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Factors Impacting Customer Loyalty of Online Shopping: A Case Study of China's E-commerce Platforms

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Abstract

Purpose: This study investigates the factors impacting satisfaction, commitment, and customer loyalty of online shopping. The research establishes a theoretical framework based on the service quality model (SERVQUAL), e-service quality model (E-SQUAL), e-tail quality model (eTailQ), theory of reasoned action (TRA), and customer loyalty model. **Research design, data, and methodology:** A total of 516 responses were collected from online questionnaires using step-by-step sampling, including purposive sampling, stratified random sampling, and convenience sampling. The respondents were customers who had online shopping experience on China's top three e-commerce platforms and who shop online at least 1 to 2 times per week. The Structural Equation Model (SEM) and Confirmatory Factor Analysis (CFA) were used to analyze the data to verify the model's goodness of fit and hypotheses. **Results:** The results showed that reliability, responsiveness, and privacy significantly and positively impacted satisfaction; however, web design did not significantly impact satisfaction. Satisfaction and perceived value had a significant impact on both commitment and customer loyalty, but commitment did not have a significant impact on customer loyalty. **Conclusion:** To improve customer satisfaction, commitment, and loyalty, it is necessary to focus on reliability, responsiveness, and privacy in e-services. Additionally, improving perceived value is essential for commitment and customer loyalty.

Keywords: E-commerce, E-service quality, Satisfaction, Commitment, Customer loyalty

JEL Classification Code: E44, F31, F37, G15

1. Introduction

E-commerce refers to business transactions between e-commerce platforms and customers through various electronic media (Ting et al., 2016). With the popularity of the Internet and the gradual maturity of the e-commerce industry, numerous transactions have shifted from offline to

online (Venkatesh et al., 2012; Weltevreden, 2008). Furthermore, the COVID-19 pandemic has accelerated this shift. Compared with 2019, the number of online shoppers in China increased by 143.59 million in 2020. From 2018 to 2019, the increase was only 28.71 million. As of December 2021, about 842 million people in China were shopping online (Ma, 2020). Online media gives consumers more

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power of independent choice, and it is easy to change the choice of online stores in the e-commerce setting. Therefore, the cost of customer acquisition for sellers is getting higher and higher (Mutum et al., 2014; Wolfenbarger & Gilly, 2003). To attract new and retain existing customers, customer satisfaction, commitment and loyalty have become the key factors to which major e-commerce platforms compete to acquire (Goutam & Gopalakrishna, 2018).

Past literature has confirmed that better e-service quality will lead to higher customer satisfaction, which leads to customer loyalty (Al-dweeri et al., 2019; Bai et al., 2012). In addition, increased satisfaction has also been shown to lead to customer commitment (Pratminingsih et al., 2013; Román et al., 2013). Moreover, satisfaction and commitment were preconditions for customer loyalty (Lee & Wong, 2016; Luarn & Lin, 2003; Pratminingsih et al., 2013; Wu, 2011). In addition to satisfaction and commitment, perceived value has been discussed in much relevant literature, and its impact on customer loyalty cannot be ignored (Parasuraman et al., 2005; Zehir & Narcikara, 2016). Goutam and Gopalakrishna (2018) and Luarn and Lin (2003) confirmed that perceived value impacts commitment and indirectly affects customer loyalty. However, it seems that previous studies, whether in China or outside China, only focus on the causal relationship between e-service quality, satisfaction, and customer loyalty and rarely incorporate perceived value and commitment into the research framework for analysis and discussion (Al-dweeri et al., 2019; Guo et al., 2012; Khan et al., 2019; Kuo et al., 2016; Kusdibyo & Februadi, 2019; Sheng & Liu, 2010; Zhang et al., 2014). Therefore, it is necessary to conduct a comprehensive examination of the causal relationship between e-service quality, satisfaction and commitment, perceived value, and customer loyalty. Moreover, most theories and research in related fields are concentrated in countries other than China (Zhang et al., 2014). As the world's largest e-commerce economy, there is a lack of in-depth research in this domain.

In addition, COVID-19 has changed people's consumption behavior and habits; new and old customers are more dependent on online shopping than before (Cramer-Flood, 2021; Grashuis et al., 2020). Some studies on e-service quality, customer satisfaction, and loyalty have been conducted in response to this phenomenon. Salamun et al. (2020) studied the impact of e-service quality on customer loyalty during the COVID-19 pandemic. Sudaryanto et al. (2021) surveyed online shoppers in East Java, Indonesia, to comprehensively understand the role of the online shopping experience as a mediating variable between e-service quality, customer satisfaction, and loyalty. Misra and Pandey (2022) explored the factors influencing customer loyalty to enterprises in B2C e-commerce during COVID-19. However, little research has been conducted in this context in China. As the world's largest e-commerce economy, customers'

perceptions of e-service quality, customer satisfaction, commitment, perceived value, and customer loyalty during online shopping, as well as the causal relationships between these dimensions are to be raised.

This study aims to investigate the impact of e-service quality (reliability, responsiveness, web design, and privacy), the perceived value on satisfaction, commitment, and customer loyalty, from a more comprehensive perspective, drawing on Chinese online shoppers in the context of being impacted by COVID-19. The research framework of this study is constructed based on the service quality model (SERVQUAL), e-service quality model (E-S-QUAL), e-tail quality model (eTailQ), theory of reasoned action (TRA), and customer loyalty model. The contribution of this study lies in a more comprehensive analysis of Chinese online shoppers' perceptions of e-service quality and online shopping. The study's results can help e-commerce platforms, and sellers better examine the quality of their services and maintain customer loyalty. In addition, this study can also fill the gap of the lack of relevant research on China's e-commerce market in the context of COVID-19.

