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## AN EMPIRICAL STUDY ON THE LOGISTICS SERVICE QUALITY OF ONLINE SHOPPING BUSINESS IN CHINA

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### Abstract

This study aims to find out the differences between customer expectations and customer experiences on logistics service quality (LSQ) of online shopping in China. Data was collected from 153 respondents through an online shopping site. Structural equation modeling is used to examine the reliability and validity of the research model. This study indicates that order condition and order discrepancy handling are the most important LSQ areas that logistics service providers should address in order to improve their service quality as well as to strength their business development.

**Keywords:** online shopping, logistics service quality, customer expectation, customer experience, third-party logistics

### Introduction

China is the most populous country in the world. According to the CNNIC report, the number of internet users in China rose to 384 million at the end of 2009 [1]. The internet penetration rate in China is 28.9%. Although most Chinese internet users are looking for online entertainment such as online games, some Chinese internet users also enjoy shopping online. Analysis International estimated that by 2012, online retail sales in China will reach 713 billion [2].

Logistics is one of the basic business functions of online shopping business and quality of logistics service affects the results of the online shopping company's performance. Since Logistic Service Quality (LSQ) depends on the process followed to provide utility in terms of time and space to the customer, the logistic process directly affects how consumers obtain benefits in an effective way from the purchased products [3]. In order to enhance LSQ of online shopping business, it is important to understand customers' expectations and customers' experiences on existing logistics services.

In this regard, this study tries to find out the gaps between customer expected services (CES) and customer received services (CRS) of online shopping in China. In this study, a research model is developed from Mentzer et al.'s [4] model that aims to test the process of LSQ. Online questionnaire survey is conducted through an online shopping website. Data are analyzed using

AMOS 18 software package. This paper first describes a review on service quality and LSQ model in the literature. Then, research model and its measure items are presented. The results of SEM analysis are reported, followed by discussions and conclusion.

### Literature Review

#### Service Quality

Since the mid-1980s, service quality has been a priority theme in both marketing and logistics research, running parallel to the interest in quality, quality management and satisfaction in companies (e.g., [5] [6] [7]). Parasuraman et al. [8] conceptualized service quality as the relative perceptual distance between customers' expectations and evaluations of service experiences. They operationalized service quality using gap model and a multi-item scale called SERVQUAL that consists of five sales (tangibles, responsiveness, empathy, reliability, and assurance). The measurement of service quality using the gap model and SERVQUAL as a tool has been tested and used by several researchers (e.g., [9] [10]). The gap model and SERVQUAL provide a sound conceptual foundation for understanding service quality in service industries.

Since the early of 1990s, third-party logistics (3PL) as a kind of service business has experienced phenomenal growth. The logistics services contribute to firm competitive advantage in both efficiency (cost leadership) and effectiveness (customer service) [11]. The quality of logistics service performance is a key marketing component that helps create customer satisfaction [12] [13]. LSQ is a complex concept demanding a great deal of attention from supplying firms.

#### Logistics Service Quality Model

The origins of LSQ research can be traced back to Perreault and Russ [14] [15], who maintained that logistics activities create time, place, and form utility, thereby enhancing product value. In 2001, Mentzer et al. [4] have conducted an empirical research to identify potential components of LSQ that apply across multiple customer segments. They found that LSQ should be conceptualized as a process, rather than merely as a single concept or second-order construct. LSQ begins to form as

soon as customers try to place orders, and perceptions develop until customers receive complete and accurate orders, in good condition, with all discrepancies addressed. Mentzer et al.'s [4] model consists of ten components. They are: personnel contact quality, order release quantities, information quality, ordering procedures, order accuracy, order condition, order quality, timeliness, order discrepancy handling, and satisfaction (as shown in Figure 1).

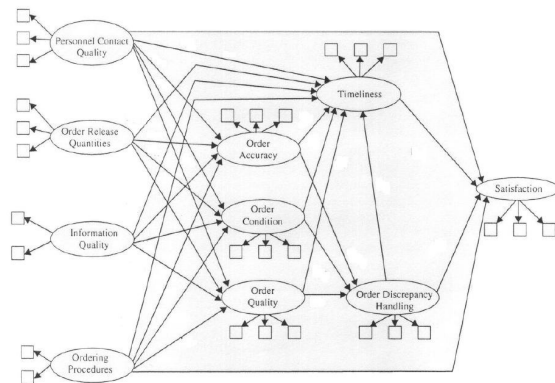


Figure 1. Logistics service quality model [4]

Of all these constructs, Mentzer et al. [4] found that timeliness has the greatest influence. Raham [16] has confirmed these results and showed 'on time delivery' is the most important component in a more recent study.

