

A Study of Consumers' Perceived Risk, Privacy Concern, Information Protection Policy, and Service Satisfaction in the Context of Parcel Delivery Services

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ABSTRACT

The proposed conceptual framework is based in the relationships among knowledge of personal information security, trust on the personal information security policies of parcel delivery service companies, privacy concern, trust in and risk of parcel delivery services, and user satisfaction with parcel delivery services. Drawing upon both cognitive theory of emotion and cognitive emotion theory that complement each other, we propose a research model and examine the relationships between cognitive and emotional factors and the usage of parcel delivery services. The proposed model is validated using data from customers who have previously used parcel delivery services. The results show a significant relationship between the cognitive and affective factors and the usage of parcel delivery services. This study enhances our understanding of parcel delivery services based on the consumers' psychological processes and presents useful implications on the importance of privacy and security in these services.

Keywords: Information Security Policy, Privacy Concern, Trust, Risk, Satisfaction, Parcel Delivery Services, Cognitive Theory of Emotion, Cognitive Emotion Theory

I . Introduction

Owing to the activation of domestic e-commerce, the parcel delivery service market grew rapidly (Song,

2011; Shin and Kim, 2011). According to the Korea Integrate Parcel Delivery Association, the scale of the South Korean parcel delivery service market grew by 9.26% in 2015 compared to the previous year

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by recording KRW 4,343.7 billion in sales.¹⁾ Following the rapid growth of the parcel delivery service market, parcel delivery service providing companies are making effort to provide improved logistics services in order to satisfy consumers' needs and wants (Im et al., 2007; Shin and Kim, 2011).

Along with the rapid growth of parcel delivery services, the number of instances of personal information leakage and crimes pretending to be parcel delivery has also increased. For instance, voice phishing that maliciously uses personal information from invoices in abandoned delivery boxes has been reported.²⁾ Therefore, parcel delivery service companies should establish personal information protection policies in order to protect parcel delivery service users and parcel delivery service users should obtain prior knowledge about relevant personal information protection to prevent the occurrence of accidents related to parcel delivery service personal information leakage accidents.³⁾

Currently, the actual state of supplementation of parcel delivery services and privacy is that not only parcel delivery service providing companies, but also most parcel delivery service users have little concern and low security consciousness for personal information leakage resulting from the use of parcel delivery services.⁴⁾ Therefore, accidents due to per-

sonal information leakage may occur any time. For instance, consumers receive goods ordered from online shopping malls through parcel delivery and the invoices on the delivery boxes bear diverse pieces of personal information.

Most consumers who use online shopping malls often discharge delivery boxes without separating the personal information in the invoices on delivery boxes. Therefore, the awareness of personal information protection should be inspired on the side of parcel delivery service users; in addition, parcel delivery companies should make effort to enhance personal information protection of their clients (Korea Internet & Security Agency, 2013). Previous studies on information protection and privacy in e-commerce mainly focus on e-commerce companies' personal information protection strategies, methods of safe use of customer data, and customer information encryption (Malhotra et al., 2004; Phelps et al., 2000; Phelps et al., 2001), and studies on personal information protection in terms of parcel delivery service users can be hardly found.

Therefore, in the present study, with regard to privacy-related issues that may occur in the process of using parcel delivery services, parcel delivery service users' level of knowledge of personal information protection and their recognition and emotions about information protection and use of parcel delivery services will be examined. The present study will analyze consumers' knowledge of personal information security in the parcel delivery industry, which is developing owing to the activation of e-commerce.

We will also analyze consumers' psychological re-

1) The Korea Economic Daily (2016) (Reporter Jeong Seung-Ho), Korea Integrate Logistics Association, in 2015, the parcel delivery market grew 11.87% to tow domestic demand, January 19, 2016, <http://www.hankyung.com/news/app/newsview.php?aid=201601189938C>

2) Voice phishing is an English term made by compounding the word voice and the word phishing, which refers to a new criminal technique that steals personal information using phone calls.

3) Boan News (Reporter Min Se-Ah), [Security blind spot in living] Carelessly dropped personal information while sending goods through parcel delivery service, May 13, 2016, <http://www.boannews.com/media/view.asp?idx=50589>

4) Money Today (2016) (Reporter Kim Jong-Hun), The police

requested to be careful against 'special crimes on Lunar New Year's Day' such as disguising train tickets or parcel delivery, February 1, 2016, <http://www.mt.co.kr/view/mtview.php?type=1&no=2016013121433544901&outlink=1>

sponses to the concern of protection of consumers' personal information, as well as implications for the development of information protection policies of parcel delivery service companies. Ultimately, the results of the present study results will provide useful implications for enhancement of consumers' awareness of personal information protection in relation to personal information protection policies in the use of parcel delivery services, as well as an insight into the ways of enhancement of customers' trust and loyalty through the provision of safe parcel delivery services.

