



## MEASUREMENT OF DISCONFIRMATION IN ONLINE PURCHASING BEHAVIOR

**Chinho Lin, Institute of Information Management of National Cheng Kung University,  
Taiwan R.O.C.**

**Email: linn@mail.ncku.edu.tw**

**Yu-Huei Wei, Department of Industrial and Information Management of National  
Cheng Kung University, Taiwan, R.O.C.,**

**Email: r38001043@mail.ncku.edu.tw**

### ABSTRACT

**Purpose:** Service quality measurement in e-shopping service is an area of growing interest to researchers and managers. The purpose of this study is to explore the disconfirmation in online purchase behavior based on the expectancy disconfirmation theory (EDT).

**Design/ methodology/approach:** A two-phase study is designed to collect data and 657 usable samples were obtained. The participants are asked to fill out a questionnaire before and after purchasing in web store. A structural equation modeling (SEM) is used to assess the research model.

**Findings:** This study presents the evidence of the scale's factor structure, reliability, content validity and discriminant validity based on the results of analysis. The results also reveal that Disconfirmation, expectation and perceived usefulness has been influenced by second-order factors.

**Research limitation/ Implication:** This study aims on widely e-shopping customers without controlling the kinds of goods or services for participants purchased. The framework can be adopted to investigate the impact of different type and price for goods or services in the future study.

**Originality/ value:** The framework is built through SEM method, and several critical factors included are proposed to measure the disconfirmation in online purchasing behavior.

**Keywords:** Online purchase, E-service quality, E-commerce, Expectancy disconfirmation theory (EDT), Structural equation modeling (SEM), Measurement



## **INTRODUCTION**

With the rapid growth of the Internet, more and more people are participating in the Internet activity and increasing electronic commerce (e-commerce). An increasing number of businesses are utilizing the World Wide Web as a marketing channel to deliver their products and services (Li et al. 2006). Moreover, the existence of the virtual marketplace facilitates the interaction between consumers with a wide array of product choices (Lim and Ting 2012), and Internet become a popular channel for business marketing.

For a long time, customer satisfaction is an important factor for marketing research. The tradition marketing research confirms that customer satisfaction is one of the mean factors of repurchase in various different industrial (e.g., Hallowell 1996; Rust and Zahorik 1993). Recently, on the e-commerce or electronic applications literature, satisfaction also is a mean factor for the research. For instance, Eid (2011) believes that ensuring customer satisfaction is the goal of online sellers, and satisfaction is believed to influence post-purchase intention to repurchase a product or reuse a service (Yen and Lu 2008). Moreover, Lee (2010) argues that Satisfaction is the strongest predictor of users' continuance intention, followed by perceived usefulness, attitude, concentration, and perceived behavioral control as significant. Therefore, not only tradition business but also e-business is pursuing increase customer satisfaction.

Disconfirmation is the gap between the consumer's expectations of the product or service and perceived performance (Yen and Lu 2008), it is the psychological state results from a cognitive. According to Oliver (1980) cognitive model of satisfaction decisions, the expectancy disconfirmation theory (EDT) was developed, and has been widely used in the marketing field to understand consumers' intentions. The studies almost to reported the relationship of expectation, perceived performance, customer satisfaction and how customer intentions change over time. There was absence of research projects dealing with explore the measurement scale. In this research, we propose the measurement scale and model for the disconfirmation in online purchase behavior.

## **THEORETICAL BACKGROUND**

### ***Expectancy Disconfirmation theory***

The success of business depends on that how can they keep the customer and catching business opportunities. The satisfaction is crucial to fostering customer loyalty, that is viewed as the key to building and retaining a loyal base of long-term consumers (Anderson and Sullivan 1993).



The disconfirmation theory proposes that a key determinant of product evaluation is the product's performance relative to initial expectations (Darke et al. 2010).

The Expectancy Disconfirmation theory (EDT) was developed by Oliver (1980) cognitive model of satisfaction decisions that consumers' post-purchase satisfaction is jointly determined by pre-purchase expectation and disconfirmation, that is widely used in the marketing and consumer behavior research. Churchill and Surprenant (1982) argues that perceived performance could also affect satisfaction directly, and sometimes it emerges as the only influence. In general, EDT was used to discussing of consumer satisfaction, repurchase intentions, post-purchase behavior, service marketing, and used to predict the consumers' product repurchase and service continuance use.

