

The Study of Difference between People who Terminated bank account and not.

After the Privacy Breaches in Korea.

[Chan-Yub Park, Se-Wong Hwang, Ye-Ji Kim]

Abstract—In January 2014, Korea experienced a major private information leakage. Many people closed their bank accounts, which lead to a momentary business paralysis. However, certain people maintained and continued to use their accounts. This study attempts to verify the difference between people who closed their accounts and those who did not. Privacy concern, switching cost, and service loyalty was assumed to be factors that might affect resistant behavior. We also examined the effect of resistance behavior on actual outcome. 174 samples were collected through online surveys and SPSS 21 was used for analysis. Results showed that privacy concerns and loyalty had significant effects on resistant behavior. The resistant behavior between the two groups also showed a significant difference.

Keywords—privacy concern, resistant behavior, service loyalty,

I. Introduction

In January 2014, there was a serious information leak in South Korea. It crippled operations for some banks as a result of bank run. Privacy leak crisis affects not only directly but also indirectly as it raises an awareness of future danger. According to the analysis of Lapointe and Rivard(2005), this information leak shows that sensing danger and raising concern affect resistance attitude and behavior.

Still, many people have not taken further actions on this privacy crisis. Although previous study has proven the link between danger factor and resistance attitude, we have not identified what prevents resistance attitude and behavior under hazardous circumstances containing high risk of privacy leak. This study is meaningful because this information crisis actually led to resistance attitude to some people when we

consider resistance attitude or intention as a final result. This study analyzes and identifies factors contributing to resistance attitude about privacy leak and causality whether resistance attitude leads to actions in reality.

II. Related Studies

A. Privacy and Privacy Concern

In early period when word “privacy” has begun to define, it meant “right to be alone” or “right for individuals to be themselves” (Westin, 1967; Warren and Brandeis, 1890). It implies personal information only belongs to one person and should not be revealed to others.

Nevertheless, with recent technology advancements of information communications, there have been numerous privacy concerns regarding to information gatherings and misuses. This extended the realm of the definition of “privacy” from the moral principle to information protection. Information privacy implies “right of self-determination,” more active form of rights than the past (Mayer-Schonberger, 1998).

Privacy concern derives from possibility of privacy violation as a result of voluntary or involuntary privacy leak (Dinev and Hart, 2006), a concern of the privacy invasion regardless of personal will (Bellman et al, 2004). Privacy concern is an evaluation or attitude towards danger when the leak happens involuntarily (Dinev and Hart, 2006).

B. Switching costs

Usually, corporations increase network effects and switching costs for lock-in (J Farrell, 2007). Network effect means the more users for products or services, the better utilities the users get. Switching cost is economic, psychological, and physical costs--time, money, and effort--when users change services or products.

As network effect can be included in switching cost (Shapiro, 1999), this research used switching cost affecting customer's resistance attitude as an independent variable. Morgan and Hunt (1994) limited the application of the term “switching cost” to economic cost whereas Fornell (1992) encompassed its terminology to learning cost, exploration cost, transaction cost, emotion cost, cognitive effort, and consumer behavior. Loyalty program, a program inducing repeated purchasing behavior by giving benefits like mileage, is one of the factors that increase switching cost. In credit card industry, point system is widely used to hold on to customers.

C.Y Park (*Author*)

- Graduate school of information / Yonsei University
- Republic of Korea

S.W Hwang (*Co-Author*)

- Graduate school of information / Yonsei University
- Republic of Korea

Y.J Kim(*Co-Author*)

- Graduate school of information / Yonsei University
- Republic of Korea

Relatively high switching cost discourages customers to switch services or products and encourages loyalty to brand. Switching cost is widely used to maintain customer loyalty (Dick and Basu, 1994). Numerous studies have found switching cost statically influences consumer loyalty. .

C. Loyalty

Gremler (1995) defines loyalty as behavioral, attitudinal, and perceptual reaction users consistently developing in certain period of time. According to Hawkinsetal (1995), service or product satisfaction increases repeated purchasing behavior, which leads to more engagement among satisfied customers with high loyalty. Satisfied customers have high possibility of loyalty, positive commission, and repeated purchasing behavior (Fornell, 1992). Jones & Sasser (1995) classified customers into four different categories based on the relations between satisfaction and loyalty.

TABLE I. CONSUMER CLASSIFICATION

Consumer Type	Consumer Satisfaction	Consumer Loyalty	Consumer Behavior
Loyal Consumer	High	High	Repeated Purchase/ Support
Seceder	Low	Low	Breakaway
Mercenary	Middle-High	Middle-Low	Repeating purchase/breakaway
Hostage	Middle-Low	High	no purchase conversion

Sonchul (2007) classified loyalty into three categories--brand loyalty, purchase loyalty, and service loyalty--and this research is relevant to service loyalty as the subject of the study is loyalty for credit card industry.