II. Research Background

2.1. Research Trend on Information Protection and Privacy

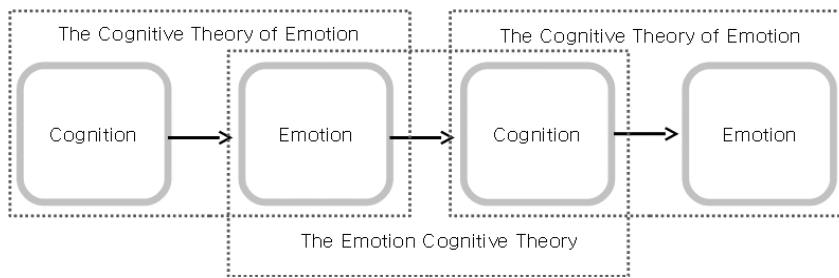
Alongside with the development of e-commerce, the parcel delivery industry grew rapidly. By now, many studies have addressed operational efficiency in the parcel delivery industry (Song, 2011; Shin and Kim, 2011). For instance, some studies examined changing factors that affect the growth of the parcel delivery industry following the growth of e-commerce, such as GDP growth rates, sales credit, and warehousing business (Song, 2011). Furthermore, in a similar context, many studies focused on human resource management, outsourcing, location and facilities, service, and management for sustainable growth of the parcel delivery industry following changes in business environments (Shin and Kim, 2011). In addition, many other studies have addressed personal information protection in the financial sector, such as personal information leakage in the card industry (Cho et al., 2014; Jeong, 2014; Yun and Kwon, 2015).

However, despite the rapid growth of the parcel delivery industry, studies on specifically parcel delivery industry-related personal information protection and privacy infringement remain scarce. Relevant studies on personal information protection have mainly been conducted in the field of e-commerce (Malhotra et al., 2004; Phelps et al., 2000; Phelps et al., 2001). In addition, studies on personal information protection have been actively conducted in the field of social network services (SNS), such as Facebook and Twitter (Iachello and Hong 2007; Rice and Walton, 2013; Tang et al., 2008). Therefore, the present study was conducted to develop relevant strategies for personal information protection in the parcel delivery industry.

2.2. Theoretical Background

As theoretical background of the study, we present a framework for analyzing the relationships among parcel delivery service users' trust in information protection policies, privacy concern, service awareness, and satisfaction with service use. This theoretical framework was derived from the cognitive theory of emotion (Mehrabian and Russell, 1974) and the emotion cognitive theory (Lazarus, 1991; Zajonc and Marku, 1982); drawing upon both theories as a theoretical background, we develop a conceptual framework of the study as <Figure 1> depicts.

The cognitive theory of emotion, which is a psychological theory used in diverse studies, systematizes the effects of cognitive characteristics on the emotional characteristics in explaining human psychology and behavior; furthermore, the emotion cognitive theory systematizes the effects of emotional characteristics on cognitive characteristics in explaining human psychology and behavior.



<Figure 1> Conceptual Framework

III. Research Model and Hypotheses

Based on the prior studies and the conceptual framework presented in section 2 as an overarching theoretical framework, we propose the following research model (see <Figure 2>) and hypotheses. The study hypotheses include those on the effect of parcel delivery service users' knowledge of personal information protection, those on the effect of trust on personal information protection policies of parcel delivery service companies, those on the effect of privacy concerns on the use of parcel delivery services, and those on the effects of trust in and risk of parcel delivery services.

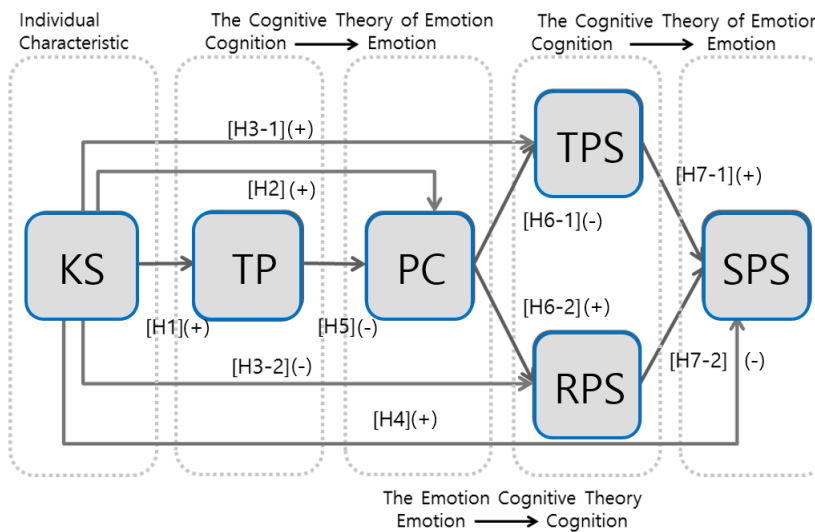
3.1. Hypothesis Development

First, the present study aims to analyze the psychological characteristics of cognitive and emotional level according to the level of users' knowledge of personal information protection in the use of parcel delivery services. According to the Korea Internet & Security Agency (2013), with an increase of the importance of personal information protection, measuring the level of individuals' knowledge of information protection becomes more important, as the knowledge of personal information protection is regarded to be able to reduce privacy infringement accidents due to personal information leakage. Today, corporations

invest much effort into protection of consumers' personal information; but more important personal information protection measures are consumers' efforts (Lim, 2016). Indeed, alongside with the efforts of companies of today to protect consumers' personal information, another and perhaps more important way to protect personal information is consumers' effort (Lim, 2016). While parcel delivery service companies should protect consumers' personal information, parcel delivery service users should also be careful to prevent personal information leakage from occurring.⁵⁾

In the use of most parcel delivery services, the provision of personal information is an indispensable element. While some people do not feel uncomfortable when providing personal information to parcel delivery service companies when they use parcel delivery services, others do feel uncomfortable. When providing personal information to parcel delivery service companies, people with a high level of information protection-related knowledge differ in their feeling of safety and emotion on parcel delivery service security depending on whether they trust the personal information protection policy of the given parcel delivery company.