## Research Design

### Research Model

In order to find out the differences between customer expectations and customer experiences on online shopping LSQ, a research model will be developed by revising Mentzer et al.'s [4] model. Since logistics service of online shopping does not involve the collaboration with the manufacturers' distribution, processing, packaging, and inventory processes. Thus, the construct of order quality and some related measure items were removed. Final, the model consists of eight constructs. They are: information quality, order procedures, order release quantities, personnel contact quality, order accuracy, timeless, order condition, and order discrepancy handling (as shown in Figure 2).

*Information quality* refers to customers' perceptions of the information provided by the supplier regarding products from which customers may choose [4].

*Order procedures* refer to the efficiency and effectiveness of the procedures followed by the supplier [4].

*Order release quantities* are related to the concept of product availability [4]. Customers will be unhappy if they cannot obtain the quantities they desire.

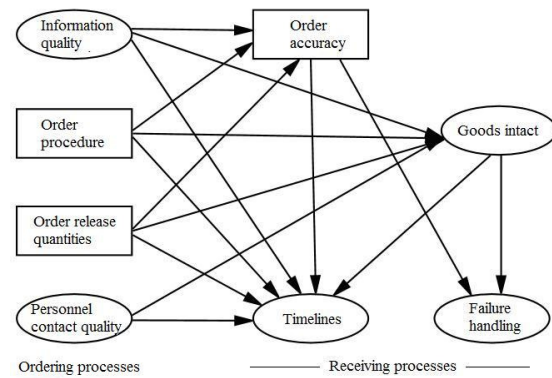


Figure 2. Research model

*Personnel contact quality* refers to the customer orientation of the supplier's logistics contact people [4]. Parasuraman et al. [17] argued that in most service encounters, quality perceptions are formed during the service delivery.

*Order accuracy* refers to how closely shipments match customers' orders upon arrival [4].

*Timelines* refers to whether orders arrive at the customer location when promised [4].

*Order condition* refers to the lack of damage to orders [4]. Appropriate packaging can prevent damage to goods consigned

*Order discrepancy handling* refers to how well the 3PL service provider addresses any discrepancies in order after the order arrive [18] [19]. How well 3PL service provider handles the discrepancies contributes to customers' perceptions of the quality of the logistics services.

### Measure Items

In order to test the design of the questionnaire, a pilot test was conducted with 68 college students to collect their feedbacks. Then, some questions were revised and some measure items were removed. On the other hand, respondents concerned about the end-point delivery process much. Thus, a measure item of the appearance of delivery personnel was added into the personnel contact quality construct. Table 1 lists all constructs and their measure items.

Table 1. Constructs and Measure Items

Constructs		Measure items
Information quality (IQ)	Q1	Shipping information is available
	Q2	Shipping information is adequate
Ordering procedures (OP)	Q3	Online requisitioning procedures are effective
Order release quantities (OQ)	Q4	Difficulties never occur due to maximum release quantities
Timelines (T)	Q5	Time between placing requisition and receiving delivery is short
	Q6	Deliveries arrive on the date promised
Order accuracy (QA)	Q7	Deliver the right items with right quantity

Personnel contact quality (PQ)	Q8	The appearance of delivery personnel
	Q9	The logistics service person makes an effort to understand my situation
	Q10	The logistics service person can solve my problems
	Q11	The logistics service person shows good knowledge/experience
Order condition (OC)	Q12	Goods received is undamaged
	Q13	Appropriate to deal with packaging to prevent damage to goods consigned
Order discrepancy handling (OD)	Q14	Provide emergence of service to remedy the order discrepancy
	Q15	Provide instructions when order discrepancy occurs

The aim of this study is to find out the differences between customer expectations and customer experiences on online shopping logistics services. The questionnaire consists of three sections. The first section is respondent's background information. The second section is 15 questions about respondent's expectations on online shopping LSQ. Respondents were asked to rate the questions along 7-point Likert-type scale, with 1 as 'very not very important' and for 7 as 'very important'. The final section is about respondent's experiences on online shopping LSQ. Respondents were asked to rate the questions along 7-point Likert-type scale, with 1 as 'very poor' and for 7 as 'very good'.

