

Identifying Key Factors Affecting Information Disclosure Intention in Online Shopping

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Abstracts

This study aims to provide a better picture of factors affecting personal information disclosure in online shopping. Online survey data from 212 online consumers of five largest Chinese online companies are used to test the proposed model. We conduct structural equation modeling with partial least squares to analyze the measurement and structural models. Our findings show that social influence and perceived effectiveness have significant and positive impacts on personal information disclosure. Information privacy concern has a significant and negative impact on personal information disclosure. However, no significant relationship is found between self-efficacy and personal information disclosure. We also find great differences in consumers' behaviors when classifying consumers according to the type of online companies. Our research extends the Theory of Reasoned Action, Protection Motivation Theory, and prior research to discuss four antecedents of personal information disclosure intention. This study is an explorative one that better explains consumers' decision-making behaviors in online shopping.

Keywords: *Information disclosure intention, information privacy concern, online shopping*

1. Introduction

With the rapid development of online shopping, personal information disclosure is a primary concern both by academicians and practitioners [31]. Online registration and order processes are used to collect personal information. However, illegal use of these personal data is more and more serious in recent years. The literature on information privacy shows that online consumers have worried about the incorrect collection and distribution of their private information [2, 15, 27]. In big data era, personal information is a valuable resource that can be used in new product promotion, advertisement, sales, etc. On the other hand, these opportunities for marketing may make the online consumers to be reluctant to disclose their personal information [17]. Therefore, it is important and valuable to understand the antecedents of personal information disclosure intention in the context of online shopping. In addition, China's e-commerce market is under very fast growing and many issues emerge during the development [35]. Our study deserves investigation in such fruitful and interesting context.

Online purchasing information disclosure intention is defined as the consumers' attitudes to provide their personal information in online shopping. Norberg, Horne and Horne [16] have explored the relationship between individuals' intentions to disclose personal information and their actual disclosure behaviors. Information system

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researchers have found that consumers who have the information privacy concern will take actions to reduce the risk of private information leakage, such as being reluctant to provide information, providing incorrect information, or deleting their information from website [27]. Such behaviors may have significant impacts on the e-commerce companies that rely on individualized products or services [25, 33]. However, there is limited research that focusing the information disclosure intention in online shopping. Li [13] conducted a comprehensive literature review of the theories in online information privacy research. A comprehensive framework is proposed concerning two related tradeoffs: the privacy calculus and the risk calculus. The two tradeoffs suggest three kinds of antecedents of intention to disclose: attitude toward disclosure, subjective norm for disclosure, and privacy self-efficacy. Based on these theoretical arguments, a large sample empirical test is required.

This study attempts to fill the research gap by empirically investigating the effects of several antecedents of information disclosure intention. Based on the seminal work of Li [13] and other literature, we investigate information privacy concern, social influence, self-efficacy, and perceived effectiveness. We also control the potential effects of purchasing intention and characteristics of respondents. We expect to provide empirical justification of the influencing factors of information disclosure intention in Chinese online shopping context.

This study is organized into the following sections. The conceptual model and related hypotheses will be developed based on the literature and practices in information system literature. These will be followed by research methodology and statistical analyses. Subsequently, the analytical results will be explained and discussed. Finally, the managerial implications and research limitations will be presented.

2. Theoretical Framework

The conceptual model in this study is show in Figure 1. As it is shown, we identify four factors (information privacy concern, social influence, self-efficacy, and perceived effectiveness) as the most relevant antecedents of information disclosure intention in current research context. We propose that they will have significant effects on information disclosure intention by controlling purchasing intention, income, degree, age, and sex. We will discuss the four antecedents in the following sections.

2.1. Theory of Reasoned Action (TRA)

According to TRA, consumers' intention of information disclosure is determined by attitude and subjective norm [26]. In this study, we use information privacy concern and social influence to represent attitude and subjective norm respectively. Information privacy concern refers to the online shopping consumers' focus on the information collection, information control, and information usage of the online shopper [15]. It has been found that online users provide incomplete or false information if they have great concern of the information disclosure [24]. In an online B-to-C research, Eastlick, Lotz and Warrington [6] found that consumers' privacy concern has negative impact on consumers' purchasing intention directly and indirectly through trust. In addition, internet privacy concern was found to be negatively related to consumers' online transaction intention [4]. In a further study, Dinev, Hart and Mullen [5] found that privacy concern is negatively related to information disclosure intention. Thus, we propose that:

H1: The greater the information privacy concern, the more likely that consumers intend to disclose personal information in online shopping.