5) Boan News (Reporter Min Se-Ah), [Security blind spot in living] Carelessly dropped personal information while sending goods through parcel delivery service, May 13, 2016, <http://www.boannews.com/media/view.asp?idx=50589>



Note: KS (Knowledge on Personal Information Security), TP (Trust in Personal Information Security Policy), PC (Privacy Concern), TPS (Trust in Parcel Delivery Services), RPS (Risk of Parcel Delivery Services), SPS (Satisfaction with Parcel Delivery Services)

<Figure 2> Research Model

When the cognitive theory of emotion and the emotion cognitive theory are applied to the use of parcel delivery services (Lazarus, 1991; Marku and Zajonc, 1982; Mehrabian and Russell, 1974), it can be seen that the level of knowledge of personal information protection affects the recognition of whether or not the parcel delivery service is safe and, eventually, affects satisfaction with the use of parcel delivery services. In addition, with regard to the use of parcel delivery services, in the cases where service users have sufficient knowledge of parcel delivery service companies' use of personal information, service users become to recognize the fact that the parcel delivery services are safe, which leads to the formation of positive emotions. However, in the cases where service users recognize insecurity, indicating that problems may occur due to parcel delivery services causing personal information infringement, service users will eventually form negative emotions.

Currently, personal information leakage accidents related to parcel delivery services are reported

frequently.⁶⁾ However, the number of personal information leakage accidents is actually extremely low, as compared to the number of cases of parcel delivery services safely provided safely with active support by parcel delivery service companies. For instance, according to a survey by Shinhan Investment Corp., the estimated domestic parcel delivery volume in April 2016 was 100,005,300 boxes, which is 4.1% larger than in 2015, and the estimated parcel delivery volume of 2016 amounted to 1.97 billion boxes.⁷⁾

If users of parcel delivery services have sufficient security knowledge, they should recognize that parcel delivery service companies' policies for protection of personal information in their provision of parcel

6) Money Today (2016) (Reporter Kim Jong-Hun), The police requested to be careful against 'special crimes on Lunar New Year's Day' such as disguising train tickets or parcel delivery, February 1, 2016, <http://www.mt.co.kr/view/mtview.php?type=1&no=2016013121433544901&outlink=1>

7) Naeway Economic TV (2016) (Reporter Jeon Chan-Wu), Shinhan Investment Corp., the fruits of the growth of the parcel delivery market are going to high rank companies, June 2, 2016, <http://nbntv.co.kr/news/view.php?id=62982>

delivery service are at trustful levels, which will lead to a reduction in customer concerns about privacy. In addition, if the parcel delivery service user has sufficient knowledge about the parcel delivery service, it will increase the trust formation in using the parcel delivery service. Furthermore, parcel delivery service users with sufficient knowledge of parcel delivery services should have high levels of trust in the use of parcel delivery service and recognize lower risks. In addition, high levels of knowledge of personal information protection should lead to high levels of satisfaction with the use of parcel delivery services. Accordingly, the following hypotheses can be formulated:

- H1: The higher the personal information protection-related knowledge of parcel delivery service users, the higher their trust in personal information protection policies of parcel delivery service companies.*
- H2: The personal information protection-related knowledge of parcel delivery service users would positively affect the privacy concerns of the parcel delivery service companies.*
- H3-1: The personal information protection related knowledge of parcel delivery service users would positively affect their trust in the use of parcel delivery services.*
- H3-2: The personal information protection related knowledge of parcel delivery service users would negatively affect the risk of using parcel delivery services.*
- H4: The personal information protection related knowledge of parcel delivery service users would positively affect their satisfaction with the use of parcel delivery services.*

Second, the effect of trust in policies for personal information security on privacy concerns can be explained by the cognitive theory of emotion (Mehrabian and Russell, 1974). Hilgard (1980) argues that, in human psychology, cognitive characteristics

affect emotional characteristics. When this theory is applied to the present study, the cognitive characteristic termed trust is related to the emotional characteristic termed concerns. That is, if parcel delivery service users trust the personal information protection policies of parcel delivery service companies, they will form positive emotions towards the parcel delivery service companies. Consequently, parcel delivery service users will form the belief that personal information will not be misused and privacy will not be infringed. That is, the belief that privacy concerns in parcel delivery services will be reduced will be formed. Therefore, the following hypothesis can be formulated:

- H5: Trust in parcel delivery service companies' personal information protection policies would negatively affect concerns about privacy infringement.*

Third, the hypothesis in terms of privacy concerns can be explained by the emotion cognitive theory (Lazarus, 1991; Zajonc and Marku, 1982). According to the emotion cognitive theory, the emotion termed concerns will affect the recognition of trust and risk. In addition, consumer behavior-related studies also indicate that emotional characteristics affect cognitive characteristics (Lee and Park, 2009). For instance, positive emotions formed in the process of shopping affect positive perceptions of quality and shopping environments. Concerns about privacy infringement in the use of parcel delivery services occur in the cases where personal information is infringed and correspond to negative emotions. The higher such concerns about privacy in the use of parcel delivery services, the lower the trust in the use of parcel delivery service and the higher the risk of use of parcel delivery services. Therefore, the following hypotheses can be formulated:

H6-1: Concerns about privacy infringement in the use of parcel delivery services would negatively affect trust in the use of parcel delivery services.

