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REVIEW ARTICLE

A BEHAVIORAL ECONOMIC APPROACH TO THE PRIVACY PARADOX IN KOREA

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ABSTRACT

This paper presents the results of a survey and an experiment of behavioral economics done in October, 2013 to find empirical evidence supporting the privacy paradox in Korea and derives implications from the results. Consequently, we found evidence for the gap between WTA (willingness-to-accept) and WTP (willingness-to-protect) but no evidence for the dichotomy between privacy attitudes and behavior. Since the privacy paradox could become an inefficient social norm, it should be redressed.

Key Words: Privacy Paradox, Behavioral Economics, Experiment, Social Norm

INTRODUCTION

Privacy paradox refers to that people bring up concerns for privacy but actually do not behave to protect privacy (Barnes, 2006; Rifon *et al*., 2007; Taddicken, 2013). That is, people don't have consistency in the value they give to their privacy and there is a significant gap between the attitude and behavior toward privacy. In U.S and Europe, various studies and surveys are carried out with regarding this subject, especially in consumer theory level(Acquisti and Glossklags, 2007; Barnes, 2006; Norberg *et al*., 2007; Pötzsch, 2009; Rifon *et al*., 2007), but in Korea, no study with such approach is carried out yet. Korea has different awareness toward privacy and different legal system environment from U.S and Europe, but the analysis on whether such paradox exists will be academically and practically important study at present point when big data utilization becomes active and IoT (Internet of Things) development is becoming reality.

As a similar phenomenon which enables the supposition of the existence of privacy paradox in Korea, according to the survey result carried out by Korea Internet and Security Agency(2013), awareness on the importance of personal information protection was very high as 97.9%, but recognition and verification of the personal information related rights was as low as 14.0%∼32.9%. Also, while 93.6% agreed that the service provider is responsible for personal information protection, the agreement on the responsibility in individual came out to be relatively low as 53.4%. This study will look at the discussion of behavioral economics that tries consumer based approach to the issue of privacy, and based on the study of Glossklags and Acquisti (2007) which continued the surveys on privacy paradox, carry out, list up, and analyze the surveys and experiments on privacy paradox in Korea. Finally, from such analysis result of actual proofs, political implications will be derived.

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Theoretical Discussion on Privacy Paradox

Study of Privacy Paradox

Barnes (2006) found that there is a significant difference between privacy concern and actual privacy setting in SNS (Social Network Service) study and started using the concept of privacy paradox, but the privacy paradox tendency already appeared in previous SNS and privacy studies. Gross and Acquisti (2005), as a result of analyzing Facebook profiles of 4,000 students, very small portion of them changed their personal information setting from the default setting. Thelwall (2008), as a result of analyzing MySpace profiles of more than 20,000 people, found that only 27% of them set the profiles as non-disclosure. Lewis *et al*. (2008), as a result of analyzing Facebook profiles of U.S private university students, found that only 1 of 3 set as non-disclosure. As behavioral economics combining psychological premise to neoclassical economy model advances starting from end of 20th century, contradictory human decision making and behavior could be empirically explained. Privacy paradox got the attention as one of the major subjects to be analyzed with behavioral economics methodology. The decision making related to privacy involves uncertainty, vagueness, complexity, etc., so it is influenced by cognitive limit of man and behavioral bias, etc. asserted by behavioral economics.

Discussion of Privacy Paradox

Behavioral economics is based on neoclassical economic models, but it does not adopt core premises of rational selection theory which is the basis of neoclassical economics theory. For example, the premises are that the preference of consumer has consistency, and consumer makes the choices maximizing the usefulness, and the consumer consistently discounts the usefulness that will occur in the future, etc. Behavioral economics has the heuristic phenomenon as the premise instead. For example, man cannot make the optimal choice because of one's born bounded rationality.

Bias and anomaly of man have adverse effect on neoclassical premises. Among many premises adopted by behavioral economics, this study will look at the existing discussions on cognitive limit and behavioral bias which are closely related to privacy issue.

