



The Influence of E-commerce Logistics Service Quality on Customer Engagement Behavior

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Abstract

Purpose: With the rapid development of e-commerce, logistics services, as an important part of e-commerce shopping, have gradually attracted people's attention. Customer engagement behavior is a new topic in marketing, and its connotation is still being explored. The purpose of this paper is to study the relationship between logistics service quality and customer engagement behavior. **Research design, data and methodology:** This study employed the method of online questionnaire survey, with Chinese e-commerce platform users as the survey objects, 248 valid survey sample data were collected, and the method of factor analysis and structural equation model analysis was used to verify the research hypothesis model constructed in this paper. **Results:** The four dimensions of e-commerce logistics service quality have different influences on customer satisfaction, and the influence of availability on customer satisfaction is not significant. Convenience, assurance, and security have a significant positive impact on customer satisfaction; Customer satisfaction has a significant positive impact on the three dimensions of customer engagement behavior: customer repeat purchase behavior, online word-of-mouth, and customer referrals. **Conclusion:** The results of this study will provide useful reference for the managers of e-commerce companies to improve customer engagement behavior by improving the logistics service quality.

Keywords: Ecommerce logistics service quality, Customer satisfaction, Customer engagement behavior, Ecommerce distribution

JEL Classification Code: C83, L81, M31, P46

1. Introduction

With the emergence of many social media platforms, the role of customers has gradually evolved from a traditional "buyer" of products or services to a more powerful "active participant." At the same time, customer behavior has

changed dramatically. On new social media, customers' non-purchasing behaviors such as liking, commenting, forwarding, recommending, and helping other customers are increasingly enriched, creating value for themselves, others, and even the enterprise. Van et al. (2010) call these non-purchasing behaviors as customer engagement behaviors.

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The phenomenon of customer engagement has attracted more and more marketing practitioners. An important sign is that the Baldrige National Quality Award "Excellent Performance Evaluation Criteria" has adopted customer engagement to replace the previous customer loyalty. This is because, compared with the traditional customer relationship variable-customer loyalty, a new concept in the marketing field-customer engagement should be paid more attention to the long-term relationship between customers and enterprises because of the suitability to the changes in the marketing environment in the context of social media.

Most existing research studies customer engagement behavior from the perspective of customers, enterprises, and the environment. The topics from the customer perspective include customer involvement, customer psychology, consumption purpose, perceived cost, etc. (Vivek et al., 2012); the topics from the corporate perspective include social capital, brand image, enterprise-scale diversity, etc. (Van et al., 2010); and the topics from the environmental dimension include competitor factors, technological, social, economic, political, and other environments (Van et al., 2010). Currently, in the field of e-commerce, Sukendia et al. (2021) used the partial least squares technique to examine the correlation of e-service quality, customers' experience, customers' engagement, and customers' loyalty within B2C e-commerce; Cao et al. (2022) constructed a customer engagement model in the live streaming commerce environment and uses structural equations for empirical testing, it was found that interaction between customers can contribute to customer engagement by increasing customer perceived value and self-efficacy. In previous studies on customer engagement behavior, customer engagement behavior is mostly used as an independent variable or intermediary variable to study its influence on factors such as value co-creation and user continuous use. However, few studies have investigated the relationship between logistics service quality and customer engagement behavior in the context of e-commerce shopping. A study is therefore necessary to provide theoretical guidance to e-commerce platforms in developing strategies to improve customer engagement behavior. Based on this, this study put forward seven hypotheses based on reviewing and sorting out relevant studies on customer engagement behavior and logistics service quality. A questionnaire survey was used to collect data from customers on e-commerce platforms, and the obtained data were analyzed. The influence relationship between e-commerce logistics service quality and customer engagement behavior is deeply researched, which provides theoretical support for improving customer engagement behavior by enhancing the quality of e-commerce logistics service.

