

USER COMPENSATION AS A DATA BREACH RECOVERY ACTION: AN INVESTIGATION OF THE SONY PLAYSTATION NETWORK BREACH

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Appendix A

Data Breach Literature

To gather articles, we searched three literature databases of Scopus, ABI/Inform, and Google Scholar. We looked for all articles that contained various keywords, such as “data breach,” “security breach,” “privacy breach,” and “information breach.” We then narrowed our focus to include scholarly articles, excluding articles in the popular and practitioner media. Most of the articles identified in this step were conceptual. From this group, we collected all empirical studies of data breaches published in IS journals over the last 10 years, shown in Table A1. We adapted level of analysis categorizations from Smith et al. (2011) and Belanger and Crossler (2011). For each study, we also recorded the timing of the study to reflect the relationship between when the phenomenon occurred and when the study was conducted.

Table A1. Empirical Studies of Data Breaches in Prior IS Literature

Reference	Level of Analysis				Method	Data	Timing	Findings
	Artifact	Individual	Organization	Social				
Evans and Furnell (2000)	X				Experiment	700,000 IP address polls	Scenario	Organizations may not classify breaches consistently, especially for online systems.
Garg et al. (2003)			X		Event Study	22 published breach announcements	After	Data breaches have a negative effect on the breached firm's share price.
Campbell et al. (2003)			X		Event Study	43 data breach announcements in news media	After	Negative effect on market value from breach announcements, but only if the breach involves confidential data. Market consequences depend on type of data breached.
Anton et al. (2004)			X		Case Study	Publicly available reports	After	Complex policies make it difficult for end-users to understand data risks. Use templates to improve compliance.
Cavusoglu et al. (2004)			X		Event Study	66 published data breach announcements	After	Breach announcements have negative effects on breached firm market value. Industry competitors are also negatively affected.
Ko and Durantes (2006)			X		Event Study	19 publicly announced data breaches	After	Breached firms suffer reduced financial performance in the following year.
Butcher-Powell (2006)			X		Case Study	Unnamed IT hardware manufacturer	Scenario	Contrasts the value of training and technical remedies in preventing security breaches.
Erickson and Howard (2007)	X				Archival analysis	589 published data breach incidents	After	More incidents reported in 2005-2006 than in the 25 years prior. Almost half of breaches are due to external malicious attack. A quarter of breaches had no identifiable cause.
Kannan et al. (2007)			X		Event Study	72 published data breach announcements	After	Abnormal negative returns for the dotcom period, but not necessarily afterwards.
Otto et al. (2007)			X		Case Study	Public sources and published reports	After	Recommend firms have a plan to deal with breaches, including interacting with affected users. Maintain good governance and audit mechanisms.
Telang and Wattal (2007)			X		Event Study	147 announcements in newspapers and CERT reports	After	Negative market reactions accrue to the vendor after a breach announcement. The market reacts differently to different types of breaches.

Table A1. Empirical Studies of Data Breaches in Prior IS Literature (Continued)

Reference	Level of Analysis				Method	Data	Timing	Findings
	Artifact	Individual	Organization	Social				
Johnson (2008)			X		Archival analysis	Searches of P2P file sharing networks to identify sensitive documents from Forbes top 30 banks	After	Sensitive data can be inadvertently shared by employees as well as customers. Brand visibility is positively associated with disclosure likelihood.
Patel et al. (2008)	X				Case Study	Documentation from University of Louisville SCADA implementation	Scenario	Proposes a breach vulnerability method using vulnerability trees.
Shropshire (2009)		X			Archival	62 published cases of internal breaches	After	Personal relationship strains and hardship are associated with propensity to breach data.
Herath and Rao (2009)		X			Survey	312 employees from 78 firms	Scenario	Breach severity perceptions affect policy implementation and compliance.
Ko et al. (2009)			X		Event Study	69 breach announcements and matched sample of non-breached firms	After	Data breaches result in negative abnormal market value losses. Different breaches have different effects: breaches of confidentiality have long term effects, while breaches of integrity do not.
Culnan and Williams (2009)			X		Case Study	Publicly available documents	After	Ethical perspectives may improve development of data breach policy. Prior research has not examined the personal harm caused by data breaches.
Goel and Shawky (2009)			X		Event Study	168 breach announcements in newspapers and public sources	After	Breach announcements have a negative effect on firm market value in subsequent days.
Andoh-Baidoo et al. (2010)					Event Study	42 announcements in major newspapers and media outlets. Stock data from NYSE.	After	Investors view breaches negatively, but may view different types of breaches as having varying levels of severity.
Lee et al. (2011)			X		Econometric Model	Two years of breach announcements from Open Security Foundation (dataloss.org)	After	Optimal security investment depends on service cost and incident likelihood. Model provides investment levels for desired levels of protection.
Garrison and Ncube (2011)			X		Archival	Five years of published data breach announcements.	After	Device theft and exposed data are more likely to occur, but number of breached records is not related to type of breach.