Social influence is one kind of subjective norm. It is the extent to which consumers' information disclosure behavior is determined by their social norm. According to TRA,

personal behavioral intention is determined by attitudes and subjective norm [8]. In technology adoption literature, subjective norm is seen as predictor of behavior intention. For example, Hsu and Lu [10] found that subjective norm positively influence online game users' intention to play online game. Thus, we propose that:

H2: The greater the social influence, the more likely that consumers intend to disclose personal information in online shopping.

2.2. Protection Motivation Theory (PMT)

According to PMT, two aspects are important for preventing individuals from threats: threat appraisal and coping appraisal [13]. Threat appraisal indicates the perceived severity and probability of the threat. Coping appraisal indicates the intention and capability of individuals to take effective preventative actions against the threat. The two aspects also reflect the perceived privacy risk and privacy control [32]. Consistent with PMT, perceived effectiveness and self-efficacy is included in this study. Perceived effectiveness is the perceived effectiveness of the online companies' security safeguards against information disclosure threat [14]. Consistent with the arguments in the Technology Acceptance Model [3], individuals would like to continue the usage of the website of the online companies if they perceive the usefulness of the security safeguards of the companies. The literature of service quality also supports the positive impact of perceived effectiveness on information disclosure intention [1]. Thus, we propose that:

H3: The greater the perceived effectiveness of website security, the more likely that consumers intend to disclose personal information in online shopping.

In this study, self-efficacy refers to a online consumer's belief that the consumer is able to conduct a set of behaviors to achieve certain goals [12]. Self-efficacy reflects the level of confidence that one consumer has to protect oneself from threats [22]. PMT suggests that self-efficacy is a very important factor to demonstrate individuals' intention to prevent themselves from threat [23]. In information technology adoption literature, self-efficacy was found to have positive impact on use of information technology [11, 29]. Self-efficacy enables online consumers to take actions to cope with the information disclosure threat [12, 14]. Thus, we propose that:

H4: The greater the self-efficacy of privacy, the more likely that consumers intend to disclose personal information in online shopping.

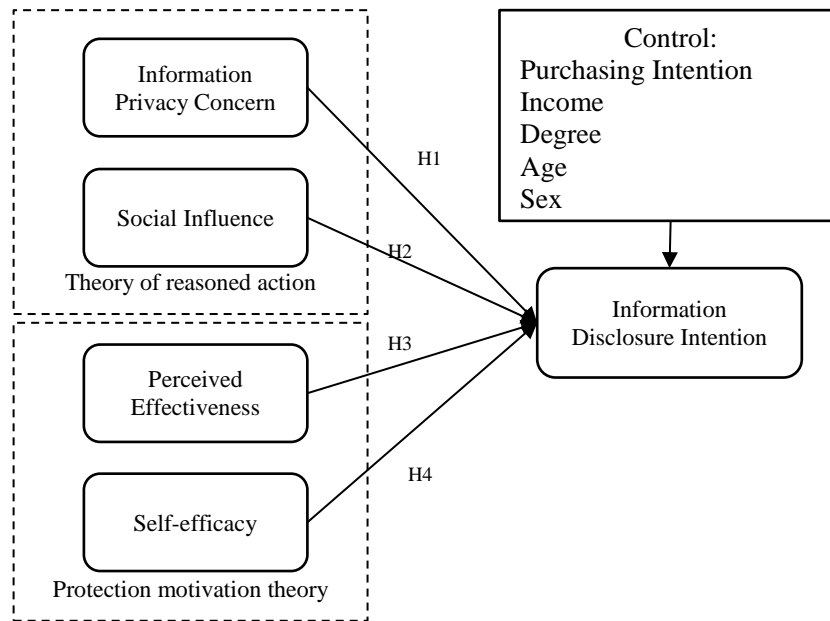


Figure 1. Conceptual Model

3. Method

3.1. Data Collection

Data were collected through online and offline process. The target respondents were the consumers who had online purchasing experiences. The respondents were checked by the first section of the questionnaire. They were asked whether they have experiences of online purchasing experiences and which online companies that they often bought from. If they had no experiences, the survey was terminated. Totally, we had 238 completed questionnaires. Among these completed questionnaires, 34 were deleted due to the incomplete answers. Finally, we had 204 valid samples for data analysis. The characteristics of the respondents are shown in Table 1.

