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Effects of Online Customer Service Types and Customer Anger on Negative Word-of-Mouth : The Moderating Role of Service Failure Controllability

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Abstract

The application of chatbots on e-commerce platforms is becoming increasingly widespread. With the rapid development of artificial intelligence technology, previous research has predominantly focused on service failures occurring with the chatbots themselves. There is limited research on scenarios where chatbots handle service failures that are controllable by the sellers. This paper conducted online surveys through two experiments involving a total of 546 participants. The results indicate that, in the event of a service failure, customers are more likely to spread negative word-of-mouth about the store and have lower repurchase intentions when served by chatbots compared to human customer service representatives. This is because customers experience higher levels of anger with the chatbots. However, when customers perceive the service failure as uncontrollable by the seller, the impact of the type of customer service provider on negative word-of-mouth via customer anger is weakened while when customers perceive it as controllable the impact is strengthened. This study provides theoretical contributions for online retail enterprises to apply intelligent customer service while preventing further deterioration of service failures.

■ KeyWords: Chatbot, Service Failure Controllability, Anger, NWOM(Negative Word-of-Mouth), E-commerce

Ⅰ. Introduction

Chatbots refer to intangible intelligent devices that interact with humans through conversation or text, powered by artificial intelligence technology (Chi et al., 2020). The rapid development of AI

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technology has driven the adoption of chatbots in the service applications of e-commerce platforms. From the perspective of businesses, this not only enhances service efficiency but also reduces labor costs.

Service failures are inevitable in any service context. Previous research on chatbots and service failures can be broadly categorized into two areas. The first focuses on service failures arising from the chatbots themselves and their impact on user service satisfaction, e.g., repeatedly providing the same information (Alimamy & Kuhail, 2023), unfriendly attitudes, long response times, and inadequate establishment of consumer preferences (Xing et al., 2022). The second area explores whether anthropomorphic design can mitigate the negative consequences of chatbot service failures. For instance, cuteness can increase customer tolerance of service failures (Lv et al., 2021), and anthropomorphic language styles positively influence consumer expectations during service recovery (Lu et al., 2024). However, the emergence of ChatGPT has made it clear that the intelligence level of chatbots can achieve natural and fluent communication with humans. Existing research predominantly focuses on anthropomorphism, functional failures, and consumer attitudes towards chatbots, while comparatively less attention has been given to the role and efficiency of chatbots in handling external service failures and to their impact on the sellers themselves.

Different task requires different role of chatbots, and what we urgently need to understand is in which service scenarios e-commerce chatbots cannot replace human customer service, even without technical functionality issues. The advantages of chatbots include being unconstrained by time, allowing them to respond to customers immediately at any time, handling a large number of customer requests simultaneously, providing consistent answers, and avoiding errors that may arise from manual operations (Ahmad et al., 2018). However, their disadvantages include the inability to handle issues that require complex judgments or authorization, lack of flexibility in addressing problems outside their predefined scope, and inability to offer empathy and emotional support like humans (Alrebdi & Hadwan, 2022). Some scholars have found that customers place greater value on the service recovery actions of higher-level managers (compared to regular employees) (Sengupta et al., 2018). Higher authority figures can make customers feel valued and cared for, and they have the authority to make higher-level decisions (e.g., monetary compensation) that can quickly resolve issues and reduce customer wait times. In cases of service failure, the inability of chatbots to make such decisions leads to numerous issues being escalated to human agents. This not only increases operational costs for the seller, deviating from the initial purpose of implementing intelligent customer service, but also makes customers feel that their concerns are not adequately addressed. They may need to spend additional time and effort, feeling undervalued or unimportant, which can increase frustration and dissatisfaction. However, there is limited research exploring whether different types of service providers (chatbots or humans) in service failure scenarios trigger customers' negative emotion (e.g. anger) and increase retaliatory behavior. We aim to fill this research gap.

Anger is a powerful emotional response that often arises in the context of service failures. It is a crucial factor influencing how customers perceive and react to these failures (Bonifield & Cole, 2007). Anger is typically triggered when customers perceive that their expectations have been violated (Weiner, 2000; Oliver, 2014). Furthermore, anger can serve as a lens through which customers evaluate their overall service experience. When customers feel angry, they are more likely to view

the entire interaction negatively, regardless of other positive aspects of the service. This emotional response not only affects their immediate reactions, but also their future intentions and behaviors towards the brand, such as spreading negative word of mouth (hereafter NWOM, Balaji et al., 2016). By focusing on anger as a mediating variable, this study aims to uncover the underlying emotional processes that drive these behaviors. Understanding the role of anger can help businesses develop more targeted strategies to manage customer emotions and reduce the negative impact of service failures.

The mediating role of customers' anger can be moderated by controbility attribute of the service failure. In the e-commerce environment, controllability attribution is a crucial basis for consumer decision-making (Hess et al., 2003). When customers believe that a failure was within the seller's control, they are more likely to experience intense negative emotions and attribute blame to the service provider (Weiner, 2000). Conversely, if the failure is perceived as uncontrollable, customers may be more forgiving. Extant research has examined various aspects of service failure controllability, highlighting its impact on customer satisfaction and recovery expectations (Smith et al., 1999; Weiner, 2000). However, there are gaps in understanding how controllability attribution interacts with different types of customer service (e.g., chatbot vs. human) and its subsequent effects on customer emotions and behaviors. Therefore, this study categorizes service failures based on whether the seller could have avoided the failure (e.g., the level of controllability of the service failure) and explores its impact on the relationship between the type of service provider and consumers' negative emotions on the spread of negative word-of-mouth.