Table A1. Empirical Studies of Data Breaches in Prior IS Literature (Continued)

Reference	Level of Analysis				Method	Data	Timing	Findings
	Artifact	Individual	Organization	Social				
Morse et al. (2011)			X		Event Study	306 breach announcements from Open Security Foundation (dataloss.org)	After	Market losses vary between breach types, suggesting that investors pay attention to the type and duration of the breach.
Gordon et al. (2011)			X		Event Study	Published breach announcements	After	Breaches have a negative effect on market valuations. However, different breaches have different effects, with the greatest negative effect for availability breaches.
Yayla and Hu (2011)			X		Event Study	123 published data breach events from news outlets	After	Negative effect on market valuation for breached firms, but stronger with pure e-commerce firms. More recent breaches appear to have a stronger negative effect than earlier events.
Collins et al. (2011)			X		Archival	2,219 data breach announcements from Privacy Rights Clearinghouse	After	Legislation and recording of breaches would improve breach management and research. Breach likelihood varies between firm types.
Goldstein et al. (2011)			X		Event Study	142 breach events in news media sources	After	Breached firms see reduced market value. However, availability events result in greater losses than system integrity announcements.
Rhee et al. (2012)		X			Survey	204 MIS executives	Scenario	Managers may have optimistically biased perceptions of breach and security risks.
Zafar et al. (2012)			X		Event Study	119 breach announcements and 867 non-breached competitors.	After	Data breach announcements negatively affect the market value of the breached firm, and its competitors in the same industry.
Chen et al. (2012)			X		Event Study	83 breach event announcements	After	IT consulting and technology firms suffer negative returns after a breach announcement.

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Appendix B

Service Recovery Literature

To gather articles, we searched three literature databases of Scopus, ABI/Inform, and Google Scholar. We looked for all that contained service outcome keywords, such as “service recovery” and “service failure,” and recovery action keywords, such as “apology” and “compensation.” We then narrowed our focus to include scholarly articles, excluding articles in the popular and practitioner media. From this group, we collected all empirical studies of service recovery published over the last 10 years. The list of target journals is shown in Table B1 and the articles are shown in Table B2.

Table B1. List of Journals Included in Background Literature Search

Marketing	Management	Information Systems
Journal of Consumer Research Journal of Marketing Journal of Marketing Research Journal of Retailing Journal of the Academy of Marketing Science Marketing Science	Academy of Management Journal Academy of Management Review Administrative Science Quarterly Decision Sciences Journal of Business Journal of Business Venturing Journal of Management Journal of Management Studies Journal of Operations Management Journal of Organizational Behavior Journal of Product Innovation Management Leadership Quarterly Management Science Operations Research Organization Science Organization Studies Strategic Management Journal	Decision Support Systems European Journal of Information Systems Information & Management Information Systems Journal Information Systems Research Journal of Information Technology Journal of Management Information Systems Journal of the Association of Information Systems MIS Quarterly

