# The effect of Personality Traits on Online Privacy Concern

PRICON conference, Zagreb

B. Škrinjarić[1], J. Budak[1], M. Žokalj[2]

[1]The Institute of Economics, Zagreb
[2]InterCapital Securities LTD, Zagreb

14th May 2018

# Introduction

- With the development of information science and the Internet, online privacy concern (OPC) issues have raised the attention of scholars (e.g. Gellman & Dixon, 2011), policy makers (e.g. Henderson, 2015) and businesses
- Viseu et al. (2004) argued that online privacy issue starts with the sitting in front of the computer, continues when using the Internet, and remains after the personal data have been submitted
- The aim of this paper is to explore what determines the privacy concern of Internet users and, specifically, if and how their personality shapes and explains the level of their concern about privacy when online
- Aim is also to test whether personality stands as an antecedent of OPC and should it be included in the extended model of online privacy concern (PRICON)

# Short background on Personality traits

- Personality traits are defined as "the substance of personality" (McCrae & Costa, 1987), an individual's tendencies resulting in different attitudinal and behavioral patterns across a diverse set of situations (including online privacy concern)
- The Big Five framework (Goldberg, 1992) divides personality into five traits: openness (to experience), conscientiousness, extraversion, agreeableness and neuroticism (emotional instability)
- The upside of personality traits in explaining OPC is their hereditary origin, stability across individual's lifetime and across cultures
- Range of other factors also affect OPC, such as socio-demographic factors, social trust (e.g. Pavlou, 2002), privacy awareness (e.g. Dommeyer & Gross, 2003), computer anxiety (e.g. Parasuraman & Igbaria, 1990), previous (negative) experience, time spent online

# Previous studies

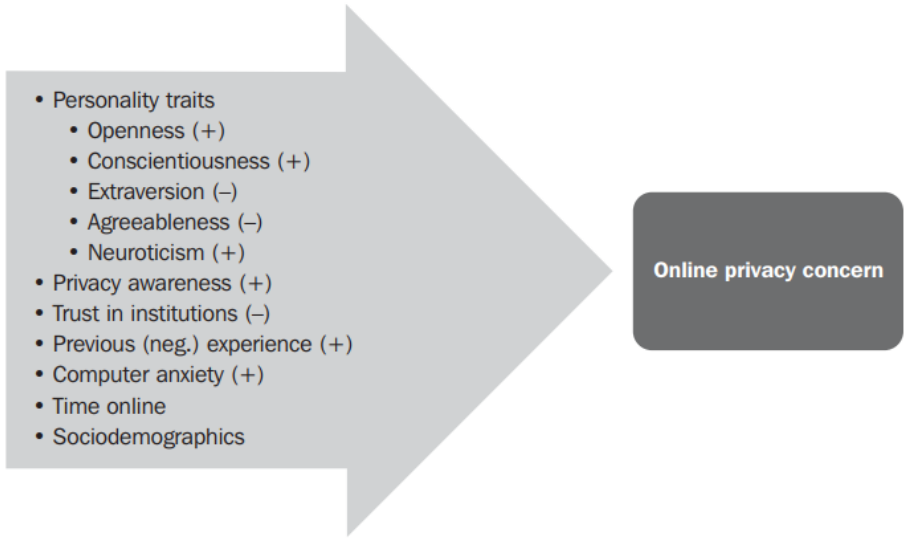
- Junglas et al. (2008) investigated the connection between the Big Five and concern for privacy (CFP) in the context of adoption of location-based services
  - Survey on 378 undergraduate and graduate students
  - Positive impact of conscientiousness and openness, negative effect of agreeableness on CFP, and no impact of neuroticism and extraversion
- Korzaan and Boswell (2008) follow the same methodology
  - Sample of 230 undergraduate students
  - Positive influence of agreeableness on information privacy concern
- Sumner et al. (2011) analyze OPC in context of Facebook activity
  - Sample of 537 individuals (mostly from the US and the UK)
  - Positive effect of extraversion, neuroticism and agreeableness on OPC
- Osatuyi (2015) extends analysis to more social media platforms
  - Sample of 298 undergrads
  - Positive impact of agreeableness and conscientiousness on information privacy concern

