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| RESEARCH ARTICLE

The Effect of eWOM and Webcare on Customer Engagement and Brand Loyalty toward Live Streaming Platforms

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| ABSTRACT
Based on the negative electronic word of mouth (NeWOM) under the live streaming platform, the paper aims to explore the mechanism of proactive and reactive webcare on customer brand loyalty. We constructed three separate experiments with no webcare, proactive webcare, and reactive webcare in response to NeWOM during the live streaming platform. In this study, 210 valid questionnaires were collected for statistical analysis, including the *Mann-Whitney U test* and *Pearson correlation analysis*. Our findings reveal that proactive and reactive webcare positively influence cognitive, emotional, and behavioral engagement, with proactive webcare demonstrating greater effectiveness. We confirm a positive correlation between these forms of engagement and brand loyalty, highlighting the strong connection between behavioral engagement and brand loyalty. At the same time, this study provides crucial inspiration for the live-streaming platform managers to focus on providing proactive webcare and develop behavioral activities in live-steaming platforms to enhance customers' brand loyalty.

| KEYWORDS
Electronic word-of-mouth, Webcare, Customer engagement, Brand loyalty.

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1. Introduction

With the rapid development of technology, live streaming technology has become a significant innovation in e-commerce. Live streaming platforms provide consumers with a new shopping experience that breaks the limitations imposed by traditional text or graphical product descriptions (Ou et al., 2014; Zhou et al., 2019). While watching live streaming, consumers post opinions about product performance, shopping experience, and other aspects in the comment section (Chen et al., 2017) to help them better understand the product and increase their brand awareness.

Electronic word-of-mouth (eWOM) is categorized into positive electronic word-of-mouth (PeWOM) and negative electronic word-of-mouth (NeWOM). Consumers pay more attention to NeWOM because it has more information about inferior products (van Noort & Willemsen, 2012) and provides more detailed information about product performance and shopping experience (Kwon et al., 2022). In addition, NeWOM reduces consumers' brand loyalty (Lee et al., 2018), especially on live streaming platforms. Therefore, effective webcare is crucial to enhance customers' brand loyalty (Schamari & Schaefers, 2015). It is essential for merchants on live streaming platforms to properly handle NeWOM and implement the right webcare strategies to increase customer trust in their brands and improve customer brand loyalty.

Previous studies have confirmed that customer engagement is a crucial factor affecting brand loyalty (Kosiba et al., 2018; Parihar et al., 2019). In customer engagement, cognitive, emotional, and behavioral engagement related to the brand can increase customers' brand loyalty (Lee & Hsieh, 2021). However, only some studies on consumer brand loyalty have used these three main factors as mediating variables. In addition, previous research on webcare tends to classify it as defensive and adaptive types (Lee

& Cranage, 2012; Liu et al., 2020), and few scholars divided webcare into proactive and reactive types to discuss and analyze the impact of webcare on customer brand loyalty.

Based on the above research foundations and shortcomings, this study categorizes webcare into proactive webcare and reactive webcare in the context of live streaming platforms, using cognitive, emotional, and behavioral engagement as mediating variables. This paper will further explore the impact of webcare on customers' engagement and whether there is a significant difference in their impact on customers' brand loyalty.

2. Literature Review

This section begins with a review of previous definitions and categorizations of eWOM and a review of the leading research industries in the field. Subsequently, the paper provides an in-depth discussion of webcare based on NeWOM. Next, research related to brand loyalty is reviewed, focusing on three sub-factors of customer engagement. Finally, the relationship between these sub-factors and brand loyalty is reviewed.

2.1 EWOM in Live streaming platforms

EWOM refers to sharing consumers' opinions and experiences of products through channels such as online review sites and social networks (Chen et al., 2017; Zhou et al., 2018). EWOM can be categorized into PeWOM and NeWOM (Liu et al., 2020). It has been shown that consumers pay more attention to NeWOM than PeWOM (Kwon et al., 2022) because NeWOM shows more characteristics of inferior products (van Noort & Willemsen, 2012). In addition, previous researchers have found NeWOM to be more helpful in evaluating products and brands (Sen & Lerman, 2007). Therefore, this paper will take NeWOM as the object of study and delve into how merchants respond to NeWOM in order to increase customers' brand loyalty.

