

Motives and Concerns of Dashcam Video Sharing

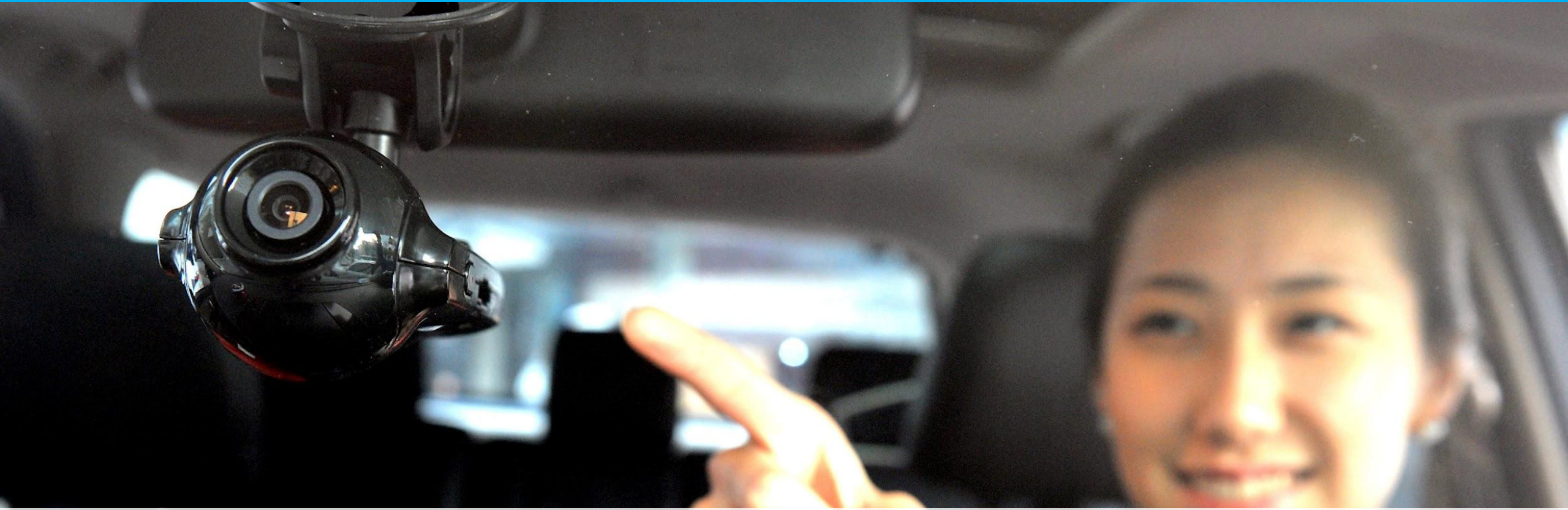
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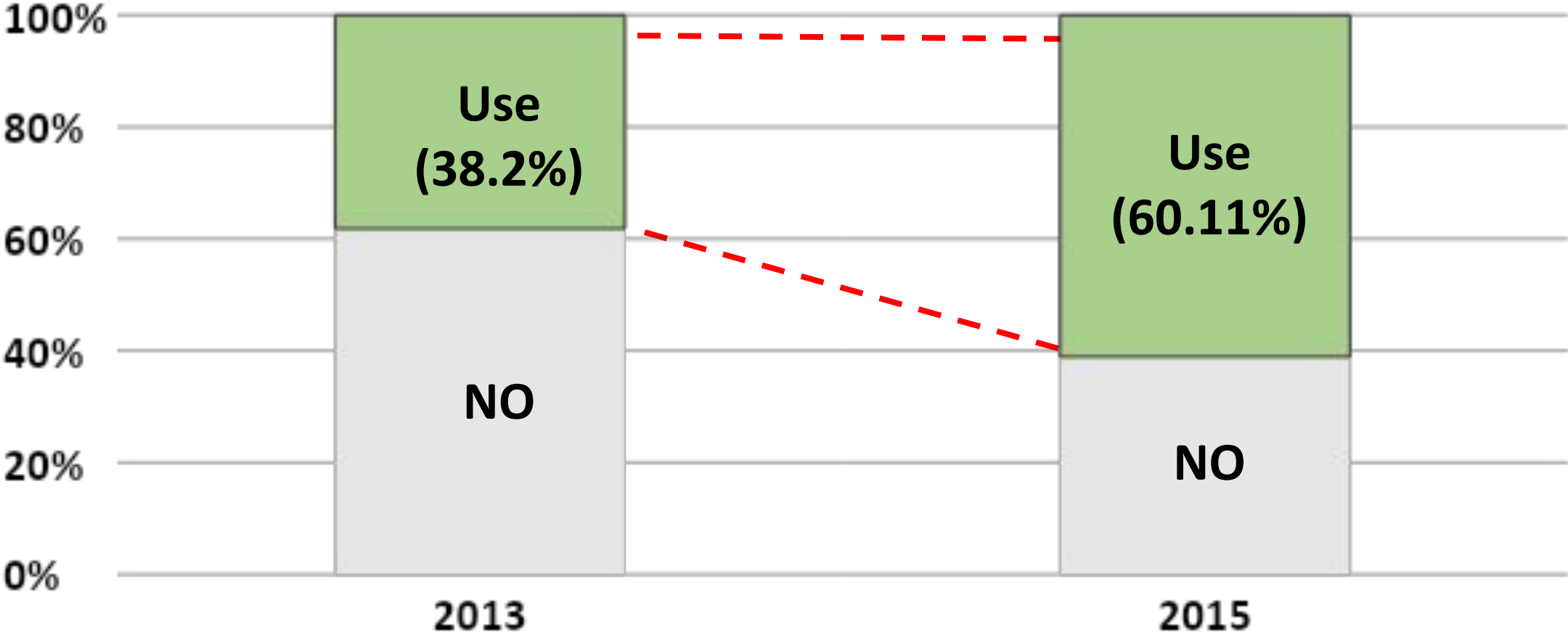
Dashcam Overview