2. Literature Review

2.1 Theoretical background

In this study, the research framework was constructed based on the service quality model (SERVQUAL), e-service quality model (E-S-QUAL), e-tail quality model (eTailQ), theory of reasoned action (TRA), and customer loyalty model. SERVQUAL was developed by Parasuraman et al. (1988) and was a multi-item scale. This model built a basic skeleton for retailers to understand consumers' service expectations and perceptions and evaluated the actual service quality by comparing the service expected by consumers with the service perceived by consumers to find out the gap and help improve the service quality (Altuntas & Kansu, 2019; Rodrigues et al., 2011).

E-S-QUAL was a multi-item scale developed and verified by Parasuraman et al. (2005) on the theoretical basis of the "Means-End Framework" (Gutman, 1982). Boshoff (2007) stated that E-S-QUAL explained the nature of e-service quality. The basic scale was the E-S-QUAL scale, which can be used to investigate the quality of service provided by the website. Another subscale was the E-RecS-QUAL scale, which measured the quality of recovery services. The items on the scale were related to the recovery service of the website, and the focus was on the customers with experience related to the recovery service encounters.

eTailQ was a scale integrated by Wolfenbarger and Gilly (2003) to test the quality of e-service, which aimed to explore the unique service characteristics of the online shopping

experience. Kim et al. (2009) and Li et al. (2015) proposed that eTailQ was an effective model for evaluating the overall service quality of a website because it took into account both the interface design and the customer experience of online services and offline support, such as fulfilling orders and delivering the goods.

The theory of reasoned action (TRA) was developed by Fishbein and Ajzen (1975). It described the process of predicting human behavior and explained the connections between attitude toward behavior, subjective norms, behavioral intention, and behavior. According to this theory, what sort of behavior an individual will take is influenced by the individual's attitude towards behavior and subjective norms. Raman (2019) stated that TRA was an intention model widely used in research to predict and describe consumer behavior in many online and offline domains.

Luarn and Lin (2003) created the customer loyalty model to conceptualize and empirically verify a customer loyalty model for e-service quality. Specifically, the customer loyalty model was designed to examine the impact of trust, customer satisfaction, and perceived value on commitment and loyalty. In addition, the model also tested the impact of commitment on loyalty. The customer loyalty model was mainly based on TRA (Fishbein & Ajzen, 1975), commitment-trust theory (Morgan & Hunt, 1994), and previous studies to measure consumer loyalty in e-service quality. Hsu (2008) stated that this model drove the development of the definition, basic dimensions, concepts, and measurements of e-service quality.

2.2 Introduction of Variables

2.2.1 Reliability

Reliability is defined as the ability to reliably and accurately execute promised services (Parasuraman et al., 2005). According to Zeithaml et al. (2002), reliability refers to a site that can provide correct technical functions, accurate service commitment, billing, and product information. Wolfenbarger and Gilly (2003) defined *reliability* as the consistency between the display and description of products selected by customers on the network and products finally received from merchants. The merchant can deliver the goods to the customer as scheduled. Hanai and Oguchi (2009) believed that reliability referred to the excellent image, natural products, and reliable payment process that online stores gave consumers. Salameh and Hassan (2015) defined reliability as a company's ability to deliver products and services to consumers under the terms of the agreement.

Zhu et al. (2002) also stated that among the dimensions of e-service quality, the reliability dimension is crucial for enhancing customer satisfaction. Based on the investigation of Kuo et al. (2016), the results showed that reliability directly led to satisfactory psychometric attributes.

Reliability is an essential factor in e-business that affected customer satisfaction. To improve customer satisfaction, the manager should ensure punctual and accurate order delivery, timely information, and comprehensive products and services (Al-dweeri et al., 2019; Nath & Zheng, 2004). The same was found in a study by Lau et al. (2013) and Hsu and Nguyen (2016); reliable service quality is the key to improving customer satisfaction. In order to test the argument of the above researchers, the following hypothesis is proposed:

H1: Reliability has a significant impact on satisfaction.

2.2.2 Responsiveness

Responsiveness is the degree to which a company is able and willing to provide problem-solving services to customers (Gefen, 2002; Zeithaml et al., 2002). According to Cox and Dale (2001), responsiveness not only refers to the timeliness of the service provided by the supplier but also refers to the willingness of the employee to respond accordingly. Parasuraman et al. (2005) defined *responsiveness* as the ability of an online retailer or e-commerce platform to handle problems and return during transactions effectively. Responsiveness can also be described as listening to customer concerns and providing clear and understandable feedback to fulfill the organization's commitment (Zemblytė, 2015).

Kassim and Abdullah (2008) stated that responsiveness is a significant aspect of building customer satisfaction. Online stores can maintain customer satisfaction and improve their competitiveness in the market if they can respond to customer requests and orders on time (Kusdibylo & Februadi, 2019). High-quality e-service depends on the speed of response. Good responsiveness saves time and costs for customers, thereby increasing customer satisfaction (Nuseir et al., 2010). However, Lin (2007) found in their study that responsiveness has a slightly smaller impact on customer satisfaction than other dimensions. Therefore, the researcher proposes the following hypothesis to test whether responsiveness affects satisfaction:

H2: Responsiveness has a significant impact on satisfaction.