Recently, EDT has been used to understand consumers' intentions in the e-commerce context. Some studies show that disconfirmation and performance are important factors in explaining satisfaction (e.g., Bhattacharjee and Premkumar 2004; Chih et al. 2012; Khalifa and Liu 2003), and Yen and Lu (2008) found that buyers' disconfirmation is positively associated with their satisfaction, and satisfaction is positively associated with loyalty intentions.

### ***Conceptualization of disconfirmation***

Disconfirmation is the psychological state results from a cognitive appraisal of expectation and perceived performance. Disconfirmation theory posits that satisfaction is an evaluative outcome of the gap between performance and expectations (Oliver and Desarbo 1988). Yi & La (2004) defined disconfirmation was perceived discrepancy between prior expectations and performance. Kopalle & Lehmann (2001) also defined disconfirmation- sensitive consumers are those who are more satisfied/ dissatisfied when products perform better/ worse than expected. This study defined the disconfirmation as perceived discrepancy between initial expectations and perceived usefulness. Lower expectation and/ or higher performance lead to greater confirmation, which in turn positively influence consumers' satisfaction.

The Disconfirmation is the gap of cognitive between expectation and perceived performance, which used in online purchasing behavior can be affected by many dimensions, and that multidimensional concept associate with satisfaction. Yen et al. (2008) argues that efficiency, privacy protection, contact, fulfillment, and responsiveness have statistically influences on buyer's disconfirmation (Yen and Lu 2008). Bhattacharjee (2001<sub>b</sub>) used performance, productivity, effectiveness and overall evaluate to measurement perceived usefulness construct, and used experience, service level and overall evaluate to measurement confirmation construct.



Kauffman and wood (2006) argues that customer will tend to pay more for the goods with the pictures on the web store. Zeithaml et al. (2002) detailed that information availability and content, ease of use, privacy/security, graphic style and reliability/fulfillment as relevant to e-SQ perceptions. Wolfenbarger and Gilly (2003) argues that Efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact is the eTailQ scale. Lee et al. (2011) used perceived value, perceived ease of use, perceived usefulness, firm's reputation, Privacy, trust, reliability and functionality to understand the relationships with online repurchase intentions. Liang and Lai (2002) found that the quality of e-store design has an effect on the consumer purchase decision. Consumers are effect more likely to shop at well-designed websites. Teo and Yeong (2003) also found that the perceived risk has a negative relationship with consumers' overall evaluation of the deal, and overall evaluation of the deal has a positive relationship with consumers' willingness to buy online.

According to previous literatures, this study used eleven items to measurement consumers' initial expectation, perceived usefulness and disconfirmation that including concept of service of internet store, efficient of transaction process, security, convenient of internet store, save money of online purchasing, easy navigation of website, the products' complete, the description of the products, deal experience, evaluation of purchasing decision, evaluation of overall shopping experience.

## **METHODOLOGY**

### ***Sampling and Data Collection***

Empirical data for this study was collected via two-phase field survey; we conducted a survey based on respondents' online purchasing experience. The data for our study were collected through a web-based questionnaire. We set up an online survey website, and the participants complete the survey questionnaire before them purchasing the goods or services; in addition, when the participants get the goods or services, they must fill out the questionnaire again. We used the participant's e-mail address and web store name to comparing the sample data was come from the same respondent. A sample of 657 respondents was obtained. The sample consisted of 64.5% women and 35.5% men.

### **Measurement instruments**

Three constructs were measured in this study: Initial Expectation, perceived usefulness, and disconfirmation, among initial expectation was measured before the participant online

purchasing and both of perceived usefulness and disconfirmation were measured after they get the goods. Items were measured using seven-point Likert scales anchored between “strongly disagree” and “strongly agree”.

Most of the measuring instruments were extended from Bhattacharjee (2001<sub>a</sub>) and Khalifa and Liu's (2007), in addition to this, some instruments were adapted from EDT, e-commerce, and e-service quality research. There are eleven measure items, respectively, would measuring constructs of Initial Expectation, perceived usefulness, and disconfirmation.

### **Analysis and Results**

The structural equation modeling (SEM) approach was used to assess if the model fit the data set. The first step was developing a measurement model by confirmatory factor analysis (CFA), that was evaluated on the criteria of reliability, convergent validity, and discriminant validity.