Table 1. Sample Characteristics

Characteristics	Category	Number	Percentage
Sex	Male	107	52.5
	Female	97	47.5
Income	Less than 3000 RMB	148	72.5
	3001 -5000	35	17.2
	5001 -8000	13	6.4
	Above 8000	8	3.9
Age	Below 20	5	2.5
	20-30	196	96.1
	Above 30	3	1.5
Degree	Others	16	7.8
	Undergraduate	105	51.5
	Graduates	83	40.7

3.2. Measures

All the measures are adapted from existing literature. Seven point Likert scale are used

in this study. Information privacy concern is adapted from Malhotra, Kim and Agarwal [15]. It is a secondary factor with three sub-dimensions. The three sub-dimensions are collection, control, and awareness. We adapt social influence from Venkatesh, Morris, Davis and Davis [30]. Self-efficacy is adapted from Lai, Li and Hsieh [12]. Apart from its original usage in IT adoption, we adapt social influence and self-efficacy in new context of online shopping. Perceived effectiveness is adapted from Parasuraman, Zeithaml and Malhotra [18]. In E-service quality, it reflects how the companies' website can assure the information security. It is also consistent with the perceived IT effectiveness in Lai, Li and Hsieh [12]. We also include several control variables in the model. In addition to the consumers' characteristics, we use purchasing intention that is adapted from Zeithaml, Berry and Parasuraman [34].

Since we only select one respondent to answer all the questions, it is necessary to concern about the common method variance (CMV). We use Harmon's single factor test to test the CMV in this study. If CMV exists, a single factor will account for the majority of covariance in the variables [20]. After taking the exploratory factor analysis for all effective questionnaires, the un-rotated factor analysis result showed that none of the factor account for most of the variance, which suggests absence of the CMV problem. We also check the correlation matrix. CMV is unlikely present if there are no too high correlations (>0.9) [19].

4. Data Analysis and Results

The partial least squares (PLS) approach to structural equation modeling (SEM) is used in this study. PLS has been widely adopted in business research such as information systems, marketing, and operations management [7, 21, 28]. Unlike the covariance-based SEM techniques, PLS assess a structural model together with its measurement model. In addition, instead of goodness of fit indices, R² value is provided to indicate the predictive power of independent variables. In this study, SmartPLS software (2.0.M3 version) is used.

The measurement model is assessed using reliability and validity tests [9]. Reliability is verified by inspecting the internal consistency of items, which is demonstrated by Cronbach's alpha. Table 2 shows that the reliability of all the constructs is above 0.7. Convergent validity is evaluated by the average variance extracted (AVE) values. All AVEs of our constructs are higher than the recommended cut-off value of 0.5, suggesting convergent validity is achieved in this study. Discriminant validity is assessed by comparing the square root of AVE of each construct against its correlations with other constructs. Table 2 shows that discriminant validity is confirmed in this study. In Table 3, factor loadings of scale items are listed.

Table 2. Validity of Latent Constructs

No.	Construct	α	AVE	(1)	(2)	(3)	(4)	(5)	(6)
1.	Information disclosure intent	0.87	0.79	0.89					
2.	Information privacy concern	0.93	0.63	-0.10	0.80				
3.	Perceived effectiveness	0.87	0.80	0.43	0.22	0.89			
4.	Purchasing intent	0.76	0.67	0.54	0.01	0.31	0.82		
5.	Self-efficacy	0.94	0.84	0.32	0.24	0.45	0.36	0.92	
6.	Social influence	0.89	0.82	0.63	-0.12	0.39	0.60	0.28	0.91

Note: Square root of AVE is shown on the diagonal of each matrix in bold; interconstruct correlation is shown off the diagonal.