Based on the above background, this paper focuses on three main aspects. First, it explores the impact of different types of e-commerce online customer service (chatbots or humans) on customer negative word-of-mouth in the context of service failure. Second, it examines the mediating role of customer anger in the relationship between type of customer service provider and consumer response, clarifying how service failure incidents affect consumer psychology. Third, it focuses on the controllability factors of merchant service failures in the online shopping context, deepening and expanding research on service failures through the study of negative word-of-mouth dissemination.

Ⅱ. Theoretical background and hypotheses development

2.1 Chatbot or Human

Chatbots do not possess physical hardware forms, cannot move or operate in the real world, and exist solely on software platforms to interact with users. They are virtual and not real (Candello et al., 2019). Users often recognize that they are interacting with a program rather than a human when engaging with a chatbot. As a program, chatbots struggle to convey the authenticity and emotionality of human interaction to consumers (Hu et al., 2021). Human communication relies not only on language but also on a wealth of non-verbal cues such as facial expressions, gestures, tone of voice, and posture. These cues play a crucial role in communication, helping to convey emotions and intentions (Horstmann, 2003). Compared to chatbots, customers find it easier to imagine how human

customer service representatives might enact the text information in real life, and they are more likely to believe that humans can understand and respond by seeing their messages. Therefore, unlike human customer service, consumers find it challenging to simulate a real-life scenario when conversing with chatbots, making it difficult for them to believe that chatbots can empathize and understand as humans do.

Additionally, the motivation for companies to introduce chatbots is perceived by most consumers as a cost-saving measure rather than an effort to improve service quality (Sharma et al., 2022). In cases of service failure, customers expect to receive understanding, sympathy, and personalized assistance. However, even if chatbots express themselves similarly to human customer service representatives, they cannot provide the realness of physical presence, nor can they dispel the negative perception that companies use chatbots solely for profit maximization. When consumers encounter service failures and are served by chatbots, they are likely to feel that the company not only made a mistake but also lacks a sincere attitude. Dissatisfaction with products and services can lead to retaliatory behavior from customers (Tripp & Gregoire, 2011), especially since advanced social media platforms provide a convenient way for aggrieved customers to spread negative word-of-mouth about the company to online networks and close family and friends. Therefore, we predict that when chatbots provide customer service to aggrieved customers, they are more likely to spread negative word-of-mouth compared to human customer service.

H1: When chatbots (vs. humans) provide online customer service in the case of service failure, consumers are more likely to spread negative word-of-mouth about the e-store.

2.2 Customer anger and negative word of mouth

The cognitive appraisal theory of emotion posits that emotions are not direct responses to external stimuli but are generated after an individual's cognitive appraisal (Lazarus, 1991). The appraisal process is divided into two types: primary appraisal and secondary appraisal. Primary appraisal involves assessing whether an event is relevant to one's goals or interests, while secondary appraisal involves evaluating whether one has the resources and ability to deal with the event. After this evaluation, individuals choose their coping mechanisms (Tomaka et al., 1997).

Furthermore, individuals experiencing a goal incongruent with their expectations can trigger anger (Smith & Lazarus, 1993). When customers experience service failures, they perceive that the failure wastes time and effort they should not have to expend. They are more inclined to seek human customer service, hoping for more effective solutions and emotional understanding and support. If they encounter an unexpected chatbot, and their expectations are unmet, they may feel further ignored or ineffectively handled, turning initial disappointment into anger. Customers' reactions to companies are easily influenced by anger (Ask & Landström, 2010). Compared to other emotions, anger is more likely to lead to retaliatory behavior (Pinker, 1997).

A possible consequence of customers' post purchase anger is the negative word of mouth. The Word-of-mouth (WOM) communication refers to the informal, non-commercial exchange of information between consumers about products, brands, services, or organizations (Arndt, 1967). Its

uniqueness lies in the fact that both the sender and receiver are consumers, rather than formal complaints directed at marketers or organizations (Anderson, 1998). Negative word-of-mouth (NWOM) typically focuses on the shortcomings of a product or service (Cheung & Thadani, 2012). After experiencing poor service, customers often prefer to express their dissatisfaction by spreading NWOM (Rodrigues et al., 2021). Research has shown that consumers are more sensitive to NWOM (Hornik et al., 2015) and are more likely to form negative perceptions of a company (Kim et al., 2016). Consequently, when users engage in retaliatory behavior, such as spreading negative information about the company and advising others not to use its products, the company's reputation can quickly suffer, potentially leading to irreversible harm (Tripp & Gregoire, 2011).

Based on this, we predict that after experiencing service failure, customers are more likely to feel unimportant and their needs unmet when served by chatbots. This triggers anger, leading to retaliatory negative word-of-mouth aimed at punishing the company.

H2: The impact of online customer service provider type on negative word-of-mouth is mediated by customer anger.