Dashcam (Dashboard Camera, Blackbox):

An onboard camera that continuously records the view (through a vehicle's windscreen), audio, and GPS (optional)

Dashcam Popularity in Korea



[Top Rider. 2015. Research on Vehicle Blackbox]

<https://www.top-rider.com:447/news/articleView.html?idxno=19493>

Dashcam Overview | A common way to find witnesses



Looking for witnesses to a car accident!!

12 July, 2013. 21:10pm, Looking for someone who witnessed a car accident of a silver car and a black car at the crossroad in Pankyo-dong

Please contact to Bundang Police center **031-786-XXXX**

Dashcam Overview | An emerging way to find evidence

The screenshot shows the ARA website interface. At the top, there are navigation tabs for '모아보기', 'KAIST', 'TALK', 'SHARE', 'HOBBY', and 'ARA'. Below this is a 'MY INFO' section with '내 정보' and '비밀번호 수정'. The main content area is titled 'All Articles - All articles in ARA BBS!' and contains a table of articles with columns for '작성자', '게시판', '제목', '추천/조회', and '글쓴날짜'. The table lists various articles, including one about a car accident investigation and another about a car's performance.

The screenshot shows the Blackbox Club website. At the top, there is a banner for '블랙박스 동호회' (Blackbox Club) with a URL 'http://cafe.naver.com/blackboxclub'. Below the banner is a list of dashcam videos with columns for '제목', '작성자', '작성일', '조회', and '추이'. The list includes various videos, such as '영화 이벤트 - 베스트셀러 원작 <오베라는 남자> 시사회 이벤트' and '공통구매 - (주)아이핀텍 FHD+HD+WiFi 2채널 터치 LCD 블랙박스'. The website also features a '카메라 정보' section and a '카메라 글쓰기' button.

The screenshot shows the Bboardream website. At the top, there is a banner for '보배드림' (Bboardream) with a URL 'http://bboardream.com'. Below the banner is a list of dashcam videos with columns for '번호', '제목', '글쓴이', '등록일', '추천', and '조회'. The list includes various videos, such as '[20년 정비사의 양심고백] 두번째 이야기 (328)' and '★폭스바겐 -CC 도 작동 영상~지중내내~사건/동영상촬영 추가★ (242)'. The website also features a '자료실' section and a '게시판' section.