Table B2. Literature Review of Service Failure

Reference	Unit of Analysis	Theory Frame	Apology	Compensation	Dependent Variables	Method	Data	Timing	Findings
Baker et al. (2008)	Individual	Racial discrimination, emotion-theoretic lens	X	X	Satisfaction, repurchase intention, word of mouth	Online panel quasi-experimental survey using scenario	1,314 members of panel	Scenario	Positive relationship between recovery effort (apology and compensation) and satisfaction, repurchase intention, and word of mouth. Black customers may perceive service failure to be more severe and require greater compensation.
Beverland et al. (2010)	Individual			X		Grounded theory	52 interviews, variety of occupations	Scenario	Conflict style moderates the relationship between failure and recovery effectiveness.
Bonifield and Cole (2008)	Individual	Social comparison theory		X	Exit complaint, Negative word of Mouth (NWOM), third party complaint propensity	Two 2 x 2 experiments	100 undergraduate students, 207 undergraduate students	Scenario (video vignettes)	Comparisons to other social groups and compensation offers are not additive in recovery. However, social comparison works when compensation is low or non-existent.
Bradley and Sparks (2012)	Individual	Attribution theory, justice theory	X	X	Satisfaction	Experiment	461 residents of a particular region	Scenario	Customer evaluations are affected by compensation received and the explanation of the source or reason for the failure. Empathy and apology performed better than just an explanation.
Casado et al. (2011)	Individual	Attribution theory, justice theory, appraisal theory	X		Choice of customer response	Logit model	165 regional bank branch customers	Scenario	Study examines double deviation (both the initial service failure and a failed service recovery). Apology and compensation positively affect customer's choice of response and emotional reaction.
Chang and Wang (2012)	Individual	Attribution theoretic lens	X	X	Customer preference for recovery channel	Conjoint and cluster analysis	201 Internet users	Scenario	Customers perceive compensation and apology as among the most critical attributes of effective service recovery.
Chebat and Slusarczyk (2005)	Individual	Justice theory, affect control theory		X	Actual loyalty exit	CATI phone survey	186 bank complainants	Critical incident recall	Compensation mediates both positive and negative emotions by improving justice perceptions.
Du et al. (2011)	Individual	Emotional contagion		X	Emotional contagion	Experiment in lab setting	260 students as restaurant patrons	Pre-failure, post-failure, post-recovery	Emotional displays from staff, coupled with compensating actions, improve recovery efforts by ameliorating negative emotions in customers.
Gelbrich (2010)	Individual	Appraisal theory and Justice theory		X	Negative word of mouth, complaining, support seeking	Quasi experimental survey with scenario, and a field survey	311 undergraduate students, 525 hotel guests recruited by students	Scenario	When customers feel helpless, explanations mitigate negative reactions, e.g., anger, even when no compensation is provided.
Gelbrich and Roschk (2011b)	Individual	Justice theory		X	Satisfaction, loyalty, word of mouth	Literature meta-analysis	87 service failure studies		The positive relation between compensation and satisfaction and word of mouth is moderated by industry and type of customer.

Table B2. Literature Review of Service Failure (Continued)

Reference	Unit of Analysis	Theory Frame	Apology	Compensation	Dependent Variables	Method	Data	Timing	Findings
Gelbrich and Roschk (2011b)	Conceptual	Weber-Fechner law and prospect theory		X	Satisfaction	Literature meta-analysis	17 service failure studies		Overcompensation (refund greater than purchase price) has a lower incremental effect on satisfaction than simple compensation (refund equal to purchase price).
Goudarzi et al. (2012)	Individual			X	Post-failure expenditure	Archival analysis of customer purchase patterns	Loyalty card purchase events	Pre- and post-failure	Compensation is not useful if it is not offered quickly. Tardy compensation is counterproductive and costly.
Gregoire et al. (2009)	Individual	Complaint propensity	X	X	Desire for revenge, desire for avoidance	Four stage survey and scenario-based experiment	172 website users, 113 students	Scenario	Compensation and apology reduce desire for revenge. High relationship quality customers are content with an apology and mild compensation. Low quality customers are more prone to revenge and need greater compensation.
Gregoire et al. (2010)	Individual	Appraisal theory and interactional, distributive and procedural fairness		X	Direct revenge, indirect revenge	Two surveys	233 website users, 103 university students	Post-failure	Desire for revenge was negatively affected by procedural and interactional fairness. Failure severity affects anger, revenge and negative word of mouth.
Grewal et al. (2008)	Individual	Attribution theory		X	Repurchase Intentions	Three experiments using scenario-based critical incident technique (CIT)	Undergraduate and graduate students (n = 251, n = 116, n = 218)	Scenario	When the firm is seen as responsible for the failure, compensation affects repurchase intention. Otherwise, customers are satisfied with an explanation.
Harris et al. (2006)	Individual	Disconfirmation		X	Satisfaction, post-purchase intentions	Scenario-based experiment in airline and banking industries	162 participants	Scenario	The positive effect of compensation on satisfaction and post-purchase intention is stronger in offline than online contexts.
Huang (2008)	Individual	Attribution theory		X	Satisfaction	Retrospective experiences (critical incident technique)	352 shoppers at a Taiwanese shopping mall	Scenario	Controllability attribution leads customers to expect compensation to recover from dissatisfaction. Stability attribution and failure severity had no effect on recovery expectations but negatively related to satisfaction.
Huang and Lin (2011)	Individual	Utility expectation		X	Satisfaction, repurchase intention	Between subjects 2 x 2 experimental design	145 university students	Scenario	Contrasts utilitarian (price reduction) and hedonic (free gift) compensation. Customers prefer to receive compensation that matches the affected service (i.e., hedonic compensation for hedonic service).