2.2.3 Web Design

Website design refers to the shaping of the overall attractiveness and appearance of the website, as well as the shaping of the visual appeal of web links, such as well-organized and customized search functions, quick access, and accessible error correction (Chung & Shin, 2008; Hsu & Nguyen, 2016; Zeithaml et al., 2002). Santos (2003) defined *website design* as the proper design of a website using specific technologies to make it easier for consumers to access, understand, and be attracted to the website. Wolfenbarger and Gilly (2003) pointed out that web design refers to all the elements (site navigation, site information

search, order processing status, good personalization, and corresponding product selection) that consumers could perceive on a site. According to Lin (2007), web design refers to the degree of user-friendliness that customers perceive when shopping at an online retailer, which includes the usability, reliability, ease of access, and ease of use of the site.

A good e-commerce website design can increase customer satisfaction with the site and attract them to purchase goods or services in the online store (Kuan et al., 2008; Wen et al., 2014). According to the research of Cho and Park (2001), the quality of website design was the criterion for customers to evaluate their satisfaction with websites and online shopping. Cyr et al. (2009) stated that better website design could make it easier for customers to navigate and improve the efficiency of placing orders, meeting customer expectations, improving their satisfaction, and increasing the profits of online stores. A visually appealing website meets consumers' aesthetic expectations, increasing their satisfaction (Wibowo et al., 2019). Therefore, this study suggests that:

H3: Web design has a significant impact on satisfaction.

2.2.4 Privacy

Li (2001) defined *privacy* as citizens having the right to enjoy their private life on the Internet without being disturbed, and their private information is protected by law. Zeithaml et al. (2002) considered that privacy was the extent to which e-service providers protected and prevented intrusions on customers' personal information. Wolfinbarger and Gilly (2003) stated that privacy was the information that customers did not want to be disclosed while sharing. Pennanen et al. (2006) believed that privacy is the right of individuals to independently decide how much their personal information could be disclosed. According to Boritz and No (2011), privacy in the field of e-commerce is the right of "individuals" to control their personal information when entities engaged in e-commerce collect, use, and transmit their personal information.

With more personal information being hacked or misused around the world (Gerrad & Cunningham, 2003; Khamseh et al., 2008), service providers need to ensure that their customers' privacy is not compromised to improve customer satisfaction (Hsu & Nguyen, 2016). Hashemi and Abbasi (2017) stated that customers are gradually paying more and more attention to the impact of privacy and information security on their online shopping experience and satisfaction. Usually, customers with less experience in online shopping would pay more attention to protecting their privacy through online stores. For such customers, online stores need to try their best to meet their demand for privacy protection to meet their satisfaction (Bernard & Makienko, 2011; Holloway et al., 2005; Tsao et al., 2016). Kundu and Datta (2015) also

proposed that service providers prioritize the privacy of customers' personal and transaction information to improve customer satisfaction. Hence, the researcher proposes the following hypothesis:

H4: Privacy has a significant impact on satisfaction.

2.2.5 Satisfaction

E-satisfaction refers to the satisfaction level of consumers after comparing purchase experience, perceived expectation, and after-sale experience. Electronic satisfaction is not only about consumers' perception of products and services (Ahmad et al., 2017; Constantin, 2013; Van La, 2005). According to Anderson and Srinivasan (2003), e-satisfaction refers to consumers' Satisfaction with past purchases. Satisfaction in e-service is the emotion generated by customers' exposure to the attributes of the source and the experience given by e-retailers (Moors, 2009). Lin and Sun (2009) believed that satisfaction is a measure of customers' consumption experience after the purchase, and this measure could observe consumers' inner changes after the purchase. Customer satisfaction fulfills customers' expectations during the purchasing process (Pereira et al., 2016).

Goutam and Gopalakrishna (2018) considered that commitment resulted from long-term satisfactory communication between the two parties. Wang et al. (2018) also found that e-satisfaction is crucial for promoting customer commitment. Satisfaction would continue to enhance customer attitude and thus create commitment (Hennig-Thurau & Klee, 1997). Satisfaction is not only a predictive factor of loyalty but also a predictive factor of commitment (Abdul-Muhmin, 2005; Hsu & Nguyen, 2016; Román et al., 2013). Wang et al. (2011) and Luarn and Lin (2003) believed that customer satisfaction significantly impacts customer loyalty. Mummalaneni et al. (2016) believed that in the field of online shopping, there is a relationship between consumer satisfaction and loyalty. Once consumers are satisfied with the shopping experience or the whole transaction process online, they will have trust in a particular online retailer, which leads to loyalty. According to Román et al. (2013), satisfaction is confirmed to be the mediator variable of e-service quality indirectly affecting loyalty. Hence, the researcher proposes the following hypotheses:

H5: Satisfaction has a significant impact on commitment.

H7: Satisfaction has a significant impact on customer loyalty.

2.2.6 Commitment

Morgan and Hunt (1994) believed that commitment means that the exchange party considered it essential to maintain a continuous relationship with the other party and desired to do its utmost to maintain this relationship. Mukherjee and Nath (2007) defined *commitment* as an associative nature and belonging to the relationship. The

commitment was clearly defined in the commitment-trust theory. In this theory, a commitment is considered the degree to which consumers considered the inseparable relationship with the website essential enough and willing to do whatever they could to maintain it (Morgan & Hunt, 1994; Wang et al., 2016). The commitment is when one person believed that maintaining an ongoing relationship with the other person would bring good returns and was therefore worth a significant effort to ensure the relationship is always maintained (Goutam & Gopalakrishna, 2018).