Dashcam video sharing via online communities

- University online community
- Car-related online community

Research Goal



To identify the key *motives* and *concerns* behind the sharing of dashcam videos (dashcam-based crowdsourcing)



Motivation for participation in online activities

- Motivations for crowdsourcing tasks [Kaufmann, 2011; Raban, 2008]
 - Intrinsic factors (e.g., enjoyment, feeling good, point)
 - extrinsic factors (e.g., monetary rewards)
- Motivations for knowledge sharing in social Q&A [Nam, 2009]
- Motivations for voluntary geographic mapping (OpenStreetMap)

[Budhathoki and Hathornthwaite, 2013]

Privacy concerns of personal information sharing

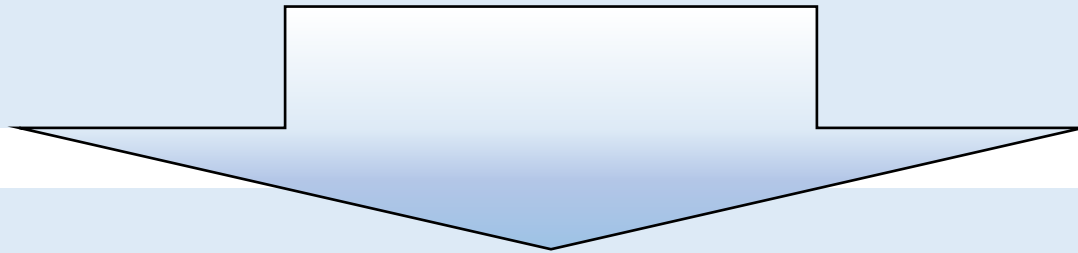
- Privacy sensitivity of various personal information types (in e-commerce environments) [Ackerman, 1999]
- Factors affecting willingness to disclose location information (who, why, what) [Consolvo, 2005]
- Organization's personal information management practice: collection, unauthorized secondary use, improper access, errors in personal data [Smith, 1996]

Privacy studies on pervasive surveillance (video/IoT devices)

- Information privacy concerns in video recording (e.g., CCTV) [Nguyen et al, 2011]
 - : Privacy concerns for data collection were lower than concerns for improper access and secondary use
- Privacy concerns with sensing & recording in a smart home [Choe et al, 2011]
 - : Types of privacy concerning activities in a private place
- Privacy concerns with wearable cameras (e.g., SenseCam, Google Glasses) [Nguyen et al., 2009]
 - : Privacy concerns are nuanced in relation to the major contextual factors
- Privacy concerns with vehicle-based sensing/recording [Sleeper et al, 2015]
 - : Affecting mental models of recording awareness due to mobility and coverage

STUDY 1: Open ended questions to understand dashcam usage

- Usage purpose of dashcam
- Sharing motives
- Sharing concerns



STUDY 2: Survey questionnaire based on the result of STUDY 1

- Respondents' motivations for participation
- Privacy attitudes and other related concerns

STUDY1: Online Survey (N=108)

In open ended questions we asked,

- Usage Purpose
 - *Why do you use dashcam?*
- Sharing motives
 - *What would you expect if you share your dashcam video?"*
- Sharing concerns
 - *What would you concern if you share your dashcam videos?*

Categorized all survey responses w/ affinity diagramming

Usage Purposes of Dashcam

-Major themes: to secure evidence for traffic-related accidents/incident (93.5%)

“ “ *Not only I can use dashcam footage as an evidence to accident, I can also feel sense of relief by installing dashcam.*

” ”

-Minor themes: insurance discount, etc.

“ “ *My Insurance companies offer a discount on insurance premiums for having a dashcam.*

” ”

Sharing Motive Themes

- To determine the truth and resolve unjust accusation
- To help other people
- To reciprocate
- To do right for public good and social justice
- To receive a monetary reward

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“ We need to help if there is someone who really need the dashcam video and sharing the video can solve his/her the unjust situation. ”

Sharing Motive Themes

- To determine the truth and resolve unjust accusation
- **To help other people**
- To reciprocate
- To do right for public good and social justice
- To receive a monetary reward

**“*If I can help other people by sharing my footage,
I am more than happy to share*”**

Sharing Motive Themes

- To determine the truth and resolve unjust accusation
- To help other people
- **To reciprocate**
- To do right for public good and social justice
- To receive a monetary reward