Existing research on eWOM has focused on traditional industries such as hotels, tourism, and catering. (Verma & Yadav, 2021). However, with the rise of emerging business models such as live streaming, the research on eWOM under live streaming platforms is still relatively insufficient (Sun et al., 2019). As an online platform with high interactivity and fast information dissemination, live streaming platforms provide consumers with a channel for real-time communication and information sharing (Wongkitrungrueng & Assarut, 2020). Studies have shown that live streaming with products has become one of the most important means of attracting consumers, and consumers are more inclined to believe in the products and shopping experiences displayed in live streaming (Zhang et al., 2023). Thus, eWOM under the live streaming platform has an essential impact on the brand image of merchants and customers' loyalty to the brand. To address this background, this study will delve into how merchants should respond to NeWOM under live streaming platforms to increase customers' brand loyalty.

2.2 Webcare

Webcare refers to brands engaging in communication and interaction with consumers on online social media platforms to address and mitigate the effects of NeWOM. Research has shown that effective webcare can increase consumer satisfaction and engagement with a brand (Schamari & Schaefers, 2015). Compared with no response, webcare can enhance customers' brand awareness and loyalty (Gao & Shen, 2024). Therefore, it is necessary to consider the role of webcare when studying the influence of NeWOM on consumers' brand loyalty.

Existing research has categorized webcare in two main ways. The first is the classification of webcare into accommodative and defensive based on remedial behaviors after a service failure (Li et al., 2018). The difference between these two types of webcare is whether the merchant acknowledges responsibility (Lee & Cranage, 2012). Accommodative webcare implies that the business acknowledges responsibility for the adverse event, whereas defensive webcare usually involves defences or excuses (Li et al., 2018). Secondly, webcare can also be divided into proactive and reactive based on whether the customer has made a specific request in the eWOM (Lopes et al., 2023). Proactive webcare indicates that a company takes an active approach to intervene, whereas reactive webcare refers to a company responding to eWOM only when explicitly requested by the customer (van Noort & Willemsen, 2012). Unlike accommodative and defensive webcare, proactive webcare occurs not only after a service failure but may also be demonstrated during service delivery (van Laer & de Ruyter, 2010). However, only some scholars have studied webcare by categorizing it into proactive and reactive webcare. Therefore, to fill this gap, this study categorizes webcare into proactive and reactive webcare to further investigate the specific impact of these two types of webcare on brand loyalty.

2.3 Brand loyalty

Brand loyalty refers to customers who are positive toward the brand and maintain a relationship with the focal brand (Gorlier & Michel, 2020). Higher brand loyalty can motivate customers to keep repurchasing in the future while increasing merchants' sales (Suh & Yi, 2012).

Past studies have addressed the mediating variables of brand loyalty, mainly the complainant's positive emotions, perceived trust, perceived risk, and customer engagement. DeWitt et al. (2008) stated that the complainant's positive emotions mediate the relationship between negative eWOM and brand loyalty. In addition, previous research revealed the relationship between customers' perceived trust and brand loyalty as well as customer churn (Jaakkola & Alexander, 2014). Customers can enhance brand loyalty by perceiving the trust of merchants, and the risk of customer loss will be reduced in the end (Leckie et al., 2016). Meanwhile, customers' perceived risk is negatively related to brand loyalty. When customers perceive service failure as less risky for the brand, their brand loyalty increases (Chang & Hsiao, 2008). In addition, NeWOM affects consumer brand loyalty by influencing customer engagement (Monferrer et al., 2019).

Past research has provided a relatively comprehensive discussion of the mediating variables influencing customer brand loyalty. However, it has tended to stay on the surface of the mediating variables. It needs to analyze in depth the impact of the factors involved explicitly in each mediating variable on brand loyalty. For example, research on customer engagement only stays on the surface of the relationship between customer engagement and brand loyalty without further exploring the depth of customer engagement. Therefore, this paper will further explore the impact of customer engagement as a mediating variable on consumer brand loyalty.