Table B2. Literature Review of Service Failure (Continued)

Reference	Unit of Analysis	Theory Frame	Apology	Compensation	Dependent Variables	Method	Data	Timing	Findings
Hui and Au (2001)	Individual	Culture theory (individualism and collectivism)	X	X	Justice perceptions, post-complaint behaviors	Experiment	University students: n = 175 (China), n = 160 (Canada)	Scenario	Not all groups see compensation in the same way. Compensation has stronger positive effect on justice perceptions and post-complaint behaviors for Canadian than Chinese customers.
Kim and Uldago (2012)	Individual			X	Satisfaction, repurchase intention	Experiment	292 university students	Scenario	Contrasts immediate and delayed compensation. Perceived severity of failure moderates effect of compensation on satisfaction and repurchase intention. In severe failure, immediate compensation has stronger positive effect on satisfaction and repurchase intention.
Li et al. (2012)	Individual	Culture theory	X	X	Complaint intention, fairness perceptions, perceived attainability of overcompensation	Two quasi-experimental studies	Undergraduate students (n = 95, n = 36)	Scenario	Overcompensation reduced post-recovery complaint tendency among "loose" (tolerant) customers but not "tight" (intolerant) customers. Either compensation or apology may improve dissatisfaction and complaint intention for loose customers, tight customers preferred apology over compensation.
Liao (2007)	Individual	Justice theory	X		Satisfaction, repurchase intention	Field study, laboratory experiment	568 surveys collected by 45 graduate students, 395 surveys collected by 32 graduate students	Scenario	Apology positively affects satisfaction and repurchase intention by improving justice perceptions. Failure severity and frequency reduce effectiveness of recovery procedures.
Lee and Lee (2012)	Individual	Equity theoretic lens		X	Satisfaction, trust, word of mouth, repurchase intention	2 x 2 between subjects factorial design	273 university students	Scenario	Compensation expressed in dollar terms is perceived as fair for a high price product. Compensation expressed in percentage terms is perceived as more fair for a low price product. Customers who are satisfied with recovery exhibit higher trust, word of mouth and repurchase intention.
Mattila (2006)	Individual	Equity theoretic lens, attribution theory		X	Tipping behavior, fairness perception	3 x 2 between subjects experiment. Participants viewed six videos of service failure.	188 undergraduate college students	Scenario (restaurant vignette)	Compensation has better justice outcomes than no compensation. Offering an explanation can also reduce incorrect attribution.
Mattila (2009)	Individual	Trust-theoretic lens	X	X	Trust, attitude to service provision, behavioral intention	Experiment	143 undergraduate students	Scenario (hypothetical newspaper article)	Apology can ameliorate negative effects of public relations disasters, for both intentional and external causes.

