

Poster: Why Privacy is All But Forgotten

An Empirical Study of Privacy & Sharing Attitude

Kovila P.L. Coopamootoo and Thomas Groß
School of Computing Science
Newcastle University
Email: firstname.lastname@newcastle.ac.uk

Abstract—The *privacy paradox*, that users’ stated privacy attitude do not match their behavior, is a well known phenomenon in research. While privacy attitude and behavior are often measured via a number of concepts related to privacy, the question arises whether privacy and sharing, for example, are in fact two different cognitive and affective constructs for the human.

This study with 60 participants is the first to investigate how privacy and sharing attitude differ. Two groups of 30 participants each were asked to describe in a 250-word free-form response what [privacy/sharing] online means for them. Responses were coded in quantitative content analysis. We found that privacy and sharing attitude differ significantly across a number of codes and that participants in privacy attitude are significantly more likely to express fear while those in sharing attitude are significantly more likely to express happiness.

I. INTRODUCTION

Privacy and sharing are believed to share a dynamic and dialectical tension, where individuals have competing needs to be both open and closed in contact with others [1]. In *privacy paradox* research, where we find that users’ stated privacy attitude do not match their behavior [2], [3], attitude is often compared with behavior via a number of concepts related to privacy. In psychology, it is known that attitudes are multidimensional constructs with cognitive and affective components [4].

The question arises whether the observed paradox is due to contradictory cognitive and affective components of privacy and sharing attitude. We conducted an empirical study to investigate the difference between privacy attitude and sharing attitude. A US sample of $N = 60$ Amazon Mechanical Turk (MTurk) workers was assigned to two groups and asked to describe in a 250-word free-form response what [privacy/sharing] online means for them. Responses were coded in quantitative content analysis.

We found that privacy and sharing attitude differ significantly across 15 out of 54 of the extracted codes, as shown in Table I. Participants in privacy attitude (PA) were significantly more likely to express fear and significantly less likely to express happiness. For sharing attitude (SA) the reverse is true. We found good discrimination between PA and SA with both coded emotion and tone analysis of participant responses. The observed differences contribute an understanding of user states in privacy (and sharing) situations online and has implications for both privacy research and practice.

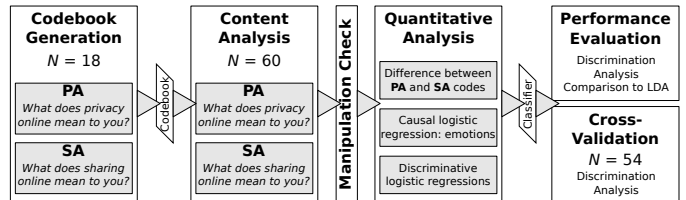


Figure 1. Experiment structure with privacy/sharing as manipulation.

II. METHOD

A. Codebook Generation

We ran a pretest and created a codebook a priori. After refinement of the codebook and coder training, we gained a set of six categories and a total of 52 codes. The categories elicited for content analysis were the participant referring to: (a) himself (SEL), (b) who others are in specific (SPE), (c) his emotions or moods (EMO), (d) others’ activities (ACO), (e) his own activities (ACS), (f) data or information (DAT).

B. Main Study

A sample of $N = 60$ MTurk workers from the US population were evenly assigned to two groups. The mean age was 38.02 years ($SD = 11.236$), 22 female and 38 male. We depict the core procedure in Figure 1.

III. RESULTS

A. Inter-Rater Reliability

The mean response unit size was 264.33 words ($SD = 17.524$), with 30 units for each for privacy and sharing. We evaluate inter-rater reliability via %-agreement and Cohen κ on 50 units across the 52 codes. We find that the coders were on agreement 88.2% of the time. There was a substantial agreement between the two coders’ judgment, $\kappa = .666$, 95% CI [.630, .670], $p < .001$.

B. Quantitative Differences

We ran a t -test on the frequency of each of codes across the two conditions. We summarize the frequency results between the IVs PA and SA across 52 codes showing significance in Table I.