H6-2: Concerns about privacy infringement in the use of parcel delivery services would positively affect the risk of the use of parcel delivery services.

Fourth, the effect of trust in and risk of the use of parcel delivery service on satisfaction with parcel delivery services can be explained by the cognitive theory of emotion (Mehrabian and Russell, 1974). According to this theory, individuals' cognition affects emotions. The recognition of trust in and risk of the use of parcel delivery services will affect the emotion termed satisfaction. In addition, studies on marketing and e-commerce in the field of the business administration underscore the importance of the effects of perceived risks and trust on satisfaction with the use of e-commerce (Armstrong and Yee, 2001; Flaherty and Pappas, 2000; Liu and Leach, 2001).

In addition, some previous e-commerce studies have emphasized the importance of risk that is contrary to trust (Kim et al., 2008; Nicolaou and McKnight, 2006). For example, Simcock, Sudbury, and Wright (2006) argued that perceived risk under the decision-making situation is closely related to satisfaction. As such, it can be seen that cognitive characteristics and trust, risk, and satisfaction, which are emotional characteristics, form important effect relations. Therefore, the following hypotheses can be formulated:

H7-1: Trust in the use of parcel delivery services would positively affect satisfaction with the use of parcel delivery services.

H7-2: Risk of the use of parcel delivery services would negatively affect satisfaction with the use of parcel delivery services.

IV. Research Methodology

4.1. Measurement

In the present study, scales developed in previous studies were used to measure the study model components. First, the level of parcel delivery service users' knowledge of personal information protection was measured using a modified version of the tool for measurement of the level of knowledge of personal information protection developed by the Korea Internet & Security Agency (Korea Internet & Security Agency, 2013). Second, trust in the customer information protection policies of parcel delivery service companies recognized by parcel delivery service users was measured using a modified version of the institution-based trust scale developed by Pavlou and Gefen (2004). The scale developed by Pavlou and Gefen (2004) was also used in a study conducted by Xu et al. (2011) to measure perceived effectiveness of privacy policy and industry self-regulation. Third, privacy concerns were measured using a modified version of the scale used by Xu et al. (2011).⁸⁾ The scale used by Xu et al. (2011) is based on the scale used in Malhotra et al. (2004) and Dinev and Hart (2006a). In the present study, this scale was modified to measure the effectiveness of privacy policies and industry's self-regulations perceived by parcel delivery service user. Fourth, trust in the use of parcel delivery services was measured using a scale composed based on the studies by

8) According to the prior privacy studies, the attributes of construct on privacy concerns have been treated as multi-dimensional attributes, cognition and attitude (e.g., conation, affection, and cognition) [Malhotra, Kim, Agarwal, 2004; Smith, et al., 1996; Buchanan, Paine, Joinson, & Reips, 2007; Xu, Teo, Tan, & Agarwal, 2009]. In this study, we define and measure a privacy concern of parcel delivery service user as a affection attribute.

Bhattacharjee (2002), Van Slyke et al. (2006), Gefen (2000), Kim (2008), McKnight et al. (2002), and Comer et al. (1999). Fifth, the risk of the use of parcel delivery services was measured using a scale composed based on a study by Van Slyke et al. (2006) and Xu et al. (2011). Sixth, a scale for satisfaction with the use of parcel delivery services was made by modifying the scale used in Anderson and Srinivasan (2003) and Chang and Chen (2009) to fit the present study. The measurements were conducted using 7-point Likert scale (1= 'not so at all' and 7='very much so'). Appendix A summarizes all measurement items.

4.2. Survey

In the present study, a questionnaire was developed based on previous studies. Questionnaire surveys were conducted with South Korean university students, graduate students, graduates, and university teachers and staff. The majority of the survey samples were university students. Since university students have experience of purchasing products through on-line shopping and that of using parcel delivery services, we assumed that the questionnaire surveys conducted with the sample groups composed mainly of university students would provide a meaningful theoretical basis to achieve the study purpose. The surveys were conducted between August and November 2015 using the document management tools provided by Google company (<https://www.google.com>).

V. Data Analysis and Results

We obtained a total of 152 responses through the questionnaire surveys. After excluding inappropriate

responses, 129 responses were used for further analysis. We used the SmartPLS 2.0 M3 (<https://www.smartpls.de/>) structural equation software that supports the partial least squares (PLS) method in the causality analysis for the study model (Hair et al., 2013). According to Hair et al. (2013), SmartPLS 2.0 M3 is advantageous in that it provides an easily usable user interface, facilitates structural model and measurement model analysis, is widely used in studies in the field of social science, and supports bootstrap analysis even in statistical analysis with small numbers of sample data, thereby providing useful empirical analysis results (Hair et al., 2013).