2.4 Customer engagement

Customer engagement refers to non-transactional behaviors focusing on a company or brand (van Doorn et al., 2010). High levels of customer engagement give customers a positive attitude toward the brand, leading to brand loyalty (Kosiba et al., 2018; Parihar et al., 2019).

Customer engagement encompasses cognitive, emotional, and behavioral dimensions (Zainol et al., 2016). Existing studies have shown that customer engagement plays a crucial mediating role in forming brand loyalty (Kaur et al., 2020). When consumers perceive cognitive fit with a particular brand, meaning that its image and quality align with their expectations or needs (Woo et al., 2019), they will develop positive attitudes, enhancing brand loyalty. Additionally, emotional resonance with the brand, such as emotional connections or identification with the values represented by the brand, also influences brand loyalty (DeWitt et al., 2008; Lv et al., 2022). Furthermore, behavioral fit, such as sharing opinions about the brand, directly impacts brand loyalty (Hollebeek et al., 2014). Therefore, merchants can improve customers' brand awareness, form a positive attitude towards the brand, and improve customers' behavioral fit through effective webcare of NeWOM to enhance brand loyalty.

Although many studies have defined the constitutive dimensions of customer engagement (Vivek et al., 2012; Harmeling et al., 2016; Shawky et al., 2020), few studies have explored in depth whether different dimensions of customer engagement have significant differences in the impact of brand loyalty. Therefore, this study aims to deeply analyze customer engagement's impact on brand loyalty by tracking cognitive, emotional, and behavioral interactions in the context of NeWOM and different webcare.

3. Methodology

3.1 Theoretical hypotheses

This study focuses on the effects of webcare on customer engagement and how these impacts further influence brand loyalty. Based on the information provided, we can infer the three hypotheses as follows:

3.1.1 Relationship between webcare and emotional, cognitive, and behavioral engagement

In the current research, an example of each type of strategy was selected for study. The selected proactive strategy was service-provider/customer rapport, as evidenced by an enjoyable interaction and establishing of a bond between the customer and the service provider (Gremler & Gwinner, 2000). Post-failure apologies, explanations, and an offer of financial compensation were selected as the reactive strategy. Compensation forms part of the outcome of a service exchange, while rapport is part of the process by which outcomes are determined (Worsfold et al., 2007). This paper demonstrates whether there is a positive or negative correlation between webcare and customer engagement and which engagement would be affected most. Thus, the first hypothesis is followed:

H1a: Proactive webcare positively influences customer engagement.
H1b: Reactive webcare positively influences customer engagement.

3.1.2 The effectiveness of different types of webcare on customer engagement

Different types of webcare differ in their effectiveness on customer engagement. Previously distinguished webcare as adaptive and defensive and studied the impact of differences on the effectiveness of customer engagement (Lopes et al., 2023). The present paper divides webcare into proactive and reactive, verifies the difference in the impact of these two types on customer engagement, and examines which webcare is more effective. Therefore, the second hypothesis is made as follows:

H2a: Compared to reactive webcare, proactive webcare is more effective in increasing customer engagement.
H2b: Compared to proactive webcare, reactive webcare is more effective in increasing customer engagement.

3.1.3 Relationship between cognitive, emotional, behavioral engagement and brand loyalty

Mollen and Wilson (2010) posited that customer brand engagement involves an interaction relationship with a brand. Hollebeek et al. (2014) claimed that customer engagement is the psychological, cognitive, emotional, and behavioral activity shown by customers while interacting with a certain organization or brand. A study by Leckie et al. (2016) shows that consumer engagement is central to brands since consumers actively co-create their experiences via interactions with brands. Accordingly, Brodie et al. (2011) investigated consumer engagement in a virtual brand community. They noted that the consumers who interact with the brand showed their loyalty to the brand by recommending the brand to others. In this view, we logically argue that customer engagement is positively associated with brand loyalty. Following the above discussions, we hypothesized that:

H3a: Cognitive engagement can positively affect brand loyalty.
H3b: Emotional engagement can positively affect brand loyalty.
H3c: Behavioral engagement can positively affect brand loyalty.