Cognitive Limit

Acquisti and Glossklags (2007) discussed on the cognitive limit which is related to privacy issue as follows. Consumers cannot grasp all of the results that can be caused by privacy threat, and do not know all protective mechanisms. Also, they do not know the probability of the occurrence of each result. Even if information on such unknown number is given, since the results are so diverse and complex, and because of the bounded rationality of the consumers, the given information cannot be processed completely, and finally, they will depend on simple model, approximate strategies, or heuristics (Acquisti and Glossklags, 2007). In reality, when a consumer decides the value of certain goods, one does not calculate the value using certain rational model, but goes through a process of setting certain intuitive value or ad hoc value, and with additional information of the goods, correcting the value. Decision making on the value of the privacy goes through the same process (Nissenbaum, 2009; Solove, 2013).

Behavioral Bias

According to behavioral economics, individual has a tendency of making paradoxical and contradictory or unexpected decisions. In this study, such bias is introduced, and looks at the discussion of Acquisti and Glossklags (2007) to see how such bias appears in relation to privacy. Hyperbolic discount means that people cannot consistently discount the usefulness that will occur in the future. At present point, they think that protecting the privacy in the future is better than receiving a small payment now, but when they are at such point, they think differently, and you can commonly see people providing personal information to receive the small payment. Valence effect means that people expect that they have higher probability to have events that are advantageous to them. As an example, when other people's privacies are invaded, one believes that it will not happen to him or her. Overconfidence is, literally, believing in one's own knowledge or ability too much. People have too much confidence in estimating the probability to be exposed to privacy danger. Rational ignorance means giving up rational decision making because that the cost of learning certain situation exceeds the benefit from rational decision making. People think that the time cost to read provisions on a company's privacy policy is bigger than the benefit from reading it, so they do not read the provisions. Status quo bias means that people want to maintain the current status rather than finding solution to solve the personal information problem (Acquisti and Glossklags, 2007).

Such bias is well explained in prospect theory which provides the theoretical basis of behavioral economics, and according to this theory, consumers make choices avoiding danger when profit is expected, and make danger preferred choices when loss is expected. When you apply this theory to privacy issue, people who do not adopt free privacy protection technology or offering their personal information to unknown people with small payment have made danger preferred choices when loss of privacy invasion is expected. Also, this theory explains so called endowment effect. That is, people assess the goods they possess higher than the same goods possessed by others. Therefore, the price they require when they sell their information is higher than the cost to pay to protect their information.

Surveys and Experiments on Privacy Paradox

Glossklags and Acquisti (2007) carried out the heuristic study on privacy paradox through behavioral economics experiment. This study intends to find heuristic basis of privacy paradox in Korea by referencing their experiments as a model.

Summary of Surveys and Experiments

The surveys are intended to find heuristic basis for privacy paradox in the two paradoxical terms, which are the gap between attitude and behavior for privacy as in Glossklags and Acquisti(2007) and the gap between the maximum amount willing to pay for privacy protection (willingness-to-protect, hereinafter WTP) and the minimum amount accepted to sell the privacy (willingness-to-accept, hereinafter WTA), that is, the gap between the value of privacy and the cost willing to pay to protect the privacy. The study agenda for this are as follows. Study agenda 1: Is there gap between will to protect privacy and behavior?

Study agenda 2: Is there gap between WTP and WTA?

Total of 163 people participated in the survey, and they were evenly distributed in ages from 10's to 40's and in gender. (Refer Table 1)

Table 1. Age and gender distribution of subjects

		Gender		Total
		Male	Female	
Age	10's	21	17	38 (23.3%)
	20's	22	19	41 (25.2%)
	30's	19	23	42 (25.8%)
	40's	20	22	42 (25.8%)
Total		82 (50.3%)	81 (49.7%)	163 (100%)

The survey targets were divided to 4 groups as in Table 2, and each group was divided to 4 sub-groups according to the ages, and the surveys and experiments were carried out to each of total of 16 sub-groups. The surveys on each sub-group was carried out in a medium size meeting room with rectangular table so that the survey targets could face each other for 10 days from Oct. 24, 2013 to Nov. 2.

