online brand communities, interpersonal interaction increases cognitive absorption and behavioral participation (Harrigan et al., 2018). Many studies confirm that social interaction within digital platforms significantly predicts engagement behaviors, including content sharing and advocacy (Shen et al., 2021; Islam & Rahman, 2017). Accordingly:

H4: Interpersonal interaction positively affects customer engagement.

Ease of use reduces effort expectancy and enhances perceived value, thereby encouraging sustained involvement (Venkatesh et al., 2016). Engagement literature indicates that reduced cognitive burden facilitates deeper immersion and continued participation (Hollebeek et al., 2019). Evidence in mobile commerce and digital service contexts shows that usability significantly enhances engagement behaviors (Molinillo et al., 2020; Fang et al., 2017). Thus:

H5: Perceived ease of use positively affects customer engagement.

Emotional experiences are central drivers of engagement because they activate affective commitment and experiential involvement (Brodie et al., 2011). Positive emotional interaction enhances hedonic value and psychological immersion. Some research confirms that emotional brand experiences significantly predict customer engagement in digital platforms (Rather, Hollebeek, & Islam, 2019). Therefore:

H6: Interactional emotion positively affects customer engagement.

Psychological ownership reflects deep self-object integration, which motivates protective and participatory behaviors (Pierce et al., 2001). When customers perceive a platform as “mine,” they exhibit stronger intrinsic motivation to invest resources and sustain interaction. Studies demonstrate that psychological ownership significantly predicts engagement behaviors in digital and service contexts

(Kumar & Nayak, 2019; Zhang et al., 2022). Ownership enhances responsibility feelings, which translate into active participation. Hence:

H7: Psychological ownership positively affects customer engagement.

In the context of this study, customer loyalty refers to a customer's sustained behavioral commitment to a specific e-commerce platform, developed through continued interaction, usage, and value co-creation within the platform service system. It is reflected in the tendency to prioritize the focal platform in future transactions, maintain an ongoing relationship with it, resist switching to competing platforms, and demonstrate supportive behaviors such as repeat purchase, continued usage, and positive recommendation. This definition is consistent with the classical view that loyalty may include both attitudinal and behavioral components (Oliver, 1999).

Ownership strengthens commitment through identity integration and the endowment effect (Peck & Shu, 2018). When consumers internalize a target as part of the self, switching costs increase psychologically, leading to loyalty intentions. Research findings confirm that psychological ownership significantly predicts repurchase intention and loyalty across digital platforms and brand communities (Kumar & Kaushik, 2022; Xu et al., 2023). Thus:

H8: Psychological ownership positively affects customer loyalty.

Engagement represents a key relational mechanism translating experience into long-term loyalty (Brodie et al., 2011). Engaged customers exhibit stronger attitudinal commitment and behavioral persistence. Meta-analytic and empirical research consistently supports the positive engagement–loyalty relationship (Pansari & Kumar, 2017; Hollebeek et al., 2019). Accordingly:

H9: Customer engagement positively affects customer loyalty.

Interactive quality can directly influence loyalty by enhancing satisfaction, trust, and perceived value (Hollebeek et al., 2019). Social interaction strengthens relational bonds (Harrigan et al., 2018), usability enhances satisfaction (Fang et al., 2017) and customer loyalty (Kurniawan & Tankoma, 2023), and emotional experiences increase attitudinal attachment (Rather et al., 2019). Therefore:

H10: Interpersonal interaction positively affects customer loyalty.

H11: Perceived ease of use positively affects customer loyalty.

H12: Interactional emotion positively affects customer loyalty.

Grounded in Social Cognitive Theory's environment–cognition–behavior logic, psychological ownership serves as a cognitive mediator translating interaction into engagement. Empirical research supports ownership as a mediator in co-creation and participatory settings (Busser & Shulga, 2019; Kumar

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& Nayak, 2019). Besides, customer engagement further translates internalized psychological states into loyalty outcomes (Pansari & Kumar, 2017). Therefore:

H13: Psychological ownership mediates the relationship between interpersonal interaction and customer engagement.

H14: Psychological ownership mediates the relationship between perceived ease of use and customer engagement.

H15: Psychological ownership mediates the relationship between interactional emotion and customer engagement.

H16: Customer engagement mediates the relationship between psychological ownership and customer loyalty.

Based on the content of the above discussion, this study has drawn the following conceptual framework, as shown in Figure 1. The proposed model can be understood as a customer-level mechanism model rather than a general ecosystem governance model. Specifically, it explains how customers’ perceptions of interpersonal interaction, perceived ease of use, and interactional emotion within e-commerce platform service systems are translated into psychological ownership, customer engagement, and ultimately loyalty.