In summary, the research model of this paper is shown in Figure 1.

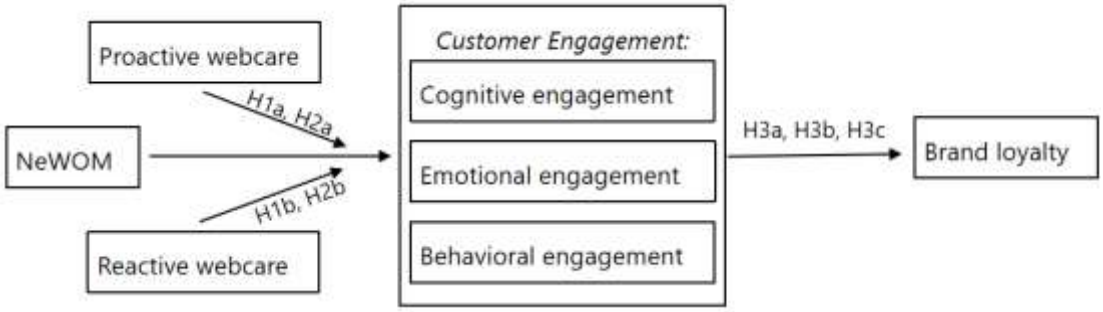

Figure 1. Research Model

3.2 Measurement of Variables

In order to maximize the validity of experimental data and conclusions, variables were measured using well-established scales developed by scholars, which were adapted to the specific experimental scenarios of this study. The scale consists of 17 items; details related to items and references for all variables are shown in Table 1.

Table 1. Measurement scale

Measured variables	Item number	Measurement items	Scale source
Webcare Satisfaction	WS1	I was satisfied with the handling of the complaint.	Brock et al., 2013
	WS2	I was very satisfied with the complaint handling of the company.	
	WS3	I felt the company provided a satisfactory solution to the problem.	
	WS4	Overall, I felt the service response from the company was good.	
Cognitive Engagement	COE1	I spend more time on the live-streaming platform.	Vivek et al., 2014; Dessart et al., 2016; Dessart, 2017; Luo et al., 2024;
	COE2	Time flies when I am interacting with people on the live-streaming platform.	
Emotional Engagement	EME1	I find live-streaming shopping is interesting.	
	EME2	I am interested in anything about live-streaming shopping.	
	EME3	When interacting with people during live-streaming shopping, I feel happy.	
Behavioral Engagement	BEE1	I share my ideas with others on the live-streaming platform.	
	BEE2	I seek ideas or information from others on the live-streaming platform.	
	BEE3	I am likely to recommend sellers that use live-streaming to my friends.	
	BEE4	I am likely to become a fan and a follower of the streamer.	
	BEE5	I am likely to keep track of the activities of a seller that uses live streaming.	
Brand Loyalty	BL1	I will select the live-streaming platform if needed in the future.	Zhou et al.,2014; Banerjee & Sreejesh, 2022;
	BL2	I will buy the products in the live streaming the next time I have the opportunity.	
	BL3	I intend to keep purchasing the products on the live-streaming platform.	

Based on literature reviews (e.g. Brock et al., 2013; Zhou et al.,2014; Dessart et al., 2016; Banerjee & Sreejesh, 2022; Luo et al., 2024), this study designed measurement items for the independent variables of cognitive, emotional, and behavioral engagement, which were referenced from studies (e.g. Vivek et al., 2014; Dessart et al., 2016; Luo et al., 2024). The effectiveness of webcare was detected by webcare satisfaction from Brock (2013). Besides, the dependent variable, brand loyalty, was measured by three scales (Zhou et al.,2014; Banerjee & Sreejesh, 2022; Sohaib & Han, 2023). All measurements were conducted using a *5-point Likert scale*.