# Our Data and model

- Data collected by a telephone survey in Croatia in 2016, at representative net sample of 2060 adult Internet users
- The following model is used

$$OPC_i = \alpha + \beta' PT_i + \gamma_1 PA_i + \gamma_2 CA_i + \gamma_3 ST_i + \delta' X_i + \epsilon_i$$

- All of the latent variables used in the model above (OPC, PT, PA, CA and ST) enter the equation in their standardized form, i.e., with a mean of 0 and standard deviation of 1



# Latent variables (1)

Table 1. Latent variables used in model

| |
|---|
| *Online privacy concern* items:<br>- I am concerned about my online privacy.<br>- All things considered, the Internet could cause serious privacy problems.<br>- Compared to others, I am more sensitive about the way my personal information is handled online.<br>- I am concerned about extensive collection of my personal information over the Internet.<br>- I am concerned about my privacy violation when using the Internet.<br>- Compared with other subjects on my mind, personal privacy online is very important.<br>(Cronbach alpha 0.86, inter-item correlation 0.79) |
| *Computer anxiety* items:<br>- Computers are a real threat to privacy in this country.<br>- I am anxious and concerned about the pace of automation in the world.<br>- I am easily frustrated by increased computerization in my life.<br>(Cronbach alpha 0.72, inter-item correlation 0.82) |
| *Trust in institutions* items:<br>- How much do you trust public authorities?<br>- How much do you trust the police?<br>- How much do you trust courts?<br>(Cronbach alpha 0.75, inter-item correlation 0.66) |
| *Privacy awareness* items:<br>- I am aware of the privacy issues and practices in our society.<br>- I follow the news and developments about privacy issues and privacy violations.<br>- I keep myself updated about privacy issues and the solutions that companies and the government employ to ensure our privacy.<br>- Websites seeking information online should disclose the way the data are collected, processed and used.<br>- A good online privacy policy should have a clear and conspicuous disclosure.<br>(Cronbach alpha 0.66, inter-item correlation 0.27) |

# Latent variables (2)

Table 1. Latent variables used in model (continued)

| |
|---|
| *Extraversion* items:<br>- I see myself as someone who is reserved.<br>- I see myself as someone who is outgoing, sociable.<br>(Cronbach alpha 0.34, inter-item correlation 0.25) |
| *Agreableness* items:<br>- I see myself as someone who is generally trusting.<br>- I see myself as someone who tends to find fault with others.<br>(Cronbach alpha 0.03, inter-item correlation 0.01) |
| *Conscientiousness* items:<br>- I see myself as someone who tends to be lazy.<br>- I see myself as someone who does a thorough job.<br>(Cronbach alpha 0.40, inter-item correlation 0.28) |
| *Neuroticism* items:<br>- I see myself as someone who is relaxed, handles stress well.<br>- I see myself as someone who gets nervous easily.<br>(Cronbach alpha 0.54, inter-item correlation 0.50) |
| *Openess* items:<br>- I see myself as someone who has few artistic interests.<br>- I see myself as someone who has an active imagination.<br>(Cronbach alpha 0.37, inter-item correlation 0.44) |