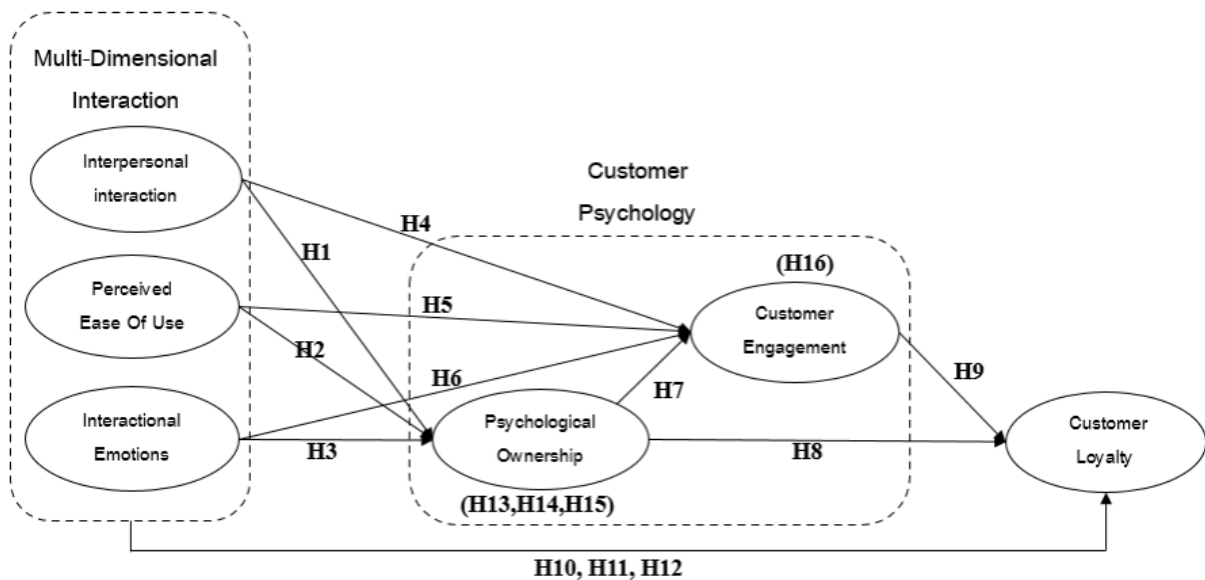


Figure 1: Conceptual Framework

METHODOLOGY

Population and Data Collection

This study employs a theory-driven, cross-sectional survey design to examine the structural relationships between platform interaction mechanisms (interpersonal interaction, perceived ease of use, and interactional emotions) and customer loyalty, with psychological ownership and customer engagement as sequential mediators. A covariance-based structural equation modeling (SEM) approach is adopted to simultaneously estimate measurement and structural components while accounting for measurement error. The empirical design is customer-centered. Although the broader platform ecosystem includes multiple actors, the present study collects data exclusively from customers in order to examine how interactional conditions are perceived and internalized at the customer level. Data are collected through an online survey administered to Chinese consumers aged 18 years or above who have completed at least one purchase within the past three months on Alibaba, JD.com, or Pinduoduo. Restricting respondents to recent purchase experiences reduces recall bias and strengthens experiential validity. Given the absence of a comprehensive sampling frame of platform users, a non-probability convenience sampling strategy is employed. A pilot study ($n = 30$) evaluates item clarity and preliminary reliability. Based on pilot feedback, ambiguous items are refined prior to main data collection. Sample size is determined using Cochran's (1977) formula for large populations. Assuming a 95% confidence level ($z = 1.96$), a conservative population proportion ($p = .50$), and a 5% margin of error ($e = .05$), the minimum required sample size is 385. To ensure adequate statistical power for SEM, particularly for mediation testing, the target sample is increased to 480 valid responses.

Measurement

Because the target respondents of this study were Chinese buyers, the questionnaire was administered in Chinese. To ensure linguistic accuracy and conceptual equivalence, the study employed a back-translation procedure. Specifically, the original English items were first translated into Chinese by a bilingual researcher familiar with the research context. The Chinese version was then independently translated back into English by another bilingual translator who had not seen the original questionnaire. The back-translated version was subsequently compared with the original English version on an item-by-item basis to identify discrepancies in wording, semantic meaning, and conceptual interpretation. Any inconsistencies or culturally inappropriate expressions were discussed and revised by the research team until satisfactory equivalence was achieved. This procedure helped ensure that the final Chinese questionnaire maintained both linguistic and conceptual consistency with the original instrument, thereby improving the validity and reliability of the measurement in a cross-language research setting (Brislin, 1970).

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All constructs are operationalized using multi-item reflective scales adapted from established marketing and information systems literature (Table 1). Minor contextual modifications are introduced to reflect digital platform interactions while preserving conceptual equivalence. The final instrument comprises three sections: (1) screening items confirming eligibility; (2) demographic variables (age, gender, income, education, shopping frequency); and (3) 33 items measuring six latent constructs. All items are assessed on five-point Likert scales (1 = strongly disagree; 5 = strongly agree). In this study, all interaction-related constructs are conceptualized at the customer level of analysis. It focuses on how customers perceive and interpret the interactional conditions generated within the platform service system. Specifically, interpersonal interaction refers to the customer’s perceived quality of relational and social exchange in the platform environment, including responsiveness, communication, and interaction with relevant platform participants as experienced by the customer. Perceived ease of use refers to the customer’s perception that the platform interface and service process are easy to understand, navigate, and operate, thereby enhancing convenience and perceived control; it does not represent direct interaction with developers as a separate actor group. Interactional emotion refers to the affective tone and emotional quality that customers experience during their interactions with the platform service system.

Table 1: Measurement Scale

Construct	Item	Measurement	Source
II	II1	The questions I raise in the comment section of this shopping platform can receive responses from other users.	Zhou & Gao (2022); Algesheimer, Dholakia, & Herrmann (2005)
	II2	I often participate in topic discussions on this platform.	
	II3	I enjoy communicating and interacting with other users.	
PEOU	PEOU1	I feel that the platform provides comprehensive product information.	Davis, (1989); Venkatesh et al. (2003)
	PEOU2	I find the platform easy and convenient to use.	
	PEOU3	I feel that the platform provides comprehensive services.	
		I feel that the platform offers multiple communication channels.	
IE	IE1	I frequently interact with customer service when using this platform.	Szymanski & Hise (2000); Verhagen et al. (2014)
	IE2	I feel pleased when interacting with the platform’s customer service staff.	
	IE3	I do not find the platform’s customer service staff annoying.	