2. Theoretical Assumptions and Models

2.1. Customer Engagement Behavior

Customer engagement behavior is a customer's behavior toward a brand or business that goes beyond purchase behavior, and motivational drivers cause this behavior (Van et al., 2010; Choi, 2019). The concept of customer engagement aggregates the multiple ways customer behaviors beyond transactions may influence the firm (Jaakkola & Alexander, 2014). When customers share the same goals as the business, customer engagement will give Enterprises positive effects, and vice versa will bring negative effects (Van et al., 2010). Customer engagement behavior includes all activities between the customer and the business initiated by the customer or the business and can be defined as the degree to which an individual is involved in engaging in the organizational product or organizational activity (Vivek et al., 2012). Customer engagement behavior can be divided into two dimensions: direct and indirect behavior. Direct behavior is mainly customer purchases; indirect behavior includes customer referrals, customer conversations about brands on social media, and customer feedback and suggestions to the company (Pansari & Kumar, 2017). These direct or indirect behaviors of customers are very valuable and essential to the development and progress of enterprises (Pansari & Kumar, 2017). Combining the characteristics of the e-commerce industry and referring to the division of customer engagement behavior dimensions by Pansari et al. (2017), this paper divides customer engagement behavior into the following three dimensions: customer repurchase behavior, online word-of-mouth, and customer referrals.

2.1.1 Customer Repurchase Behavior

Customer repurchase behavior refers to the repeated purchases of products or services from the same enterprise or platform by customers, and this behavior has the characteristics of continuity (Peyrot & Van, 1994). After the shopping behavior, customers will decide whether to repurchase the same product or service according to the overall shopping experience (Hellier et al., 2003). Social relationship theory holds that customer repurchase behavior is the tendency of customers to maintain personal relationships after comparing alternative relationships based on relationship satisfaction (Chiu et al., 2009).

2.1.2 Online Word-of-mouth

Berger describes word-of-mouth as informal communication to other consumers about the ownership, usage, or characteristics of a seller or specific goods and services (Berger, 2014). However, with the Internet's development today, word of mouth's meaning has been further expanded. The views and opinions of a specific object spread on the Internet also belong to word of mouth,

which is called online word of mouth (Gelb & Johanson, 1995). Online word-of-mouth refers to any positive or negative comments which are made by potential, actual or previous consumers on the products or services and transmitted to various groups of people or organizations through the Internet (Hennig-Thurau et al., 2004). Online word-of-mouth is also considered as an online customer feedback system; that is, using the two-way communication ability of the Internet, individuals share their experiences and opinions on the Internet about the products or services (Dellarocas, 2003). This paper defines online word-of-mouth as customers who share their views, comments, and shopping experiences through social platforms after getting their evaluation of the overall quality of a company's products or services.

2.1.3 Customer Referrals

Customer referrals refers to the behavior that customers are satisfied with the products or services of the enterprise and then recommend the products or services of the enterprise to people familiar with them. Customer referrals help attract customers who would not be attracted through traditional marketing channels (Kumar, 2013), thereby indirectly improving company performance. Furthermore, referring customers are more profitable for businesses than non-referrals (Schmitt, et al., 2011). Customers are more likely to recommend the product or service provider to others when they perceive higher value from a product or service (Choi, 2018). The customer's perception of value is based on the customer's overall assessment of the experience of the purchased product or service, which is measured by weighing its advantages and disadvantages (Zeithaml, 1988).

2.2. Customer Satisfaction

Customer satisfaction could be described as a happy mood in which customers feel that their needs, desires, and goals have been met in the consumption experience. Customer satisfaction mainly depends on the customer's cognitive evaluation (whether products and services meet their expectations) and emotional evaluation (whether the consumption experience is pleasant) (Szymanski & Henard, 2001). Oliver puts forward the expectation inconsistency model to explain customer satisfaction; that is, when consumers' expectation is greater than the actual perception, customers will tend to be dissatisfied. When the expectation is lower than the true perception, the customer will be satisfied; When the two are consistent, customers will show

The research results on the relationship between logistics service quality and customer satisfaction have been relatively mature. The research shows that service quality is an essential factor affecting customer satisfaction (Uvet, 2020). As one of the critical links in e-commerce shopping, logistics services, and their quality positively impact

a neutral attitude (Anderson, 1973). Customer satisfaction can significantly positively affect customer behavioral intentions (Oliver, 1980; ZAID, 2021). And customer engagement behaviors, including customer repurchase behavior, online word-of-mouth, and customer referrals (Pansari & Kumar, 2017), are inferred to be influenced by customer satisfaction. Therefore, the following assumptions are made:

H1: Customer satisfaction can positively impact customer repurchase behavior.

H2: Customer satisfaction can positively impact online word of mouth.

H3: Customer satisfaction can positively impact customer referrals.