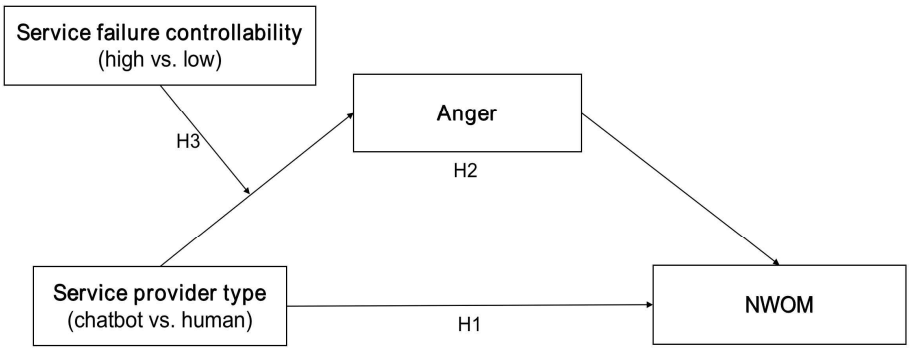
2.3 Moderating role of service failure controllability

According to attribution theory, people experiencing negative events attempt to determine the causes of these events, attributing them based on factors such as controllability, stability, and causality (Weiner, 1985). In the context of online shopping, e-commerce platforms merely facilitate transactions between consumers and sellers, providing infrastructure and some support services (Sharma & Lijuan, 2015). However, the quality of products, the provision of services, and communication and relationship management with consumers ultimately fall under the responsibility of the sellers themselves. Consequently, when consumers encounter product issues while shopping online, they tend to attribute errors to the sellers, differing only in their perceptions of the seller's level of control over such errors. Service failure controllability refers to the extent to which service providers can control and avoid service failures (Weiner, 1985; Folkes, 1988). If a service failure is perceived as controllable, meaning the service provider could have prevented or reduced its occurrence, customers are inclined to hold more negative perceptions of the service provider (Folkes, 1984; Choi & Mattila, 2008).

This study posits that the controllability of seller service failures moderates the relationship between online customer service type and customer anger. Seller service failure controllability may interact with online customer service type because consumers, when faced with service failures, judge whether such mistakes could have been avoided by the seller based on their shopping experience and the objective environment of the store (Van Vaerenbergh et al., 2014). If customers believe the seller could have controlled and avoided the mistake but did not, they are more disappointed and likely to seek customer service primarily to express emotions rather than to resolve issues. Encountering a chatbot perceived as incapable of truly listening can lead customers to feel disrespected and misunderstood, thereby triggering anger. On the other hand, if a service failure is perceived as uncontrollable by the seller, the proportion and priority of seeking customer service to

vent emotions would be lower. Consequently, even encountering a chatbot may not result in significant increases in negative emotions. Therefore, we can hypothesize:

H3: The impact of online customer service provider type on negative word-of-mouth through customer anger is moderated by the level of service failure controllability. Specifically, when seller service failure controllability is high, customer anger is higher with chatbot service compared to human service, but this difference is not observed when service failure controllability is low.



NWOM: Negative Word-of-Mouth

Figure 1. Conceptual model

Ⅲ. Study 1

The first objective of Study 1 is to verify that in the context of online shopping service failures, the likelihood of customers spreading negative word-of-mouth about the store is higher when served by a chatbot compared to a human customer service (H1). The second objective is to demonstrate that customer anger mediates the relationship between the type of customer service and the likelihood of customers spreading negative word-of-mouth.

3.1 Research design

In this study, an online survey was conducted using the Questionnaire Star platform to recruit participants, each of whom received monetary compensation of one RMB. Participants were required to have engaged in communication with e-commerce customer service and be familiar with online shopping. The sample size was 146 (Table 1), with 53.42% being female. The majority of participants were aged between 20 and 39 years (91.10%). The respondents were predominantly employed in companies or students (71.92%). Regarding income, the largest proportion fell within the range of 3001 to 10000 RMB, accounting for 51.37%, aligning with characteristics typical of consumers familiar with online shopping.

Table 1. Demographic characteristics

Category	Study 1 (N=146)		Study 2 (N=400)	
	Frequency	Percentage	Frequency	Percentage

Gender				
Male	68	46.58%	186	46.50%
Female	78	53.42%	214	53.50%
Age				
<20	7	4.79%	21	5.25%
20s	105	71.92%	287	71.75%
30s	28	19.18%	88	22.00%
40s	2	1.37%	3	.75%
>50	4	2.74%	1	.25%
Education				
Below high school	12	8.22%	25	6.25%
High school degree	20	13.70%	92	23.00%
Bachelor's degree	55	37.67%	147	36.75%
Master's degree and above	59	40.41%	136	34.00%
Monthly income (RMB)				
<1000	25	17.12%	59	14.75%
1001-3000	32	21.92%	83	20.75%
3001-5000	33	22.60%	98	24.50%
5001-10000	42	28.77%	129	32.25%
>10000	14	9.59%	31	7.75%
Occupation				
Agency staff	5	3.42%	13	3.25%
Corporate staff	39	26.71%	150	37.50%
Freelance worker	20	13.70%	49	12.25%
Student	66	45.21%	156	39.00%
Other	16	10.96%	32	8.00%

Study 1 employs a 2 (service provider: chatbot vs. human) between-subjects design, with participants randomly assigned to one of the two conditions. All participants first read a written description of an online shopping service failure scenario:

Imagine you need to buy something online. You find a product that meets your needs, and the page shows that it will be delivered within three days. After completing the payment, three days later, you check the order status and find that the item is still in transit and has not been delivered as scheduled. You decide to contact customer service to report the issue, and the service representative is a human (chatbot) customer service agent."