Table 1: Measurement Scale (Cont.)

Construct	Item	Measurement	Source
	IE4	Interaction with customer service has strengthened my sense of closeness with them.	
PO	PO1	I can choose the purchasing method that best suits me.	Pierce et al. (2003); Fasolo, B., et al. (2024); Hollebeek et al. (2014)
	PO2	I can freely arrange the time to purchase products.	
	PO3	I can select and purchase the brand products that I prefer.	
	PO4	Before shopping, I am willing to spend time and energy to learn about the platform's website.	
	PO5	I strongly identify with the philosophy of the platform's website.	
	PO6	The strict quality control of the platform particularly attracts me to purchase products here.	
	PO7	After customer service introduces the product, I am allowed to experience it myself, which gives me a sense of comfort and freedom.	
	PO8	The platform strives to serve me according to my preferences, making me feel like a member of a big family.	
CE	CE1	I enjoy browsing more updated information about products.	Hollebeek et al. (2014);Hollebeek, et al. (2023); Waqas, et al. (2025)
	CE2	Whenever I use this website, it reminds me of many related aspects, such as its advertisements.	
	CE3	Any information about this website easily captures my attention.	
	CE4	When using this website, I associate it with the brand's story, which inspires and motivates me.	
	CE5	I feel enthusiastic about this website, and using it makes me happy.	
	CE6	I am proud to use this website.	
	CE7	Based on my knowledge of this website, I am willing to use its products.	
	CE8	Compared with other similar websites, I spend more time on this one.	
	CE9	The high-quality experience from using this website makes me want to recommend it to people around me.	

Table 1: Measurement Scale (Cont.)

Construct	Item	Measurement	Source
CL	CL1	I considered the current platform is my first choice to meet my shopping needs.	Megdadi et al. (2013); Zeithaml, Berry, & Parasuraman (1996)
	CL2	I have a firm desire to keep my purchasing transactions with the current platform.	
	CL3	I defend the current platform policies positively.	
	CL4	I enjoy the friendly attitude and excellent service of the current platform's customer service.	
	CL5	I will not think of moving to another platform of whatever the competitors offer is attractive.	

Note: Customers' Loyalty (CL); Customer Engagement (CE); Psychological Ownership (PO); Interactional Emotion (IE); Perceived Ease of Use (PEOU); Interpersonal Interaction (II)

Data Analysis

Data analysis followed a two-step structural equation modeling (SEM) procedure using AMOS 28.0 to ensure rigorous assessment of both the measurement and structural components of the model. First, confirmatory factor analysis (CFA) was performed to evaluate the psychometric properties of the measurement model. Convergent validity was assessed based on standardized factor loadings ($\geq .70$), composite reliability (CR $\geq .70$), and average variance extracted (AVE $\geq .50$). Discriminant validity was examined using the Fornell–Larcker criterion. Overall model fit was evaluated using multiple indices, including χ^2/df , CFI, TLI, RMSEA, and SRMR. Moreover, the structural model was estimated to test the hypothesized relationships among constructs. Direct, indirect, and total effects were examined simultaneously within the SEM framework. Mediation effects were assessed using bias-corrected bootstrapping with 5,000 resamples. Indirect effects were considered statistically significant when 95% confidence intervals excluded zero.

RESEARCH FINDINGS

Sample Characteristics

The 480 sample was relatively balanced by gender (55.2% female; 44.8% male). The majority of respondents were between 18–39 years old (83.4%), reflecting the demographic profile of active digital consumers in China. Most participants held at least a bachelor's degree (62.5%) and reported middle-income levels, with 57.1% earning between 4,000 and 7,999 RMB per month. Overall, the demographic profile aligns with the mainstream e-commerce user base, supporting the suitability of the dataset for examining engagement and loyalty mechanisms.

Common Method Bias Test

Because this study relied on self-reported questionnaire data collected from a single source, common method bias (CMB) could not be entirely ruled out. Following the recommendations of Podsakoff et al. (2003), several procedural remedies were adopted during questionnaire design and administration, including assuring respondents of anonymity and confidentiality, reducing item ambiguity, and arranging the measurement items in a clear and neutral format to minimize evaluation apprehension and social desirability bias. In addition, Harman's single-factor test was conducted to assess the potential influence of common method bias. The results showed that multiple factors with eigenvalues greater than 1 emerged, and the first unrotated factor accounted for 34.12% of the total variance, which was below the recommended threshold of 50%. Therefore, common method bias was unlikely to pose a serious threat to the findings of this study (Podsakoff et al., 2003).

Measurement Model Assessment

Internal consistency was assessed using Cronbach's alpha and composite reliability (CR). All constructs exceeded the recommended threshold of 0.70 (Nunnally, 1978). Cronbach's α ranged from 0.880 to 0.944, indicating strong reliability across all scales. These results confirm satisfactory internal consistency (Table 2). Confirmatory factor analysis (CFA) was conducted using AMOS 29. The overall measurement model demonstrated good fit: $\chi^2/df = 1.736$, RMSEA = 0.039, SRMR = 0.034, CFI = 0.970, TLI = 0.967, GFI = 0.908, AGFI = 0.892. All indices met commonly accepted thresholds (Hu & Bentler, 1999; Kline, 2015). From Table 2, standardized factor loadings ranged from 0.674 to 0.921 and were statistically significant ($p < 0.001$). Composite reliability values ranged from 0.881 to 0.944, and AVE values ranged from 0.635 to 0.840, exceeding recommended cutoffs (Hair et al., 2010). These findings establish convergent validity.

