

CONSUMERS' ATTITUDES CHANGE IN RESPONSE TO PRIVACY VIOLATION ONLINE INCIDENT

13th International Odyssey Conference on Economics and
Business conference presentation

Bruno Škrinjarić, Jelena Budak, Edo Rajh

This work was financed by Croatian Science Foundation under project
IP-2019-04-7886.

The Institute of Economics, Zagreb

June 4th, 2022

Introduction

- Very little is known about consumers' reactions to the privacy breach experienced on the Internet
- A subjective notion of privacy violation online incident (hereafter: PVOI) might generate quite diverse behavioral outcomes of different individuals
- The aim of this research is to examine consumers' attitudes towards the Internet and consumer online behavior after the PVOI
- This issue is assessed by applying the concept of resilience and coping strategies in reaction to the stress, whereas the change in online consumers' attitudes and behavior is in the focus of this empirical research

Survey data collection

- The data were collected by a survey questionnaire (CATI method, January-February 2021) on a sample of Internet users in Croatia over the age of 18 who have had (at least subjectively) the OPVI in the past three years
- An online version of the telephone directory was used as a sampling frame, and data from the Eurobarometer 91.1 study were used to estimate the number of Internet users
- To estimate the number of Internet users with OPVI, we used the results of Anić et al. (2019), who used a similar dataset to propose an extended model of online privacy concerns
- Sample was representative by NUTS2 regions and settlement size
- With a response rate of 4.6 %, the final sample consisted of 1,000 Internet users aged 18 or older ([▶ Socio-economic characteristics](#))

Empirical model

- Our empirical model is the following:

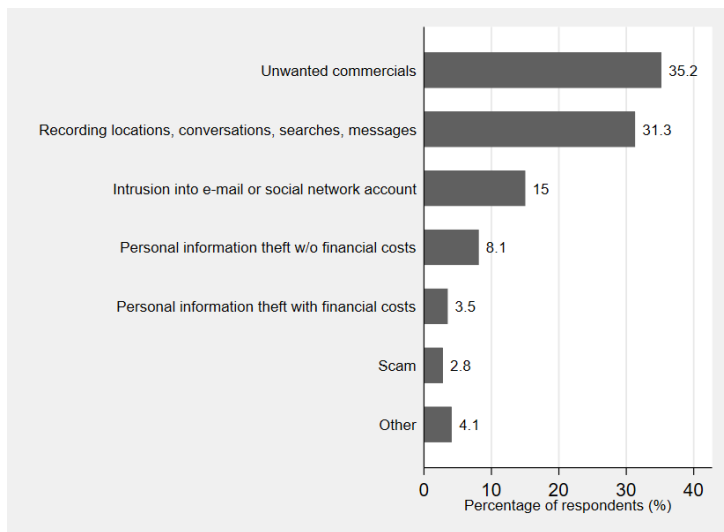
$$ATT_i = \alpha + \beta_1 RES_i + \beta_2 PVC_i + \beta_3 SKILL_i + \beta_4 OAW_i + \beta_5 ST_i + \beta_6 GIAS_i + \beta_7 OPC_i + \beta_8 SH_i + \beta_9 TIME_i + \gamma' X_i + \varepsilon_i$$