3.3 Research design

A questionnaire survey was carried out utilizing a quantitative study design and the snowball sampling technique. An initial sample of live-streaming customers who subsequently referred their acquaintances was chosen, thus creating a snowball effect. A *5-point Likert scale* was used in the survey to capture customer engagement behaviors.

In this article, all variables are latent variables. According to Gao et al. (2017), it is necessary to design a questionnaire as latent variable data are challenging to obtain. The questionnaire consists of three parts and is used by an anonymous random sample. The initial segment pertains to inquiries related to the subject screening purpose and questionnaire requirements. The second section is the core scenario experiment. Participants will read the experimental scenario detailing NeWOM on live-streaming, as well as proactive and reactive webcare information (Worsfold et al., 2007). Then, they will answer questions related to material manipulation. In addition, subjects must answer questions about customer engagement and brand loyalty (Dessart, 2017). The final section investigates the demographic characteristics of the respondents, including gender, age, experience, and income.

4. Results and Analysis

4.1 Confirmatory factor analysis

4.1.1 Descriptive statistics

A total of 217 questionnaires were collected during the experiment. Through the rationality filtering of the questionnaires, 70 copies were retained in each group of experiments, with a total of 210 valid questionnaires. The recovery rate was 96.77%. The demographic characteristics of the adequate sample are analyzed as follows. Most of the subjects were 18-30 years old, accounting for 88.68%, indicating that the subjects were mostly young. Judging from the educational attainment, most of the subjects had a bachelor's degree, accounting for 83.12%. Notably, more than 90% of participants have experienced live-streaming, highlighting their substantial experience in this domain. Consequently, the subjects' essential information characteristics meet this study's needs.

4.1.2 Reliability assessment

The reliability of the measurement was assessed using *Cronbach's Alpha*. *A Cronbach's Alpha* value above 0.6 is typically regarded as acceptable, and a value over 0.7 indicates that the questionnaire is highly reliable. Table 2 indicates the reliability analysis results for the questionnaire.

Table 2. The results of the reliability assessment

Construct	Items	*Cronbach's Alpha (α)*
Webcare satisfaction	4	0.925
Cognitive engagement	2	0.871
Emotional engagement	3	0.843
Behavioral engagement	5	0.886
Brand loyalty	4	0.943

As evidenced in Table 2, the alpha values for the five constructs, spanning from 0.8 to 0.95, surpassed the established threshold of 0.7 for high reliability, thus affirming the robust consistency and stability of the questionnaire measurement data. This indicates a solid internal consistency among the items measuring each construct, ensuring the reliability of our data analysis and the validity of our research findings.

4.1.3 Validity assessment

Convergent validity was examined through composite reliability (CR) and average variance extracted (AVE). Construct reliability can be accepted with CR values higher than the 0.7 threshold and AVE values exceeding the 0.5 minimum requirements (Fornell & Larcker, 1981; Hair et al., 2010). In addition, standardized factor loadings of items are supposed to be 0.5 or above at a significance level <0.001.

Table 3. The results of convergent validity

	M	SD	SL	SE	p	AVE	CR
WS1	2.280	1.865	0.968				
WS2	2.260	1.842	0.987	0.021	***	0.9565	0.9888
WS3	2.280	1.87	0.979	0.023	***		
WS4	2.320	1.869	0.978	0.023	***		
COE1	2.963	1.1365	0.905			0.7733	0.8721
COE2	3.170	1.163	0.853	0.055	***		
EME1	3.220	1.009	0.740				
EME2	2.860	1.031	0.869	0.093	***	0.6455	0.8447
EME3	3.130	1.110	0.796	0.101	***		
BEE1	3.130	1.172	0.719				
BEE2	3.440	1.172	0.716	0.099	***		
BEE3	3.250	1.072	0.812	0.090	***	0.6087	0.8856
BEE4	3.090	1.160	0.797	0.098	***		
BEE5	3.150	1.055	0.848	0.089	***		
BL1	3.230	1.096	0.883				
BL2	3.400	1.061	0.820	0.056	***	0.7798	0.9340
BL3	3.240	1.144	0.906	0.054	***		
BL4	3.070	1.116	0.920	0.052	***		

Note(s): X2 /df = 2.188; GFI = 0.867; TLI = 0.957; CFI = 0.965 &RMSEA = 0.074; SL = standardized loadings; M = Factor mean; SD = standard deviation; CR = composite reliability and AVE = average variance extracted.