After reading the written material, participants viewed chat screenshots corresponding to their assigned condition (see Appendix A). The dialogue content was identical for both the chatbot and human conditions, with only the account name presented to the customer differing (e.g., the chatbot condition used "Customer Service Bot," while the human condition used a human name like "Anan"). Participants were then asked to complete a questionnaire measuring anger (Bonifield and Cole, 2007) and negative word-of-mouth (NWOM; Gregoire and Fisher, 2006). All responses were measured using

a 7-point Likert scale (1 = “strongly disagree,” 7 = “strongly agree”). Table 2 shows the constructs of all our variables and their associated reliability coefficients.

3.2 Main effect

An independent samples t-test indicated a significant main effect of customer service provider type on negative word-of-mouth (NWOM). Customers were more likely to spread negative word-of-mouth when served by a chatbot compared to a human customer service representative (M_chatbot = 5.406, SD = 1.573 vs. M_human = 4.009, SD = 1.499; t(144) = -5.495, p < .001). Therefore, H1 was supported.

Table 2. Measurement items

Variables (Source)	Measures	Study 1		Study 2	
		α	Mean (SD)	α	Mean (SD)
Service failure controllability (Hess et al., 2003)	The cause of the service failure is likely to be highly controllable by the e-store.	-	-	.842	4.178 (1.438)
	The cause of the service failure is likely to be preventable by the e-store.				
Anger (Bonifield and Cole, 2007)	I would feel angry about my experience at this e-store.	.935	4.059 (2.166)	.933	3.738 (1.698)
	I would feel very displeased with the service at this e-store.				
	The more I think about it, the more hostile I would feel towards the e-store.				
NWOM (Grégoire and Fisher, 2006)	I spread negative word-of-mouth about the e-store.	.868	4.708 (1.684)	.875	4.494 (1.383)
	I denigrated this e-store to my friends.				
	When my friends were looking for a similar product or service, I told them not to buy from this e-store.				

3.3 Mediating effect

We employed Hayes (2017) PROCESS model 4 for conducting mediation analysis, using 5000 bootstrapped resamples to correct for guided bias and to calculate 95% confidence intervals (CI) to test the significance of the mediation hypothesis. We used the type of customer service provider as the independent variable (Human = 0; Chatbot = 1), anger as the mediator variable, and negative word-of-mouth as the dependent variable. Table 3 presents the results of the mediation analysis, showing that anger significantly mediated the relationship between customer service provider type and negative word-of-mouth (β = .836, SE = .187, 95% CI = [.491, 1.221]). Our analysis results support H2.

Table 3. Bootstrap confidence intervals for the mediating effect

	M (Anger)					
Antecedent	Coefficient	SE	t	p	LLCI	ULCI
X (Service provider type)	1.699	.331	5.135	.000	1.045	2.352
Constant	3.210	.234	13.725	.000	2.748	3.672
Model summary	R^2 = .155					
	F (1, 144) = 26.372, P<.001					
	Y (NWOM)					
Antecedent	Coefficient	SE	t	p	LLCI	ULCI
X (Service provider type)	.562	.213	2.633	.009	.140	.983
M (Anger)	.492	.049	9.959	.000	.394	.590
Constant	2.430	.211	11.537	.000	2.014	2.846
Model summary	R^2 = .512					
	F (2, 143) = 74.986, P<.001					
Path			Effects	BootSE	LLCI*	ULCI*
Service provider type → NWOM			.562	.213	.140	.983
Service provider type → Anger → NWOM			.836	.187	.491	1.221

Notes: LLCI = lower level of 95% confidence interval, ULCI = upper level of 95% confidence interval
*:Boot strapping LLCI and ULCI

IV. Study 2

The objectives of Study 2 are twofold. First, Study 2 aims to enhance the robustness of H1 and H2 by using different online service failure scenarios. Second, Study 2 seeks to test H3, which posits that the level of seller controllability in service failures moderates the mediating effect of customer anger on the relationship between the type of customer service provider and negative word-of-mouth.

4.1 Design and participants

Study 2 employed a 2 (service provider: chatbot vs. human) X 2 (service failure controllability: high vs. low) between-subjects design. We recruited 400 participants (53.50% female) through the Chinese survey platform Wenjuanxing. Participants were randomly assigned to one of four experimental conditions. Written stimulus materials regarding the seller's service failure controllability level were designed based on previous research (von Aswege et al., 2018). The online customer service providers were either chatbots or human agents. Participants assigned to the high controllability condition read the following service failure scenario:

"Imagine you needed to buy a piece of clothing, so you placed an order online at a clothing retail store for a size M shirt. The order confirmation email clearly stated that you ordered a size M.

Upon receiving the package, you discovered that the T-shirt inside was size L, not the size M you ordered. You decide to contact customer service to address this issue, and you are assisted by a human (chatbot) customer service representative. "

In the low seller controllability condition, participants read the following scenario:

"Imagine you needed to buy a piece of clothing, so you placed an order online at a clothing retail store for a size M shirt. The order confirmation email clearly stated that you ordered a size M. Upon receiving the package, you found that although the T-shirt was labeled as size M, it didn't fit properly and felt larger than the M size you usually wear. You decide to contact customer service to address this issue, and you are assisted by a human (chatbot) customer service representative. "

Participants were then asked to view chat screenshots corresponding to their assigned condition (see Appendix B). For the manipulation check, we measured participants' perceived level of service failure controllability by the seller using two items (Hess et al., 2003). The remaining measures for anger and negative word-of-mouth (NWOM) were the same as in Study 1. Finally, participants provided their demographic information (see Table 1).