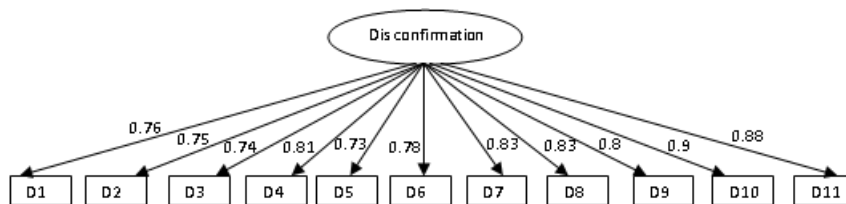
A confirmatory factor analysis (CFA) was to test the reliability and validity of the measurement model. Table 1 shows the descriptive statistics and correlation. Figure 1 show that each item's standardized loading for disconfirmation. All loading value is exceeding 0.55. But the values of fit indices were not within the threshold of recommended values. Therefore, we consider four latent factors.

The Figure 2 and table 2 show the result of consider four latent factors. Standard item loadings were over 0.70 and all items were significant at the 0.001 level. Composite reliability of each factor was all above 0.70. All AVEs of factors range from 0.7 to 0.86, well above the recommended value 0.5. The results to achieve the criteria of convergent validity assess, that standard loading of each item on its underlying factor should be over 0.7 (Gefen et al., 2000), composited reliability should be above 0.7, and the average variance extracted (AVE) should exceed 0.5 (Bagozzi and Yi 1988). The result shown the convergent validity was established. In Table 3, the most square root of the AVE for each factor was larger than the correlation of any specific factor with any of the other factors, showing that we had discriminant validity. This study also considers second order factor analysis, the result as shown in figure 3, and the goodness of fit for Model1, Model 2 and Model 3 are compared in Table 4.

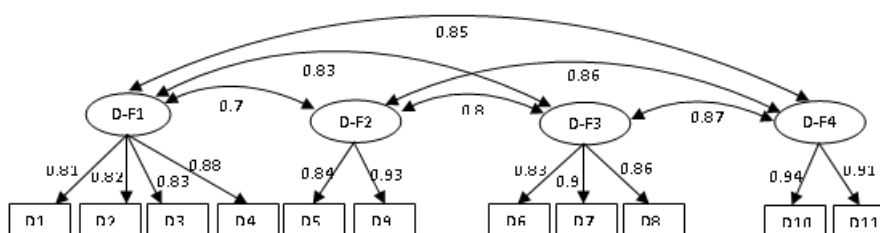
**Table 1. Descriptive statistics and correlation**

	Mean	SD	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11
D1. The service of internet store.	4.94	1.15	1										
D2. The efficient of transaction process.	5.33	1.27	0.67	1									
D3. The security of internet store.	5.07	1.19	0.70	0.67	1								
D4. The conveniently of internet store.	5.41	1.15	0.66	0.73	0.75	1							
D5. The function of save money by online products.	5.03	1.24	0.51	0.51	0.46	0.55	1						
D6. Can be easy navigation of website.	5.15	1.16	0.54	0.55	0.54	0.61	0.59	1					
D7. The completely products.	5.09	1.18	0.61	0.61	0.60	0.65	0.60	0.78	1				
D8. The internet store provides descriptions of the products.	4.98	1.18	0.64	0.59	0.61	0.65	0.56	0.68	0.77	1			
D9. The internet store will provide an excellent deal	5.05	1.23	0.56	0.53	0.51	0.56	0.78	0.58	.670	0.67	1		
D10. Evaluation of purchasing decision.	5.23	1.14	0.67	0.65	0.63	0.70	0.66	0.67	0.73	0.75	0.76	1	
D11. Evaluation of overall shopping experience.	5.29	1.18	0.65	0.65	0.62	0.69	0.67	0.67	0.68	0.70	0.71	0.85	1

**Note:** Correlations is all significant at the 0.001level (two-tailed)



**Figure 1. Model 1 testing results**



**Figure 2. Model 2 testing results**

Table 2. Results of Convergent Validity Testing

Factor	Item	Std. Loading	Error Loading	AVE <sup>a</sup>	CR <sup>b</sup>
D_F1	D1	0.81	0.46	0.70	0.87
	D2	0.82	0.52		
	D3	0.83	0.43		
	D4	0.88	0.31		
D_F2	D5	0.84	0.47	0.79	0.78
	D9	0.93	0.42		
D_F3	D6	0.83	0.25	0.75	0.89
	D7	0.9	0.36		
	D8	0.86	0.20		
D_F4	D10	0.94	0.15	0.86	0.90
	D11	0.91	0.25		