Table B2. Literature Review of Service Failure (Continued)									
Reference	Unit of Analysis	Theory Frame	Apology	Compensation	Dependent Variables	Method	Data	Timing	Findings
Mattila (2010)	Individual	Emotion centric lens		X	Satisfaction	Between subjects quasi-experimental design	195 attendees at a US arts festival	Scenario	Females are more satisfied than males with compensation when they can choose between compensation alternatives.
Mattila and Cranage (2005)	Individual	Equity theory	X	X	Satisfaction	2 x 2 between subjects experimental design	280 undergraduate students	Scenario	Compensation and apology positively affect perceptions of fairness, which is positively related to satisfaction. Combined apology and compensation improves interactional fairness.
Mattila and Patterson (2004)	Individual	Attribution theory and culture		X	Perceived effort, satisfaction, problem handling	Quasi experimental survey with scenario	Undergraduate students, n = 150 American, n = 139 Thai, n = 132 Malay	Scenario	Compensation, perceived effort and explanation positively affected post-recovery satisfaction. Response varied between cultures.
Maxham and Netemeyer (2002)	Individual	Perceived, distributive and procedural justice		X	Recovery satisfaction, firm post-satisfaction, word of mouth intention, purchase intention	Two survey studies, with one post-failure and two post-recovery rounds in each.	Bank customers (n = 692 and n = 339)	Post-failure and post-recovery	Service repair used to compensate customers to return them to original position. Justice perceptions were positively related to satisfaction. Procedural justice was positively related to purchase intentions in both studies.
Morrison and Huppertz (2010)	Individual	Justice theory		X	Satisfaction	2 x 2 between subjects quasi experimental survey design	808 university students	Scenario	Membership of a loyalty program has no effect when both focal and referent customers receive equal compensation. When the referent customer received greater compensation, respondents were very dissatisfied with the outcome. They were less dissatisfied if the referent customer was a loyalty program member.
Noone (2012)	Individual	Equity theoretic lens		X	Fairness perceptions, negative word of mouth	Laboratory experiment	Participants recruited at two hotels (n = 81, n = 85) and an airport (n = 85)	Scenario	Cash-based overcompensation yielded higher perceptions of fairness than full compensation or credit-based overcompensation.
Orsingher et al. (2010)	Individual	Justice theory		X	Intentions to return, word of mouth and satisfaction	Meta-analysis	50 research papers about satisfaction with complaint handling		Distributive, Interactional and procedural justice positively affect satisfaction.
Park et al. (2008)	Organization	Justice theory	X	X	Distributive, procedural, and interactional justice	Qualitative analysis using textual coding and Critical Incident Technique	346 Service experience narratives of family travelers from online public customer complaint websites	Post-failure and post-recovery	Complaint rates and compensation effects on justice perceptions vary between industries. Justice perceptions vary between industries, possibly because different industries exhibit different failure types.

Table B2. Literature Review of Service Failure (Continued)

Reference	Unit of Analysis	Theory Frame	Apology	Compensation	Dependent Variables	Method	Data	Timing	Findings
Patterson et al. (2006)	Individual	Justice theory, culture theory	X	X	Post-recovery satisfaction, fairness perceptions	Experiment	Undergraduate students in Thailand (n = 246) and Australia (n = 241)	Scenario	Eastern and Western culture types may affect service recovery response. Higher perceptions of justice are positively related to post-recovery satisfaction.
Prasongsukarn and Patterson (2012)	Individual	Justice theory, culture theory		X	Post-recovery satisfaction, fairness perceptions	Experiment	1,098 undergraduate students	Scenario	Perceptions of recovery are likely affected by the timing of recovery actions. Providing information about recovery mechanisms affects satisfaction with compensation.
Roggeveen et al. (2011)	Individual	Justice theory and expectation disconfirmation		X	Satisfaction, Repurchase Intention	Four experiments with failure scenarios	University students n = 79, n = 111, n = 87, n = 168	Scenario	Customer involvement improves recovery for severe failures. Compensation assists for severe, but not non-severe failures.
Sparks and McColl-Kennedy (2001)	Individual	Justice theory		X	Satisfaction, future intentions	2 x 2 x 2 x 2 between-subject experimental design using video vignettes	420 members of business and community groups	Scenario (hotel setting)	Higher satisfaction with services when a partial refund was given if the provider was seen to be following policy. For token (minor) compensation, respondents showed higher satisfaction if they felt the provider was doing them a favor.
Vazquez-Casielles et al. (2012)	Individual	Attribution theory, emotion-theoretic lens		X	Satisfaction, repurchase intention, positive and negative word of mouth, third party complaint propensity	2 x 2 x 2 between-subjects experimental design	432 customers at a Spanish airport	Scenario (travel setting)	Financial compensation and social comparison are positively related to behavioral intentions.
Voorhees et al. (2006)	Individual	Equity theory		X	Repeat purchase intentions, negative affect, regret, negative word of mouth	Survey using critical incident technique	530 university students	Scenario	Non-complainers are less likely to repurchase than customers who (a) complain and receive satisfactory recoveries or (b) do not complain but receive recovery
Wang and Mattila (2011)	Individual	Culture theory, justice theory	X		Post-failure satisfaction, loyalty intentions	Between-subjects experimental design	286 undergraduate students	Scenario	Different cultures perceive failure explanations in different ways. Taiwanese participants saw apology as more just. Fairness was positively related to satisfaction and intention.
Wirtz and Mattila (2004)	Individual	Equity theory, attribution theory	X	X	Negative word of mouth (NWOM), repatronage intention, post-recovery satisfaction	2 x 2 x 2 between-subject factorial experiment	187 working adults	Scenario	Compensation and apology affect post-recovery satisfaction. Compensation alone does not improve satisfaction with a poor recovery process. Post-recovery satisfaction fully mediated service recovery and behavioral intentions.