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Table 2: Convergent Validity of the Scale

Construct	Item	Ustd.	S.E.	C.R.	P	Loading	CR	AVE	Alpha
II	II1	1				0.919	0.940	0.840	0.943
	II2	0.952	0.029	32.318	***	0.909			
	II3	0.98	0.029	33.305	***	0.921			
PEOU	PEOU1	1				0.816	0.902	0.697	0.905
	PEOU2	1.08	0.052	20.654	***	0.829			
	PEOU3	1.111	0.051	21.93	***	0.868			
	PEOU4	1.033	0.05	20.567	***	0.826			
IE	IE1	1				0.709	0.881	0.651	0.884
	IE2	1.235	0.073	16.802	***	0.828			
	IE3	1.24	0.074	16.816	***	0.829			
	IE4	1.239	0.072	17.228	***	0.853			
PO	PO1	1				0.684	0.932	0.635	0.936
	PO2	1.176	0.071	16.665	***	0.823			
	PO3	0.975	0.07	13.868	***	0.674			
	PO4	1.061	0.072	14.671	***	0.716			
	PO5	1.21	0.071	17.003	***	0.842			
	PO6	1.226	0.071	17.27	***	0.856			
	PO7	1.241	0.071	17.549	***	0.872			
	PO8	1.271	0.072	17.57	***	0.873			
CE	CE1	1				0.724	0.944	0.655	0.947
	CE2	1.064	0.068	15.576	***	0.714			
	CE3	1.074	0.066	16.202	***	0.741			
	CE4	1.253	0.068	18.503	***	0.841			
	CE5	1.245	0.066	18.871	***	0.857			
	CE6	1.285	0.064	19.949	***	0.903			
	CE7	1.245	0.067	18.595	***	0.845			
	CE8	1.208	0.066	18.345	***	0.834			
	CE9	1.186	0.067	17.676	***	0.805			

Table 2: Convergent Validity of the Scale (Cont.)

Construct	Item	Ustd.	S.E.	C.R.	P	Loading	CR	AVE	Alpha
CL	CL1	1				0.803	0.904	0.654	0.907
	CL2	1.047	0.054	19.342	***	0.802			
	CL3	0.99	0.051	19.405	***	0.804			
	CL4	1.051	0.055	19.26	***	0.799			
		1.046	0.051	20.406	***	0.836			

Note: Customers' Loyalty (CL); Customer Engagement (CE); Psychological Ownership (PO); Interactional Emotion (IE); Perceived Ease of Use (PEOU); Interpersonal Interaction (II)

Table 3: Discriminant Validity Scale

	CL	CE	PO	IE	PEOU	II
Customers' Loyalty (CL)	0.809					
Customer Engagement (CE)	0.454	0.809				
Psychological Ownership (PO)	0.428	0.318	0.797			
Interactional Emotion (IE)	0.394	0.363	0.443	0.807		
Perceived Ease of Use (PEOU)	0.362	0.367	0.363	0.509	0.835	
Interpersonal Interaction (II)	0.402	0.349	0.385	0.501	0.456	0.917

Note: Bolded text on the diagonal is the square root of AVE, and below the diagonal is the correlation coefficient between the latent variables

Discriminant validity was assessed using the Fornell–Larcker criterion (1981) in Table 3. For all constructs, the square root of AVE exceeded inter-construct correlations, indicating satisfactory discriminant validity and absence of multicollinearity concerns.

Structural Model and Hypothesis Testing

The structural model demonstrated satisfactory fit ($\chi^2/df = 1.736$; RMSEA = 0.039; CFI = 0.970; TLI = 0.967; NFI = 0.933), indicating that the hypothesized framework adequately represents the observed data.

Direct Effects

The structural model examination revealed that the majority of the hypothesized relationships were supported, as shown in Table 4. First, interpersonal interaction (II), perceived ease of use (PEOU), and interactional emotion (IE) were found to be significant predictors of psychological ownership (PO). Specifically, II (H1: $\beta = 0.180$, $p < 0.001$), PEOU (H2: $\beta = 0.137$, $p = 0.013$), and IE (H3: $\beta = 0.283$, $p < 0.001$) all exerted significant positive effects on PO, indicating that customers develop stronger feelings of ownership toward the platform when they enjoy positive interactions, perceive the system as easy to use, and experience emotional engagement. Similarly, II (H4: $\beta = 0.146$, $p = 0.008$), PEOU (H5: $\beta = 0.181$, $p = 0.001$), and IE (H6: $\beta = 0.137$, $p = 0.023$) significantly influenced customer engagement (CE), supporting the importance of both technological and interactional factors in enhancing consumer behavioral involvement. Additionally, PO demonstrated a significant positive impact on CE (H7: $\beta = 0.135$, $p = 0.008$), suggesting that psychological ownership acts as an internal motivational driver that encourages consumers to engage more actively with the system. Moreover, psychological ownership (H8: $\beta = 0.220$, $p < 0.001$), customer engagement (H9: $\beta = 0.276$, $p < 0.001$), and interpersonal interaction (H10: $\beta = 0.144$, $p = 0.006$) positively influenced customer loyalty (CL). These results indicate that customers who feel ownership of the platform, engage more deeply, and maintain positive interpersonal interactions are more likely to exhibit stronger loyalty intentions. However, the direct effects of PEOU (H11: $\beta = 0.070$, $p = 0.199$) and IE (H12: $\beta = 0.089$, $p = 0.125$) on CL were not statistically significant. This implies that while ease of use and emotional interaction enhance engagement and psychological ownership, they do not independently guarantee loyalty, suggesting an indirect-only relationship through other mediators.