D. User resistance

User resistance is negative reaction or behavior the users develop when receiving information system. According to User Resistance Theory, system users perceive danger through interactions between organization environment and its system, advancing to resistance behavior (Lapointe et al., 2005). Moreover, the theory articulates the spectrum of behavior into six different levels of perceiving danger: accepting, neutral, indifferent, negative, positive, and aggressive resistance.

Resistance studies have been conducted as innovation resistance, a state where a person maintains current state from the force of innovation and does not accept innovation. However, we should acknowledge that resistance does not always stand as an opposite to acceptance (Kim et al., 2010) because acceptance is a gradual and consecutive process (Ram, 1987).

User resistance falls into two kinds: active and passive resistance (Ettlie, 1982). Also, user resistance can be specified into resistant attitude and resistant behavior for a change/danger users perceive. Hereby attitude means psychological resistance like repulsion, anxiety, and objection,

and behavior means physical resistance like refusal of reception or suspension after psychological resistance. Users develop resistant attitude in dangerous circumstances. But it doesn't mean it always leads to resistant behavior.

III. Study model and methodology

A. Study model and hypothesis

This study model is based on information system user resistance theory by Lapointe and Rivard (2005). Through theoretical consideration, the theories are structuralized in Figure 1.

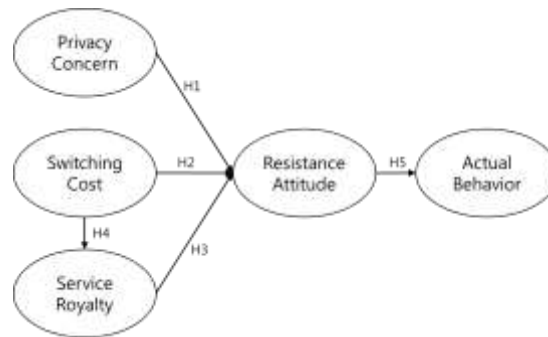


Figure 1. Study model

This study limited the range of analysis to people who knew about the privacy leak in January, 2014. This led to three independent variables affecting resistance attitude. Privacy concern is expect to affect resistance attitude. As a precedence factor for service loyalty, switching cost is expected to alleviate resistance attitude. With those being said, below are hypotheses.

Hypothesis 1: Privacy concern positively affects resistance attitude

Hypothesis 2: Switching cost negatively affects resistance attitude.

Hypothesis 3: Loyalty negatively affects resistance attitude.

Hypothesis 4: Switching cost positively affects loyalty.

Hypothesis 5: Resistance attitude affects actual behavior.

1) Observed variable

This study modified measurement scales verified from previous studies. It was measured by Likert scale 7. TABLE II. shows operational definition and references.

TABLE II. OPERATIOANAL DEFINITION OF OBSERVED VARIABLES

Variables	Operational definition	Reference
Privacy Concern: PC	Level of individual's privacy concern	Dinev & Hart(2006)
Switching Cost: SC	Economic and psychological cost when switching services	Fornell(1992)
Service Loyalty: SR	Consumers' willingness to maintain loyalty to services	Gremler(1995)
Resistance Attitude: RA	Negative, hostile attitude derived from past privacy leaks	Lapointe & Rivard(2005)

2) Analysis methods

As analysis methods, this study used SPSS 21.0 to check reliability and validity analysis. Reliability analysis was measured with Cronbach's alpha, and variables with low measured were excluded from the study.

Validity test was to verify the validity of each variable's suitability, and variables with less suitability were removed from the study. An analysis of aggregated structure model was conducted by a correlation analysis and regression analysis.

Based on question 21 on the survey, we used t-test for verifying the difference between two groups, a group which canceled the service right away users knew about the incident whether or not it was their information that leaked"(28 persons, 18%) and others (128 persons, 82%).

3) Sample design and data acquisition

This study took an online survey to the credit (or debit) card users who knew about the leak. This survey was taken for four days from May 28th to 31th, 2014 with 173 participants.

IV. Result

A. Demography

For gender, male consists 55.1% (81 persons) and female 22.9% (70 persons). For age, 20s consists the greatest portion, 58.3 % (91 persons) the, 30s does 32.7% (51 persons), and 40s does 9% (14 persons). Job distribution tells that 48.7% is student, 37.8% is worker and 13.5 % is others.