<sup>a</sup>AVE is average variance extracted,  $\rho_v = \frac{\sum \lambda_i^2}{[\sum \lambda_i^2 + \sum var(\epsilon)]}$

<sup>b</sup>CR is composited reliability,  $\rho_c = \frac{(\sum \lambda_i)^2}{[(\sum \lambda_i)^2 + \sum var(\epsilon)]}$

Table 3 discriminant validity

	D_F1	D_F2	D_F3	D_F4
D_F1	<b>0.84</b>			
D_F2	0.7	<b>0.89</b>		
D_F3	0.83	0.8	<b>0.86</b>	
D_F4	0.85	0.86	0.8	<b>0.92</b>

Note: Values in the diagonal row are square roots of the average variance extracted. The other cells contain the correlation between constructs.

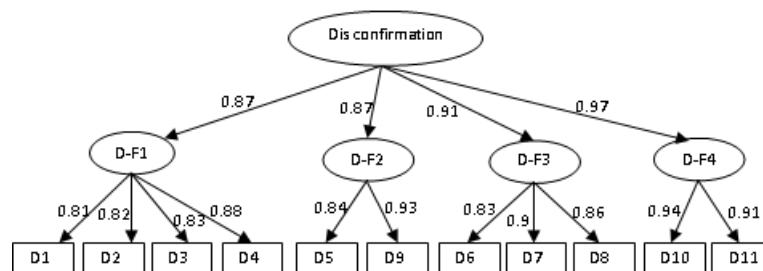


Figure 3. Model 3- second order model



Table 4. Goodness of fit statistics

		Disconfirmation			
		Model 1	Model 2	Model 3	
$X^2/df$	<5 (Bentler,1989)	22.24	4.58	5.65	
RMSEA	<0.06 (Hu and Bentler, 1999)	0.18	0.07	0.08	
NFI	>0.9 (Bentler and Bonett, 1980)	0.94	0.99	0.98	
NNFI	>0.9 (Bentler and Bonett, 1980)	0.92	0.99	0.98	
CFI	>0.95 (Bentler, 1989)	0.94	0.99	0.98	
GFI	>0.9 (Hu and Bentler, 1999)	0.79	0.95	0.94	

## CONCLUSION

This study aims on widely e-shopping customers without controlling the kinds of goods or services for participants purchased. Our study developed and tested three models explaining the measurement of disconfirmation model in online purchasing behavior. We suggest eleven items to measure the construct of disconfirmation, and the items are influenced by four latent factors, and we also test the second-order model.

## REFERENCES

1. Anderson, E. W., and Sullivan, M. W., (1993), "The Antecedents and Consequences of Customer Satisfaction for Firms", *Marketing Science*, Vol.12 NO.2, pp. 125-143.
2. Bagozzi, R. P., and Yi, Y., (1988), "On the evaluation of structural equation models", *Journal of the Academy of Marketing Science*, Vol.16 NO.1, pp. 74-94.
3. Bhattacharjee, A., (2001<sub>a</sub>), "An empirical analysis of the antecedents of electronic commerce service continuance", *Decision Support Systems*, Vol.32, pp. 201-214.
4. Bhattacharjee, A., (2001<sub>b</sub>), "Understanding information systems continuance: an expectation- confirmation model", *MIS Quarterly*, Vol.25 NO.3, pp. 351-370.
5. Bhattacharjee, A., and Premkumar, G., (2004), "Understanding changes in belief and attitude toward information technology usage: a theoretical model and longitudinal test",



*MIS Quarterly*, Vol.28 NO.2, pp. 229-254.