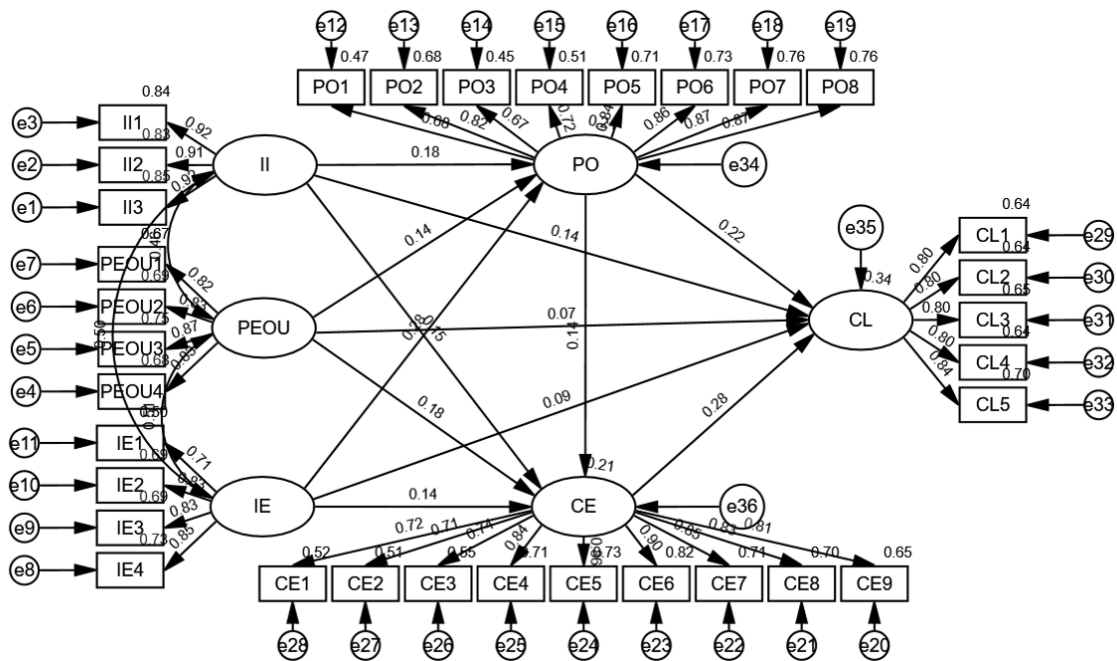


Figure 2: Results of Analysis of Structural Modeling with Hypotheses

Table 4: The Result of Direct Effect Test

No.	Path	B	β	S.E.	C.R.	P	Result
H1	PO ← II	0.142	0.18	0.043	3.35	***	Accepted
H2	PO ← PEOU	0.105	0.137	0.042	2.481	0.013	Accepted
H3	PO ← IE	0.189	0.283	0.04	4.775	***	Accepted
H4	CE ← II	0.144	0.146	0.054	2.674	0.008	Accepted
H5	CE ← PEOU	0.173	0.181	0.054	3.219	0.001	Accepted
H6	CE ← IE	0.114	0.137	0.05	2.28	0.023	Accepted
H7	CE ← PO	0.169	0.135	0.064	2.635	0.008	Accepted
H8	CL ← PO	0.279	0.22	0.064	4.337	***	Accepted
H9	CL ← CE	0.281	0.276	0.05	5.663	***	Accepted
H10	CL ← II	0.145	0.144	0.053	2.741	0.006	Accepted
H11	CL ← PEOU	0.068	0.07	0.053	1.284	0.199	Rejected
H12	CL ← IE	0.075	0.089	0.049	1.535	0.125	Rejected

Note: *** $p \leq 0.001$, ** $p \leq 0.01$, * $p \leq 0.05$

Customers' Loyalty (CL); Customer Engagement (CE); Psychological Ownership (PO); Interactional Emotion (IE); Perceived Ease of Use (PEOU); Interpersonal Interaction (II)

Mediation Analysis

Bootstrapping with 5,000 resamples (95% bias-corrected confidence intervals) was employed to test mediation effects (Preacher & Hayes, 2008). Indirect effects were considered significant when the confidence interval excluded zero. From Table 5, psychological ownership all significantly partially mediated the effects of interpersonal interaction ($\beta = 0.024$), perceived ease of use ($\beta = 0.018$), and interactional emotion ($\beta = 0.032$) on customer engagement. Additionally, customer engagement partially mediated the relationship between psychological ownership and loyalty ($\beta = 0.047$). These findings support a sequential mechanism in which interactional and technological stimuli foster psychological ownership, which enhances engagement, ultimately leading to loyalty.