““ *I always try to help because I also can request dashcam video someday.* ””

Sharing Motive Themes

- To determine the truth and resolve unjust accusation
- To help other people
- To reciprocate
- **To do right for public good and social justice**
- To receive a monetary reward

“*I would share my dashcam video for social justice.*”

Sharing Motive Themes

- To determine the truth and resolve unjust accusation
- To help other people
- To reciprocate
- To do right for public good and social justice
- **To receive a monetary reward**

“*I would only share my dashcam footage if there is a financial reward.*”

Sharing Concern Themes

- Privacy Sensitivity
- Requester's Trustworthiness
- Data Management

Sharing Concern Themes

-Privacy Sensitivity

- Recorded audio
- Video content with traffic violation
- Bystander privacy
- Passenger identities
- Driving routes (GPS)
- Video content without traffic violation

“*If the footage I am about to share includes a phone call with my co-worker discussing a company’s confidential information, I might get in trouble for sharing.*”

Sharing Concern Themes

- Privacy Sensitivity

- Requester's Trustworthiness

- Police
- Accident involved party
- Insurance company

“ I am reluctant to share my dashcam footage with insurance companies since they would only care about making profit out of the situation. ”

Sharing Concern Themes

- Privacy Sensitivity
- Requester's Trustworthiness

-Data Management

- Non-disposal of shared data
- Identity exposure
- Misuse of shared videos
- Retaliation
- Misuse of shared locations

“ You never know if your shared footage was properly disposed or spread to other people, unless there are strict regulations. ”

STUDY2: Online Survey (N=373)

In a 7-point Likert-scale questionnaire,

- **Sharing motives**
 - 3 social justice items
 - 3 altruism items
 - 3 reciprocity items
 - 3 monetary reward items
- **Sharing concerns**
 - 6 privacy sensitivity items
 - 5 data management items
 - 3 trustworthiness items

The items were selected based on the explorative study (Study 1) and literature review results for statistical analysis

Sharing Motive Themes

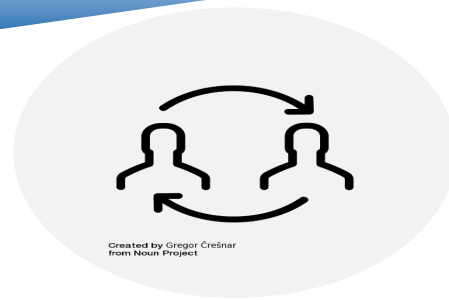
- To determine the truth and resolve unjust accusation
- To help other people
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- To receive a monetary reward



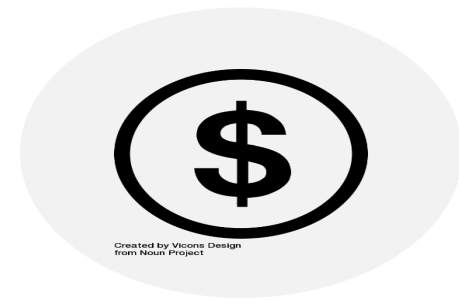
Social Justice



Altruism



Reciprocity



Monetary Reward

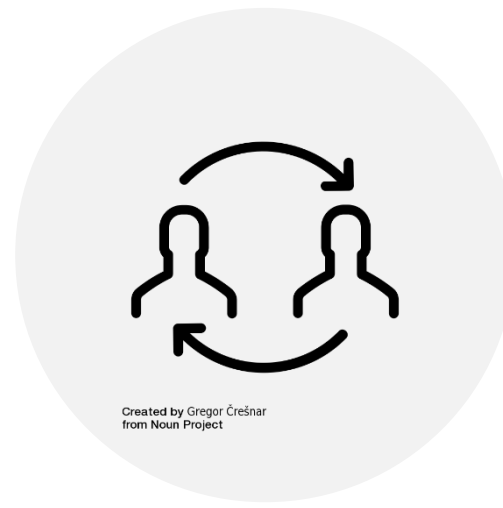
STUDY 2 – Method | Sharing Motives



Social Justice



Altruism



Reciprocity



Monetary

Reward

:The concept in which people are willing to risk their own welfare to ensure that others are treated fairly.