Fishbein and Ajzen (1975) have explained in TRA that commitment positively influenced consumers' repeat purchase behavior at a particular vendor. When customers have an emotional or psychological attachment to a product or brand, this is called commitment, and it is an essential indicator of customer loyalty (Garbarino & Johnson, 1999; Pratminingsih et al., 2013; Wang & Hu, 2009). Similarly, Vieira (2011) proposed that commitment occurred earlier than loyalty, which was a psychological and emotional attachment to the brand produced by consumers before they were sure that they could make repeated purchases. A high level of commitment can transform consumers' emotions into behavioral changes to achieve loyalty to a brand or product. The higher the level of commitment, the higher the loyalty will be (Faria et al., 2013). Therefore, this study suggests that:

H8: Commitment has a significant impact on customer loyalty.

2.2.7 Perceived value

Customer perceived value refers to consumers' subjective feelings when they purchase products or services. It represented a trade-off between benefits and costs (Anderson & Weitz, 1992). Zeithaml et al. (2002) considered perceived value as benefit and sacrifice. It was the perception of the monetary and non-monetary (Time and effort spent purchasing and using the product) costs associated with the utility of an e-service. Perceived value could generally be described as the customer's inner evaluation of the product's value and perception of its value (Zehir & Narcikara, 2016). Tzavlopoulos et al. (2019) considered that perceived value resulted from the consumer comparing what he paid for the service with what he received.

Luarn and Lin (2003) argued that a customer's perceived value of a good or service should be positively correlated with commitment. It is more important for managers to make customers feel that the service or product brings them value than to make them feel that the price is reasonable because this can help build customer commitment (Lai, 2015). Pura (2005) noted that customers' perceived value of products or services directly affects their commitment and reduces their intention to search for substitutes. Additionally, Goutam and Gopalakrishna (2018) found that perceived value was

significant for consumers to generate online loyalty. Consumers who perceived value in a transaction were less inclined to switch to another e-service provider (Chang et al., 2009). Luarn and Lin (2003) also believed there was a positive relationship between customer loyalty and customer perception of the value of a product or service. Putri and Pujani (2019) stated that loyalty was a natural progression if an e-commerce site offered the best value to customers. Hence, the researcher proposed the following hypotheses:

H6: Perceived value has a significant impact on commitment.

H9: Perceived value has a significant impact on customer loyalty.

2.2.8 Customer loyalty

Customer loyalty refers to the attitude that customers show great affection for e-business, which leads to repeated purchase behavior. Online customer loyalty can be considered a customer's preference for continuing to use a particular website (Anderson & Srinivasan, 2003; Jeong & Lee, 2010; Tweepphoncharoen & Vongurai, 2020). According to Wang et al. (2011), customer loyalty in the context of e-tailing is conative loyalty, a consumer's behavioral intention to make repeated purchases from a specific e-retailer. Chang et al. (2009) defined *electronic loyalty* as the commitment to repeatedly buying favorite products/services and consecutive positive word-of-mouth publicity in the future. Oliver (1997) believed that customer loyalty is the healthy choice of a website or a company to consume, and the attitude remains unchanged. Similarly, the definition of customer loyalty in the field of the e-commerce domain is proposed as a commitment to continuously revisit and not choose other websites due to preference generated by shopping on that website, according to Cyr et al., (2009) and Flavián et al. (2006).

3. Research Framework and Methodology

3.1 Research Framework

The research framework of this study was constructed based on four theoretical frameworks in previous studies. The first theoretical framework of Kassim and Abdullah (2008) studied the relationship between ease of use, web design, responsiveness, personalization, assurance, satisfaction, trust, and customer loyalty (word-of-mouth and intention) in an e-commerce setting. The second theoretical framework of Minimol (2018) studied e-service quality and perceived value as predictors of customer loyalty toward online supermarkets. The third theoretical framework of Al-dweeri et al. (2019) conducted an empirical study in online retailing to study the relationship among efficiency, privacy, reliability, emotional benefit, customer service, e-

satisfaction, e-trust, behavioral loyalty, and attitudinal loyalty. The fourth theoretical framework of Luarn and Lin (2003) carried out a customer loyalty model to test the factors' impact on customer loyalty in the e-service context. The research framework is illustrated in Figure 1.

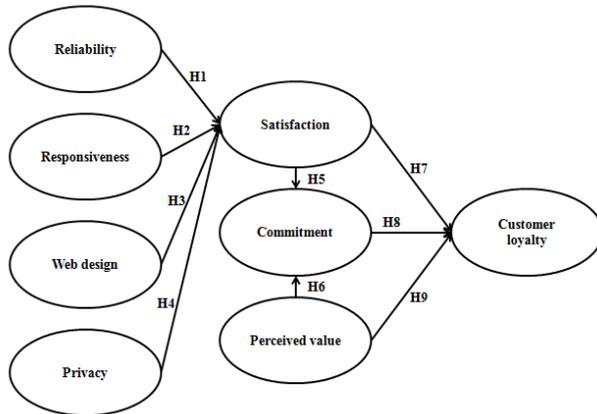


Figure 1: Research Framework

- H1:** Reliability has a significant impact on satisfaction.
H2: Responsiveness has a significant impact on satisfaction.
H3: Web design has a significant impact on satisfaction.
H4: Privacy has a significant impact on satisfaction.
H5: Satisfaction has a significant impact on commitment.
H6: Perceived value has a significant impact on commitment.
H7: Satisfaction has a significant impact on customer loyalty.
H8: Commitment has a significant impact on customer loyalty.
H9: Perceived value has a significant impact on customer loyalty.

