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COMPUTING

Title: A Codebook for Extracting Privacy & Sharing
Attitude

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A Codebook for Extracting Privacy & Sharing Attitude

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Abstract: Background. Scholars mostly agree that an attitude involves a positive or negative evaluation of a particular entity [2, 3, 4, 5], where the attitude object includes anything the person holds in mind. Evaluations can be expressed via thoughts, feelings, intentions to behave and behavior. Together with cognitive responses (individuals' belief and knowledge about an attitude object) and affective responses (individuals' feelings and emotions about an attitude object), behavioral responses (the way the attitude influences how individuals act or behave) form the three main classes of responses [6]. So far, privacy literature has not had a codebook for extracting privacy or sharing attitude dimensions from individuals' free form text. Aim. To provide a codebook for extracting privacy and sharing attitudes from free-form text.

Method. Amazon Mechanical Turk participants were queried with "What does [privacy/sharing] online mean to you?" and asked to provide a response within 250-words.

First, an initial codebook was created from a sample of $N = 18$. We facilitated a conventional line-by-line coding of all response units, where each unit was independently coded by two coders. We obtained an initial codebook with a set of 43 concepts that are grouped across 7 categories.

Second, the initial codebook was refined in several runs with 2 trained coders into 6 categories and a total of 52 codes (Table 1, plus "Other" codes later refined into 29 finer codes (Table 2). We report on the detailed procedure and the full study in Coopamootoo & Groß [1]. The codebook was employed and inter-rater reliability computed, as reported in our privacy versus sharing privacy attitude investigation [1].

Results. The categories produced in the codebook and 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). .

We evaluate inter-rater reliability via %-agreement and Cohen k 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, $k = .666$, 95% CI [.630, .670], $p < .001$. We provide further agreement results across each category in Coopamootoo & Groß [1].

Conclusions. This is a first codebook that enable extraction of cognitive, affective and behavioral dimensions of attitude, in particular designed for privacy and sharing. We believe that it can be employed on privacy-related free-form responses well beyond attitudes, such as to tease out user perceptions, emerging themes or mental models among others.

About the authors

Dr Kovila P.L. Coopamootoo is a Research Fellow in the Secure & Resilient Systems group and the Centre for Cyber Crime and Computer Security at Newcastle University.

Her two research strands are within (1) Usable Privacy and Security and (2) Evidence-Based Methods. She designs and runs lab and online studies, in particular to understand attitude and drivers of behaviour (including emotional states, efficacy, fatigue, stress and cognitive effort). This line of research targets supporting and empowering users towards privacy and optimum security. She employs scientific methodology for cyber-security and privacy and seeks to produce clear guidelines and tools for evaluating research quality.

Current Research: Cyber Security, Privacy and Evidence-based Methods for Security

- I'm a Tenured Reader in System Security (Associate Professor) at the Newcastle University. I'm the Director of the Centre for Cybercrime and Computer Security (CCCS), a UK Academic Centre of Excellence in Cyber Security Research (ACE-CSR). I'm a member of the Secure and Resilient Systems group and the Centre for Software Reliability (CSR).

Suggested keywords

privacy, sharing, codebook, content analysis, attitude

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Aim. To provide a codebook for extracting privacy and sharing attitudes from free-form text.

Method. Amazon Mechanical Turk participants were queried with “*What does [privacy/sharing] online mean to you?*” and asked to provide a response within 250-words.

First, an initial codebook was created from a sample of $N = 18$. We facilitated a *conventional line-by-line* coding of all response units, where each unit was independently coded by two coders. We obtained an initial codebook with a set of 43 concepts that are grouped across 7 categories.

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Table 1: The 52 codes in the final codebook.