4.2 Manipulation check

The independent samples t-test results indicated that participants in the high controllability condition perceived significantly higher levels of seller's service failure controllability compared to those in the low controllability condition (M_{high} = 4.728, SD = 1.325 vs. M_{low} = 3.628, SD = 1.325; $t(398) = -8.268$, $p < .001$). Thus, participants felt that the service failure of receiving the wrong clothing size from the seller was more avoidable than the failure of receiving a larger size than expected. Our manipulation was successful.

4.3 Main effect

In the independent samples t-test analysis, it was found that consumers were significantly more likely to spread negative word-of-mouth about the e-store when serviced by a chatbot compared to when serviced by a human ($M_{chatbot}$ = 4.938, SD = 1.195 vs. M_{human} = 4.050, SD = 1.417; $t(398) = -6.778$, $p < .001$). H1 was supported again.

4.4 Main effect

The mediation analysis using Hayes (2017) PROCESS model 4 revealed that anger significantly mediated the relationship between customer service provider type and negative word-of-mouth (β = .274, SE = .086, 95% CI = [.111, .450]), thus supporting H2 again (Table 4).

Table 4. The mediating role of anger

	M (Anger)					
Antecedent	Coefficient	SE	t	p	LLCI	ULCI
X (Service provider type)	.570	.168	3.401	.001	.241	.900
Constant	3.453	.119	29.140	.000	3.220	3.686
Model summary	R^2 = .028					
	F (1, 398) = 11.567, P<.001					
	Y (NWOM)					
Antecedent	Coefficient	SE	t	p	LLCI	ULCI
X (Service provider type)	.614	.105	5.851	.000	.408	.820
M (Anger)	.481	.031	15.559	.000	.421	.542
Constant	2.388	.130	18.443	.000	2.133	2.642
Model summary	R^2 = .443					
	F (2, 397) = 157.924, P<.001					

Path	Effects	BootSE	LLCI*	ULCI*
Service provider type → NWOM	.614	.105	.408	.820
Service provider type → Anger → NWOM	.274	.086	.111	.450

Notes: LLCI = lower level of 95% confidence interval, ULCI = upper level of 95% confidence interval
*:Boot strapping LLCI and ULCI

4.5 Moderated mediating effect

To understand the interaction effects of service failure controllability and customer service provider type on anger, we conducted moderated mediation analysis using Model 7 from the PROCESS macro. Service failure controllability was treated as the moderating variable (Low service failure controllability = 0; High service failure controllability = 1). The results indicated significant interaction effects of service failure controllability and customer service provider type on anger (β = .720, t(396) = 2.673, p < .01; Figure 2). As shown in Table 5, significant moderated mediation effects were observed for negative word-of-mouth (β = .347, SE = .125, 95% CI = [.098, .590]).

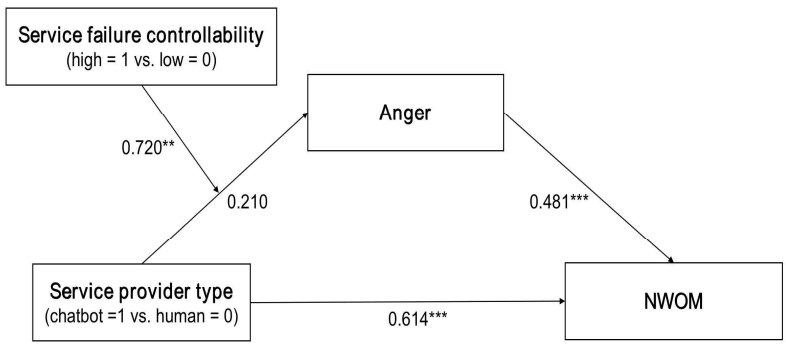


Figure 2. The role of service failure controllability
Notes: p* < .05, p** < .01, p*** < .001

Table 5. The moderated mediating effect of service failure controllability

	M (Anger)					
Antecedent	Coefficient	SE	t	p	LLCI	ULCI
X (Service provider type)	.210	.190	1.103	.271	-.164	.584
W (Service failure controllability)	1.607	.190	8.436	.000	1.232	1.981
X × W	.720	.269	2.673	.008	.191	1.250
Constant	2.650	.135	19.678	.000	2.385	2.915
Model summary			R^2 = .376			
			F (3, 396) = 79.445, P<.001			
	Y (NWOM)					
Antecedent	Coefficient	SE	t	p	LLCI	ULCI
X (Service provider type)	.614	.105	5.851	.000	.408	.820
M (Anger)	.481	.031	15.559	.000	.421	.542
Constant	2.388	.130	18.443	.000	2.133	2.642
Model summary			R^2 = .443			
			F (2, 397) = 157.924, P<.001			
Service provider type → Anger → NWOM			Effects	BootSE	LLCI*	ULCI*
Low service failure controllability			.101	.093	-.073	.291
High service failure controllability			.448	.096	.267	.641
Index of Moderated Mediation			.347	.125	.098	.590