Table B2. Literature Review of Service Failure (Continued)

Reference	Unit of Analysis	Theory Frame	Apology	Compensation	Dependent Variables	Method	Data	Timing	Findings
Wirtz et al. (2010)	Individual	Justice theory		X	Perceived fairness, opportunistic claiming, satisfaction	Five studies: observation, interviews and three experiments (lost baggage scenario, catering scenario, catering scenario).	500 claim documents, 17 interviews, n = 360 students, n = 261 employees, n = 82 employees	Scenario, post-recovery	Customers were more opportunistic for low or unfair compensation, low employee concern and inconvenience. Greater opportunism for one time rather than continuing relationships. Opportunistic claimants were not more satisfied.
Wong (2004)	Individual	Culture theory	X	X	Repurchase intentions, word of mouth	3 × 2 between-subjects design	Three university student samples: USA (n = 253), Australia (n = 192), Singapore (n = 71)	Scenario	Compensation improves repurchase intention and word of mouth in the US sample, but not the Singaporean or Australian groups. Apology improves satisfaction in Singaporean and Australian but not US group.
Worsfold (2007)	Individual	Justice theory		X	Satisfaction, repatronage intentions, and complaint intentions	2 × 2 × 2 independent groups factorial design	Undergraduate students (n = 180, n = 179)	Scenarios (DVD hire store, restaurant)	Compensation and rapport were most effective when losses were non-financial or failure was negligible. Proactive rapport-building may offset failure perceptions.

Note: Unit of analysis was classified as conceptual, artifact, individual, organization, or social.

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Appendix C

Constructs and Survey Items

Table C1 lists the survey items used in the study.¹

Table C1. Relevant Constructs and Survey Items for Round 1 and Round 2	
Items Used in Round 1	
Expected Compensation	A month of free network membership for all customers is obvious if the console network is breached.
	I expect that Sony gives customers free downloadable content if the network is breached.
	I expect to get a new console if the console network gets hacked.
Items Used in Round 2	
Experienced Compensation	A month of free network membership for all customers was obvious when the console network was breached.
	As expected, Sony gave customers free downloadable content when the network was breached.
	As expected, I got a new console when the console network got hacked.
Items for Outcome and Control Variables (Identical in both data collection rounds)	
Service Quality	Sony's customer services are of high quality.
	Sony's customer services are always functional.
	The performance of Sony's customer services is very reliable.
	The customer service of Sony is not good quality. *
Continuance Intention	I intend to continue playing online games on the console network.
	I want to continue playing online games on the console network rather than discontinue.
	I predict I will continue playing online games on the console network.
	I plan to continue playing online games on the console network.
Repurchase Intention	I intend to continue purchasing products from Sony.
	All things considered, I will purchase products from Sony over the next 12 months.
	Chances are high that I will continue purchasing products from Sony.
	I don't intend to repurchase products from Sony in future.*
Intrinsic Motivation	I find playing online games on the console network enjoyable.
	The actual process of playing online games on the console network is pleasant.
	I have fun playing online games on the console network.
	I find it unenjoyable playing online games on the console network.*
Extrinsic Motivation	When I play online games on the console network, I always try to reach a high score.
	I play online games on the console network as it allows me to compete with other players.
	I want to gain achievements games when playing online games on the console network.
	I play online games on the console network to get higher in the rankings.
Habit	Playing online games on the console network has become automatic to me.
	Playing online games on the console network is natural to me.
	I play online games on the console network as a matter of habit.
	I do not play online games on the console network habitually. *