3.2 Research Methodology

Regarding data collection, the researchers distributed online questionnaires to the target population. The questionnaire design was divided into three parts: screening questions, demographic questions, and factors impacting online shopping on satisfaction, commitment, and customer loyalty. For scale items, the variables involved in the research framework were measured by a five-point scale from (1) "strongly disagree" to (5) "strongly agree."

Before distributing the online questionnaire to the target population, the researchers conducted the index of Item-Objective Congruence (IOC) test to examine the content validity of the research. The scale items of 8 variables were evaluated by three experts who hold a philosophy of doctor qualification or philosophy of doctor candidates and should actively conduct the research or have professional experiences relevant to the research topic or e-commerce industries. In addition, the researcher conducted a pilot test in

which the questionnaire was distributed to 50 target populations to test the reliability of the research by using Cronbach's Alpha coefficient test. After both content validity and reliability met the research requirements, the researchers distributed questionnaires to the target population and finally obtained 516 valid questionnaires for research. After collecting the data, the researchers used statistical software SPSS and Amos to analyze the data by applying confirmatory factor analysis (CFA) and structural equation models (SEM).

3.3 Target Population and Sample Size

Barnsbee et al. (2018) concluded that the target population is the group of individuals who were studied by the intervention and could draw conclusions from it. The target population of this study is the customers who are 16 years old and over, have online shopping experience in China's top 3 e-commerce companies, and shop online at least 1 to 2 times per week.

According to Cramer-Flood (2021), China's top three e-commerce platforms, Alibaba, JD.com, and Pinduoduo, accounted for nearly 80% of the market share. In order to ensure that the research results can sufficiently cover the entire Chinese e-commerce industry, this paper conducted a case study on these three e-commerce platforms to explore factors impacting online shopping on satisfaction, commitment, and customer loyalty. Additionally, customers who shop online at least once or twice a week are more experienced than those who shop less frequently.

Taherdoost (2017) defined sample size as a group drawn from a population to make inferences about specific population characteristics. The recommended minimum sample size of 444 was determined according to the study with eight latent and 31 observed variables, as calculated by calculator. In order to ensure the validity of the collected questionnaires, the researchers distributed about 700 questionnaires and finally screened 516 valid questionnaires for research.

3.4 Sampling Procedures

Since the target group of this study must be the customers who have online shopping experience in China's top 3 e-commerce companies and do online shopping at least 1 to 2 times per week, the researchers used step-by-step sampling methods including purposive sampling, stratified random sampling and convenience sampling to get the sample size from the target population. Purposive sampling is the strategy of deliberately selecting specific persons or events to gather the information that could not be obtained from other choices (Zeithaml et al., 1996). This study arranged four stages in the sampling procedure. The researchers firstly selected purposive sampling to select China's top three e-commerce

platforms according to market capitalization. Then, stratified random sampling was applied to determine a proportional sample size according to the total annual active users of the three companies as of the first quarter of 2021 from China Internet Watch (2021), as shown in Table 1. In the third stage, the researchers used convenience sampling to distribute questionnaires online via social networks. In the fourth stage, customers who shopped online at least once or twice a week were selected using purposive sampling.

Table 1: Sample size from China's top 3 e-commerce platforms

E-commerce platforms (Public Limited Company)	Market Capitalization (In Billion U.S. dollars)	Approximate Active users (Million)	Sample Size
Alibaba	530.18	811.00	196
Pinduoduo	113.87	823.80	199
JD.com	110.89	500.00	121
Total	754.94	2134.80	516

Source: China Internet Watch (2021); Companiesmarketcap (2021)

4. Results and Discussion

4.1 Demographic Information

As shown in Table 2, among the 516 respondents, 29.1% were male, and 70.9% were female. The age of the respondents is concentrated in the two ranges of 16 – 24 years old and 25 – 35 years old, accounting for 50.8% and 32.0%, respectively. Regarding education, respondents with a bachelor's degree accounted for the most significant proportion, accounting for 55.8%. More than 90% have a junior college degree or above. Among the 516 respondents, 410 did not have a disposable income of more than 5,000 CNY, of which 267 were less than or equal to 2,000 CNY, accounting for 51.7%, and 143 were in the range of 2001 – 5000 CNY, accounting for 27.7%. In terms of Current employment status, 38.4% of respondents worked full-time, and 21.9% worked part-time. Few of the respondents were retired. The rest were not employed or tended not to disclose their employment status.