6. Chih, W.-H., Wang, K.-Y., Hsu, L.-C., and Cheng, I. S., (2012), "From disconfirmation to switching: an empirical investigation of switching intentions after service failure and recovery", *The Service Industries Journal*, Vol.32 NO.8, pp. 1305-1321.
7. Churchill, G. A., and Surprenant, C., (1982), "An investigation into the determinants of customer satisfaction", *Journal of Marketing Research*, Vol.19, pp. 491-504.
8. Darke, P. R., Ashworth, L., and Main, K. J., (2010), "Great expectations and broken promises: misleading claims, product failure, expectancy disconfirmation and consumer distrust", *original empirical research*, Vol.38, pp. 347-362.
9. Eid, M. I., (2011), "Determinants of e-commerce customer satisfaction, trust, and loyalty in Saudi Arabia", *Journal of electronic commerce research*, Vol.12 NO.1, p 16.
10. Gefen, D., Straub, D. W., and Boudreau, M. C., (2000), "Structural equation modeling and regression: guidelines for research practice", *Communication of the Association for Information Systems*, Vol.4 NO.7, pp. 1-70.
11. Hallowell, R., (1996), "The relationships of customer satisfaction, customer loyalty, and profitability: an empirical study.", *International Journal of Service Industry Management*, Vol.7 pp. 27-42.
12. Kauffman, R. J., and Wood, C. A., (2006), "Doing their bidding: An empirical examination of factors that affect a buyer's utility in Internet auctions", *Information Technology and Management*, Vol.7 NO.3, pp. 171-190.
13. Khalifa, M., and Liu, V., (2003), "Determinants of satisfaction at different adoption stages of internet-based services", *Journal of the Association for Information systems*, Vol.4 NO.5, pp. 206-232.
14. Khalifa, M., and Liu, V., (2007), "Online consumer retention: contingent effects of online shopping habit and online shopping experience", *European Journal of Information Systems*, Vol.16, pp. 780-792.
15. Kopalle, P. K., and Lehmann, D. R., (2001), "Strategic management of expectation-the role of disconfirmation sensitivity and perfectionism", *Journal of Marketing Research*, Vol.38 NO.3, pp. 386-394.
16. Lee, C. H., Eze, U. C., and Ndubisi, N. O., (2011), "Analyzing key determinants of online repurchase intentions", *Asia Pacific Journal of Marketing and Logistics*, Vol.23 NO.2, pp. 200-221.
17. Lee, M.-C., (2010), "Explaining and predicting users' continuance intention toward e-learning: An extension of the expectation–confirmation model", *Computers & Education*, Vol.54 NO.2, pp. 506-516.
18. Li, D., Browne, G. J., and Chau, P. Y. K., (2006), "An empirical investigation of web site use using a commitment-based model", *Decision Sciences*, Vol.37 NO.3, pp. 427-444.



19. Liang, T.-P., and Lai, H.-J., (2002), "Effect of store design on consumer purchases: van empirical study of on-line bookstores", *Information & Management*, Vol.39, pp. 431-444.
20. Lim, W. M., and Ting, D. H., (2012), "E-shopping: An Analysis of the Uses and Gratifications Theory", *Modern Applied Science*, Vol.6 NO.5, pp. 49-63.
21. Oliver, R. L., (1980), "A cognitive model of the antecedents and consequences of satisfaction decisions", *Journal of Marketing Research*, Vol.17 NO.4, pp. 460-469.
22. Oliver, R. L., and Desarbo, W. S., (1988), "Response determinants in satisfaction judgments", *Journal of Consumer Research*, Vol.14, pp. 495-507.
23. Rust, R., and Zahorik, A., (1993), "Customer satisfaction, customer retention, and market share", *Journal of Retailing*, Vol.69, pp. 193-215.
24. Teo, T. S. H., and Yeong, Y. D., (2003), "Assessing the consumer decision process in the digital marketplace", *Omega*, Vol.31 NO.5, pp. 349-363.
25. Wolfinbarger, M., and Gilly, M. C., (2003), "eTailQ: dimensionalizing, measuring and predicting eTail quality", *Journal of Retailing*, Vol.79 NO.3, pp. 183-198.
26. Yen, C.-H., and Lu, H.-P., (2008), "Effects of e-service quality on loyalty intention: an empirical study in online auction", *Managing Service Quality*, Vol.18 NO.2, pp. 127-146.
27. Yi, Y., and La, S., (2004), "What influences the relationship between customer satisfaction and repurchase intention? Investigating the effects of adjusted expectations and customer loyalty", *Psychology and Marketing*, Vol.21 NO.5, pp. 351-373.
28. Zeithaml, V. A., Parasuraman, A., and Malhotra, A., (2002), "Service Quality Delivery through Web Sites: A Critical Review of Extant Knowledge", *Journal of the Academy of Marketing Science*, Vol.30 NO.4, pp. 362-375.