The surveys were carried out in mainly 3 stages. The first stage is the stage to produce the personal information. Using tablet PC, 1st survey sheet was answered which induced to produce personal information. Along with quiz scores composed of common sense and logics (general information on individual that does not include personal characteristics), information on individual such as weight, desired travel destination, political tendency, school grades, economic ability, sexual interest, etc. that can grasp personal information on health, taste, tendency, economic feasibility, sociality and individuality were answered(Glossklags and Acquisti, 2007). The second stage is the stage asking the intention to sell or protect personal information.

Table 2. Choice problems given to each group

	Choice problem 1 (quiz score)	Choice problem 2 (Weight)	Respondent
Group 1	sell or do not sell quiz score at 1,000 won	protect or do not protect weight with 1,000 won cost	38
Group 2	protect or do not protect quiz score with 1,000 won cost	sell or do not sell weight at 1,000 won	41
Group 3	sell or do not sell quiz score at 100 won	protect or do not protect weight with 1,000 won cost	42
Group 4	protect or do not protect quiz score with 100 won cost	sell or do not sell weight at 100 won	42

Table 3. Dichotomy between privacy attitudes and behavior(unit: %)

1,000 won group (Approximately $ 1)					100 won group (Approximately $ 0.1)				
	Sell		Protect			Sell		Protect	
	Quiz score	Weight	Quiz score	Weight		Quiz score	Weight	Quiz score	Weight
Attitude	55.0	75.6	14.6	32.5	Attitude	35.7	60.0	45.0	40.5
Actual behavior	70.0	82.9	9.8	30.0	Actual behavior	40.5	70.0	20.0	35.7
Gap	15.0p▲	7.3p△	4.9 p▽	2.5p▽	Gap	4.8p△	10.0 p△	25.0p▼	4.8p▽
BR	33.3	29.9	33.6	7.7	BR	7.5	25.0	55.6	11.9

Among the personal information answered by each individual survey target in the first stage, they were asked to answer whether they are willing to sell or protect quiz score and weight in the 2nd survey sheet. As in Glossklags and Acquisti(2007), quiz score and weight were to be chosen between 'sell or do not sell' and 'protect or do not protect'. This was to avoid two extreme decisions such as ‘sell or protect' and to find whether they have will to sell or protect. To the 4 groups, the choice questions as in Table 2 were given.

The third stage is the stage of implementing the will for personal information. It was checked whether the will to sell or protect personal information lead to actual behavior. That is, it was intended to check whether the intention to sell or protect personal information is executed without change when it caused actual profit or loss of the individual. For this, actual cash was shown to the experiment targets, and for the experiment targets who chose sell between 'sell or do not sell', the corresponding amount (1,000 won or 100 won) cash was given and the corresponding items (quiz score or weight information) were open to all participants in the sub-group. For those who chose protect between ‘protect or do not protect', they were asked to pay the corresponding amount (1,000 won or 100 won) cash and the corresponding items (quiz score or weight) were not disclosed.

Survey and Experiment Result

Among 163 survey targets, 82 were male (50.3%) and 81 were female (49.7%), and the average age was 29.8 (stdev.10.5). The average quiz score on common sense was 8.0 out of 10.0 (stdev. 1.4) and the average quiz score on logics was 6.8 (stdev. 1.5). The average weight was 62.1kg (stdev. 12.6).
For desired travel destination, 48.5% chose Europe, 16.6% domestic place, 14.7% Asia, 14.1% North America, 3.1% Oceania, 1.8% South America, and 1.2% chose Africa. For political tendency, conservative was 8.0% and progressive was 68.7%, and the gray tendency showing standpoint changes according to individual cases was 23.3%. For school grades, the average grade of the high school student survey targets was 34.0% above average (stdev. 22.4) and the average college entrance exam score of the survey targets who are high school graduate or older was 76.5 out of 100 (stdev. 9.4).