Table 5: Analysis of Mediation Effects

No.	Path	Effect	95% CI		P
			Lower	Upper	
<i>Indirect Effect</i>					
H13	II → PO → CE	0.024	0	0.068	0.047
H14	PEOU → PO → CE	0.018	0	0.064	0.041
H15	IE → PO → CE	0.032	0.001	0.073	0.041
H16	PO → CE → CL	0.047	0.001	0.118	0.044
<i>Direct Effect</i>					
	II → CE	0.144	0.006	0.298	0.042
	PEOU → CE	0.173	0.049	0.313	0.005
	IE → CE	0.114	0.005	0.236	0.044
	PO → CL	0.279	0.117	0.452	0.001
<i>Total Effect</i>					
	II → CE	0.168	0.031	0.314	0.019
	PEOU → CE	0.191	0.063	0.337	0.003
	IE → CE	0.146	0.030	0.267	0.012
	PO → CL	0.326	0.163	0.502	0.001

Note: Customers' Loyalty (CL); Customer Engagement (CE); Psychological Ownership (PO); Interactional Emotion (IE); Perceived Ease of Use (PEOU); Interpersonal Interaction (II)

Discussion

This study explains how customer-perceived multi-dimensional interaction within e-commerce platform service systems is translated into customer loyalty through a sequential process of internalization and enactment. The findings show that loyalty does not arise directly from interactional conditions alone, but from the way customers psychologically absorb and behaviorally express those experiences over time. More specifically, interpersonal interaction, perceived ease of use, and interactional emotion shape customers' evaluations of the platform environment, foster psychological ownership, stimulate customer engagement, and ultimately strengthen loyalty (Lemon & Verhoef, 2016). In this sense, the results support the central argument advanced in the Introduction: in platform-based service systems, interaction becomes loyalty-relevant not because interaction automatically produces loyalty, but because it shapes how customers interpret the platform, how they relate themselves to it, and whether they are willing to continue participating in it. This pattern can be understood as a customer-level mechanism

situated within a broader value co-creation context. From the perspective of value co-creation theory, the findings suggest that interaction in platform ecosystems becomes consequential when customers do not merely encounter service touchpoints, but actively experience them as opportunities for participation, self-investment, and meaning construction (Roy et al., 2023; Chen et al., 2023). From the perspective of social cognitive theory, multi-dimensional interaction functions as an environmental condition that influences downstream behavior through intervening psychological states, particularly psychological ownership and engagement (Zhang & Hu, 2024). From the perspective of social identity theory, repeated and meaningful interaction strengthens customers' sense of attachment, self-relevance, and relational connection to the platform, making loyalty more durable and identity-relevant rather than purely transactional (Herzallah et al., 2025; Rahman et al., 2025). Taken together, the results indicate that loyalty in e-commerce platform ecosystems is better understood as the outcome of an interaction–internalization–enactment process than as a simple direct response to isolated service attributes. The hypothesis-specific findings further elaborate this overall mechanism by showing how different interaction dimensions operate through distinct but complementary psychological and behavioral pathways.

H1 was supported. This finding aligns with prior research demonstrating that interactive exchange and relational communication foster psychological ownership by strengthening perceived closeness and self-investment (Pierce et al., 2001; Kirk et al., 2015). Participatory interaction enables customers to embed personal meanings into service experiences, thereby enhancing feelings of “mine-ness.” Value co-creation literature similarly indicates that dialogical interaction and customer participation reinforce psychological attachment to the focal entity (France et al., 2016; Busser & Shulga, 2019).

H2 was supported. The result extends established technology acceptance and usability research showing that ease of use enhances perceived control and reduces cognitive burden (Venkatesh et al., 2016). Because perceived control is a foundational antecedent of psychological ownership (Pierce et al., 2003; Peck & Shu, 2018), user-friendly multichannel systems may accelerate internalization of the platform into the self-concept. This interpretation is consistent with research demonstrating that frictionless digital experiences promote stronger psychological attachment and continuance intentions (Hsieh & Chang, 2016).

H3 was supported. Emotional interaction significantly enhanced psychological ownership. Affective experiences are central to ownership formation because they generate symbolic meaning and relational warmth (Kirk et al., 2015). Emotional resonance reduces psychological distance and strengthens self-object integration, consistent with service research emphasizing the experiential basis of attachment in digital environments (Schmitt, 1999).

H4–H6 were supported. Interpersonal interaction, ease of use, and emotional exchange all positively influenced customer engagement. These findings align with customer engagement theory,

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which conceptualizes engagement as an activated cognitive, emotional, and behavioral state emerging from interactive experiences (Brodie et al., 2011; Hollebeek et al., 2014). Social interaction enhances relationship quality and social presence, usability reduces effort expectancy, and affective stimulation intensifies immersion—all of which promote engagement behaviors such as participation and advocacy (Dessart et al., 2015; Islam & Rahman, 2017).

H7 was supported. Psychological ownership positively influenced customer engagement. This result corroborates theoretical arguments that ownership motivates protective, participatory, and contributory behaviors (Pierce et al., 2001). When customers perceive a platform as psychologically “theirs,” they exhibit greater intrinsic motivation to sustain involvement and invest effort, thereby translating cognitive internalization into active engagement.

H8 was supported. Psychological ownership significantly predicted customer loyalty. Consistent with ownership theory, internalization increases commitment and switching resistance (Pierce et al., 2003; Peck & Shu, 2018). Customers who incorporate the platform into their self-concept are more likely to demonstrate repurchase intention and relational persistence, extending loyalty research beyond satisfaction-based explanations (Oliver, 1999).

H9 was supported. Engagement significantly predicted loyalty. This finding aligns with prior research identifying engagement as a key relational mechanism that converts interactive experience into enduring loyalty outcomes (Brodie et al., 2011; Pansari & Kumar, 2017). Engaged customers display stronger attitudinal commitment and sustained behavioral intentions.

