



Open Materials Discourse: Re-Evaluating Internet Users' Information Privacy Concerns: The Case in Japan

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Abstract:

This paper provides the survey materials used to collect the data for the conceptual replication of the Internet Users' Information Privacy Concerns (IUIPC) model by Malhotra et al. (2004). The replication paper (Pape et al., 2020) used awareness, collection and control as constructs for the second order construct of IUIPC, as well as risk and trusting beliefs from the original paper. Instead of intended behavior the self-developed construct of willingness to share was used. Altogether more than 9,000 data points were collected. This paper provides additional materials and details on the participants, and the Japanese survey questions along with an English version for readers who are unfamiliar with Japanese. We hope that the additional information and in particular the Japanese questions provide some background on our study which will allow others a better understanding of our research and to make use of the questions themselves.

Keywords: privacy concerns, IUIPC, Japan, IUIPC replication study, materials, translation, internet users' information privacy concerns

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1 Procedure

The online survey was conducted via web forms in 2015 in Japan with the help of the market research institute “Macromill Group”¹, The respondents were selected with no bias towards location, marital status, or number of children. Gender and age were balanced in the dataset. Each combination of gender (male, female) and age group (20s, 30s, 40s, 50s, over 60) was represented by 10%.

The survey was part of a larger study, where participants also reported about their willingness to share certain data types for a certain purpose (cf. Nakamura et al. (2016)). However, we only report the relevant questions for our study and omit other questions.

2 Participants

After removing incomplete survey responses, we ended up with 9,287 respondents. The Japanese participants were still balanced in terms of gender, with 50.53% males. The median of the yearly personal income of the participants was between 2 and 4 million Yen (approximately between 16,500 and 33,000 Euro) in our survey, with an inter-quartile range of 2 to 3 million Yen. With respect to education in our sample 41.96% of our respondents hold at least a Bachelor's degree. Regarding the used devices, 53.5% of the participants used a smartphone (30.0% Android, 23.5% iPhone) to answer the survey.

3 Questionnaire Items

All questions were only asked in Japanese. However, for better comprehensibility we first give the English version and then provide the Japanese translation. Items are split between demographic items and the items from the original paper on “Internet Users Information Privacy Concerns” (IUIPC) (Malhotra et al., 2004).

3.1 Demographic Items

Demographic items cover gender, age and income with the scales presented below.

Demographics (English)

- Your gender: [GEN] male female
- Your age: [AGE] _____
- What is your current highest educational level? [EDU]
- Did not complete High School High School/GED
- Some College Bachelor's Degree
- Master's Degree Advanced Graduate work or Ph.D.

Demographics (Japanese)

- 性別: [GEN] 男性 女性
- 年齢: [AGE] _____
- 最終学歴: [EDU]
- 高校を卒業していない 高校
- 短大 大学 学部
- 大学院 修士課程 大学院 博士課程

¹ <https://group.macromill.com>

3.2 IUIPC Items

Items for the constructs Awareness, Collection, Control, Risk beliefs and Trusting beliefs are taken from Malhotra et al. (2004, pp. 351-352). The items below were answered on a Likert-type scale ranging from 1 - "strongly disagree" (Japanese: 全く思わない) to 7 - "strongly agree" (Japanese: 強く思う).

Awareness (English)

- Companies seeking information online should disclose the way the data are collected, processed, and used. [IUIPC_AWR_01]
- A good consumer online privacy policy should have a clear and conspicuous disclosure. [IUIPC_AWR_02]
- It is very important to me that I am aware and knowledgeable about how my personal information will be used. [IUIPC_AWR_03]

Awareness (Japanese)

- オンラインで情報を集める企業は、データがどのように収集、処理、使用されるかを公開するべきである。 [IUIPC_AWR_01]
- 優れた消費者オンラインプライバシーポリシーでは、はっきりと、かつ明確に情報が開示されるべきである。 [IUIPC_AWR_02]
- 自分の個人情報がどのように利用されるかについて認知することは、非常に重要なことである。 [IUIPC_AWR_03]

Collection (English)