5.1. Characteristics of Samples

The demographic characteristics of the samples are as follows. First, among 129 response samples, 69 respondents (53.5%) were males, and 60 (46.5%) were females. With regard to the number of hours of using the Internet per day, 12 respondents (9.3%) were using the Internet for less than 1 hour, 52 (40.3%) for 1-2 hours, 38 (29.5%) for 2-3 hours, 17 (13.2%) for 3-4 hours, and 10 (7.8%) for more than 4 hours. As for the number of times of using parcel delivery services per month, 61 respondents (47.3%) reported using parcel delivery services 1-2 times per month, 45 respondents (34.9%) 3-4 times, 16 respondents (12.4%) 5-6 times, four respondents (3.1%) 7-8 times, two respondents (1.6%) 9-10 times, and one respondents (0.8%) at least 11 times.

5.2. Measurement Model Test

First, we verified the reliability and validity of the variables through a measurement model testing. Despite the use of diverse criteria for measurement of reliability in empirical analyses, Cronbach alpha

values and Construct Reliability are widely used (Fornell and Larcker, 1981; Nunnally and Bernstein, 1994). In the present study, both Cronbach alpha and construct reliability values, which show the reliability of study variables, exceeded 0.7, indicating that reliability was sufficiently secured (Nunnally and Bernstein, 1994). The Average Variance Extracted (AVE) values, another criterion for validity, were found to exceed 0.5 (Fornell and Larcker, 1981; Hair et al., 2013).⁹⁾ <Table 1> summarizes the results of measurement model testing. We also conducted confirmatory factor analysis (CFA). Some measurement items such as tps9, rps3 and rps4 were dropped as a result of CFA. Appendix B shows the results of CFA.

The validity of discrimination between the study model constitutive variables was verified by correlation analysis and comparison of AVE square root values (Fornell and Larcker, 1981; Hair et al., 2013). <Table 2> summarizes the results. According to Hair et al. (2013), variables can be said to have secured discriminant validity when the AVE square root value is shown to be higher than the correlation coefficient (see also Fornell and Larcker, 1981). On reviewing the results of the empirical analyses, it could be seen that the variables that constitute the measurement model of the present study sufficiently satisfied the discriminant validity criteria.

For detecting multicollinearity, we also examined tolerance and the VIF (Variance Inflation Factor) (Mansfield and Helms, 1982). As shown in <Table 3>, the analyzed results satisfied basic conditions by Mansfield and Helms, (1982) (The VIF values of all indicator < 5 and The tolerance values of all indicator > 0.1). Therefore, in this study, there is not an issue of multicollinearity.

9) $AVE = \frac{\sum[\lambda_i^2] \text{Var}(X)}{\sum[\lambda_i^2] \text{Var}(X) + \sum[\text{Var}(e_i)]}$

5.3. Structural Model Analysis and Results

First, in the present study, the structural model was analyzed using PLS. Since the number of data in the structural model analysis was small, the analysis was conducted after entering the bootstrap option 1000 (Hair et al., 2013). The explanatory power of dependent variables was evaluated by R square values. To review the R square of the dependent variables, the values were shown to be 16.27% for trust in security policies of parcel delivery service companies, 7.96% for concerns about privacy infringement, 2.38% for trust in parcel delivery services, 8.81% for risk of parcel delivery services, and 52.04% for satisfaction with the use of parcel delivery services. The results of structural model testing are depicted in <Figure 3>.

First, the effects of information security related knowledge are follows. (1) H1 predicting that knowledge of personal knowledge protection would affect trust in personal information protection policies was supported (t -value = 4.99, p 0.001). First, it can be seen that trust in personal information protection policies of parcel delivery service companies is high when parcel delivery service consumers recognize the importance of information security and have sufficient knowledge.

(2) H2 predicting that knowledge of personal information protection would positively affect privacy concerns was supported (t -value = 2.76, p < 0.01). At present, the level of individuals' information security is continuously rising and information security policies have been systematically established, because domestic parcel delivery services are mainly provided by large groups' affiliates. On reviewing the home pages of most parcel delivery companies, it can be seen that those companies are investing much effort into the protection of parcel delivery service users'

<Table 1> Reliability and Validity Analyses

	Item Number	Mean	S.D.	AVE	Composite Reliability	Cronbachs Alpha
PC	4	3.99	1.40	0.83	0.95	0.93
TP	8	3.35	1.16	0.72	0.88	0.81
KS	5	2.50	1.07	0.81	0.96	0.94
TPS	3	4.01	1.04	0.64	0.93	0.92
RPS	2	4.82	1.07	0.85	0.92	0.82
SPS	3	4.88	1.10	0.79	0.92	0.87

Note: PC (Privacy Concern), KS (Knowledge on Personal Information Security), SPS (Satisfaction with Parcel Delivery Services), TP (Trust in Personal Information Security Policy), RPS (Risk of Parcel Delivery Services), TPS (Trust in Parcel Delivery Services)

<Table 2> Correlation Analysis

	PC	KS	SPS	TP	RPS	TPS
PC	0.91*					
KS	0.14	0.90*				
SPS	0.10	-0.11	0.89*			
TP	-0.19	0.40	0.21	0.85*		
RPS	0.24	-0.14	0.21	-0.02	0.92*	
TPS	0.14	0.09	0.70	0.40	0.2	0.80*