TABLE III. RESPONDENTS DEMOGRAPHY

Variables	Frequency
Gender	Male 86 persons (55.1%)
	Female 70 persons (44.9%)
Age	20s 91 persons (58.3%)
	30s 51 persons (32.7%)
	40s and above 14 persons (9.0%)
Occupation	Student 76 persons (48.7%)
	Worker 59 persons (37.8%)
	Etc. 21 persons (13.5%)
Main usage to users	Main usage 39 persons (25%)
	Not main usage 117 persons (75%)

B. Reliability and validity test

This analysis identified factors to construct validity. We used factors greater or equal than 0.6 when using principal components analysis and varimax. There are four variables for factor analysis--privacy concern, switching cost, loyalty, and resistance attitude with 14 questions. Carrying capacity for each of 4 elements was more than 0.713, indicating the legitimacy of questions. Nevertheless, 2 questions were excluded from this study as those did not directly explain this study.

From reliability test, the value of Cronbach's alpha was 0.984 maximum and 0.721 minimum, both greater than 0.6, proving its reliability of the test.

Figure 2. RELIABILITY TEST
Figure 3.

	variable	Column	Cronbach's alpha
Dependent variable	Privacy Concern	3	0.879
	Switching Cost	3	0.721
	Service Royalty	3	0.816
Independent variable	Resistance Attitude	3	0.984

C. Study hypothesis verification

This study used correlation analysis and regression analysis. To identify each correlation, linear regression analysis was used to distinguish correlation analysis, independent variables, and dependent variables. T-test and ANOVA were to demonstrate differences between all groups.

1) Factors for resistance attitude and linear regression

From TABLE V, we know that service resistance attitude is positively affected by privacy concern and negatively by loyalty. Switching costs are not significant.

TABLE V. LINEAR REGRESSION ANALYSIS

model	Non standardized coefficient		Standardized coefficient	t	Significance probability
	B	Standard error	Beta		
1	1.647	.579		2.846	.005
	PC .499	.078	.465	6.385	.000
	SC .127	.079	.121	1.609	.110
	BR -.222	.100	-.159	-2.216	.028

2) Factors affecting loyalty and its regression analysis

TABLE VI indicates switching cost affects loyalty.

TABLE VI. LINEAR REGRESSION ANALYSIS OF LOYALTY AND SWITCHING COST

model	Non standardized coefficient		Standardized coefficient	t	Significance probability
	B	Standardized error	beta		
1	3.362	.253		13.294	.000
SC	.200	.058	.267	3.444	.001

As a result of regression analysis, hypothesis model looks like Figure 2.

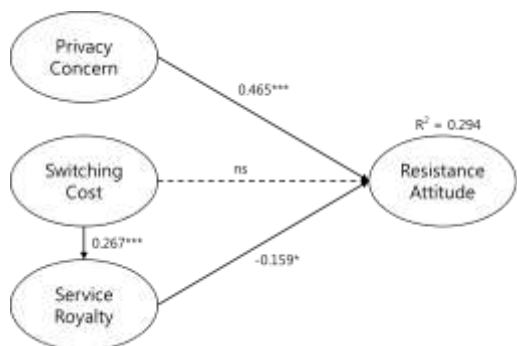


Figure 2. Analysis result

3) T-test for actual behavior group and others

Comparing a group with actual behavior with other groups, the actual behavior group is different by 0.008 in significance level. Resistance attitude for actual behavior group is higher than other group: 4.45 and 3.59 on average and 1.9 and 1.44 standard deviation. Privacy concern, switching cost, and loyalty demonstrate no difference between two groups.

v. Result and limitation

This analysis identified factors affecting users' resistance attitude and behavior under the circumstance where users are aware of danger from privacy leak. First factor was privacy concern, a state when users feel anxious about possibilities of negative consequences followed by the leak. From the crisis in January, people actually canceled the service despite the fact that the leak happened 6 months prior and did not cause an actual damage. This indicates that resistance behavior derives from privacy concern.

For loyalty, the study showed that consumers with higher satisfaction offset resistances. On the other hand, switching cost did not seem to affect directly. Yet, perceiving high switching cost increases loyalty which we can say switching cost indirectly influences resistance attitude. Additionally, the study found that the fewer credit cards individual have, the greater influence it has on resistance attitude as fewer credit cards decrease switching costs and increase resistance attitude. This result, however, is an analogical interpretation and needs further test.

Moreover, comparing an action group to a group without action on average, a group that took action had high resistance. And the action group was more likely to pass from thought to action. Also, users who figured the actual leak are more likely to cancel the service than the people who knew both about the leak and the fact that their information was safe; an obvious consequence concerning the possibilities of future harms followed by the leak.