### Findings

#### Descriptive Statistics

According to 2009-10 China online shopping market report, particular online shopping site was selected as the sampling site to collect data. Through its free business communication platform, 250 sets of questionnaire were sent and 206 sets of questionnaire were received. The responding rate is 82.40 percent. However, only 153 sets of questionnaire were valid. Table 2 shows the results of descriptive statistics in CES and table 3 shows the results of descriptive statistics in CRS.

Table 2. Descriptive statistics (Customer expected service) (Items = 15, N = 153)

		Means	S.D.	Skewness	Kurtosis
IQ	Q01	5.739	.686	-.106	-.139
	Q02	5.118	.668	-.139	-.752
OP	Q03	5.333	.734	.796	.405
	Q04	5.137	.574	.421	1.013
T	Q05	6.105	.690	-.383	-.003
	Q06	6.581	.592	-1.094	.207
OA	Q07	6.608	.541	-.946	-.172
	Q08	5.765	.522	-.499	.394
PQ	Q09	6.039	.658	-.463	.760
	Q10	6.137	.539	.104	.240
	Q11	6.039	.511	.065	.882
	Q12	6.712	.468	-1.141	-.192
OD	Q13	6.798	.403	-1.494	.236
	Q14	6.745	.452	-1.351	.409
	Q15	5.902	.535	-.350	1.222

Table 3. Descriptive statistics (Customer received service) (Items = 15, N = 153)

		Means	S.D.	Skewness	Kurtosis
IQ	Q01	5.405	.846	-1.018	.203
	Q02	4.824	1.283	-.763	-.662
OP	Q03	4.595	.996	-.812	.413
	Q04	4.386	.852	-1.093	.628
T	Q05	4.783	.716	-.637	.607
	Q06	5.190	.714	-.295	-.999
OA	Q07	5.373	.777	-.760	-.031
	Q08	5.150	.909	-.463	-.299
PQ	Q09	4.915	.678	-.793	2.227
	Q10	4.601	.898	-1.274	1.322
	Q11	4.464	.866	-1.119	.623
OC	Q12	5.000	.802	-.464	.134
	Q13	4.686	1.035	-.564	.004
OD	Q14	4.712	.978	-.677	.529
	Q15	4.673	.785	-1.252	1.942

#### Model fit

In this study, Structural Equation Modeling (SEM) is employed to evaluate the relationships between eight constructs. Table 4 shows the model fit indices that indicate the model provides an acceptable fit.

Table 4. Model fit indices

	Value	Interpretation
Chi-square	.910	P>0.05, explanatory power of the model
Relative/ normed Chi-square	.794	<2, complexity of effects from model
GFI	.946	>0.9, explanatory power of the model
RMR	.060	The smaller the better
AGFI	.918	>.90, model complexity influence
PGFI	.623	>.50, model of simple
CFI	1	>.95, model of improvement

#### Results of SEM analysis

Figure 3 shows the results of SEM analysis. Table 5 and 6 show the standard estimates of direct and indirect effects respectively. Only significant values (p < 0.05) are listed.

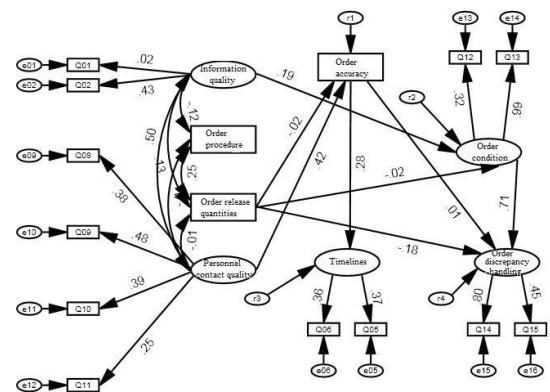


Figure 3. SEM results

Table 5. Standard estimates of the direct effects

	OQ	PQ	IQ	OA	OC	OD	T
OA	-.016	.422					
OC	-.018		.188				
OD	-.181			.007	.715		
T				.284			
Q05							.369
Q14						.798	
Q15						.454	
Q06							.359
Q13					.988		
Q12					.324		
Q08		.382					
Q09		.484					
Q10		.388					
Q11		.246					
Q01			.016				
Q02			.428				