Note: * \sqrt{AVE}

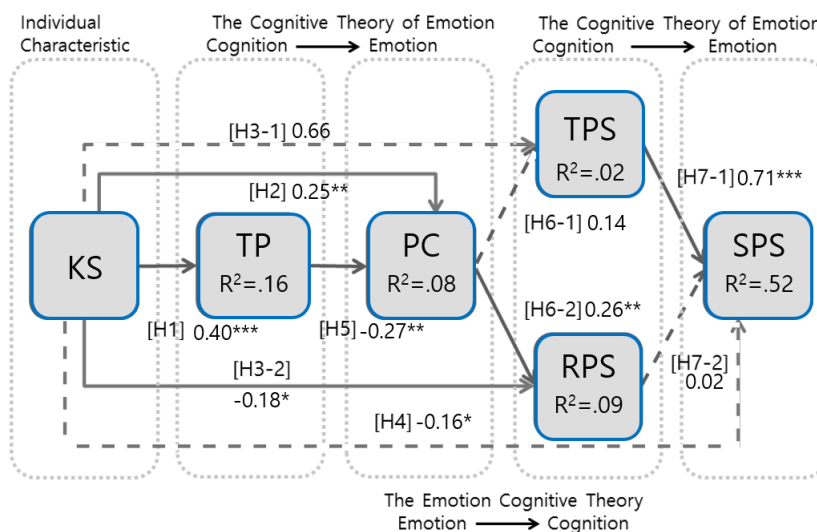
<Table 3> Multicollinearity Test

Variables	Tolerance	VIF
PC	.808	1.238
KS	.745	1.342
TP	.620	1.614
RPS	.874	1.145
TPS	.747	1.339

personal information. In addition, as parcel delivery service users' knowledge of personal information protection increases, they will know better how personal information can be misused or exploited. Therefore, increases in the knowledge of personal information protection were shown to increase concerns about parcel delivery service related privacy issues.

(3) H3-1 predicting that knowledge of personal information protection would positively affect trust

in the use of parcel delivery services was not supported by the results (t -value = 0.6), while H3-2 predicting that knowledge of personal information protection would affect the risk of the use of parcel delivery services was adopted (t -value = 2.08, $p < 0.05$). As with parcel delivery service users' knowledge of parcel delivery companies' use of personal information in the process of providing parcel delivery services that increases privacy concerns, higher levels of knowl-



<Figure 3> Results of Structural Model Test

edge of the use of personal information were found to be associated with the recognition of higher levels of the risk of parcel delivery services. On the other hand, knowledge of personal information protection was found to have no effect on trust in the use of parcel delivery services. These results can be explained by the Prospect Theory suggested by Tversky and Kahneman (1981) and Tversky and Kahneman (1992), according to which humans actively respond to situations that cause losses to them, but not to situations that are beneficial to them.

(4) H4 predicting that knowledge of personal information protection would affect satisfaction with the use of parcel delivery services was not supported by the results. Unlike expectations, that is, users with more knowledge of the use of parcel delivery services were found to be less satisfied with the use of parcel delivery services use satisfaction. This unexpected empirical finding is explained by the privacy communication management theory (Petronio, 2002). Therefore, as with the claims of Petronio (2002), much knowledge of information leakage in the proc-

ess of provision of parcel delivery services was found to reduce satisfaction with parcel delivery services.

Second, the results of verification of hypotheses in terms of the cognitive theory of emotion are as follows. (5) H5 predicting that trust in parcel delivery service companies' privacy policies would negatively affect privacy concerns was supported (t -value = 2.76, $p < 0.01$). That is, parcel delivery service companies' effort to reinforce privacy for personal information protection was found to reduce consumers' anxiety about personal information leakage.

Third, the results of verification of hypotheses in terms of the emotion cognitive theory are as follows. (6) H6-1 predicting that privacy concerns would negatively affect trust in the use of parcel delivery services was not supported by the results (t -value = 1.4), while H6-2 predicting that privacy concerns would positively affect the risk of use of parcel delivery services was supported (t -value = 2.96, $p < 0.01$). That is, concerns about privacy infringement due to personal information leakage in process of the parcel delivery services were not found to affect trust

<Table 4> Results of the Structural Model Test

Hypotheses	Beta	t-Value	Results
H1: KS → TP	0.40	4.99^{***}	Accepted
H2: KS → PC	0.25	2.76^{**}	Accepted
H3-1: KS → TPS	0.06	0.81	Rejected
H3-2: KS → RPS	-0.18	2.08[*]	Accepted
H4: KS → SPS	-0.16	2.16[*]	Rejected
H5: TP → PC	-0.27	2.76^{**}	Accepted
H6-1: PC → TPS	0.14	1.50	Rejected
H6-2: PC → RPS	0.26	2.96^{**}	Accepted
H7-1: TPS → SPS	0.71	15.70^{***}	Accepted
H7-2: RPS → SPS	0.02	0.50	Rejected

Note: t -value > 3.30 ($p < 0.001^{***}$), t -value > 2.56 ($p < 0.01^{**}$), t -value > 1.96 ($p < 0.05^{*}$); Bootstrapping times = 1000

in parcel delivery services, but were found to negatively affect risks. As with H3-1 and H3-2 described above, this can be explained by the prospect theory suggested by Tversky and Kahneman (1981) and Tversky and Kahneman (1992). Therefore, parcel delivery service companies should let consumers recognize the fact that they make effort to first reduce privacy infringement in order to reduce parcel delivery service users' recognition of the risk of the use of parcel delivery services.