- It usually bothers me when online companies ask me for personal information. [IUIPC_COLL_01]
- When online companies ask me for personal information, I sometimes think twice before providing it. [IUIPC_COLL_02]
- It bothers me to give personal information to so many online companies. [IUIPC_COLL_03]
- I'm concerned that online companies are collecting too much personal information about me. [IUIPC_COLL_04]

Collection (Japanese)

- オンライン企業に個人情報入力を求められることは不快である。 [IUIPC_COLL_01]
- オンライン企業に個人情報を求められたとき、時々、情報を提供する前にじっくり考えることがある。 [IUIPC_COLL_02]
- オンラインで多くの企業に個人情報を提供することに不安を感じる。 [IUIPC_COLL_03]
- オンライン企業が自分の情報をあまりにも多く得ているのではないかと心配になる。 [IUIPC_COLL_04]

Control (English)

- Consumer online privacy is really a matter of consumers' right to exercise control and autonomy over decisions about how their information is collected, used, and shared. [IUIPC_CTRL_01]
- Consumer control of personal information lies at the heart of consumer privacy. [IUIPC_CTRL_02]
- I believe that online privacy is invaded when control is lost or unwillingly reduced as a result of a marketing transaction. [IUIPC_CTRL_03]

Control (Japanese)

- 消費者オンラインプライバシーとは消費者自身の情報がどのように収集され使用され、そして共有されるかについての決定を制御及び自治する権利のことである。 [IUIPC_CTRL_01]

- 消費者による個人情報のコントロールは、消費者プライバシーの核心である。 [IUIPC_CTRL_02]
- マーケティングのためのデータのやりとりの結果、個人情報のコントロールができなくなったり、低下したりしたときに、オンラインプライバシーが侵害されていると思う。 [IUIPC_CTRL_03]

Risk beliefs (English)

- In general, it would be risky to give (the information) to online companies. [IUIPC_RSK_01]
- There would be high potential for loss associated with giving (the information) to online firms. [IUIPC_RSK_02]
- There would be too much uncertainty associated with giving (the information) to online firms. [IUIPC_RSK_03]
- Providing online firms with (the information) would involve many unexpected problems. [IUIPC_RSK_04]
- I would feel safe giving (the information) to online companies. [IUIPC_RSK_05]

Risk beliefs (Japanese)

- たいていの場合、オンライン企業に個人情報を提供することは危険である。 [IUIPC_RSK_01]
- オンライン企業に情報を提供した場合、自分が損する可能性は非常に高い。 [IUIPC_RSK_02]
- オンライン企業に情報を提供した場合、不安要素が多すぎる。 [IUIPC_RSK_03]
- オンライン企業に情報を提供した場合、多くの予期しない問題が起こる可能性がある。 [IUIPC_RSK_04]
- オンライン企業に個人情報を提供することは安全だと思う。 [IUIPC_RSK_05]

Trusting beliefs (English)

- Online companies would be trustworthy in handling (the information). [IUIPC_TRST_01]
- Online companies would tell the truth and fulfil promises related to (the information) provided by me. [IUIPC_TRST_02]
- I trust that online companies would keep my best interests in mind when dealing with (the information). [IUIPC_TRST_03]
- Online companies are in general predictable and consistent regarding the usage of (the information). [IUIPC_TRST_04]
- Online companies are always honest with customers when it comes to using (the information) that I would provide. [IUIPC_TRST_05]

Trusting beliefs (Japanese)

- 情報の取り扱いに関して、オンライン企業を信頼できる。 [IUIPC_TRST_01]
- 私が提供した情報に関して、オンライン企業は真実を述べ、規約を守ってくれるだろう。 [IUIPC_TRST_02]
- 個人情報を扱う際、オンライン企業は私にとって不益なことはしないと信じている。 [IUIPC_TRST_03]
- 大概、オンライン企業の個人情報の利用法は一貫しており、予想可能である。 [IUIPC_TRST_04]
- 顧客が提供する情報の利用について、オンライン企業は常に正直である。 [IUIPC_TRST_05]

Willingness to share (English)