► Variables

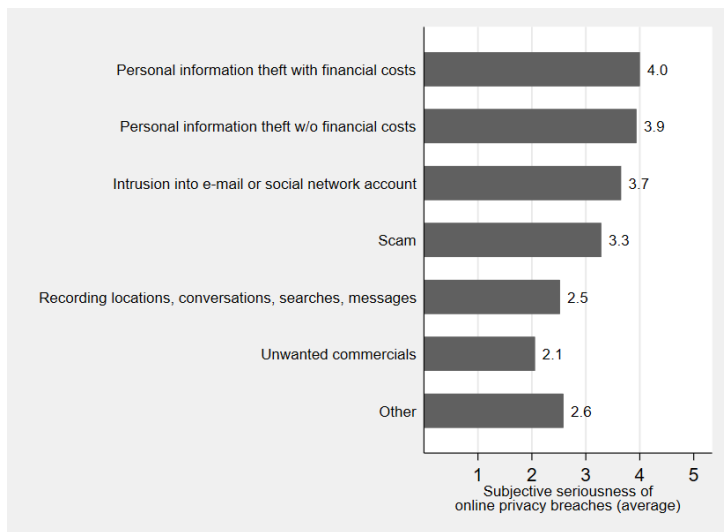
► Latent constructs

- Our empirical methodology is organized in two steps:
 - 1 We test the reliability, consistency, and dimensionality of latent constructs
 - The reliability of the selected measurement scales was analyzed by Cronbach's alpha coefficient, alpha-if-deleted indicator, and different correlations
 - The dimensionality of the measurement scale was examined by exploratory factor analysis
 - 2 Once the latent constructs (variables) were estimated and tested, the research model was estimated using Ordered Probit estimation technique

Online privacy violation cases



Online privacy violation seriousness



Ordered Probit results - Internet usage after PVOI

	Much less frequently (1)	Less frequently (2)	The same (3)	More frequently (4)	Much more frequently (5)
Resilience to PVOI	-0.004*** (0.001)	-0.050*** (0.009)	0.043*** (0.008)	0.008*** (0.002)	0.003** (0.001)
Online privacy awareness	0.001 (0.001)	0.009 (0.008)	-0.008 (0.007)	-0.001 (0.001)	-0.001 (0.001)
Social trust	-0.000 (0.001)	-0.001 (0.007)	0.001 (0.006)	0.000 (0.001)	0.000 (0.001)
General Internet attitude	-0.002** (0.001)	-0.023*** (0.007)	0.020*** (0.007)	0.004** (0.001)	0.002** (0.001)
Online privacy concern	0.001 (0.001)	0.009 (0.008)	-0.007 (0.007)	-0.001 (0.001)	-0.001 (0.001)
Sharing private information online	-0.001* (0.001)	-0.020** (0.009)	0.017** (0.007)	0.003** (0.001)	0.001* (0.001)

Ordered Probit results - Level of cautiousness on the Internet after PVOI

	Dramatically decreased (1)	Slightly decreased (2)	Remained the same (3)	Slightly increased (4)	Dramatically increased (5)
Resilience to PVOI	0.001 (0.001)	0.008*** (0.002)	0.097*** (0.015)	-0.042*** (0.008)	-0.063*** (0.010)
Online privacy awareness	-0.000 (0.000)	-0.004*** (0.001)	-0.051*** (0.014)	0.022*** (0.007)	0.033*** (0.009)
Social trust	0.000 (0.000)	0.003*** (0.001)	0.045*** (0.013)	-0.020*** (0.006)	-0.029*** (0.009)
General Internet attitude	-0.000 (0.000)	-0.001 (0.001)	-0.017 (0.014)	0.007 (0.006)	0.011 (0.009)
Online privacy concern	-0.001 (0.001)	-0.008*** (0.002)	-0.107*** (0.015)	0.047*** (0.008)	0.069*** (0.010)
Sharing private information online	0.000 (0.000)	0.004*** (0.001)	0.053*** (0.015)	-0.023*** (0.007)	-0.035*** (0.010)

Ordered Probit results - Range of activities performed over the Internet after PVOI

	Dramatically decreased (1)	Slightly decreased (2)	Remained the same (3)	Slightly increased (4)	Dramatically increased (5)
Resilience to PVOI	-0.007*** (0.002)	-0.044*** (0.010)	0.035*** (0.009)	0.014*** (0.004)	0.001* (0.001)
Online privacy awareness	0.003* (0.002)	0.018* (0.009)	-0.015* (0.008)	-0.006* (0.003)	-0.001 (0.000)
Social trust	-0.000 (0.001)	-0.002 (0.009)	0.001 (0.007)	0.000 (0.003)	0.000 (0.000)
General Internet attitude	-0.004*** (0.002)	-0.029*** (0.009)	0.024*** (0.008)	0.009*** (0.003)	0.001* (0.001)
Online privacy concern	0.004** (0.002)	0.025** (0.010)	-0.020** (0.008)	-0.008** (0.003)	-0.001 (0.000)
Sharing private information online	-0.003** (0.002)	-0.022** (0.010)	0.018** (0.008)	0.007** (0.003)	0.001 (0.000)