Notes: LLCI = lower level of 95% confidence interval, ULCI = upper level of 95% confidence interval
*:Boot strapping LLCI and ULCI

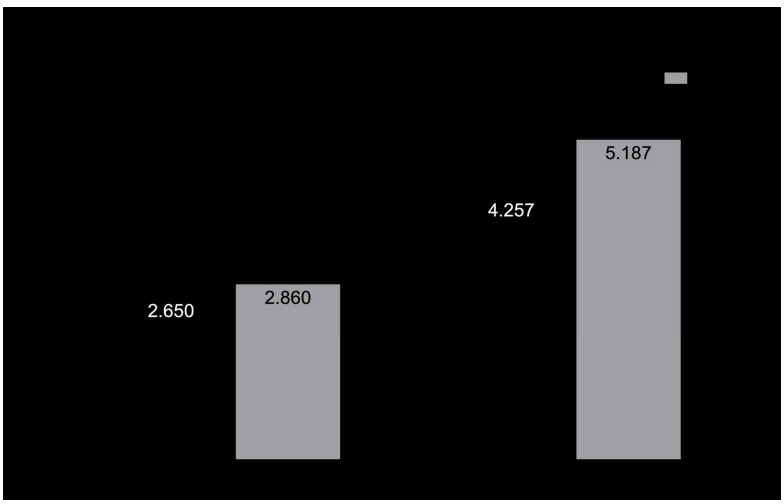


Figure 3. Interaction effect of service failure controllability and service provider type on customer anger
Notes: ns p > .05, * p < .05, ** p < .01, *** p < .001;
SFC = service failure controllability

In particular (Figure 3), when there was high service failure controllability on the seller's part, consumers exhibited significantly higher anger when serviced by a chatbot compared to human agents (M_chatbot = 5.187 vs. M_human = 4.257; $p < .001$). However, under conditions of low service failure controllability, there was no significant difference in consumer anger between chatbot and human agents (M_chatbot = 2.860 vs. M_human = 2.650; $p > .05$). These results are consistent with our predictions, supporting H3.

V. General Discussion

In this study, we found that in cases of service failure, when chatbots were used as online customer service agents, customers were more likely to spread negative word-of-mouth compared to interactions with human agents. One of the reason that explains this phenomenon is that service failure handled by chatbots may invoke anger in customer's mind. in other words, customer anger mediated the relationship between type of service agent and negative word-of-mouth. Moreover, we further discovered that when customers perceived the service failure as something the seller could hardly avoid, there was no significant difference in customer anger between interactions with chatbot and human agents. This suggests that chatbots are more suitable for providing online customer service when customers perceive low controllability of service failures by the seller, but not suitable when the failure can be easily avoided. If the chatbot is used for the service failure which can be avoided, customers might feel that the service providers neglects their obligation or lacks resources required to handle the situation which leads to customers' anger.

5.1 Theoretical Contributions

This study extends the application scenarios of chatbots in the realm of e-commerce service failures. Previous researchers have either focused on the study of service failures caused by imperfect technology in chatbots (Xing et al., 2022) or explored the impact of chatbot anthropomorphism on consumer service experiences (Lu et al., 2024). However, there has been insufficient discussion on whether chatbots are suitable for scenarios where service failures have already occurred, particularly lacking specific answers on how the type of customer service provider in such contexts directly influences consumers' negative word-of-mouth and underlying mechanisms. This study addresses these gaps by designing experimental scenarios to enhance research on core service roles in the e-commerce service domain. It investigates the direct impact of different customer service provider entities on consumer retaliatory behaviors. We found that in situations where the seller has already caused service failures, directly engaging consumers with chatbots not only leads to customer attrition but also encourages them to spread negative word-of-mouth.

Furthermore, this study enriches prior research on antecedents of negative word-of-mouth from a consumer psychological perspective. It incorporates the cognitive appraisal theory to further reveal anger as a mediating effect, demonstrating that consumers still expect emotional remedies from human companions even after service failures. These findings offer new perspectives and insights into the research on chatbot customer service in handling service failure scenarios and

human-machine collaboration.

This study also contribute to advancing theories in service marketing by enriching Attribution Theory in the context of online service failures and human-chatbot interactions. Previous studies predominantly addressed service failures attributed to chatbot malfunctions, whereas our research categorizes online after-sales service failures based on seller controllability into high and low categories and uses it as a moderating variable to observe consumers' psychological changes when interacting with different types of customer service. This research found that when customers perceive service failures as difficult for the seller to avoid, the use of chatbots can effectively perform a role similar to human customer service. Our findings not only provides practical implications for businesses to flexibly deploy intelligent customer services based on their specific situations but also aids enterprises in maximizing the effectiveness of human-machine collaboration.

5.2 Practical Implications

This study makes a significant contribution to how e-commerce platforms, which have widely implemented chatbots, should handle service failures. With the rapid advancement of technology, consumers have gained considerable knowledge about intelligent chatbots through news and social media, and they have accumulated extensive human-computer interaction experiences as chatbots have been increasingly applied across various service domains. In the future, companies should shift their focus from concerns about the technical functionality of chatbots to enhancing the service experience of active online shoppers.