Table 2: Demographic Information

Table 3: Confirmatory Factor Analysis Result, Composite Reliability (CR) and Average Variance Extracted (AVE)

Variables	Source of Questionnaire	No. of Items	Cronbach's Alpha	Factors Loading	CR	AVE
Reliability (RE)	(Al-dweeri et al., 2019)	5	0.887	0.724 – 0.858	0.890	0.619
Responsiveness (RES)	(Kassim & Abdullah, 2008)	4	0.913	0.812 – 0.887	0.914	0.726
Web design (WD)	(Kassim & Abdullah, 2008)	4	0.945	0.888 – 0.912	0.945	0.811
Privacy (PR)	(Al-dweeri et al., 2019)	4	0.925	0.827 – 0.892	0.911	0.720
Satisfaction (SA)	(Al-dweeri et al., 2019)	3	0.920	0.852 – 0.921	0.920	0.793

Demographic and General Data (N=516)		Frequency	Percentage
Gender	Male	150	29.1%
	Female	366	70.9%
Age	16 – 24 years	262	50.8%
	25 – 35 years	165	32.0%
	36 – 50 years	69	13.3%
	51 years or above	20	3.9%
Education Level	Elementary School or lower	3	0.6%
	Junior High School	11	2.0%
	Senior High School	26	5.0%
	Junior College	87	16.9%
	Bachelor's degree	288	55.8%
	Master's degree or above	101	19.7%
Monthly Income	2000 China Yuan (CNY) or lower	262	50.8%
	2001–5000 CNY	165	32.0%
	5001–10000CNY	69	13.3%
	10001 CNY or above	20	3.9%
Current Employment Status	Employed Full-time	198	38.4%
	Employed Part-Time	113	21.9%
	Students	94	18.2%
	Retired	10	1.9%
	Prefer not to say	101	19.6%

Note: N=516

4.2 Confirmatory Factor Analysis (CFA)

Through CFA, convergent validity (factor loading, composite reliability, average variance extracted) and discriminant validity could be verified. According to Cronbach (1951), an alpha value greater than or equal to 0.70 should appear in the results for each construct to ensure that the research tool is functional. The results in Table 3 showed that the Cronbach's Alpha value of all constructs exceeded 0.7. Hair et al. (2010) suggested that the factor loading of each variable should be higher than 0.7. Composite reliability (CR) should be greater than 0.7, and the average variance extracted (AVE) should be greater than 0.5 for all constructs. Overall, the factor loading, composite reliability, and average variance extracted from each variable in Table 3 met the requirements of the criterion, indicating that the statistical estimates were significant.

Variables	Source of Questionnaire	No. of Items	Cronbach's Alpha	Factors Loading	CR	AVE
Commitment (CM)	(Luarn & Lin, 2003)	4	0.899	0.813 – 0.864	0.899	0.690
Perceived value (PV)	(Luarn & Lin, 2003)	3	0.841	0.772 – 0.818	0.841	0.639
Customer loyalty (CL)	(Kassim & Abdullah, 2008)	4	0.919	0.835 – 0.877	0.919	0.740

Note: Composite Reliability (CR); and Average Variance Extracted (AVE)

The AVE square roots of the variable are presented in Table 4. According to the criterion set by Fornell and Larcker (1981), the square root of AVE for each latent construct should be higher than the correlation between that construct and any other latent construct. In Table 4, the values of the square root of AVE for each latent construct were all larger than the correlation between any pair of latent constructs. Therefore, the discriminant validity was acceptable.

Table 4: Discriminant Validity

	RE	RES	WD	PR	SA	CM	PV
RE	0.787						
RES	0.547	0.852					
WD	0.283	0.379	0.900				
PR	0.520	0.506	0.443	0.848			
SA	0.497	0.584	0.295	0.540	0.890		
CM	0.434	0.409	0.267	0.482	0.588	0.830	
PV	0.399	0.370	0.284	0.392	0.403	0.353	0.799

Note: The diagonally listed value is the AVE square roots of the variables

4.3 Structural Equation Model (SEM)

Structural equation modeling (SEM) is a multivariate analysis technique used in many social sciences to verify multivariate causality relationships (Beran & Violato, 2010). The measurement of SEM can be achieved by evaluating the fit indices for the test of a single path coefficient and the overall model fit. The indices and its value used for goodness of fit were CMIN/DF = 2.148, RMSEA = 0.047, GFI = 0.901, AGFI = 0.883, NFI = 0.929, TLI = 0.956, and CFI = 0.960 accordingly. Each index's statistical values met the criterion's requirements, indicating a good model fit as shown in Table 5.

Table 5: Goodness of Fit for Structural Model

Index	Acceptable Values	Statistical Values
X2/df (CMIN/df)	< 3.0 (Hu & Bentler, 1999)	2.148
RMSEA	< 0.08 (Hair et al., 2010)	0.047
GFI	> 0.90 (Hu & Bentler, 1999)	0.901
AGFI	> 0.80 (Segars & Grover, 1993)	0.883
NFI	> 0.90 (Hair et al., 2010)	0.929
TLI	> 0.90 (Gefen et al., 2000)	0.956
CFI	< 3.0 (Hu & Bentler, 1999)	0.960
Model Summary		Acceptable Model Fit

Note: CMIN/DF = The ratio of the chi-square value to degree of freedom, RMSEA = root mean square error of approximation GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, NFI = normalized fit index, TLI = Tucker Lewis index and CFI = comparative fit index

4.4 Research Hypothesis Testing Result

The hypothesis testing result between variables was measured using regression weights, the significance of the path coefficients, and R2 variances in the structural model. The results showed that all hypotheses were supported except H3 and H8. According to Table 6, the hypothesis testing results of the structural model can be summarized as follows:

Table 6: Hypothesis Results of the Structural Equation Modeling

Hypothesis	(β)	t-Value	Result
H1: RE → SA	0.164	3.268**	Supported
H2: RES → SA	0.366	7.480***	Supported
H3: WD → SA	0.004	0.086	Not Supported
H4: PR → SA	0.286	5.878***	Supported
H5: SA → CM	0.547	12.258***	Supported
H6: PV → CM	0.152	3.482***	Supported
H7: SA → CL	0.420	7.951***	Supported
H8: CM → CL	0.097	1.825	Not Supported
H9: PV → CL	0.275	6.083***	Supported

Note: *** p<0.001, ** p<0.01

H1: Reliability significantly impacted satisfaction with standardized path coefficients of 0.164 and a t-value of 3.268**. Therefore, the hypothesis was supported. This result is consistent with the findings of Lin (2007) and Kuo et al. (2016) that reliability was a vital dimension affecting customer satisfaction. This indicated that customers value whether the products sent by the e-commerce platform were consistent with the description and whether the delivery is efficient.