H10 was supported. This result is consistent with service relationship research demonstrating that interpersonal rapport, relational communication, and socio-emotional connection enhance long-term loyalty outcomes, particularly when interaction strengthens trust and satisfaction (Palmatier et al., 2006; Morgan & Hunt, 1994). Even within multichannel environments, relational quality remains a key determinant of loyalty beyond purely functional factors. Thus, “humanized” interaction retains strategic relevance even when ownership and engagement are included in the model.

H11 was rejected. The absence of a significant direct effect is consistent with research cautioning against assuming a simple linear relationship between experience attributes and loyalty outcomes (Lemon & Verhoef, 2016). Omnichannel and service experience studies suggest that functional attributes such as ease of use often influence loyalty indirectly through satisfaction, trust, or psychological states rather than directly (Venkatesh et al., 2016; Hsieh & Chang, 2016). Additionally, in mature digital environments, usability may function as a hygiene factor: once a minimum threshold is met, its incremental impact on loyalty diminishes, particularly when relational and affective variables are simultaneously considered.

H12 was rejected. This finding aligns with research indicating that emotional and experiential cues frequently influence loyalty through mediating mechanisms rather than as stable direct drivers (Brodie et al., 2011; Cachero-Martínez & Vázquez-Casielles, 2021). Emotional responses can stimulate engagement and attachment, but loyalty formation often requires deeper relational mechanisms such as trust or commitment (Morgan & Hunt, 1994). In multichannel contexts, affective experiences may be episodic or channel-specific, limiting their direct effect on enduring loyalty.

H13–H15 were supported. These mediation results are consistent with psychological ownership theory, which posits that interactive participation fosters ownership perceptions that subsequently motivate behavioral involvement (Pierce et al., 2001; Peck & Shu, 2018). Prior research similarly positions psychological ownership as a bridge linking interactive stimuli to engagement behaviors in participatory service environments (Busser & Shulga, 2019). The findings therefore reinforce ownership as the cognitive translation layer between environmental interaction and behavioral activation.

H16 was supported. The sequential mediation from psychological ownership to engagement to loyalty aligns with Social Cognitive Theory’s environment–cognition–behavior logic. Psychological internalization (ownership) becomes loyalty-relevant when enacted through sustained participatory behavior (engagement), which strengthens relational commitment (Pansari & Kumar, 2017). This explanation also helps reconcile mixed findings in engagement–loyalty research: engagement operates as the behavioral conduit through which internalized psychological attachment translates into durable loyalty outcomes.

Overall, the full pattern supports a high-level conclusion: multichannel interaction quality builds loyalty primarily through internalization (psychological ownership) and enactment (customer engagement), while direct “feature-only” paths to loyalty (ease of use; interactional emotions) are not guaranteed and may be bounded by market maturity, relationship stage, and the presence of stronger relational/identity mechanisms.

Implication

The findings yield two sets of implications. Theoretically, they refine multichannel interaction research by specifying the psychological and behavioral mechanisms through which interaction quality translates into loyalty. Managerially, they indicate that loyalty in multichannel systems is not secured by isolated improvements in usability or affect, but by systematically cultivating psychological ownership and sustained engagement across integrated touchpoints.

Theoretical Implications

First, the results advance multichannel and omnichannel literature by validating a sequential mechanism in which interaction quality shapes loyalty predominantly through intervening constructs. Specifically, interpersonal interaction, perceived ease of use, and interactional emotions strengthen psychological ownership and customer engagement (H1–H6), while loyalty emerges primarily through psychological ownership and engagement (H8–H10, H16). This clarifies that multichannel interaction effects unfold as a staged process rather than a direct attribute–outcome relationship, aligning with contemporary customer-journey perspectives that emphasize cumulative experience formation across touchpoints (Lemon & Verhoef, 2016).

Second, psychological ownership is positioned as a pivotal internalization mechanism that converts multichannel stimuli into relational motivation. The supported mediation paths (H13–H15) indicate that interpersonal, functional, and affective interaction elements do not merely “add” to engagement; they become behaviorally consequential once internalized into a sense of “mine-ness,” which then energizes engagement (H7). This extends the application of psychological ownership to multichannel settings by identifying it as a central explanatory bridge between interaction design and participatory outcomes.

Third, the results refine theorizing about loyalty formation by distinguishing between proximal experience drivers and distal relational outcomes. The rejection of direct effects from perceived ease of use and interactional emotions to loyalty (H11–H12) suggests boundary conditions: in mature multichannel markets, usability and pleasant affect may function as baseline expectations (hygiene factors) that are necessary for participation but insufficient for durable commitment. Loyalty is better explained by identity-relevant and participation-based mechanisms, psychological ownership and engagement, than by functional convenience or episodic affect alone (H8–H9, H16). This contributes to engagement–loyalty debates by showing that engagement is a critical behavioral conduit through which ownership translates into loyalty, rather than assuming engagement uniformly produces loyalty across contexts (H16).

Managerial Implications

This study offers several important managerial implications for e-commerce platform managers seeking to build sustainable customer loyalty in multichannel service environments. More specifically, the findings suggest that loyalty does not arise directly from isolated service improvements, but from a sequential process in which interactional conditions foster psychological ownership and customer engagement, which in turn strengthen long-term relational commitment. Accordingly, managers should focus less on optimizing individual touchpoints in isolation and more on designing an integrated service system that converts interaction experiences into enduring customer–platform relationships.