2.3. Logistics Service Quality

Logistics service quality is the customer's perception of the complete service provided by the logistics service provider (Thai, 2013). The quality of logistics service cannot be determined unilaterally by the enterprise but must be consistent with the needs and expectations of customers (Mentzer et al., 2001). In past research, the most famous theory to study the quality of logistics services is the 7Rs theory proposed by Perreaul et al. (Perreaul & Russ, 1974). The core of the 7Rs theory is that enterprises can deliver goods to the right place at the right time, in good condition, at the right price, and with accurate commodity information (Hua & Jing, 2015).

Regarding evaluating the actual level of logistics service quality, scholars have proposed many scales and evaluation models, among which the more representative ones are the PDSQ scale (Perreaul & Russ, 1974) and the LSQ scale (Mentzer et al., 1989). Many scholars have proposed measurement scales with different dimensions based on these two scales. After a comprehensive comparison of these research results, it is found that the dimensions that appear more frequently include service availability, The ability of customers to obtain the services provided by the enterprise (Mentzer et al., 1999), service convenience. The ability of logistics companies to provide customers with convenience when choosing payment methods, delivery methods, and delivery regions (Lin et al., 2015), and service assurance. The ability to trust the results of enterprise service execution (Chen et al., 2021), and service security. The ability of the enterprise to effectively protect the privacy and personal safety of customers during the transaction of goods (Parasuraman et al., 1988).

customer satisfaction (Gaudenzi et al., 2020). Based on this, the following assumptions are made:

H4: The availability of e-commerce logistics services can positively impact customer satisfaction.

H5: E-commerce logistics service convenience can positively impact customer satisfaction.

H6: E-commerce logistics service assurance can positively impact customer satisfaction.

H7: The security of e-commerce logistics services can positively impact customer satisfaction.

2.4. Construction of Research Models

Combined with the above theoretical background and hypotheses, the hypotheses model of this paper is shown in Figure1.

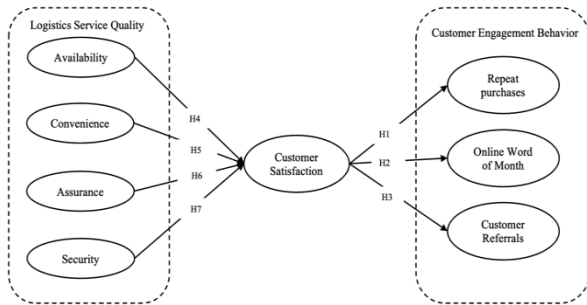


Figure 1: Hypotheses model

3. Research Design

3.1. Scale Design

After summarizing, modifying, and supplementing the related literature's measurement items, this paper's measurement scale is formed, as shown in Table 1. The scale consists of three parts. The first part is a survey on the perception of e-commerce logistics service quality, including availability, convenience, assurance, and security, corresponding to eleven items. The second part is the customer satisfaction survey, including three items. The third part is a survey of customer engagement behavior, including repeated purchases, online word-of-mouth, and customer referrals, corresponding to eleven items. The measurement items are scored using the Likert 7-level measurement method, and the person filling in the questionnaire fills in according to their actual perception.

Table 1: Measurement scale

Variable	Codes	Measurement items
Availability	AV1	I understand what logistics services the platform provides users
	AV2	I understand how to enjoy the logistics services provided by this platform
Convenience	CO1	It is convenient to return, and you can choose the return method by yourself
	CO2	The distribution distance set by the logistics enterprise selected by the platform is reasonable
	CO3	The logistics companies selected by the platform provide flexible delivery times
Assurance	AS1	Logistic anomalies can receive information warnings
	AS2	To ensure that the goods will not be lost during transportation
	AS3	Be able to take the initiative to assume the loss and compensation of the goods
Security	S1	Personal privacy can be effectively protected in the process of purchasing products
	S2	Personal privacy can be effectively protected during the delivery of goods
	S3	Delivery personnel can take effective protective measures during the delivery process
Customer satisfaction	CS1	The logistics services provided by this platform fully meet my requirements
	CS2	The quality of integrated logistics services provided by this platform exceeded my expectations