- I share my dashcam footages to achieve social justice.
- Sharing dashcam footages helps to achieve justice in society.
- If sharing my video footages can resolve an unjust accusation or a wrong treatment, I will actively help victims.

[Dean, 2009]

STUDY 2 – Method | Sharing Motives



Social Justice



Altruism



Reciprocity



Monetary

Reward

:A behavior performed without expecting any future reward and is

carried out mainly to benefit others

- I share dashcam footage with others who are in need of videos will use my contribution.
- It is important to help others by providing dashcam footage without expecting anything in return.
- I expect dashcam users to actively share dashcam footages without expecting anything in return.

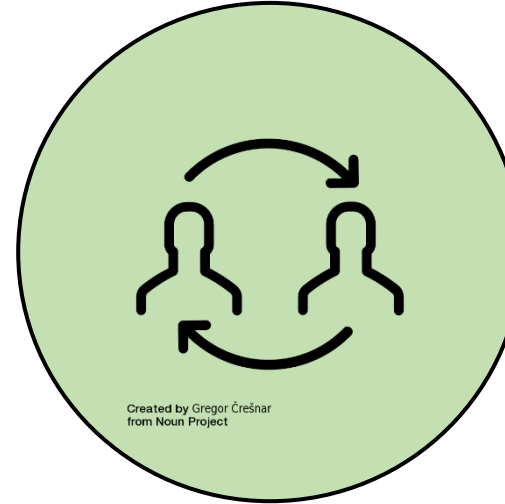
STUDY 2 – Method | Sharing Motives



Social Justice



Altruism



Reciprocity



Monetary

Reward

:Social rule that says people give back the kind of treatment they

have received from another

- I expect that if someone else's only fair for me to help them by sharing my dashcam footage.
- I will actively share my dashcam footages to help others, if I was helped by others dashcam footage.
- If I receive dashcam footages from other people, I should share my footages with others in return.

STUDY 2 – Method | Sharing Motives



Social Justice



Altruism



Reciprocity



Monetary

Reward

:Financial payment for something good that has been done

- I need financial benefits to share my dashcam footages.
- I will share dashcam footages to make financial profits.
- I will make financial profits by sharing dashcam footages.