# Descriptive statistics

Table 2. Descriptive statistics of variables used in model

| Variable | N | Mean | St. Dev. | Min | Max |
|---|---|---|---|---|---|
| Gender | | | | | |
| Male | 1024 | 0.5 | 0.5 | 0 | 1 |
| Female | 1024 | 0.5 | 0.5 | 0 | 1 |
| Age | 2060 | 39.83 | 12.91 | 18 | 84 |
| Number of people in household | 2060 | 3.52 | 1.26 | 1 | 12 |
| Education | | | | | |
| Primary or less | 17 | 0.01 | 0.09 | 0 | 1 |
| Secondary | 1035 | 0.5 | 0.5 | 0 | 1 |
| Tertiary | 945 | 0.46 | 0.5 | 0 | 1 |
| PhD or post-grad | 63 | 0.03 | 0.17 | 0 | 1 |
| Occupation | | | | | |
| Self-employed | 42 | 0.02 | 0.14 | 0 | 1 |
| Manager | 44 | 0.02 | 0.14 | 0 | 1 |
| Professional | 616 | 0.3 | 0.46 | 0 | 1 |
| Technician/clerk | 373 | 0.18 | 0.39 | 0 | 1 |
| Worker | 508 | 0.25 | 0.43 | 0 | 1 |
| Retired | 180 | 0.09 | 0.28 | 0 | 1 |
| Student | 180 | 0.09 | 0.28 | 0 | 1 |
| Unemployed | 103 | 0.05 | 0.22 | 0 | 1 |
| Other | 14 | 0.01 | 0.08 | 0 | 1 |
| Place or residence size | | | | | |
| 10,000 or less | 279 | 0.14 | 0.34 | 0 | 1 |
| 10,001–50,000 | 731 | 0.35 | 0.48 | 0 | 1 |
| 50,001–100,000 | 311 | 0.15 | 0.36 | 0 | 1 |
| More than 100,000 | 739 | 0.36 | 0.48 | 0 | 1 |

Table 2 (continued). Descriptive statistics of variables used in model

| Variable | N | Mean | St. Dev. | Min | Max |
|---|---|---|---|---|---|
| Personality traits | | | | | |
| Extraversion | 2060 | 3.92 | 0.87 | 1 | 5 |
| Agreeableness | 2060 | 3.96 | 0.70 | 1 | 5 |
| Conscientiousness | 2060 | 4.09 | 0.84 | 1 | 5 |
| Neuroticism | 2060 | 2.47 | 0.96 | 1 | 5 |
| Openness | 2060 | 2.87 | 0.86 | 1 | 5 |
| Previous experience with online privacy | 2060 | 0.18 | 0.38 | 0 | 1 |
| Trust in institutions | 2060 | 2.75 | 0.94 | 1 | 5 |
| Time spent actively online | 2060 | 3.22 | 2.87 | 0.5 | 24 |
| Privacy awareness | 2060 | 3.92 | 0.64 | 1.4 | 5 |
| Computer anxiety | 2060 | 2.94 | 1.06 | 1 | 5 |

# OLS results

Table 3. OLS results

| | Version 1 | | Version 2 | | Version 3 | |
|---|---|---|---|---|---|---|
| Extraversion | -0.029 | -0.02 | -0.031 | -0.02 | -0.038* | -0.02 |
| Agreeableness | -0.03 | -0.021 | -0.029 | -0.021 | -0.024 | -0.021 |
| Conscientiousness | 0.03 | -0.02 | 0.024 | -0.021 | 0.017 | -0.021 |
| Neuroticism | 0.032 | -0.02 | 0.037* | -0.02 | 0.033* | -0.02 |
| Openness | -0.02 | -0.019 | -0.02 | -0.02 | -0.022 | -0.02 |
| Privacy awareness | 0.212*** | -0.02 | 0.208*** | -0.02 | 0.204*** | -0.02 |
| Computer anxiety | 0.440*** | -0.019 | 0.434*** | -0.02 | 0.423*** | -0.02 |
| Male | | | -0.013 | -0.039 | -0.014 | -0.039 |
| Age | | | 0.001 | -0.002 | 0.001 | -0.002 |
| Household | | | 0.019 | -0.015 | 0.021 | -0.015 |
| Education effect (benchmark is primary education) | | | No effect | | | |
| Occupation effect (benchmark is self-employed) | | | No effect | | | |
| Size of place of residence effect (benchmark is less than 10,000) | | | No effect | | | |
| Previous online experience | | | | | 0.267*** | -0.051 |
| Trust in institutions | | | | | -0.021 | -0.02 |
| Time | | | | | -0.002 | -0.007 |
| $N$ | 2,060 | | 2,060 | | 2,060 | |
| Adj. $R^2$ | 0.2592 | | 0.259 | | 0.2689 | |