	CS3	Overall, I am satisfied with the logistics services provided by the platform
Customers repurchase behavior	RP1	I will buy products on this platform again in the future
	RP2	For the same product or service, I would give priority to this platform
	RP3	I will make this e-commerce platform my first choice for shopping in the future
Online word of mouth	OW1	I will rate and share my opinion on the platform on the platform
	OW2	I will share my shopping experience on social platforms (Weibo, WeChat, etc.)
	OW3	I will comment on my shopping experience on relevant websites or forums
	OW4	I will rate and share my shopping experience on the platform
Customer referrals	CR1	I would recommend this platform to friends and family
	CR2	I would recommend this platform to anyone who asks me for their opinion
	CR3	I will spread the positive message of this platform to others
	CR4	The platform has a high level of service quality and is worth recommending to my friends and relatives

3.2. Data Collection

In this study, data were collected through online questionnaire survey. After the questionnaire was edited on the website Wenjuanxing, the questionnaire was sent to friends on WeChat and WeChat group to investigate the users of the e-commerce platform in China. Besides, the online lottery was provided to attract the users of the e-commerce platform to participate in the survey, to increase the number of survey samples as many as possible. After a week of research, 262 questionnaires were finally collected. After excluding 14 invalid questionnaires without shopping experience on e-commerce platforms, 248 valid questionnaires were obtained, with an effective rate of 94.65%.

4. Results

4.1 Demographics

In the main study survey, 262 questionnaires have been collected, and 14 participants have reported no E-commerce platform shopping experiences; these responses have been deleted. Thus, 248 responses have ultimately been collected for analysis. The results show that all the respondents are from China, about 58.5% of the responders are men, 64.9% of them are in the range of 20 to 30 years old, which is because 20-30 years old people are the main group of online shopping in China, and most of them have monthly incomes above 3,000 yuan. The specific demographic results are listed in Table 2.

Table 2: Demographic characteristics of research participants.

Name	Category	Frequency	Percent
Gender	Male	103	41.5
	Female	145	58.5
Age	≤20	64	25.8
	21-30	161	64.9
	31-40	13	5.2
	41-50	8	3.2
	≥50	2	0.8
Monthly household income	≤3000	28	11.3
	3000-6000	61	24.6
	6000-9000	52	21.0
	9000-12000	49	19.8
	≥12000	58	23.4

4.2. Model

To verify the reliability and validity of the measurement scale, Cronbach's alpha and principal component analysis were used in the first step. The analysis results are listed in Table 3.

Table 3: Results of component analysis.

Construct	Item	Component								Cronbach ' α
		1	2	3	4	5	6	7	8	
Online word of mouth	OW3	0.900	0.157	0.146	0.029	0.032	0.151	0.061	0.048	0.909
	OW2	0.895	0.086	0.098	0.032	0.088	0.107	0.057	0.144	
	OW4	0.818	0.299	0.043	0.078	0.042	0.063	0.233	0.119	
	OW1	0.675	0.320	0.271	0.164	0.270	0.100	-0.039	-0.034	
Customer referrals	CR2	0.238	0.795	0.076	0.171	0.192	0.165	0.155	0.103	0.914
	CR3	0.227	0.762	0.309	0.157	0.188	0.110	0.067	0.154	
	CR1	0.290	0.729	0.095	0.241	0.147	0.224	0.173	0.144	
	CR4	0.209	0.703	0.270	0.207	0.269	0.079	0.203	0.181	
Security	S1	0.187	0.245	0.755	0.156	0.261	0.222	0.208	0.171	0.914
	S2	0.207	0.217	0.753	0.161	0.134	0.287	0.228	0.105	
	S3	0.193	0.200	0.658	0.183	0.323	0.267	0.268	0.185	
Convenience	CO3	0.133	0.171	0.114	0.769	0.174	0.093	0.192	0.206	0.831
	CO2	0.074	0.215	0.239	0.739	0.191	0.191	0.064	0.274	
	CO1	0.014	0.235	0.072	0.694	0.248	0.165	0.233	0.155	
Customers repurchase behavior	RP3	0.239	0.326	0.220	0.155	0.713	0.082	0.180	0.110	0.859
	RP1	-0.022	0.259	0.166	0.311	0.705	0.210	0.188	0.146	
	RP2	0.164	0.176	0.224	0.266	0.690	0.329	0.089	0.154	
Customer satisfaction	CS2	0.248	0.231	0.368	0.138	0.146	0.703	0.138	0.052	0.897
	CS1	0.168	0.221	0.302	0.248	0.291	0.687	0.269	0.108	
	CS3	0.166	0.147	0.193	0.223	0.458	0.656	0.277	0.119	
Assurance	AS2	0.091	0.165	0.118	0.088	0.263	0.119	0.771	0.094	0.781
	AS3	0.164	0.147	0.317	0.356	0.155	0.145	0.643	0.049	
	AS1	0.095	0.186	0.280	0.240	-0.041	0.360	0.620	0.214	
Availability	AV2	0.123	0.207	0.098	0.217	0.114	0.056	0.096	0.856	0.860
	AV1	0.116	0.130	0.168	0.263	0.153	0.106	0.130	0.835	