All items were measured using a seven-point Likert scale (1 = strongly disagree...7 = strongly agree).

*reverse-coded items

Reference

Petter, S., Straub, D., and Rai, A. 2007. "Specifying Formative Constructs in Information Systems Research," *MIS Quarterly* (31:4), pp. 623-656.

¹All constructs are conceptualized as reflective even though it is clear that "Expected Compensation" and "Experienced Compensation" are formative. Fortunately, according to Petter et al. (2007), there is likely not a Type I or Type II problem when exogenous variables such as these are mis-specified.

Appendix D

Tests for Sample Selection Bias

All survey research involves the possibility of sample selection bias. This sample selection bias can occur when one group contributes more than others because they feel particularly passionate about the phenomenon under study. Ordinarily, this sample bias is difficult to gauge and only approximations can be made (Wagner 2012). However, the two-stage survey method applied in this research allows us to assess the differences between those who responded in round 1 but did not respond in round 2.

We adapted a technique from Whitehead et al. (1993) and Dubin and Rivers (1989), and used a binary logistic regression to compare demographic indicators of round 1 respondents against round 2 respondents. This technique allows for contingent dependencies between both rounds and is robust to shared or dependent error terms between rounds. The dependent variable was set equal to 1 if they participated in round 1 only, and to 2 if they participated in both rounds. We included purchase date, income, weekly use, and gender as independent variables. Table D1 shows the results of this testing.

	B	S.E.	Wald	Sig.	Exp(B)
Purchase Date	.126	.088	2.034	.154	1.134
Income	.055	.039	2.012	.156	1.057
Weekly Use	-.068	.054	1.578	.209	.934
Gender	-.159	.217	.536	.464	.853
Constant	-253.273	177.052	2.046	.153	.000
Cox & Snell R ²	.013				
Nagelkerke R ²	.019				

Table D1 shows that no variables were significant predictors of participation in the second round of the survey. Wald statistics for all variables were not significant, which suggests that they have low or no explanatory power (Agresti 1990). Both the Cox & Snell R² and Nagelkerke R² were low, indicating low model explanatory power.

We also ran a non-parametric Mann-Whitney U test on the same variables. The advantage of a non-parametric test is that it is robust to variable skewness and kurtosis. We obtained similar results from these non-parametric tests.

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Appendix E

Respondent Demographics

Table E1. Respondent Demographics for Study 1					
Demographic	Category	Study 1			
		Round 1		Round 2	
		n	%	n	%
Gender	Men	369	66.25	91	63.19
	Women	184	33.03	53	36.81
	No response	4	0.72	0	0
Annual Salary	Less than US \$12,500	115	20.65	23	15.97
	US \$12,500 - US \$24,999	86	15.44	24	16.67
	US \$25,000 - US \$37,499	113	20.29	30	20.83
	US \$37,500 - US \$49,999	65	11.67	20	13.89
	US \$50,000 - US \$62,499	60	10.77	14	9.72
	US \$62,500 - US \$74,999	30	5.39	8	5.56
	US \$75,000 - US \$87,499	25	4.49	7	4.86
	US \$87,500 - US \$99,999	18	3.23	7	4.86
	US \$100,000 or more	19	3.41	6	4.17
	Prefer not to say	26	4.67	5	3.47
Age (years)	Less than 20	51	9.16	6	4.17
	20-25	209	37.52	45	31.25
	26-30	141	25.31	42	29.17
	31-35	79	14.18	22	15.28
	36-40	36	6.46	10	6.94
	41-50	31	5.57	15	10.42
	Older than 50	7	1.26	4	2.78
	No response	3	0.54	0	0.00