For the economic level, based on the family economic level decided by high school students or younger, with 9 point as the highest, low (1∼2) was 1.3%, middle to low (3∼4) was 29.0%, middle (5) was 35.5%, middle to high (6∼7) was 34.2%, and high (8∼9) was 0%, and the yearly family income average of adults was 39,194,252 won (stdev. 19896805.6). For the sexual interest, the average number of watching erotic video or pictures in the last 1 year was 43.9 (stdev. 99.3). Gap between Attitude and Behavior toward Privacy:

In Table 3, BR (Breaking Rate) is the ratio of people who chose sell behavior among the people who chose do-not-sell for sell and the ratio of people who chose do-not-protect behavior among the people who chose protect for protect. As you see in Table 3, only 55.0% showed attitude to sell quiz score at 1,000 won, but after being aware that cash is given and actual profit is generated, it increased to 70.0% with increase of 15.0%. For weight, only 75.6% showed attitude to sell at 1,000 won, but actual behavior showed 82.9% sell with increase of 7.3%. In 100 won group, weight information sell increased to 70.0% sell with increase of 10.0% from the attitude, and the quiz score was sold at 100 won by 40.5% which is 4.8% increase from attitude.

On the other hand, 14.6% told to protect quiz score with 1,000 won cost, but after being aware that cash payment causes actual loss, only 9.8% protected with decrease of 4.9%. Also for weight, 32.5% told to protect with 1,000 won cost, but actual behavior was only 30.0%. As such, in actual behavior, the lowered protection will also occurred at small cost of 100 won. 45.0% told to protect quiz score with 100 won payment, but in actual behavior, only 20.0% protected quiz score with 100 won payment with decrease of 25.0%. Also for weight, 40.5% told to protect, but in actual behavior, only 35.7% protected. If you look at the 'gap' row in Table 3, the ratio of subjects who had different behavior from the attitude toward the privacy was within 10%p, and as you look at 'BR' row in Table 3, except the subjects who protected the quiz score in 100 won group, you can see that the experiment targets who did not behave as their will to protect privacy was not majority. But, it is clear that sell behavior increased and protect behavior decreased in actual behavior compared to the time of attitude.

Gap between WTP and WTA

When you look at Table 4 which summarized WTA and WTP for each personal information answered by the survey targets, travel destination had the smallest WTA/WTP ratio of 2.4, and income level had the biggest WTA/WTP ratio of 71.4. As a result, you can see that there is a very big gap between WTA and WTP.

Table 4. WTP and WTA for each personal information

		Mean (won)	Answered 0 won (%)	WTA/WTP (ratio)
Quiz Score	WTA	762,761	1.2	41.7
	WTP	18,303	43.6	
Weight	WTA	1,461,476	1.8	61.0
	WTP	23,976	41.7	
Travel Destination	WTA	94,990	9.2	2.4
	WTP	38,912	64.4	
Political Tendency	WTA	757,649	6.1	9.1
	WTP	83,566	44.2	
School Grade	WTA	980,449	3.1	12.5
	WTP	78,662	37.4	
Income Level	WTA	4,603,480	3.7	71.4
	WTP	64,480	36.2	
Sexual Interest	WTA	1,206,226	8.0	33.6
	WTP	35,914	35.6	

Also, when you look at the ratio of the survey targets who answered 0 won as the maximum payment to protect personal information, sexual interest was 35.6%, which was relatively low, income level was 36.2%, school grade was 37.4%, weight was 41.7%, quiz score was 43.6%, political tendency was 44.2%, and travel destination was 64.4%. That is, about 40% of the survey targets had no will at all for personal information protection for all personal information items.