Code	Content	Code	Content	Code	Content
How Participant Views Himself		Participant's Emotions		Data/Information	
SEL01	as a customer	EMO01	annoyed, irritated, angry	DAT01	contact info, real name, phone # or addr.
SEL02	as a profile/online account	EMO02	fear, concern, worry or vulnerable, helpless	DAT02	online account, online identity
SEL03	as a customer and an online profile	EMO03	trust or hope	DAT03	bank accounts, cards or PIN
SEL04	other descriptions	EMO04	happy, pleased, good or that it's fun, enjoyable	DAT04	location data or geographic data
How Participant Views Others		EMO05	a sense of connection with others	DAT05	habits, hobbies or preferences
SPE01	website or service providers in general	EMO06	benevolent	DAT06	items purchased
SPE02	ad agencies and marketing firms	EMO07	an improvement in his life, value to life	DAT07	things uploaded: picture, thoughts
SPE03	specific businesses including Google or Facebook	EMO08	other moods or emotions	DAT08	online behavior, actions he does online
SPE04	other users	Participant's Own Activities		DAT09	health data
SPE05	other organizations or businesses	ACS01	makes, follows friends, networks, stays in touch	DAT10	other types of data
Participant's View of Others' Activities		ACS02	creates or contributes content		
ACO01	gain access, hack, track, collect participants' data	ACS03	researches, reviews, learns, read news		
ACO02	target participant with adverts	ACS04	offers help or support to others		
ACO03	others can steal or commit fraud	ACS05	makes purchases		
ACO04	reveal data to third party	ACS06	visits questionable, adult sites or content		
ACO05	collect financial data	ACS07	works online		
ACO06	put technical safeguards in place	ACS08	sets or has a password to protect information or account		
ACO07	notify or warn participant	ACS09	creates/has a fake profile, hides or conceals information		
ACO08	have laws to punish others	ACS10	opts out to providing information or being contacted		
ACO09	others share data/info with participant	ACS11	gives consent to others		
ACO10	others judge participant	ACS12	other actions		
ACO11	any other neutral actions of others				
ACO12	any other positive actions of others				
ACO13	any other negative actions of others				

Table 2: The finer codes derived from the 'other' codes defined in the codebook.

Code-Content	Code-Content	Code-Content	Code-Content
How Participant Views Others		Participant's view of Others' Activities	
SPE04.1-close-connections	ACO13.1-passive-threats	Data/Information	
SPE04.2-certain-people	ACO13.2-active-threats	DAT10.1-personal-identifiable-info	How Participant Views Himself
SPE05.1-businesses/company in general	ACO13.3-others'-problems	DAT10.2-specific-content	SEL04.1-victim
SPE05.2-institutions	ACO13.4-support	DAT10.3-malicious-data	SEL04.2-the-product
SPE05.3-specific-names		DAT10.4-my-information	SEL04.3-the-email
SPE05.4-on/offline-SP	Participant's Emotions		SEL04.4-criminal
SPE05.5-technology-tools	EMO08.1-Satisfaction	DAT10.5-meta-data-profiling	SEL04.5-sharer
SPE04-05.1-adversaries	EMO08.2-Indifference		SEL04.6-miserable-angry-loser
SPE04-05.2-connection-acquaintainces-friends	EMO08.3-Jealousy		SEL04.7-online-avatar
SPE04-05.3-anyone-on/offline			

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CodeBook

This codebook contains 1. Instructions to code transcripts, 2. a series of categories and codes.

Instructions

Part A. Read each sentence of the provided transcripts and identify the codes described below.

Identify codes that participants refer directly to. This is explicit for all categories except EMO.

Highlight the section in the text where you can find the codes. Write the codes in the right margin.

Notes

- A code may appear more than once in a transcript.
 - o If it appears more than once, please highlight the code for each occurrence.
- A code may appear more than once in 1 sentence.
 - o If it appears more than once, please highlight the code for each occurrence.
- A code may not appear at all in a transcript.
- More than one code from a category can be present in a transcript.
- A code may be directly identified if it has the exact description as the codebook.
- A code may refer the description of the code book, according to your own interpretation.

Categories and Codes

This code book is divided into a series of categories. The participant refers to ..

#	Category	Description
1	SEL	himself
2	SPE	who others are in specific
3	EMO	his emotions or moods
4	ACO	others' activities
5	ACS	his own activities
6	DAT	data or information

Part B. At the end of each transcript, rate the overall sentiment of the participant. The overall sentiment refers to either a positive, negative or neutral attitude.

Notes

- **Positive** if overall, the participant seems happy, joyful, delighted, excited or enthusiastic.
- **Positive** if overall the transcript seems more positive than negative (even if it has some negative)
- **Negative** if overall, the participant seems afraid, scared, nervous, angry, irritated, guilty, ashamed, sad or upset.
- **Negative** if overall the transcript seems more negative than positive (even if it has positive)
- **Neutral** if participant neither exhibits positive or negative attitude.
- **Neutral** if positive and negative sentiment seem to cancel each other out.

1 SEL: Participant talks of himself.

Inclusion criteria: Hint – participant says “I” or refers to “I”. The participant, himself is the subject.