Then, structural equation modeling (SEM) was employed to analyze the research data using Amos 24. In the measurement model, all the constructs were modeled as correlated, and it showed a good model fit for the sample data, with the values of $\chi^2 = 560.081$, $df = 247$, $\chi^2/df = 2.268$, $p < .05$, comparative fit index (CFI) = .936, normed fit index (NFI) = .892, Tucker–Lewis Index (TLI) = .922, root mean square error of approximation (RMSEA) = .072, and root mean residual (RMR) = .096.

Next, the convergent validity and discriminant validity were used to measure the construct validity. All items show convergent validity with statistically significant ($p < .01$) factor loadings and standardized factor loadings above 0.70 with critical ratios above 2.57. The results of the measurement model are listed in Table 4.

Table 4: Results of measurement model.

Construct	Items	Estimate	S.E.	C.R.	P
Availability	AV1	1.000	N/A	N/A	N/A
	AV2	0.947	0.073	13.052	.000

Convenience	CO1	1.000	N/A	N/A	N/A
	CO2	0.983	0.075	13.082	.000
	CO3	1.031	0.085	12.062	.000
Assurance	AS1	1.000	N/A	N/A	N/A
	AS2	0.752	0.076	9.867	.000
	AS3	0.963	0.079	12.253	.000
Security	S1	1.000	N/A	N/A	N/A
	S2	0.970	0.050	19.260	.000
	S3	0.913	0.043	21.214	.000
Customer satisfaction	CS1	1.000	N/A	N/A	N/A
	CS2	0.841	0.051	16.575	.000
	CS3	0.901	0.041	21.876	.000
Customers repurchase behavior	RP1	1.000	N/A	N/A	N/A
	RP2	1.152	0.077	14.872	.000
	RP3	1.113	0.080	13.909	.000
Online word of mouth	OW1	1.000	N/A	N/A	N/A
	OW2	1.434	0.102	14.005	.000
	OW3	1.469	0.100	14.623	.000
	OW4	1.298	0.096	13.556	.000
Customer referrals	CR1	1.000	N/A	N/A	N/A
	CR2	1.037	0.063	16.534	.000
	CR3	0.919	0.054	17.181	.000
	CR4	0.969	0.054	17.829	.000

Note: SE, standard error; CR, critical ratio.

As suggested by Fornell and Larcker (1981), we assessed the discriminant validity of all the measured constructs. The results are presented in Table 5, which shows that the square root of the average variance extracted (AVE) for each factor

was greater than its correlations with other factors. Therefore, the results supported the discriminant validity of all pairs of constructs.

Table 5: Results of correlation analysis and discriminant validity assessment.

AVE	AV	CO	AS	S	CS	RI	OW	CR
AV	0.759							
CO	0.692(0.478)	0.634						
AS	0.533(0.284)	0.725(0.525)	0.548					
S	0.533(0.284)	0.637(0.406)	0.794(0.630)	0.783				
CS	0.476(0.226)	0.681(0.463)	0.800(0.64)	0.812(0.659)	0.755			
RP	0.538(0.289)	0.752(0.565)	0.682(0.465)	0.752(0.565)	0.810(0.656)	0.672		
OW	0.333(0.110)	0.323(0.104)	0.423(0.179)	0.501(0.251)	0.469(0.220)	0.413(0.171)	0.724	

CR	0.533(0.284)	0.671(0.450)	0.656(0.430)	0.697(0.486)	0.660(0.436)	0.735(0.540)	0.582(0.339)	0.730
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Note: The figures along the diagonal line mean AVE, and the figures in parentheses are the squares of the correlation coefficients. The abbreviations' meanings are as follows: AV=availability; CO=convenience; AS=assurance; S=security; CS=customer satisfaction; RP=customer repurchase behavior; OW=online word of mouth; CR=customer referrals.