# Ordered probit results

Table 4. Ordered probit results

| | Outcome 1 | Outcome 2 | Outcome 3 | Outcome 4 | Outcome 5 |
|---|---|---|---|---|---|
| Extraversion | 0.001 | 0.007* | 0.009* | -0.006* | -0.011* |
| Agreeableness | 0.001 | 0.001 | 0.001 | -0.002 | -0.001 |
| Conscientiousness | 0.001 | -0.005 | -0.006 | 0.004 | 0.008 |
| Neuroticism | -0.001* | -0.008* | -0.010* | 0.006* | 0.012* |
| Openness | 0.001 | 0.006 | 0.008 | -0.005 | -0.009 |
| Privacy awareness | -0.003*** | -0.040*** | -0.051*** | 0.032*** | 0.063*** |
| Computer anxiety | -0.007*** | -0.083*** | -0.106*** | 0.065*** | 0.129*** |
| Male | 0.001 | 0.003 | 0.004 | -0.003 | -0.005 |
| Age | 0.001 | 0.001 | 0.001 | 0.001 | -0.001 |
| Household | 0.001 | 0.001 | 0.001 | -0.001 | -0.002 |
| Education level (primary benchmark) | | | | | |
| Secondary | 0.004*** | 0.072*** | 0.158*** | 0.005 | -0.239** |
| Tertiary | 0.005*** | 0.082*** | 0.170*** | -0.003 | -0.254** |
| Post-grad | 0.004* | 0.074*** | 0.161** | 0.004 | -0.243** |
| Occupation (self-employed benchmark) | No effect | | | | |
| Settlement size (10,000 or less benchmark) | No effect | | | | |
| Previous online experience | -0.004*** | -0.052*** | -0.067*** | 0.041*** | 0.082*** |
| Trust in institutions | 0.001** | 0.010** | 0.013** | -0.008** | -0.016** |
| Time | 0 | 0.001 | 0.002 | -0.001 | -0.002 |
| *N* | 2060 | 2060 | 2060 | 2060 | 2060 |

# Results - summary

- The model was tested with OLS and Ordered Probit Estimation
- Only Extraversion and Neuroticism showed to be of statistical significance
- All other social-psychological factors (privacy awareness, computer anxiety, trust in institutions and previous online privacy breach experience) showed to be of statistical significance
- Computer anxiety has the strongest (positive) impact to online privacy concern
- Socio-demographic factors all insignificant

# Conclusion

- The analysis indicates that an average Internet user in Croatia is concerned about privacy when online, and that the Croatian Internet population is very conscientious, agreeable and extraverted
- Positive effect of **conscientiousness** on OPC was not significant
- Although **openness** has been assumed and confirmed in previous studies to be positively related to privacy concern, this was not confirmed in this research
- The ambiguous effect of **agreeableness** has not been resolved either way in this empirical study
- Opposite to previous findings of Junglas et al. (2008), **neuroticism** and **extraversion** came up significant in explaining an individual's OPC

# Suggestions and further challenges

- Getting more in-depth insight into the personality of Internet users in the context of their OPC might be useful in designing marketing strategies and consumer-oriented business policies
- Caution in interpreting results based on shortened Big Five model
- Survey was conducted on only one country's Internet user population - potential for extending the research to other nations by using the same methodology and survey instrument
- Another line of future research is to test the extended model of online privacy concern with the consequences of online privacy concern included in the model

# Thank you for your attention!

We would appreciate any questions/comments!

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

bskrinjaric@eizg.hr
jbudak@eizg.hr
mateo.zokalj@intercapital.hr

*This work has been fully supported by Croatian Science Foundation under the project 7913.*

The Institute of Economics, Zagreb

PRIvacy CONcern

hrzz Croatian Science Foundation