Table 3. Factor Loadings of Scale Items

Construct Measures	Confirmatory Factor Analysis of Construct Measures	
	First-order Std. Factor Loading	Second-order Std. Factor Loading
Information disclosure intention		
I would like to reveal financial information in online shopping	0.912	
I would like to assure that my financial information in online shopping is true	0.852	
I believe that it is viable to reveal financial information in online shopping	0.904	
Information privacy concern		
Collection		
		0.863
It usually bothers me when online companies ask me for personal information	0.833	
When online companies ask me for personal information, I sometimes think twice before providing it	0.887	
It bothers me to give personal information to so many online companies	0.913	
I'm concerned that online companies are collecting too much personal information about me	0.882	
Control		
		0.913
Consumer online privacy is really a matter of consumers' right to exercise control and autonomy over decisions about how their information is collected, used, and shared	0.899	
Consumer control of personal information lies at the heart of consumer privacy	0.905	
I believe that online privacy is invaded when control is lost or unwillingly reduced as a result of a marketing transaction	0.834	
Awareness		
		0.917
Companies seeking information online should disclose the way the data are collected, processed, and used	0.918	
A good consumer online privacy policy should have a clear and conspicuous disclosure	0.935	
It is very important to me that I am aware and knowledgeable about how my personal information will be used	0.893	
Social influence		
My friends think that I should provide personal contact information in online shopping	0.949	
My families think that I should provide my financial information in online shopping	0.921	
My colleagues or classmates think that I should provide my financial information in online shopping	0.849	
Perceived effectiveness		
The company's website would protect my private data in online shopping	0.913	
The company's website would not leakage my personal information to other websites	0.930	
The company's website would protect my credit card information from other usage	0.836	

Self-efficacy

I am confident of my skill to handle online purchasing security issues	0.913
I am confident of handling online purchasing security issues even if there is no one around to show me how to do it	0.940
I am confident of handling online purchasing security issues even if I have never used such security issues before	0.948
I am confident of handling online purchasing security issues after observing someone else deal with similar issues	0.871

Purchasing intention

I classify myself as the loyal customer of the company	0.674
I do not want to change to other companies for better service	0.877
I will continue the transactions with the company even if I need to pay more money	0.891

The results of the structural model are showed in Figure 2. The model explains 49.9% of variance (R^2) of information disclosure intention. Consistent with the theoretical conjectures, information privacy concern is significantly and negatively related to information disclosure intention. Social influence and self-efficacy have significant and positive influence on information disclosure intention. However, the significant impact of perceived effectiveness on information disclosure intention is not supported. Among the control variables, only purchasing intent has significant impact on information disclosure intention.

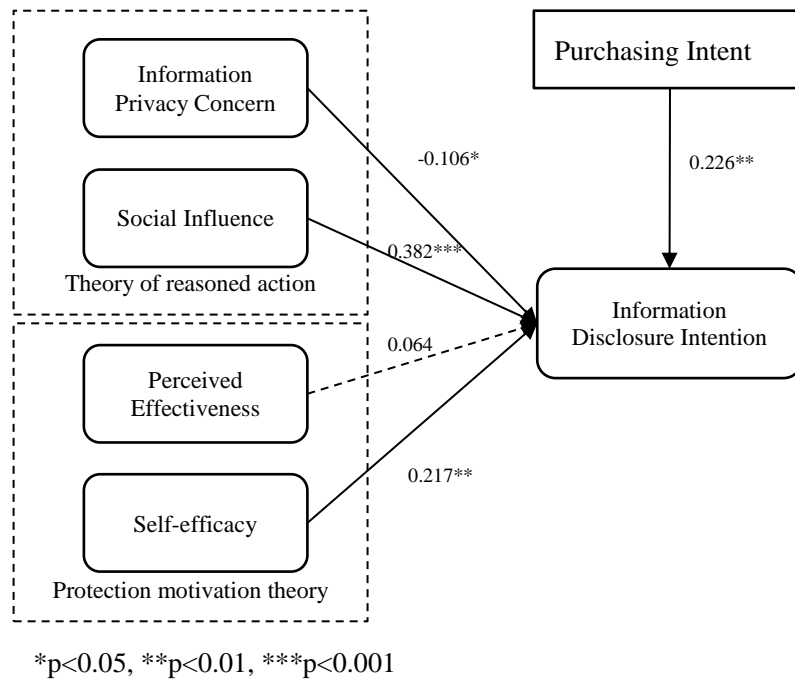


Figure 2. SEM Results

We also conducted further analyses by dividing the sample into two groups. One group is online companies such as Taobao.com that are open platform for offline companies (149 samples). The other group includes companies like JD.com, dangdang.com, Joyo.com, and VANCL.com that are mainly direct online sale companies (63 samples). In the following discussions, we use JD.com to represent these four companies. We separately run our model in each subsample. Great differences are found across two

groups (Table 4). It is interesting to find that information privacy concern and self-efficacy have no significant impact on information disclosure intention in the companies such as JD.com. It seems that these factors are more effective when consumers purchase in an open platform for offline companies. Considering the differences in the two types of companies, we use ANOVA to compare the mean value of key factors (Table 5). The results show that information disclosure intention, social influence, perceived effectiveness, and purchasing intention have higher level in the consumers of JD.com than Taobao.com.