As shown in Table 3, each construct had acceptable construct reliability, with the CR values ranging from 0.84 to 0.99, higher than the 0.7 threshold. The validity test results ensured convergent validity, as all the AVE values ranged from 0.60 to 0.96, exceeding the 0.5 minimum requirement. In addition, all the measurement items had standardized factor loadings of 0.5 or above at a significance level <0.001, which ensured convergent validity.

To evaluate discriminant validity rigorously, we adopted the established method outlined by Fornell and Larcker (1981). This approach entails comparing the squared correlations between constructs with their respective Average Variance Extracted (AVE) values. By scrutinizing these comparisons, we can ascertain whether the constructs in our study exhibit distinct patterns of variance, thus validating the unique contribution of each construct.

Table 4. Test results of discriminant validity

	Brand loyalty	Behavioral engagement	Cognitive engagement	Emotional engagement	Webcare satisfaction
Brand loyalty	0.883				
Behavioral engagement	0.795**	0.780			
Cognitive engagement	0.769**	0.770**	0.879		
Emotional engagement	0.739**	0.783**	0.959**	0.803	
Webcare satisfaction	0.284**	0.197	0.364**	0.379**	0.978**
AVE	0.7798	0.6087	0.7733	0.6455	0.9565

Note: * means sig. <0.05, * * means sig.<0.01

As shown in Table 4, the squared root of AVE values for each construct was mainly more significant than the squared correlations between it and other constructs, indicating discriminant validity. This suggests that the constructs measure distinct aspects of the phenomenon, reinforcing effectiveness in the validity of the measurement model.

4.2 Hypothesis Testing

4.2.1 Relationship between webcare and cognitive, emotional, and behavioral Engagement

Regarding the impact of webcare on customer engagement, we conducted a correlation analysis to examine the effects of proactive webcare and reactive webcare on customer engagement and to determine which type of engagement is most affected.

Table 5. Webcare influences outcomes on three types of engagement

Types of webcare	Customer engagement	Mean	Standard Deviation	Pearson Correlation	Sig. (2-tailed)
Proactive webcare	Cognitive engagement	3.414	.8426	.532**	.000
	Emotional engagement	3.314	.6970	.577**	.000
	Behavioral engagement	3.326	.7430	.390**	.001
Reactive webcare	Cognitive engagement	3.050	1.152	.481**	.000
	Emotional engagement	3.119	.9540	.470**	.000
	Behavioral engagement	3.183	1.042	.509**	.000

**At the 0.01 level (two-tailed), the correlation was significant.

In Table 5, proactive webcare has a significant impact on customer engagement in terms of cognitive, emotional, and behavioral participation (sig.<0.01), showing a positive correlation (Pearson correlation>0), supporting hypothesis H1a. Furthermore, particularly in cognitive and emotional engagement, proactive webcare demonstrates a significant and close relationship (Cognitive Engagement: Pearson correlation=0.532>0.4; Emotional Engagement: Pearson correlation=0.577>0.4).

Reactive webcare also significantly influences customer engagement in cognitive, emotional, and behavioral participation (sig.<0.01), displaying a positive correlation (Pearson correlation>0), confirming hypothesis H1b. Additionally, reactive webcare exhibits a high degree of correlation with all three aspects of client engagement (Pearson correlation>0.4), with the most significant impact observed in behavioral participation (Pearson correlation=0.509), followed by cognitive and emotional participation.

4.2.2 The effectiveness of different types of webcare on customer engagement

Webcare is classified data; cognitive, emotional, and behavioral engagement in customer engagement is quantitative data. Mann-Whitney U was selected to test whether consumers significantly differ in cognitive, emotional, and behavioral engagement when proactive and reactive online care. The results are shown in Table 6.