Ordered Probit results - Attitude toward the Internet after PVOI

	Much more negative (1)	More negative (2)	Unchanged (3)	More positive (4)	Much more positive (5)
Resilience to PVOI	-0.016*** (0.003)	-0.093*** (0.015)	0.102*** (0.016)	0.005*** (0.002)	0.002** (0.001)
Online privacy awareness	0.001 (0.002)	0.003 (0.013)	-0.004 (0.014)	-0.000 (0.001)	-0.000 (0.000)
Social trust	-0.009*** (0.003)	-0.055*** (0.013)	0.060*** (0.014)	0.003*** (0.001)	0.001** (0.001)
General Internet attitude	-0.014*** (0.003)	-0.084*** (0.014)	0.092*** (0.015)	0.005*** (0.001)	0.002** (0.001)
Online privacy concern	0.010*** (0.003)	0.061*** (0.014)	-0.067*** (0.015)	-0.003*** (0.001)	-0.001** (0.001)
Sharing private information online	-0.005* (0.003)	-0.029** (0.014)	0.031** (0.016)	0.002* (0.001)	0.001 (0.000)

Conclusion and discussion I

- Internet users with **higher resilience to PVOI** are more likely to use the Internet the same or more frequently after PVOI (similar interpretation is for general Internet attitude and sharing private information online)
- Internet users with **higher resilience to PVOI** are most likely not to change their level of cautiousness while online
- Consumers with **higher online privacy awareness and online privacy concern** are more likely to stay at the same or to increase their cautiousness on Internet after PVOI
- **More resilient individuals** are less likely to decrease their range of Internet activities or to keep them on the same or even increased level

Conclusion and discussion II

- Individuals who are **more resilient, with greater level of social trust and with better general Internet attitude are most likely not to change their attitude** toward Internet after PVOI
- Overall, results show that resilience of consumers helps them to maintain similar attitudes and online behavior after privacy violation incident
- Firms and regulators should build on reducing privacy concerns and perceived risks of online users to prevent changing positive attitudes toward using internet into negative ones

Thank you for your attention!

We would appreciate any questions/comments!

For any further questions/comments, please contact us by e-mail:

`bskrinjaric[at]eizg[dot]hr`

`erajh[at]eizg[dot]hr`

`jbudak[at]eizg[dot]hr`

Socio economic characteristics

Variable	N	Mean	St. dev.	Min.	Max.
Gender					
Female	513	0.51	0.5	0	1
Male	487	0.49	0.5	0	1
Age categories					
18-34	347	0.35	0.47	0	1
35-50	304	0.3	0.46	0	1
50+	349	0.35	0.48	0	1
Education					
Secondary school or less	538	0.54	0.49	0	1
Higher education	462	0.46	0.49	0	1
Occupation of respondent					
Self-employed	50	0.05	0.22	0	1
Manager	45	0.05	0.21	0	1
Professional	160	0.16	0.37	0	1
Technician/clerk	191	0.19	0.39	0	1
Worker	191	0.19	0.39	0	1
Retired	159	0.16	0.37	0	1
Student	111	0.11	0.31	0	1
Unemployed	93	0.09	0.29	0	1
Income of respondents' household					
Up to 6.500 HRK	182	0.18	0.39	0	1
6.501-10.000 HRK	229	0.23	0.42	0	1
10.001-15.000 HRK	253	0.25	0.43	0	1
> 15.000 HRK	113	0.12	0.32	0	1
No answer	223	0.22	0.42	0	1
NUTS2 region of respondent					
Pannonian Croatia	263	0.26	0.44	0	1
Adriatic Croatia	353	0.35	0.48	0	1
City of Zagreb	163	0.16	0.37	0	1
North Croatia	221	0.22	0.42	0	1
Place or residence size					
10,000 or less	309	0.31	0.46	0	1
10,001-50,000	296	0.3	0.46	0	1
50,001-100,000	79	0.08	0.27	0	1
More than 100,000	316	0.32	0.47	0	1