H2: The hypothesis supported that responsiveness significantly impacted satisfaction from the standardized path coefficient of 0.366 and t-value at 7.480***. In addition, responsiveness was the variable that had the most significant impact on satisfaction compared with reliability, web design, and privacy. The studies of Kassim and Abdullah (2008) and Kusdiby and Februadi (2019) also pointed out that responsiveness significantly impacted satisfaction, which supported the results of this hypothesis. When customers shop online, the most important thing is the ability of e-service providers to provide timely feedback and solve problems when customers encounter problems or need to inquire.

H3: The hypothesis that web design has a significant impact on satisfaction was not supported, the standardized

path coefficient was 0.004, and the t-value was 0.086. According to the result, web design did not significantly impact satisfaction. Although this finding contradicted the findings of Bai et al. (2012) and Hsu and Nguyen (2016), Faraoni et al. (2019) and Fernandus (2020) came to the same conclusion in their study that web design was not a predictor of satisfaction. Web design of e-commerce platforms has gradually begun to be regarded as a less critical aspect by customers.

H4: The standardized path coefficient between privacy and satisfaction was 0.286, and the t-value at 5.878***. This suggested that privacy had a significant impact on satisfaction. The studies of Goutam and Gopalakrishna (2018) and Kundu and Datta (2015) confirmed that privacy was one of the critical factors affecting satisfaction with e-service quality, which supported this finding. This result was also supported by Kuo et al. (2016).

H5: Satisfaction significantly impacted commitment with a standardized path coefficient of 0.547 and a t-value of 12.258***. Therefore, the hypothesis was supported. This finding was in line with the study of Luarn and Lin (2003) that proper management of customer satisfaction was the key to improving commitment. This finding is consistent with Román et al. (2013) and Lee and Wong (2016), confirming that satisfaction was a crucial predictor that significantly affected commitment. When customers perceive that the online shopping experience brings them satisfaction, the commitment relationship between customers and e-commerce platforms can be well established.

H6: The hypothesis that perceived value has a significant impact on commitment was supported, the standardized path coefficient was 0.152, and the t-value was 3.482***. The result indicated that perceived value had a significant impact on commitment. The significant effect of perceived value on commitment has been demonstrated in the study of Luarn and Lin (2003). This finding was also consistent with Goutam and Gopalakrishna (2018) that perceived value was a predictor of commitment.

H7: The standardized path coefficient between satisfaction and customer loyalty was 0.420, and the t-value at 7.951***. The result indicated that satisfaction had a significant impact on customer loyalty. Among satisfaction, commitment, and perceived value, satisfaction had the most significant impact on customer loyalty. Lin and Sun (2009) also suggested that satisfaction was the most critical factor in predicting customer loyalty in online shopping. The studies of Brilliant and Achyar (2014), Sheng and Liu (2010), and Wu (2011) also found that satisfaction was an antecedent of customer loyalty.

H8: Commitment did not significantly impact satisfaction with standardized path coefficients of 0.097 and a t-value of 1.825. Therefore, the hypothesis was not

supported. This result contradicted the findings of Goutam and Gopalakrishna (2018), Pratminingsih et al. (2013), and Rafiq et al. (2013), all of whom proposed that commitment significantly affected customer loyalty. However, Fullerton (2003) argued that excessive commitment was not necessarily beneficial for the relationship between service providers and customers.

H9: The hypothesis was supported that perceived value significantly impacted satisfaction from a standardized path coefficient of 0.275 and t-value at 6.083***. The implication is that when customers perceive the value provided by e-services and experience the increase in value after weighing the gains and sacrifices in the process of online shopping, which will lead to an increase in customer loyalty. This finding is consistent with previous studies by Chinomona et al. (2014), Minimol (2018), Putri and Pujani (2019), and Zehir and Narcikara (2016).

5. Conclusions and Recommendation

5.1 Conclusion and Discussion

This study constructed a research framework with eight variables and nine hypotheses to explore the relationship among reliability, responsiveness, web design and privacy, perceived value, satisfaction, commitment, and customer loyalty toward online shopping. This study investigated the factors impacting online shopping on satisfaction, commitment, and customer loyalty. The sample selected for this study is customers who have shopping experience on China's top three e-commerce platforms and shop online 1 to 2 times a week. This study adopted the quantitative analysis method, and the data were collected from an online questionnaire distributed to the target population. IOC and pilot tests were used to examine the content validity and reliability of the proposed conceptual framework. CFA was used to confirm the model fit, and SEM was applied to test the conceptual framework's relationship between constructs and items.