Table 4. Comparison of Path Coefficients between Groups

	Taobao.com(149)		JD.com(63)	
	Path Coefficient/Sig.		Path Coefficient/Sig.	
Information privacy concern -> IDI	-0.152	*	0.066	
Social influence -> IDI	0.403	***	0.290	*
Perceived effectiveness -> IDI	0.127		-0.034	
Self-efficacy -> IDI	0.232	***	0.203	

IDI: information disclosure intention

Table 5. Factor Score Differences between Groups

Factors	JD.com (63)		Taobao.com (149)		Sig.(two-tailed)
	Mean	SD	Mean	SD	
Information disclosure intention	4.24	1.44	3.57	1.44	0.002
Information privacy concern	5.72	0.89	5.69	0.99	0.830
Social influence	3.98	1.61	3.32	1.44	0.004
Perceived effectiveness	4.82	1.13	4.47	1.04	0.031
Self-efficacy	4.80	1.26	4.66	1.14	0.408
Purchasing intention	4.36	1.26	3.77	1.21	0.002

5. Discussions and Conclusions

Consistent with the findings of [5], we found that information privacy concern is negatively related to information disclosure intention. Our findings also support the arguments in IT adoption literature that self-efficacy would improve IT usage [12]. In our context, self-efficacy helps in improving information disclosure intention in online shopping. Although consistent with our hypotheses, it is interesting to find that social influence has the most significant impact on information disclosure intention. It seems that social influence plays the most important role for information disclosure intention in online shopping. It shows that the word of mouse is very important in online shopping. Social influence has relatively high impact on information disclosure intention than self-efficacy. In China, it may be true that some others' suggestions are relatively important than self-confidence in dangerous situation.

In this study, we did not confirm the significant role of perceived effectiveness for information disclosure intention. It may be due to the indirect impact of perceived effectiveness on information disclosure intention. The other three antecedents is close related to the individual person's attitudes, subjective norm, and ability. It is embedded in the mind or body of the person. However, perceived effectiveness is formed by the influence of the online shopper. The other reason may be the lack of variance among the few companies.

Further analyses show that online consumers' behaviors will be different when they purchase in different kinds of online companies. During purchase in direct sale online companies, consumers have higher intention to provide their personal information and to

purchase. Also the security system of these online companies make consumers feel more comfortable, which is demonstrated by the higher level of perceived effectiveness. Another interesting finding is that social influence has higher level in the consumers of these online companies too. It indicates that most consumers give positive word of mouth of these online companies.

In summary, we have proposed and empirically tested a comprehensive model of information disclosure intention and its four antecedents based on TRA and PMT. We simultaneously test the impacts of four antecedents on information disclosure intention. We have provided some results that are consistent with the prior literature: information privacy concern inhibits information disclosure intention; social influence and self-efficacy facilitate information disclosure intention. However, our study also shows some surprise: perceived effectiveness has no impact on information disclosure intention. Therefore, this study contributes to the online shopping literature by providing insights into the antecedents of information disclosure intention. Our study also shows some interesting results by classifying the samples according to types of online companies.

6. Limitations and Future Research Directions

Clearly, all research has limitations. There are several limitations to this study. First, this study includes only a limited number of respondents who have relatively low income. People who have different level of income may behave differently in online shopping. Therefore, the generalization of our findings to other consumers may not be valid. Future studies could include more high income consumers and compare the differences. Second, we only use survey method to investigate the relationships of perceived values. It will be better to combine experimental and survey methods to investigate the causal effects.

Regarding other possibilities for future research, the first recommendation is to investigate the impact of perceived effectiveness on online consumers' behaviors. It is interesting to identify some mediators between perceived effectiveness and information disclosure intention.

In addition, in order to understand the influence of online companies' type, it is interesting to collect comparable sample to test the moderating effects. In addition to online consumers' personal attitudes, online companies' characteristics are also important factors that may influence information disclosure intention.

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