4.3. Testing Hypotheses on Structural Model

The results of the test of the overall structural model are presented in Table 6 and Figure 2, and they indicate a good model fit with values of $\chi^2 = 667.395$, $df = 262$, $\chi^2/df = 2.547$, $p < .05$, CFI = .917, NFI = .871, TLI = .905, RMSEA = .079, and RMR = .135. The results of testing the hypotheses are as follows.

First, customer satisfaction has a significant positive impact on customer engagement behavior. As listed in Table 6, customer satisfaction shows significant effects on

customer repurchase behavior (H1, C.R.=13.282, $p=.000$), online word of mouth (H2, C.R.=7.490, $p=.000$) and customer referrals (H3, C.R.=2.310, $p=.000$).

Next, E-commerce logistics service quality has a significant positive impact on customer satisfaction. convenience (H5, C.R.=3.310, $p=.000$), assurance (H6, C.R.=2.442, $p=.015$) and security (H7, C.R.=6.425, $p=.000$) show significant effects on customer satisfaction, with only availability (H4, C.R.= -1.093, $p=.275$) having no such effect.

Table 6: Results of hypothesis testing.

Hypotheses	Path	Estimate	S.E.	C.R.	P	Results
H1	CS→RP	0.704	0.053	13.282	.000	Accepted
H2	CS→OW	0.497	0.066	7.490	.000	Accepted
H3	CS→CR	0.759	0.062	2.310	.000	Accepted
H4	AV→CS	-0.062	0.057	-1.093	.275	Rejected
H5	CO→CS	0.295	0.089	3.310	.000	Accepted
H6	AS→CS	0.234	0.096	2.442	.015	Accepted
H7	S→CS	0.446	0.073	6.425	.000	Accepted

Note: SE = standard error; CR = critical ratio.

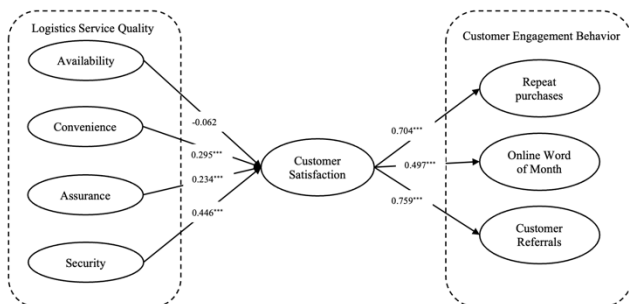


Figure 2: The path model.

Note: The numbers in the paths are the estimates of each path coefficient, and ***means $p < .000$, **means $p < .01$, and *means $p < .05$.

5. Discussion

5.1 Research Summary

After constructing the theoretical hypothesis model and empirical analysis, this study verified the research hypothesis proposed in this paper and obtained the research results. The results are explained as follows:

5.1.1 E-commerce Logistics Service Quality has a Positive Impact on Customer Satisfaction

This study divides the e-commerce logistics service quality into four dimensions: availability, convenience, assurance, and security. Through the verification of the structural equation model, it is found that the e-commerce logistics service quality significantly impacts customer satisfaction. There are specific differences in the effects of these four dimensions on customer satisfaction.

In the data analysis results, the impact of convenience on customer satisfaction has a significant positive effect. With the rapid development of the e-commerce industry, customers' demand for convenience has also increased rapidly. Providing convenient delivery services within a reasonable time and scope can enhance the overall shopping experience of customers, thereby increasing customer satisfaction; The reason may be that availability is only a fundamental guarantee that the most basic services the customer needs will be satisfied. Therefore, the satisfaction of the most basic service needs may not lead to customer satisfaction. On the other hand, consumers may be dissatisfied with the service when the basic guarantees are not met; Assurance has a significant positive impact on customer satisfaction. Assurance emphasizes that the customer's rights and interests can be effectively protected. The e-commerce platform can try to ensure that the goods will not be lost during the commodity transaction process, can take the initiative to take responsibility when there is an error, and can effectively protect the customer's rights and interests, will enhance the customer's goodwill towards the e-commerce platform, and improve satisfaction (Parasuraman et al., 1988); Security has a significant positive impact on customer satisfaction. In today's information age, people pay more and more attention to their personal information security and privacy security. In this epidemic era, people pay more and more attention to health and security. E-commerce platforms can be used in the entire commodity transaction process. Protecting the privacy and security of customers and taking into account the health and safety of customers, will enhance customers' goodwill towards the e-commerce platform and improve their satisfaction.