Table 6. Results of the Mann-Whitney U test for proactive and reactive webcare

Variable	Webcare	Mean	Mann-Whitney U	p
Cognitive engagement	Proactive webcare	78.32	1902.500	0.021
	Reactive webcare	62.68		
Emotional engagement	Proactive webcare	77.30	1974.000	0.045
	Reactive webcare	63.70		
Behavioral engagement	Proactive webcare	73.87	2214.000	0.323
	Reactive webcare	67.13		

When the significance level (p) is less than 0.05, it indicates a significant relationship between the two variables. As evidenced in Table 6, in terms of cognitive engagement (p=0.021<0.05) and emotional engagement (p=0.045<0.05), different types of webcare have a significant impact on these two types of engagement. However, regarding behavioral engagement, there is no significant difference between proactive and reactive webcare, suggesting that both types of webcare have similar effects on behavioral engagement. Additionally, in terms of cognitive, emotional, and behavioral engagement, proactive webcare consistently shows more substantial effects compared to reactive webcare (Cognitive engagement: M(proactive webcare)>M(reactive webcare); Emotional engagement: M(proactive webcare)>M(reactive webcare); Behavioral engagement: M(proactive webcare)>M(reactive webcare)).

4.2.3 Test of the influence degree of three types of customer engagement on brand loyalty

Customer engagement includes cognitive, emotional, and behavioral engagement. We conducted a correlation analysis to examine the effects of three engagements on brand loyalty and to determine which type of engagement is the most effective in enhancing brand loyalty (Table 7).

Table 7. Results of cognitive, emotional, and behavioral engagement on brand loyalty

Variable	Customer engagement	Mean	Standard deviation	Pearson Correlation	Sig. (2-tailed)
Brand loyalty	Cognitive engagement	3.067	1.0822	.681**	.000
	Emotional engagement	3.069	.917	.651**	.000
	Behavioral engagement	3.214	.9339	.710**	.000

**At the 0.01 level (two-tailed), the correlation was significant.

As shown in Table 7, cognitive engagement, emotional engagement, and behavioral engagement all had significant effects on brand loyalty (sig.<0.01) and showed a positive correlation (Pearson correlation>0). Cognitive engagement, emotional engagement, and behavioral engagement were highly related to brand loyalty (Pearson correlation>0.4); among them, behavioral engagement had the greatest influence on brand loyalty (Pearson correlation=0.710), followed by cognitive engagement and emotional engagement.

4.2.4 Results of hypothesis test

The study focuses on the scenario of live streaming platforms, utilizing the assumptions about the types of webcare and its effectiveness in enhancing brand loyalty. After collecting and analyzing data, the research concludes with a summary of hypothesis testing results in Table 8.

Table 8. Summary of theoretical test results

	Research hypothesis	Result
H1 a	Proactive webcare positively influences customer engagement.	Established
H1 b	Reactive webcare positively influences customer engagement.	Established
H2 a	Compared to reactive, proactive webcare is more effective in increasing customer engagement.	Established
H2 b	Compared to proactive, reactive webcare is more effective in increasing customer engagement.	Not Established
H3 a	Cognitive engagement can positively affect brand loyalty.	Established
H3 b	Emotional engagement can positively affect brand loyalty.	Established
H3 c	Behavioral engagement can positively affect brand loyalty.	Established

As H1 a and H1 b are established, Table 8 shows that two types of webcare enhance customer engagement. However, it should be noted that proactive webcare is more effective than reactive webcare as H2 a is established. Additionally, in the live streaming platform, three sub-factors of customer engagement positively impact brand loyalty, which aligns with the former research in retail banking (Kosiba et al., 2018). Our paper verifies that webcare affects eWOM in live streaming platforms, improves customer engagement, and thus enhances brand loyalty.