Comparison to Glossklags and Acquisti(2007): Now, let's compare and analyze Korea's privacy paradox survey and experiment result against Glossklags and Acquisti(2007) (hereinafter, marked as G&A) result. First of all, G&A limited the survey targets to young college students, and it has high possibility of forming private relationship, so they can be sensitive to privacy, but our experiment selected various population composition, and it has low possibility of forming private relationship, so it can have lower sensitivity toward privacy than G&A. G&A may be difficult to represent entire internet users, but almost all age groups using internet evenly participated in our experiment, so it can represent all internet users.

To verify the gap between attitude and behavior toward privacy, G&A first carried out experiment to choose whether to sell or protect information selling with cash transaction, and then WTA and WTP were presented to compare with transaction price. In our case, we focused on how the intention and behavior for sell and protect were changed before and after the cash transaction. Therefore, our method can be said to be more direct method to prove privacy paradox. As a result, for the gap between attitude and behavior toward privacy, G&A and we had similar conclusion that 'contradicting attitude and behavior toward privacy' is not still a dominant phenomenon.
For the gap between WTA and WTP, G&A and we had the same conclusion that there is a significant gap between the two. In such terms, it can be said to be that privacy paradox clearly exists in our society or among U.S college students.

That is, most of the people give high value for their own personal information, but they have contradicting attitude toward the payment to protect personal information.

Conclusion and Political Implications

As a result of the survey and experiment related to privacy paradox carried out in this study, in terms of the gap between WTA and WTP, heuristic basis was found, but in terms of the gap between attitude and behavior toward privacy, no concerning heuristic basis was found. Nevertheless, you can say that there is a clear gap between privacy protection pursued by the legal standard and the behavior of the people in reality.
To overcome such gap, the first political measure to consider is a new approach to the consent system. The personal information provided based on formal consent procedure according to the law related to personal information protection has the risk of paternalism that can be processed without a separate control (Solove, 2013). That is, by the self control right for personal information depending on only the consent system, it is decided with simple binary choice (agree or disagree). This enables only 4 statistical choices in the decision of the attitude and behavior for privacy protection. Protect behavior with protect attitude toward privacy, no-protect behavior with protect attitude, protect behavior with no-protect attitude, and no-protect behavior with no-protect attitude. The situation given to us for possible selection among these choices is the case of protect attitude, and when behavior is required, we fall into an actual situation which must require consent decision.

To sum up, in the current consent system, consent paradox exists where self control right for personal information cannot operate properly(Solove, 2013). Thus, not the simple binary choice, but new approach to consent system is required so that more diverse and flexible consents can be possible. The second political plan to consider is the adjustment of social standard such as privacy paradox. If the tendency of privacy paradox expands to several personal information fields in the future, it may become social standard. Like Mark Zuckerberg(Huffington Post, 2010), some people are becoming to consider privacy paradox at the level of ideal expectation, and it is, in some cases, becoming practice in the level of expectation. One thing important is, that the privacy paradox shows a very similar shape with the issues presented by legal and economic social standard studies. That is, people's behaviors are not decided simply by the contents of the legal provisions.

Privacy paradox can be assumed as the collision of practice which is becoming the level of legal standard and social standard. Eric Posner pointed out the non-legal social standard inevitably has incomplete elements that can become inefficient standard and presented delayed information, strategic behavior, collision between moral standard and profit standard, distorted preference, and negative external effect as the cause of such flaw(Posner, 1996). Among them, delayed information is the cause of cognitive limit and distorted preference is the cause of bias. Cognitive limit and bias were pointed out as the cause of privacy paradox in the above. Therefore, since privacy paradox is inefficient social standard and shows the embedded limit of the self formed standard, it is socially preferable to directly and indirectly adjust and correct it through new legal provisions such as giving the right to delete pictures or texts to those who are included in such pictures or texts.

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