5.1.2 Customer Satisfaction has a Significant Positive Impact on Customer Engagement Behavior

According to the above empirical analysis results, it can be found that customer satisfaction has a significant positive impact on the three dimensions of customer engagement behavior: customer repeat purchases, online word-of-mouth, and customer referrals. When customers are satisfied with their purchase experience on an e-commerce platform, they are willing to repurchase behavior on this platform,

recommend it to their relatives and friends, and share their views about the e-commerce platform on social platforms. Customers can only choose an e-commerce platform based on their shopping experience in the online environment. Only an e-commerce platform that meets customer needs and satisfies customers can gain a good reputation from customers and attract customers to repurchase behavior on the platform. Therefore, the higher the customer satisfaction, the more stimulated customer engagement behavior.

5.2 Managerial Implication

First, provide convenient logistics services. Among the customers of e-commerce, young people in the age group of 20-30 occupy a large proportion, and young people generally like to receive convenient and efficient services. Therefore, the e-commerce platform can provide a variety of transportation and distribution methods as possible by establishing cooperation with several logistics companies and providing customers with a free choice of ways to receive and return goods, so that customers can choose the one that suits them according to their needs. Convenient express and distribution solutions, such services can allow customers to truly appreciate the sincerity of the e-commerce platform, thereby improving customer satisfaction.

Second, promise effective returns and exchanges, and take the initiative to take responsibility when there is a deviation. Since most of the entire e-commerce shopping process is carried out through the Internet, customers cannot experience the products or services they want to buy, making them take certain risks. The e-commerce platform should provide effective returns and exchanges. If the customer needs to return, the e-commerce platform should actively receive and assist the customer in carrying out a series of return operations and timely feedback on the relevant information of the return to the customer so that the customer can feel a positive attitude toward the e-commerce platform in solving the problem. When there is a mistake in the service of the e-commerce platform itself, such as sending the wrong product or causing damage or loss of the product during transportation, it must explain to the customer in time, take the initiative to take responsibility, and give the customer a sincere apology and reasonable compensation. Only the correct attitude and way to deal with the problem can save customers' dissatisfaction with the e-commerce platform and even win customers' trust again.

Third, pay attention to protecting the privacy and security of customer information. With the development of the e-commerce industry, people's dependence on online shopping is also increasing. However, the entire online shopping process, from order placement to delivery and then to the discarding of express packaging, may cause the

leakage of customers' personal privacy information. However, spam text messages, harassing calls, and telecommunication frauds after privacy leaks are annoying. E-commerce platforms should establish practical measures to protect customers' privacy information to make customers feel at ease.

Fourth, During the epidemic period, take the initiative to establish effective protective measures to enhance customers' sense of safety. In this period of repeated outbreaks, epidemic protection should be carried out regularly in the process of providing services to customers, and there should be no slack. Only by giving basic guarantees for customers' safety can customers' sense of security be established, customer satisfaction is improved, and customer engagement is affected.

5.3 Limitation and Future Research

First, Sample collection is inadequate. There is a massive base of consumers with the shopping experience on e-commerce platforms in China. However, only 248 valid sample data were collected in this study, and college students accounted for a large proportion of the sample data, which was incomplete and therefore not universal enough. The number of effectively collected samples should be increased in future studies, preferably ten times the number of questionnaire measurement items, to ensure the comprehensiveness and diversity of the sample.

Second, Insufficient variable introduction. In addition to the four dimensions mentioned in this article, many dimensions reflect the quality of e-commerce logistics services. This article only discusses the impact of e-commerce logistics service quality on customer engagement behavior from four dimensions, which has certain limitations. In future research, we can consider introducing more dimensions based on the research in this paper. In addition, brand image can also be used as a moderating variable to explore how the service quality of e-commerce logistics affects customer engagement behavior.

Third, the relationship between the various dimensions of e-commerce logistics service quality has not been explored. This paper only considers the influence of the four dimensions of e-commerce logistics service quality on customer engagement behavior but does not analyze the correlation between the four dimensions of e-commerce logistics service quality. In the follow-up study, the mutual influence of various aspects of e-commerce logistics service quality can be further studied. After introducing more influencing factors, further, analyze the mutual influence relationship between the influencing factors to make the research more comprehensive and provide a reference for e-commerce platform operators.

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