5. Discussion

5.1 Main findings

Based on NeWOM on a live streaming platform, this study examines the intrinsic effects of webcare, customer engagement, and brand loyalty. The empirical results indicate that proactive and reactive webcare significantly affect customer engagement. Proactive webcare had a more prominent influence on emotional and cognitive engagement, while reactive webcare had the most significant effect on behavioral engagement. It is worth noting that the differences in the impact of different types of webcare on behavioral engagement were not significant. Generally, the overall effect of proactive webcare on customer engagement was significantly better than that of reactive webcare. Finally, this study finds that cognitive, emotional, and behavioral engagement had a significant effect on brand loyalty, with behavioral engagement having the most significant level of impact, followed by cognitive and emotional engagement.

This study makes an essential contribution to the field of webcare and fills some gaps in the existing literature. Firstly, the study systematically explores the impact of webcare on customer engagement, with a particular emphasis on the impact before and after service failure. This is an important addition to previous research on webcare after service failure. Previous researchers have found that proactive and reactive webcare are essential in achieving marketing objectives (van Noort & Willemsen, 2012). Therefore, to better understand the different impacts of webcare, it is necessary to divide webcare into proactive and reactive types.

Secondly, this study classified customer engagement into cognitive, emotional, and behavioral (Chan et al., 2010; Hollebeek et al., 2016) to illustrate the effectiveness of webcare. Previous researchers have found that webcare plays a vital role in increasing customer engagement (Wongkitrungrueng & Assarut, 2020; Lv et al., 2022). This study demonstrates that proactive webcare and reactive webcare had a significant effect on customer engagement under the live streaming platform, further confirming that webcare improves customer engagement. More interestingly, this study finds significant differences between different types of webcare on cognitive engagement and emotional engagement but not on behavioral engagement. Thus, proactive webcare has a significantly better overall effect on customer engagement than reactive webcare.

Finally, this study finds that behavioral engagement has the greatest impact on brand loyalty, providing new insights into the literature on customer loyalty. In previous research on customer engagement, cognitive engagement was found to most influence customer loyalty (van Doorn et al., 2010). However, this study finds that behavioral engagement had the most significant influence

on brand loyalty, followed by cognitive and emotional engagement. This suggests that brand building not only depends on consumers' cognitive processes but also requires attention and guidance for behavioral engagement.

5.2 Managerial Implications

The main managerial implication of this study is that we provide new insights into managing NeWOM on live-streaming platforms. Increasing customer brand loyalty on live-streaming platforms is a great challenge for companies (Lv et al., 2022). This study found that webcare can be an essential tool for managing customers' NeWOM and increasing brand loyalty. Specifically, the results of this study show that enterprises can adopt proactive webcare to respond to customers' eWOM and actively provide support and services to increase customer engagement and enhance customer brand loyalty (van Noort & Willemsen, 2012). In particular, managers must be attentive to customer needs and respond to them promptly (Woo et al., 2019). In addition, this study found that behavioral engagement has the most significant impact on brand loyalty. Therefore, firms should encourage customers to participate in specific actions, such as attending events and sharing experiences, to strengthen their brand loyalty (Dolan et al., 2017). In conclusion, the strategy proposed by this study is of practical significance.

6. Conclusion

This study explores the impact of webcare on brand loyalty through customer engagement, offering insights for e-commerce live-streaming platforms. It identifies proactive and reactive webcare's effects on emotional, cognitive, and behavioral engagement, with proactive webcare showing the greater influence on emotional and cognitive engagement, while reactive webcare is more effective in behavioral engagement. Overall, proactive webcare has a more favorable impact on engagement. Moreover, customer engagement positively correlates with brand loyalty, consistent with those of Leckie et al. (2016). Businesses should prioritize proactive webcare to improve customer engagement and brand loyalty by providing support and services and encouraging customer advocacy during live broadcasts to enhance brand loyalty further.

Our study has limitations but offers insights for future research. Firstly, other factors may influence outcomes when examining the effects of proactive and reactive webcare on customer engagement. Future research could explore webcare's interaction with timeliness or trustworthiness. Secondly, relying on self-reported measures may introduce biases. Future studies could use objective measures or multiple approaches. Additionally, sample selection limitations exist, with specific consumer perspectives playing a role in shaping the current results (Hollebeek, 2018). Future research could broaden the sample range to enhance representativeness and generalizability, thus improving understanding of consumer responses.

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