Table 1
COMPONENT DIFFERENCES BETWEEN PA & SA, RESTRICTED TO
SIGNIFICANCE LEVEL $\alpha = .01$

Code	p	
Participant Views Others In Specific As		
8 SPE04-other users	< .001	***†
9 SPE05-other org./business	.003	**
Finer Details of SPE04 & SPE05		
53 SPE04-close connections	.009	**
54 SPE04-certain people	< .001	***†
56 SPE05-business/company in general	< .001	***†
58 SPE04-05-adversaries	.006	**
59 SPE04-05-connection-acquaintances-friends	< .001	***†
Participant's Emotions		
11 EMO02-fear/worry/concern	.005	**
13 EMO04-happy/pleased/fun/joy	< .001	***†
16 EMO07-life improvement	.005	**
Participant's View of Others' Activities		
18 ACO01-gain access/hack/track	< .001	***†
19 ACO02-target with adverts/advertise data	.005	**
21 ACO04-reveal to 3rd party/profit on/leak	.002	**
30 ACO13-other negative actions	< .001	***†
Participant's Reference to Data/Information		
49 DAT07-content uploaded or created online	< .001	***†

Differences marked with a dagger † are statistically significant under Bonferroni correction, with $\alpha_B = .00096$.

C. Causal Analysis

How does the induced PA and SA cause a difference in the likelihood of fear and happiness? The condition PA vs. SA predicted the occurrence of fear, $\chi^2(2, 60) = 10.116, p = .001$. A transition from PA to SA made participants 1/10th as likely to express fear, $p = .007, \exp(B) = 0.107$.

The condition PA vs. SA predicted the occurrence of happiness, $\chi^2(2, 60) = 13.079, p < .001$. A participant in the sharing condition SA was more than eight times as likely to express happiness than a participant in the privacy condition PA, $p = .001, \exp(B) = 8.5$.

D. Discriminative Analysis

1) *Coded Emotions*: Given the observed codes on emotions, what is the likelihood that the attitude would be a privacy attitude PA or a sharing attitude SA? A logistic regression model was able to distinguish participants in PA versus participants in SA with statistical significance, $\chi^2(2, 60) = 21.447, p < .001$. Figure 2 shows the regression surface for both predictors combined. We also obtained a significant model with emotional tone extracted with IBM's *Tone Analyzer*.

2) *Adversaries vs. Close Connections*: Given the observed codes on adversaries and close connections, what is the likelihood that the attitude would be a PA or a SA? Again a logistic regression model was statistically significant, $\chi^2(2, 60) = 10.985, p = .004$.

The model based on coded parties, coded emotion and tone analysis gave fair to excellent discrimination respectively. We cross-validated the tone analysis model on another dataset, giving excellent discrimination of 93% AUC.

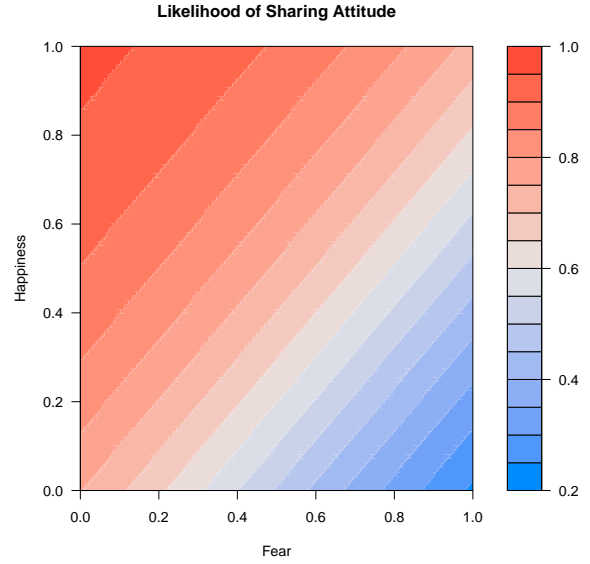


Figure 2. Likelihood to be in sharing or privacy attitude depending on fear and happiness.

IV. DISCUSSION

Given the significant differences observed, when studies compare privacy attitude and sharing behavior in any form, we expect to see a dichotomy readily explained by the difference between the underlying attitudes. This observation extends to real-world scenarios. When users consider their attitude to privacy, think about how adversaries might harm them, feel fear and worry, users are more likely to endorse privacy. When the very same users are sharing, communicating with close connections and friends, feeling happiness and joy, they are less likely to follow through with their privacy attitude.

V. CONCLUSION

This study is the first to empirically investigate the difference between privacy attitude and sharing attitude. The conflicting concepts between these attitudes indicate that it may be challenging for users to follow through on both attitudes at the same time.

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