Code	Description
SEL01	a customer
SEL02	a profile/online account
SEL03	as a customer and an online profile
SEL04	other descriptions – <i>note details please</i>

Exclusion criteria: missing view, reference or description of self

Typical exemplars: SEL01 – “...as a customer, I am...”; SEL02 - “...my online account is accessed..”

2 SPE: In particular, who are the others

Inclusion criteria: In particular, who are the others the participant refers to?

Code	Description
SPE01	website or service providers in general
SPE02	ad agencies and marketing firms
SPE03	specific businesses including Google, Facebook, Instagram or Pinterest
SPE04	other users – <i>note details please</i>
SPE05	other organisations or businesses -- <i>note details please</i>

Exclusion criteria: missing view, reference or description of others

Typical exemplars: SPE01 - “...doing business with a bank”

3 EMO: Participant’s feeling or mood

Inclusion criteria: Participants express, refer to or attribute certain emotions, mood or feeling to their actions. These can refer to actions in the present or past, refer to participants’ own actions or others’ actions.

For each code: read “participant is, feels, expresses or refer to) ...”

Note for coders: This category is an exception where you can infer what the participant is feeling. If you are inferring please add “(‘inferred)” next to the code you identify.

Code	Description
EMO01	annoyed, irritated, angry. Or participants claim it’s unjust, disturbing, difficult or hard.
EMO02	fear, concern, worry or vulnerable, helpless
EMO03	trust or hope
EMO04	happy, pleased, good or that it’s fun, enjoyable, great, nice
EMO05	a sense of connection with others
EMO06	benevolent (e.g. helping others)
EMO07	an improvement in his life, value to life
EMO08	other moods or emotions – <i>note details please</i>

Exclusion criteria: missing view, reference or description of feelings or moods

Typical exemplars: EMO02 – “I worry about my financial data..”

4 ACO: Others’ activities

Inclusion criteria: Participant expresses, refers to or describes actions already conducted by others or expected of them

Note for coders: others can be anyone else who is not the participant, e.g. users, people, business, organisation etc

Code	Description
ACO01	others can gain access, hack, track, collect, prey on participants’ data or watch or spy
ACO02	participant is targeted by adverts, others advertise participant’s data
ACO03	others can steal, commit fraud or other illegal action from data
ACO04	reveal data to third party, profit on, share or leak participants’ data
ACO05	collect financial data
ACO06	put technical safeguards in place such as encryption or others
ACO07	notify or warn participant
ACO08	have laws to punish others
ACO09	others share data/info with participant
ACO10	others judge participant
ACO11	any other actions of others

Exclusion criteria: missing view, reference or description of others’ activities

Typical exemplars: ACO01 - “hackers gain access to my personal data...”

5 ACS: Participant's activities

Inclusion criteria: Participant expresses, refers to or describes **his own** activities.

The subject of the action is the participant himself.

Code	Description
ACS01	makes, follows friends, networks, stays in touch, plays games or shares interest online or visits social network sites
ACS02	creates or contributes content: post likes, dislikes or post pictures or comment to posts
ACS03	researches, reviews, learns, read news or plans events or outings online
ACS04	offers help or support to others
ACS05	makes purchases
ACS06	visits questionable, adult sites or content
ACS07	works online
ACS08	sets or has a password to protect information or account
ACS09	creates/has a fake profile, hides or conceals information, or removes, identifiable information such as name
ACS10	opts out to providing information or being contacted
ACS11	gives consent to others
ACS12	other actions --- <i>note details please</i>

Exclusion criteria: missing view, reference or description of his own activities

Typical examplars: ACS05 - "I **purchase** groceries online..."

6 DAT: Participant refers to or mentions a type of data or information

Inclusion criteria: Participant expresses, refers to, mentions or describes data or information involved

Code	Description
DAT01	contact information, real name, phone number or address
DAT02	online account, online identity, username or password
DAT03	bank accounts, cards or PIN
DAT04	location data or geographic data
DAT05	habits, hobbies or preferences
DAT06	items purchased
DAT07	things he uploaded or created online (e.g. picture, thoughts, idea, facts, knowledge, speciality, opinions, insights)
DAT08	online behaviour, actions, what activity he does online or where he's been online
DAT09	health data
DAT10	other types of data --- <i>note details please</i>

Exclusion criteria: missing view, reference or description data or information type

Typical examplars: DAT08 - "...which **site I've visited**"