First, managers should treat interpersonal interaction as a strategic relational resource rather than a routine service function. The results indicate that interpersonal interaction is the most influential interaction dimension, exerting both direct and indirect effects on loyalty through psychological ownership and engagement. In practical terms, this means that e-commerce platforms should invest in communication practices that increase customers' sense of recognition, responsiveness, and relational continuity across channels. Such practices may include training customer service staff, sellers, and livestream hosts to provide empathetic and personalized responses; using customer history and contextual memory to avoid repetitive or impersonal communication; and maintaining a consistent interaction tone across live chat, social media, call centers, and after-sales support. In livestreaming and social commerce settings, managers should also encourage real-time acknowledgment, personalized replies, and interactive dialogue that allow customers to feel socially visible and relationally connected. These practices are important because they help transform interaction from a transactional exchange into a relational experience that supports customers' sense of attachment to the platform.

Second, perceived ease of use should be managed not merely as a technical usability objective, but as a mechanism for enhancing customer control, familiarity, and self-investment. The findings show that ease of use contributes to psychological ownership and engagement, but does not directly translate into loyalty. This implies that usability matters less as an end in itself than as a condition that enables customers to become psychologically invested in the platform. Accordingly, managers should reduce friction throughout the customer journey by simplifying navigation structures, streamlining payment and checkout procedures, integrating shopping carts and service records across channels, and improving the transparency of order tracking, returns, and complaint handling. At the same time, platforms should provide customers with opportunities to personalize and manage their own experience, such as saved preferences, customized dashboards, self-service tools, and cross-device continuity. These design features strengthen customers' sense of competence and control, while also encouraging them to invest time, habits, and personal preferences into the system—conditions that are conducive to the development of psychological ownership.

Third, managers should approach interaction emotion as a journey-level design issue rather than as a series of isolated pleasant moments. Although interaction emotion positively affects psychological ownership and engagement, it does not directly secure loyalty. This suggests that emotionally positive interactions are insufficient unless they are consistently reinforced and embedded within the broader customer journey. In response, e-commerce platforms should develop emotionally coherent service experiences across pre-purchase, purchase, and post-purchase stages. This can be achieved through warm and reassuring onboarding communication, humanized service language, timely and supportive assistance during transactions, and empathetic service recovery when problems arise. In particular, service failure episodes deserve special attention, as customers often form stronger emotional judgments in moments of disruption than in routine exchanges. Therefore, refund disputes,

logistics delays, or service errors should be handled not only efficiently, but also with apology, explanation, acknowledgment, and respect. The practical objective is to ensure that customers feel emotionally valued throughout the service process, thereby allowing momentary positive emotions to develop into deeper relational bonds.

Fourth, the findings suggest that engagement should be treated as a leading indicator and operational pathway of loyalty. Because customer engagement directly predicts loyalty and mediates the influence of psychological ownership, managers should move beyond a narrow emphasis on repeated purchase behavior and instead cultivate active, meaningful, and participatory customer involvement. From a managerial perspective, this requires building engagement structures that encourage customers to contribute, interact, and co-create value with the platform. Examples include customer communities, feedback systems, personalized content delivery, membership interaction programs, review contribution mechanisms, and user advocacy initiatives. Importantly, these activities should reward meaningful participation rather than only transactional frequency. The model suggests that loyalty is reinforced through active enactment and relational involvement, not solely through repeated buying. Therefore, platforms that encourage customers to share experiences, provide suggestions, participate in discussions, and contribute to service improvement are more likely to generate durable loyalty.

Finally, the combined findings imply that sustainable loyalty in multichannel e-commerce settings depends on the coordinated management of three interactional levers. Specifically, managers should prioritize: (1) relationally rich interpersonal interaction, (2) usability conditions that strengthen customer control and self-investment, and (3) emotionally coherent service journeys that reinforce customers' sense of being valued. These conditions jointly facilitate psychological ownership and engagement, which then translate into loyalty. Therefore, the managerial challenge is not simply to make the platform more efficient or more enjoyable, but to create a service ecosystem in which customers can interact smoothly, feel socially recognized, and become psychologically connected to the platform over time. In this sense, loyalty should be understood as the outcome of a managed co-creation process rather than the automatic result of service performance alone.

Limitations and Future Research

This study has several limitations that suggest avenues for further research. First, the cross-sectional design limits causal inference and does not capture the dynamic evolution of psychological ownership, engagement, and loyalty. Longitudinal and time-lagged studies are needed to validate the sequential mechanism over time. Second, the use of self-reported perceptual measures may introduce common method bias. Future research should incorporate objective behavioral data and experimental designs to strengthen causal and external validity. Third, contextual generalizability remains constrained. The non-significant direct effects of perceived ease of use and interactional emotions on loyalty may be contingent on industry characteristics or digital maturity. Cross-industry and cross-cultural comparisons

would help identify boundary conditions. Moreover, alternative relational mechanisms such as trust or attachment may complement or compete with psychological ownership in explaining engagement and loyalty. Testing alternative mediation structures would further refine the theoretical model. Together, these directions provide a foundation for advancing theory on multichannel relationship formation and loyalty development. A further limitation is that, although the study is situated in a multi-actor platform ecosystem, the empirical data were collected only from customers. Therefore, the findings reflect customer-perceived interaction dimensions rather than the perspectives of other actors such as sellers, platform operators, or developers. Future research may adopt a multi-stakeholder design to compare how different ecosystem participants perceive and contribute to value co-creation and loyalty formation.

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