According to the results of statistical analysis, the analysis first showed that dimensions related to e-service quality, reliability, responsiveness, and privacy all significantly impacted satisfaction, except for web design. Satisfaction was most affected by responsiveness. Previous studies have mentioned that the responsiveness of e-service providers was an important factor in determining customer satisfaction (Kim & Jackson, 2009; Pham & Ahammad, 2017). Privacy was second only to responsiveness, an impact on satisfaction. Al Karim (2013) stated that customer satisfaction in online shopping was determined by protecting personal privacy. Although the effect of reliability on satisfaction was inferior to responsiveness and

privacy in the results, the non-negligible effect of reliability on satisfaction is emphasized in the studies of Alam and Yasin (2010) and Lin (2007).

Second, satisfaction is vital in influencing commitment and customer loyalty (Luarn & Lin, 2003; Román et al., 2013). Hence, e-commerce platforms should ensure consistency in the product description, quality, and efficient delivery to build a committed relationship with customers. Additionally, we must ensure that customers' requirements and inquiries arising from online shopping can be solved promptly and efficiently, and the protection of customers' privacy shall be improved. Perceived value also significantly impacted commitment and customer loyalty, but not as much as satisfaction. Luarn and Lin (2003) proposed that the committed relationship and the generation of repeated purchases originate from the customer's perception of good service quality and improved value.

Third, the results indicated that commitment had no significant effect on customer loyalty, although previous research had confirmed that the impact of commitment on customer loyalty was significant (Faria et al., 2013; Lee & Wong, 2016; Pratminingsih et al., 2013; Rafiq et al., 2013). The reason may be that most customers establish a committed relationship with an e-commerce platform only because of low prices of products and services, lack of choice, or habitual dependence. Such commitment was called continuance commitment, while the lack of affective commitment can lead to looking elsewhere when faced with a drop in quality of service or an increase in price (Fullerton, 2003). Therefore, service providers or e-commerce platforms should try to enhance the customer's sense of identity in online shopping, share the same values, and make customers feel a sense of belonging.

To sum up, strengthening the management of reliability, responsiveness, and privacy in e-services quality can help improve customer satisfaction and thus enhance customer commitment and loyalty. Additionally, enhancing customers' perceived value in the online shopping process can encourage customers to establish a committed relationship with e-commerce platforms and lead to customer loyalty.

5.2 Recommendation

For theoretical implications, this study verified the research framework constructed by integrating the service quality model (SERVQUAL), e-service quality model (E-SQUAL), e-tail quality model (eTailQ), theory of reasoned action (TRA), and Customer loyalty model. The result indicated that reliability, responsiveness, and privacy were three significant factors affecting satisfaction in online shopping settings. From the results, web design did not appear to significantly impact satisfaction, which was

contrary to the e-tail quality model. Additionally, it can be inferred from the results that satisfaction and perceived value significantly affect commitment and customer loyalty. However, the effect of commitment on loyalty is not significant, which is inconsistent with the Customer loyalty model.

For practical implications, satisfaction was proved to be the most influential factor for commitment and customer loyalty toward online shopping. Therefore, how to ensure and enhance customer satisfaction in the process of online consumption is crucial. Managers of e-commerce platforms and those who provide e-services for online shopping need to understand which predictors affect customer satisfaction to strive to improve customer satisfaction in these aspects. From the results of the study, specific methods to improve service quality to achieve satisfaction and thus gain commitment and customer loyalty can focus on improving responsiveness, reliability, and privacy.

Responsiveness was considered the most critical factor in influencing commitment and customer loyalty through satisfaction. Therefore, it is essential to respond to customer inquiries and solve customer problems promptly and effectively during the entire online shopping process, from pre-sales to after-sales. For instance, e-commerce platforms can set up more manual customer service personnel and train these staff to solve some complex problems arising from customer inquiries or shopping. Simultaneously, e-commerce platforms should develop more intelligent algorithms to help them better handle common inquiries and questions. Additionally, after the customer completes the order, a return visit by telephone or online can be made to consult the customer about their feelings and suggestions on this consumption.

For privacy, customers' personal and property information should be better protected. For example, e-commerce platforms should enhance the security of their website systems to prevent customer privacy from being leaked. In addition, the platform should strengthen the scrutiny of customer privacy data and try to collect and save only the information used to provide products or services.

Reliability directly or indirectly affects commitment and customer loyalty through satisfaction, so e-commerce platforms should pay more attention to improving the reliability of products and delivery services. For example, conduct regular reviews to weed out online stores that offer products that do not match the product information described on the Internet. Regarding distribution, the platform can choose to cooperate with high-quality logistics companies or build its own logistics channels to ensure that products are delivered to customers safely and on time.

It is worth noting that the impact of perceived value on commitment and customer loyalty cannot be ignored, even if it is less effective than satisfaction. Customers must

perceive value increases rather than decreases as they shop online. Therefore, e-commerce platforms can provide some marketing strategies such as price reductions, bundled sales, buy one get one free, and membership systems within an affordable range.

5.3 Limitation and Further Study

First, since the study only considered 516 online shoppers from China's three largest e-commerce platforms, caution should be exercised when generalizing the results to e-commerce platforms with smaller sizes or e-commerce platforms in other countries. Second, relatively low R² values in the proposed model indicated that the independent variables did not sufficiently explain the variance of the dependent variables. Future research could add additional variables better to predict satisfaction, commitment, and customer loyalty. Finally, when selecting commitment and customer loyalty in future research, we can consider classifying commitment into continuance and affective commitment and classifying customer loyalty into behavioral and attitudinal loyalty to conduct more comprehensive and specific research (Fullerton, 2003).

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