Fourth, the results of verification of hypotheses in terms of the cognitive theory of emotion are as follows. (7) H7-1 predicting that trust in the use of parcel delivery services would positively affect satisfaction with the use of parcel delivery services was supported (t -value = 15.70, $p < 0.001$), while H7-2 predicting that the risk of the use of parcel delivery services would negatively affect satisfaction with the use of parcel delivery services was not supported (t -value = 0.50). That is, whereas the recognition of the risk of parcel delivery services did not affect satisfaction with the use of parcel delivery services, the recognition of trust in parcel delivery services affected satisfaction with the use of parcel delivery

services. Therefore, although it is important for parcel delivery service companies to establish risk mitigation strategies for services for parcel delivery service users' satisfaction with the use of parcel delivery services; they should first establish service strategies to enhance trust. According to the results of verification of hypotheses, H1, H2, H3-2, H5, H6-2, and H7-1 were supported. The results of structural model testing and hypotheses tests are summarized in <Table 4>.

VI. Discussion

6.1. Implications for Research and Practice

The theoretical implications of the present study are as follows. First, the cognitive emotion theory and the emotional cognition theory are important theories to explain the interactions between customers and websites on e-commerce websites (Verhagen and van Dolen, 2011). The theoretical significance of the present study lies in that our results demonstrate that the cognitive emotion theory and the emotional cognition theory can be effectively combined

and applied to the area of protection of the privacy and personal information of parcel delivery service users.

Second, studies on personal information leakage in the area of parcel delivery service and related personal information security are scarce. Specifically, previous research on consumer-related personal information protection predominantly focused on e-commerce (Xu et al., 2011), while, currently, parcel delivery service-related studies mainly analyze efficient operation of parcel delivery service companies (Im et al., 2007; Kim and Shin, 2011; Song, 2011). The theoretical value of the present study is that it emphasizes the importance of personal information protection for the enhancement of the privacy of consumers who use parcel delivery service. Therefore, our results provide a theoretical basis for further research in the domain of parcel delivery service privacy.

Third, the present study is theoretically significant in that it underscores the importance of consumers' awareness about personal information protection in the area of the domestic parcel delivery industry and contributes to the activation of future research on personal information protection and privacy in parcel delivery service for customer satisfaction.

The practical implications of the present study are as follows. First, the results of the present study suggest that consumers' trust in personal information protection policies of parcel delivery companies ultimately affects customers' satisfaction with the use of parcel delivery services. Taken together, the results of the present study provide useful information on the development of personal information protection policies and privacy protection guidelines by logistics companies for creation of competitive advantages. For instance, the results of the present study underscore the legitimacy of establishment of information

protection policies to reduce consumers' privacy concerns, enhance trust in the use of parcel delivery services, and reduce the risk of the use of parcel delivery services through the development of business models that support safer personal information protection.

Second, the results of the present study emphasize that logistics companies should recognize the importance of protection of the personal information of parcel delivery service users to facilitate the development and establishment of personal information protection strategies through the introduction of RFID-based information systems into the field of parcel delivery invoice related business, as well as to help the improvement of logistics processes so that personal information written on invoices is safely deleted or parcel delivery services are provided with less information entered.

6.2. Limitations of the Study and the Direction of Future Studies

The present study has several limitations. First, questionnaire surveys were conducted mainly with university students based on the method of convenient sampling. This brings about the limitation that diverse parcel delivery service users' opinions were sufficiently reflected. In addition, the collected data is cross-sectional although the proposed research model presents the logical sequence of the study between cognition-emotion and emotion-cognition. Therefore, the results of the study should carefully apply to practice with cautions. Future studies should be conducted with diverse sample groups with longitudinal setting so that study results can be applied to more subdivided fields.

Second, in the present study, a structural model analysis was conducted using the bootstrap technique

with a relatively small ($n = 129$) number samples. Although the results of verification of hypotheses were shown to be significant in terms of statistical methodology, there are some limitations in the generalizability of the study results. Therefore, in future studies, empirical surveys should be conducted with sufficiently large numbers of parcel delivery service user samples.

Third, in the present study, limited aspects were analyzed, such as trust in services and recognition of risks that affect satisfaction with the use of parcel delivery services, privacy concerns in the use of parcel delivery services, and the characteristics of trust in parcel delivery companies' personal information protection policies. To obtain more in-depth information, more detailed psychological responses of parcel delivery service users to privacy concerns should be analyzed. For instance, as argued by Johnston and Warkentin (2010), cognitive responses to information security accidents, fear as an emotional response, and avoidance of the accidents should be considered. Therefore, future studies should consider parcel delivery service users' fear of personal information leakage accidents formed due to previous experience and related cognitive, emotional, and be-

havioral responses.