First, the results of this study highlight the critical role of customer anger in consumer complaint behavior regarding service failures, particularly when chatbots are used. We suggest that companies should avoid over-reliance on chatbots for initial customer service interactions. Most customers who seek customer service do so with specific issues, especially when post-purchase service failures occur. Initial interactions with chatbots can easily make customers feel undervalued and uncared for, increasing their anger and ultimately leading them to spread negative word-of-mouth about the store to others. This not only results in the loss of current customers but also potential future customers.

Second, we recommend that companies pay attention to identifying customer demands and, when dealing with post-purchase issues, choose whether to use chatbots based on the seller's controllability level. This article helps companies better understand the distinctions in service failures based on seller controllability, enabling them to better categorize service failure types in the future. When consumers encounter service failures that the seller could have avoided, their primary motive for contacting customer service is often to vent their dissatisfaction. In such contexts, interacting with a chatbot, even if it can provide appropriate responses, cannot truly listen to the customer's grievances, or empathize with their feelings. This understanding leads to increased consumer anger. Therefore, companies can use intelligent keyword recognition to deploy chatbots when customers perceive low seller controllability, thereby alleviating the pressure on customer service personnel during peak service times.

Third, companies should be cautious about the potential for negative word-of-mouth due to

differences in customer service types. The use of chatbots is no longer a novel technology; many consumers are aware that the primary reason companies use such technology is to save labor costs, not to enhance their service experience. When service failures occur and chatbots are used, customers may perceive that the company is not making sufficient efforts to address the issue, and similar problems may arise in the future. Given the intense competition and the lower switching costs for consumers in the online environment compared to offline, as well as the diverse and convenient ways consumers can share their experiences via social media, companies must focus on improving the customer service experience. Enhancing service experience is the true shortcut to sustaining long-term profitability, even with mature technology

5.3 Limitations and Future Research

This study only explored one service scenario, the e-commerce platform, and further research is needed to verify whether the findings apply to other service domains. For example, in the hospitality industry (Buhalis & Cheng, 2020), even in scenarios with high controllability by the hotel, consumers might prefer chatbots to resolve issues because of their ability to provide 24/7 instant responses and consistent, accurate information, thereby reducing waiting times. In the banking industry (Eren, 2021), dealing with sensitive personal information and financial data, consumers might feel uncertain about the security and privacy protection measures of chatbots and may prefer human customer service agents who offer greater flexibility and judgment.

Additionally, this study did not extend to subsequent service recovery scenarios. Future research could explore how chatbots can effectively perform service recovery in these contexts to make customers feel that the company empathizes with their situation and alleviates their negative emotions. This study also did not examine the impact of chatbot design elements on consumer complaint behavior. Future research could incorporate design elements such as cuteness and humor into chatbots to investigate their effects.

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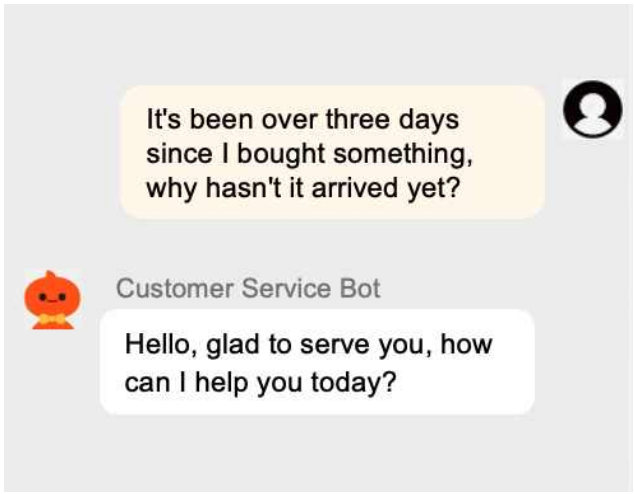
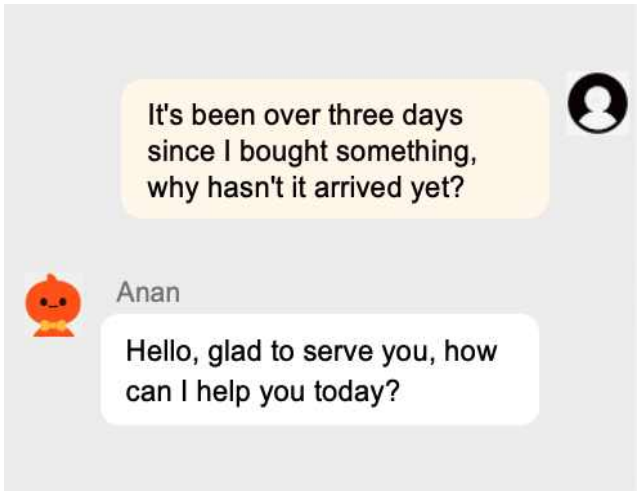
Appendix A

Chatbot conditions:

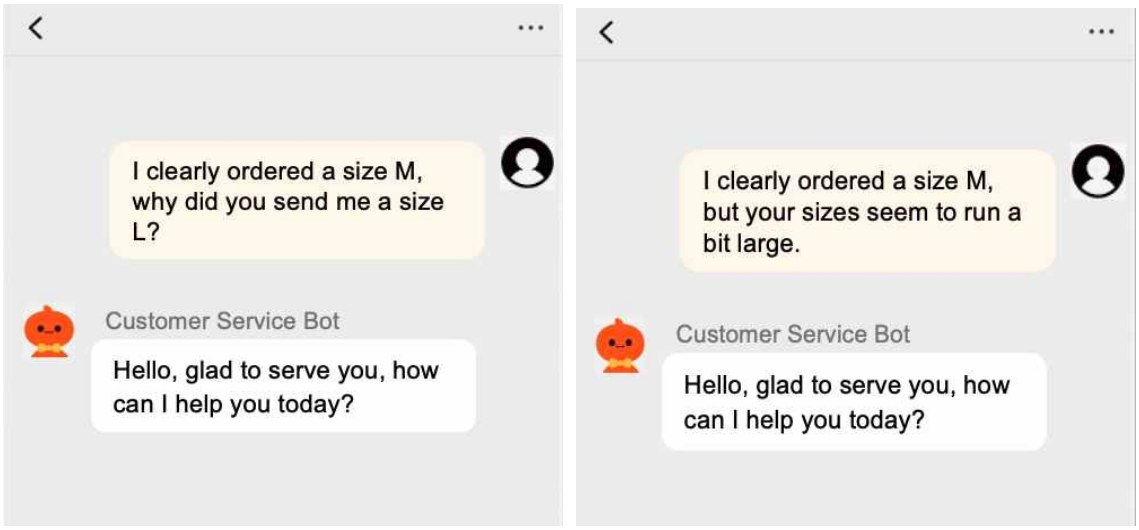


Human conditions:

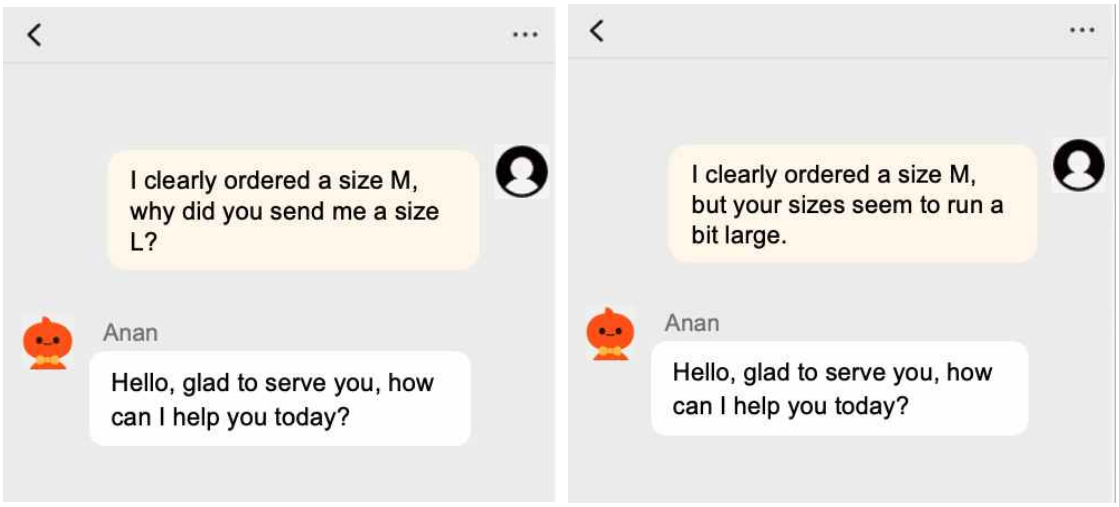


Appendix B

Chatbot conditions: Left image (high service failure controllability group), right image (low service failure controllability group)



Human conditions: Left image (high service failure controllability group), right image (low service failure controllability group)



온라인 고객 서비스 유형과 고객 분노가 부정적 구전에 미치는 영향 및 서비스 실패 통제 가능성의 조절 효과

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국 문 요 약

전자 상거래 플랫폼에서 챗봇의 적용이 점점 더 널리 퍼지고 있다. 인공지능 기술의 급속한 발전과 함께, 이전 연구는 주로 챗봇 자체에서 발생하는 서비스 실패에 초점을 맞추었다. 그러나 판매자가 통제할 수 있는 서비스 실패를 챗봇이 처리하는 상황에 대한 연구는 제한적이다. 본 논문은 총 546명의 참가자를 대상으로 두 가지 실험을 통해 온라인 설문 조사를 실시했다. 연구 결과, 서비스 실패가 발생했을 때, 챗봇이 제공하는 서비스가 인간 고객 서비스 대표보다 더 많은 부정적인 구전을 유발하며, 재구매 의도도 낮아진다는 것을 나타냈다. 이는 고객들이 더 높은 수준의 분노를 경험하기 때문이다. 그러나 고객이 서비스 실패를 판매자가 통제할 수 없는 것으로 인식할 때, 고객 분노를 통해 고객 서비스 제공 유형이 부정적 구전에 미치는 영향이 약화되고, 소비자들이 그 서비스 실패를 판매자가 통제할 수 있는 것으로 인식할 때 서비스 제공 유형이 부정적 구전에 미치는 영향은 강화된다. 본 연구는 온라인 소매 기업이 지능형 고객 서비스를 적용함과 동시에 서비스 실패의 추가 악화를 방지하기 위한 이론적 기여를 제공한다.

■ 중심어: 챗봇, 서비스 실패 통제 가능성, 분노, 부정적 구전, 전자 상거래

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