- If I see a benefit for myself, I am in general willing to share personal information with online companies. [WILL_BNF_ME]

- I am in general willing to share personal information with online companies. [WILL_BNF_OTHER]
- I'm in general willing to share personal information with online companies, if I see a benefit for them. [WILL_BNF_COMP]

Willingness to share (Japanese)

- もし私に利益があると感じたならば、オンライン上の企業とパーソナル情報を共有してもよい。 [WILL_BNF_ME]
- もし他の人たちに利益があると感じたならば、オンライン上の企業とパーソナル情報を共有してもよい。 [WILL_BNF_OTHER]
- もしオンライン上の企業に利益があると感じたならば、その企業とパーソナル情報を共有してもよい。 [WILL_BNF_COMP]

4 References

- Malhotra, N. K., Kim, S. S., & Agarwal, J. (2004). Internet Users' Information Privacy Concerns (IUIPC): The Construct, the Scale, and a Causal Model. *Information Systems Research*, 15(4), 336–355.
- Pape, S., Ivan, A., Harborth, D., Nakamura, T., Kiyomoto, S., Takasaki, H. & Rannenber, K. (2020). Re-evaluating Internet Users' Information Privacy Concerns: The Case in Japan. *AIS Transactions on Replication Research*, 6, Paper 18, 1-18.
- Nakamura, T., Kiyomoto, S., Tesfay, W. B., & Serna, J. (2016): Easing the burden of setting privacy preferences: A machine learning approach. Paper presented at the *International Conference on Information Systems Security and Privacy*.

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Sebastian Pape is a senior researcher working at the Chair of Mobile Business & Multilateral Security at Goethe University Frankfurt. He successfully completed diplomas in mathematics (Dipl.-Math.) and computer science (Dipl.-Inform.) at Darmstadt University of Technology and holds a doctoral degree (Dr. rer. nat.) from the University of Kassel. From 2005 to 2011, he worked as research and teaching assistant at the Database Group (lead by Prof. Dr. Lutz Wegner) at the University of Kassel. From 2011 to 2015, he was a senior researcher and teaching assistant at the Software Engineering for Critical Systems Group (lead by Prof. Dr. Jan Jürjens) at TU Dortmund University. From October 2014 to January 2015, he was a visiting researcher (of Prof. Dr. Fabio Massacci) at the security group at the University of Trento. From October 2018 to August 2019 he was standing in as a professor for business informatics at Regensburg University.

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David Harborth works at the Chair of Mobile Business & Multilateral Security at Goethe University Frankfurt am Main as a research assistant and PhD student since 2015. His major area of research deals with the socio-economic and technical issues of Augmented Reality (AR) as well as privacy-enhancing technologies and the related human aspects. He published his research in outlets like the International Conference on Information Systems, IEEE International Symposium on Mixed and Augmented Reality, Proceedings on Privacy Enhancing Technologies Symposium or Behaviour & Information Technology.

Toru Nakamura was born in 1983. He received the B.E., M.E., and Ph.D degree from Kyushu University, in 2006, 2008, and 2011, respectively. In 2011, he joined KDDI and in the same year he moved to KDDI R&D Laboratories, Inc. (currently renamed KDDI Research, Inc.). In 2018, he moved to Advanced Telecommunications Research Institute International(ATR). Since 2020, he is a researcher in KDDI Research, Inc. again. He received CSS2016 SPT Best Paper Award. His current research interests include security, privacy, and trust, especially privacy enhanced technology and analysis of privacy attitudes. He is a member of IEICE and IPSJ.

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Haruo Takasaki received the Bachelor of Laws from Tohoku University, Sendai, Japan, in 1980, and Ph.D. degrees in economics from Kyushu University, Fukuoka, Japan in 2018. In 1980, he joined Kokusai Denshin Denwa (KDD, later changed to KDDI) and has a lot of experience in the field of telecommunication. He has moved to KDDI Research Institute in 2005. Since then, he has researched in the field of privacy regulation and economics of privacy. He was certified as Privacy Design Ambassador from Privacy Commissioner of Ontario, Canada, in 2014.

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