List of variables

Variable	Description	Values
ATT1	Internet usage after PVOI*	1 – Much less frequently, 2 – Less frequently, 3 – The same, 4 – More frequently, 5 – Much more frequently
ATT2	Level of cautiousness on the Internet after PVOI	1 – Dramatically decreased, 2 – Slightly decreased, 3 – Remained the same, 4 – Slightly increased, 5 – Dramatically increased
ATT3	Range of activities performed over the Internet after PVOI	1 – Dramatically decreased, 2 – Slightly decreased, 3 – Remained the same, 4 – Slightly increased, 5 – Dramatically increased
ATT4	Attitude toward the Internet after PVOI	1 – Much more negative, 2 – More negative, 3 – Unchanged, 4 – More positive, 5 – Much more positive
PVC	PVOI category	1 – Unwanted commercials, 2 – Intrusion into e-mail or SN account, 3 – Recording locations, conversations, searches, messages, 4 – Scam, 5 – Personal information theft w/o financial costs, 6 – Personal information theft with financial costs, 7 – Other
RES	Resilience to online privacy violation	1 – Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly agree
SKILL	Average Internet skills	1 – Not at all, 2 – Not so well, 3 – Okay, 4 – Well, 5 – Very well
ST	Social trust	1 – Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly agree
OAW	Online privacy awareness	1 – Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly agree
GIAS	General internet attitude scale	1 – Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly agree
OPC	Online privacy concern	1 – Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly agree
SH	Sharing private information online	1 – Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly agree
TIME	Time spent online for private and work-related reasons	0 – 24
Gender	Gender of respondent	1 – Male, 0 – Female
Age	Age category of respondent	1 – 18–29, 2 – 30–39, 3 – 40–49, 4 – 50–59, 5 – 60+
Education	Education of respondent	1 – Primary school or less, 2 – Secondary education (high school), 3 – Tertiary education (university, college), 4 – Post-graduate education (PhD, MBA, ...)
Income	Average household income of respondent	1 – Up to 2.000 HRK*, 2 – 2.501–3.500 HRK, 3 – 3.501–5.000 HRK, 4 – 5.001–6.500 HRK, 5 – 6.501–8.000 HRK, 6 – 8.001–10.000 HRK, 7 – 10.001–12.000 HRK, 8 – 12.501–15.000 HRK, 9 – 15.001–20.000 HRK, 10 – More than 20.001 HRK, 11 – Does not want to answer
Region	NUTS 2 region** of respondent	1 – Panonian Croatia, 2 – Adriatic Croatia, 3 – City of Zagreb, 4 – North Croatia
Settlement	Settlement size of respondent	1 – 10.000 or less, 2 – 10.001–50.000, 3 – 50.001–100.000, 4 – More than 100.000

List of latent construct items

Latent construct	Items	Description
Resilience to online privacy violation (RES)	res.1	I bounced back quickly after the most recent online privacy violation incident.
	res.2	I had a hard time making it through after the most recent online privacy violation incident.
	res.3	It didn't take me long to recover from the most recent online privacy violation incident.
	res.4	It was hard for me to snap back when the most recent online privacy violation happened.
	res.5	I came through the most recent online privacy violation incident with little trouble.
	res.6	It took me a long time to get over the most recent online privacy violation incident.
Social trust (ST)	st.1	In general, I trust people.
	st.2	In general, I trust state public institutions.
	st.3	In general, I trust local/municipal public institutions.
	st.4	In general, I trust my local community (e.g., neighbors, people that surround me).
Online privacy awareness (OAW)	oaw.1	I keep myself updated about privacy issues and the solutions that companies and the government employ to ensure our online privacy.
	oaw.2	Web sites seeking information about me should disclose the way the data are collected, processed, and used.
	oaw.3	A good online privacy policy should have a clear and conspicuous disclosure.
Online privacy concern (OPC)	opc.1	I am concerned about my online privacy.
	opc.2	I am concerned about extensive collection of my personal information over the Internet.
	opc.3	I am concerned about my privacy violation when using the Internet.
Sharing information online (SH)	sh.1	I don't mind sharing private information publicly on the Internet.
	sh.2	I don't mind posting my current location publicly on the Internet.
	sh.3	I don't mind posting with whom I am at the moment publicly on the Internet.
	sh.4	I see no problem in sending my credit card data when buying online.