Fourth, in this study, we cannot reflect various attributes (e.g., cognition, affection, and conation) in the measurement of privacy concern of parcel delivery service users. McGrath (1982) emphasizes the precise judgment of researchers in measurement, pointing out the difficulty of perfect measurement in the course of the research and pointed out the limitations. Buchanan et al. (2007) measured privacy concerns as an attitude variable reflecting cognitive and emotional characteristics. On the other hand, Xu et al. (2010) measured privacy concerns as cognitive characteristics. In this study, privacy concerns of parcel delivery service users were measured as an emotional response to personal information leakage in the use of courier services. In this study, we made a measurement that reflects one attribute (e.g., affective perspective) of attitude in the measure of privacy concern. Therefore, future studies on measurement of privacy concerns should be made from various perspectives (e.g., cognition, affection, and conation). For example, future research should be undertaken to measure the propensity, cognition, affection, conation, and behavior to privacy concerns under various business contexts.

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<Appendix A> Measurement Items

Constructs	Measurement items	Related studies
Knowledge of personal information security protection (KS)	<p>ks1: I understand the management system of parcel delivery service companies to manage my personal information.</p> <p>ks2: I understand the roles for management and supervision of parcel delivery service companies' personal information handling persons.</p> <p>ks3: I understand how parcel delivery service companies control personal information processing systems.</p> <p>ks4: I understand parcel delivery service companies' personal information processing and management systems.</p> <p>ks5: I understand parcel delivery service companies' measures to prevent and respond to personal information infringement accidents.</p>	Korea Internet & Security Agency (2013), Lim (2006)
Trust in personal information protection policies (TP)	<p>tp1: I am confident that parcel delivery companies' privacy policies will safely protect my personal information.</p> <p>tp2: I believe that parcel delivery service companies will safely manage my personal information pursuant to their privacy policies.</p> <p>tp3: I believe that parcel delivery service companies' privacy policies are promises to protect individuals' privacy.</p>	Pavlou and Gefen (2004), Xu et al. (2011)
Concerns about privacy infringement (PC)	<p>pc1: I am worried that personal information provided to parcel delivery service companies may be contaminated.</p> <p>pc2: I am concerned about the fact that others can see my personal information in the process of parcel delivery services by parcel delivery service companies.</p> <p>pc3: I am concerned about the provision of my personal information to parcel delivery service companies because others can know my information.</p> <p>pc4: I am concerned about the provision of my personal information to parcel delivery service companies because I don't know how the information will be used.</p>	Xu et al. (2011) Malhotra et al. (2004), Dinev and Hart (2006a)
Trust in parcel delivery service (TPS)	<p>tps1: Parcel delivery service companies provide specialized services based on systematized procedures.</p> <p>tps2: Parcel delivery service companies properly utilize information in the process of providing parcel delivery services.</p> <p>tps3: Parcel delivery service companies provide parcel delivery services to customer according to accurate procedures.</p> <p>tps4: Parcel delivery service companies have secured customer service policies for provision of parcel delivery services to customers.</p> <p>tps5: Parcel delivery service companies listen to customers' requirements with open attitudes.</p> <p>tps6: Parcel delivery service companies make their best effort to understand customers' related parts.</p> <p>tps7: Parcel delivery service companies are very reliable service companies.</p> <p>tps8: I feel a sense of trust when I examine the process of parcel delivery workers' provision of parcel delivery services.</p> <p>tps9: I trust parcel delivery workers. (dropped)</p>	Bhattacharjee (2002), Van Slyke et al. (2006), Gefen (2000), Kim (2008), McKnight et al. (2002), Comer et al. (1999)
Risk of parcel delivery services (RPS)	<p>rps1: The parcel delivery services provided by parcel delivery service companies have dangerous aspects in the process of receiving products to be sent.</p> <p>rps2: The parcel delivery services provided by parcel delivery service companies may cause potential losses in the process of delivery of goods.</p> <p>rps3: The parcel delivery services provided by parcel delivery service companies have the risk of wrong delivery. (dropped)</p> <p>rps4: The parcel delivery services provided by parcel delivery service companies have risks in the processes of return and collection. (dropped)</p>	Van Slyke et al. (2006), Xu et al. (2011)
Satisfaction with parcel delivery services (SPS)	<p>sps1: I am generally satisfied with the use of parcel delivery services.</p> <p>sps2: I will recommend the use of parcel delivery services to people around me.</p> <p>sps3: I think the use of parcel delivery services is a wide choice for delivery of goods</p>	Anderson and Srinivasan (2003), Chang and Chen (2009)

<Appendix B> Confirmative Factor Analysis

	PC	KS	SPS	TP	RPS	TPS
pc1	0.89					
pc2	0.91					
pc3	0.93					
pc4	0.93					
ks1		0.82				
ks2		0.91				
ks3		0.96				
ks4		0.94				
ks5		0.83				
tp1				0.86		
tp2				0.92		
tp3				0.72		
tps1						0.80
tps2						0.80
tps3						0.75
tps4						0.77
tps5						0.80
tps6						0.80
tps7						0.82
tps8						0.81
rps1					0.91	
rps2					0.93	
sps1			0.85			
sps2			0.92			
sps3			0.90			

※ PC (Privacy Concern), KS (Knowledge on Personal Information Security), SPS (Satisfaction with Parcel Delivery Services), TP (Trust in Parcel Delivery Services), RPS (Risk of Parcel Delivery Services), TPS (Trust in Personal Information Security Policy)

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