However, we have not figured if the factors mentioned above-privacy concern, switching cost, and loyalty- affect behaviors in reality because there were only 28 persons out of 156 who canceled the service. We also expected more users would cancel the service, but the study turned out that only 18 percent of survey recipients actually canceled: Small sample size was a limitation.

Also it can be noticeable that the study was conducted 5 months after the incident.

This study analyzed consumers' resistance behavior with the information leak happened in reality. It is meaningful as this study further considered resistance behavior developing in reality besides behavioral attitude or intention. It suggests that maintaining high loyalty to users is the most effective method preventing consumer loss when privacy leak happens.

References

- [1] Bellman, S., Johnson, J., Kobrin, J., & Lohse, L. (2004). International Differences in information privacy concerns: A global survey of consumers. *The Information Society*, 20, 313~324.
- [2] Dinev, T., & Hart, P. (2006). An extended privacy calculus model for e-commerce transactions. *Information Systems Research*, 17(1), 61-80.
- [3] Ettlie, J. E. & R. D O'keefe, "Innovative Attitudes, Values, and Intentions in Organizations", *Journal of Management Studies*, Vol19, No.2, pp.163-182, 1982.
- [4] Harris and Associates Inc., & Westin, A. (1998). *Ecommerce and privacy: What net users want. Privacy and American Business and Pricewaterhousecoopers. LLP.*
- [5] Lee, Y. and O. Kwon, "Model based approach to estimating privacy concerns for context-aware services", *Journal of Intelligence and Information Systems*, Vol.16, No.2(2009), 97~111.
- [6] Mayer-Schonberger, V., "Generational Development of Data Protection in Europe," In *Agre, P. and Rotenberg, M. (eds.), Technology and Privacy: The New Land Scape*, MA: MIT Press, 1998.
- [7] Ram, S., "A Model of Innovation Resistance", *Advances in Consumer Research*, Vol.14, No.1(1987), 208~212.
- [8] Rogers, E.M., *Diffusion of Innovations*, 4th ed., New Yprk, The Free Press, 1995.
- [9] Warren, S. D. and Brandeis, D. L., "The Right to Privacy," *Harvard Law Review*, Vol. 4, No. 5, 1890, pp. 193-220.
- [10] Westin, A. F., *Privacy and Freedom*, New York: Atheneum, 1967.
- [11] Carl Shapiro & Hal R. Varian, *Information Rules: A Strategic Guide to the Network Economy*, Harvard Business School Press, 1999, pp.127-159.
- [12] Thomas A. Burnham. Judy K. Frels. Vijay Mahajan. (2003) "Consumer Switching Costs: A Typology, Antecedents, and Consequences". *Journal of the Academy of Marketing Science*. Vol.31, No.2., pp109-126
- [13] Richard L Oliver. "Whence consumer loyalty?", *Journal of marketing*, Vol.63, 1997, pp.33-44
- [14] Reichheld, Fredrick F., *The Loyalty Effect*, Boston, Harvard Business School Press, 1996.
- [15] Sharma, Neeru and Paul G. Patterson, "Switching Costs, Alternative Attractiveness and Experience As Moderators of Relationship

Commitment in Professional, Consumer Services", International Journal of Service Industry Management, 11(5), 2000, pp.470-490.

- [16] Ping, Robert A., "The Effects of Satisfaction and Structure Constraints on Retailer Exiting, Voice, Loyalty, Opportunism, and Neglect", Journal of Retailing, 69(Fall), 1993, pp.320-352.
- [17] Mandall, L., "Credit card Use in the United States", Institute for social research of the University of Michigan, 1982, p.2.
- [18] Soojin Yang, "Analysis of the relations between loyalty program satisfaction and consumer loyalty : focus on the credit card industry", Seoul National University master's thesis, 2002, p.7
- [19] Youjae Lee, "Analysis of switching costs' precedence factor and result variables – focus on regulation effect regarding type of service =registration form". Marketing analysis Volume 20, 3rd, 2005, pp 1-28
- [20] Chul Son, " Analysis of satisfaction and switching costs affecting loyalty : focus on individualization", Yonsei University Master's thesis, 2007, p.8
- [21] Kyunghyun Min, "Impact analysis of perception of switching costs on continuous intention to use", Chungju University Master's thesis, 2007, pp19-22

About Authors:



C.Y Park
Master Student of Yonsei University
(Graduate School of Information)

Research interest:
ICT-based Smart-marketing, Information
Technology, Machine-Learning, Data analysis.



S.W Hwang
Master Student of Yonsei University
(Graduate School of Information)

Research interest:
Open collaboration, Business model, Business
strategy.



Y.J Kim
Master Student of Yonsei University
(Graduate School of Information)

Research interest:
Collective intelligence, open collaboration,
strategic servicization, Big data.