Table 6. Standard estimates of the indirect effects

	OQ	PQ	IQ	OA	OC	OD	T
OD	-.013	.003	.134				
T	-.005	.120					
Q05	-.002	.044		.105			
Q14	-.155	.002	.107	.006	.570		
Q15	-.088	.001	.061	.003	.325		
Q06	-.002	.043	.000	.102			
Q13	-.017		.185				
Q12	-.006		.061				

## Discussions

### The Gaps of Customer Expectations

The results of descriptive statistics (Table 2 and 3) show that there are level differences between CES and CRS. For the measure item where the value of its CES is higher than the value of its CRS, the LSQ performed in this measure item by 3PL service providers cannot meet the customers' requirements. It can be interpreted as customers are not satisfied on this service quality.

For the CES, the highest five measure items are: (1) appropriate to deal with packaging to prevent damage to goods consigned, (2) provide emergence of service to remedy the order discrepancy, (3) goods received is undamaged, (4) deliver the right items with right quantity, and (5) deliveries arrive on the date promised. The highest three constructs are: order condition, order accuracy, and timelines.

While for the CRS, the lowest four measure items are: (1) difficulties never occur due to maximum release quantities, (2) the service person shows good knowledge/experience, (3) online requisitioning procedures are effective, and (4) the service person can solve my problems. The lowest two constructs are: order release quantities and ordering procedures.

The top three unsatisfied measure items (largest difference between CES and CRS) are: (1) appropriate to deal with packaging to prevent damage to goods consigned, (2) provide emergence of service to remedy the order discrepancy, and (3)

Goods received is undamaged. The top two unsatisfied constructs are: order condition and order discrepancy handling.

Prior research provided that order accuracy and timelines are the two most important measures in LSQ. However, the results of this study indicate that order condition and order discrepancy handling become the most customers' concerns. In fact, LSQ decline in the busy peak seasons such as Chinese New Year holiday in China. 3PL service providers should provide close and smooth communication channels to facilitate customer participation and interactions in order to reduce shipping errors as well as improve the order discrepancy handling time.

### Implications for Practices

The results of SEM (Table 5 and 6) show that:

- (1) Order accuracy is direct affected by personnel contact quality (estimate = 0.422). In order to provide good personnel contact quality, the delivery personnel should keep his/her appearance well (estimate = 0.382). Also, logistics service person should make an effort to understand shopper's situation (estimate = 0.484) and try his/her best to solve shopper's problems (estimate = 0.388). 3PL service provider should provide training to the logistics service person in order to enrich his/her knowledge and experience in logistics service areas (estimate = 0.246).
- (2) Order condition is direct affected by information quality (estimate = 0.188). Adequate shipping information is an essential element for the information quality (estimate = 0.428). 3PL service provider should release adequate shipping information to the shoppers.
- (3) Order discrepancy handling is direct affected by order condition (estimate = 0.715) and is indirect affected by information quality (estimate = 0.134). Appropriate packaging is useful for good order condition (estimate = 0.988). 3PL service provider should provide appropriate packaging to protect the goods consigned.
- (4) Timelines are direct affected by order accuracy (estimate = 0.284) and are indirect affected by personnel contact quality (estimate = 0.12).
- (5) Order procedure does not have any obvious effect in this case.

### Limitations

The study has measured the expectations and experiences of the respondents about LSQ of online shopping at the same time. Carman [20] indicated that expectation and perception measures could not both be administered at the same time. It is a

limitation on the research design. However, it is difficult to do that.

The questionnaire was distributed through an online shopping web site in China. The results of the study may not fully represent the expectations and experiences in LSQ of online shopping of the whole population in China. Future research can expand the scope to other countries to test the generalization of the results.

### Conclusion

Online shopping business grows quickly in China. Good logistics service is a successful key for online shopping business. This study aims to find out the gaps between customers' expectations and customers' experiences on online shopping in China. The results of the study indicate that customers are not satisfied in order condition and order discrepancy handling. Order condition is direct affected by information quality (e.g. adequate shipping information). Order discrepancy handling is direct affected by order condition (e.g. appropriate packaging). 3PL service providers should address above issues in order to improve their service quality as well as to strength their business development.

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