STUDY 2 – Method | Sharing Motives



Social Justice



Altruism



Reciprocity



Monetary
Reward

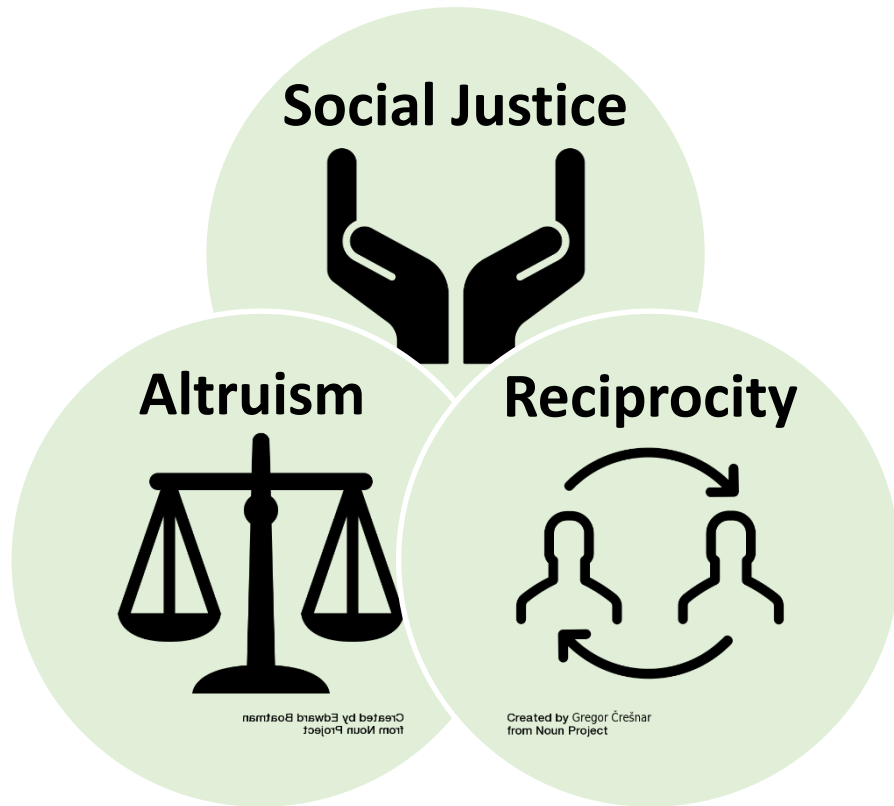
Factor Analysis

To find underlying factors by clustering the questions

STUDY 2 – Result | Sharing Motives

Subscales	Motivation	Factor Loading	Mean	SD
Factor 1: Reciprocal altruism & Social justice (Cronbach's alpha =.878)			5.82	0.92
Social justice	I share my dashcam footages to achieve social justice.	.804	5.75	1.29
Altruism	I share my dashcam footage because those who are in need of videos will use my contribution.	.798	5.81	1.23
Social Justice	Sharing dashcam footages helps to achieve justice in society.	.774	5.78	1.31
Reciprocity	I expect other people to help me, so it's only fair for me to help them by sharing my dashcam footage.	.754	5.46	1.50
Reciprocity	If will actively share my dashcam footages to help others, if I was helped by others' dashcam footages.	.752	6.27	0.99
Reciprocity	If I receive dashcam footages from other people, I should share my footages with others in return.	.661	5.86	1.30
Altruism	It is important to help others by providing dashcam footage without expecting anything in return.	.621	5.66	1.36
Social justice	If sharing my video footages can resolve an unjust accusation or a wrong treatment, I will actively help victims.	.616	6.48	0.82
Altruism	I expect dashcam users to actively contribute answers without expecting anything in return.	.611	5.31	1.57
Factor 2: Monetary reward (Cronbach's alpha =.897)			2.78	1.50
Monetary reward	I need financial benefits to share my dashcam footages.	.919	2.64	1.60
Monetary reward	I will share dashcam footages to make financial profits.	.907	2.77	1.69
Monetary reward	I will make financial profits by sharing dashcam footages.	.870	2.95	1.66

STUDY 2 – Result | Sharing Motives



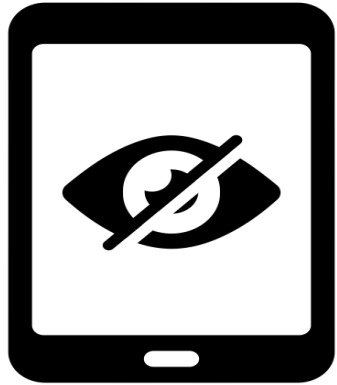
Factor 1:
“Reciprocal Altruism & Social Justice”

(Mean=**5.82**, SD=0.92)

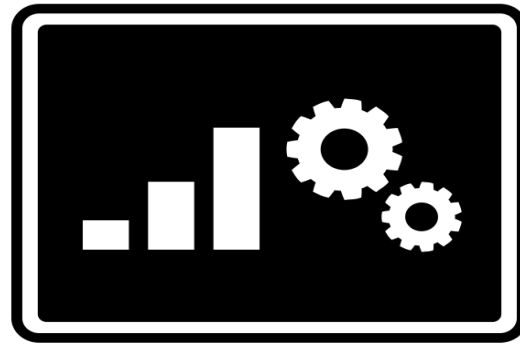


Factor 2:
“Monetary Reward”
(Mean=**2.78**, SD=1.50)

STUDY 2 – Result | Sharing Concerns



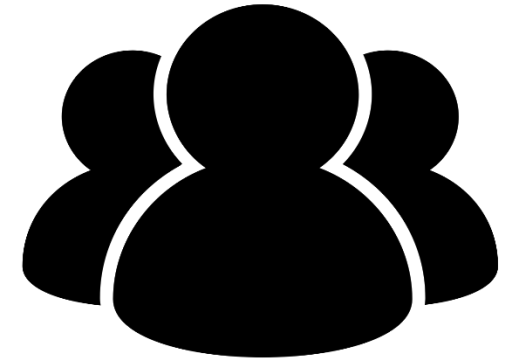
Privacy Sensitivity



Data
Management



Requesters'
Trustworthiness



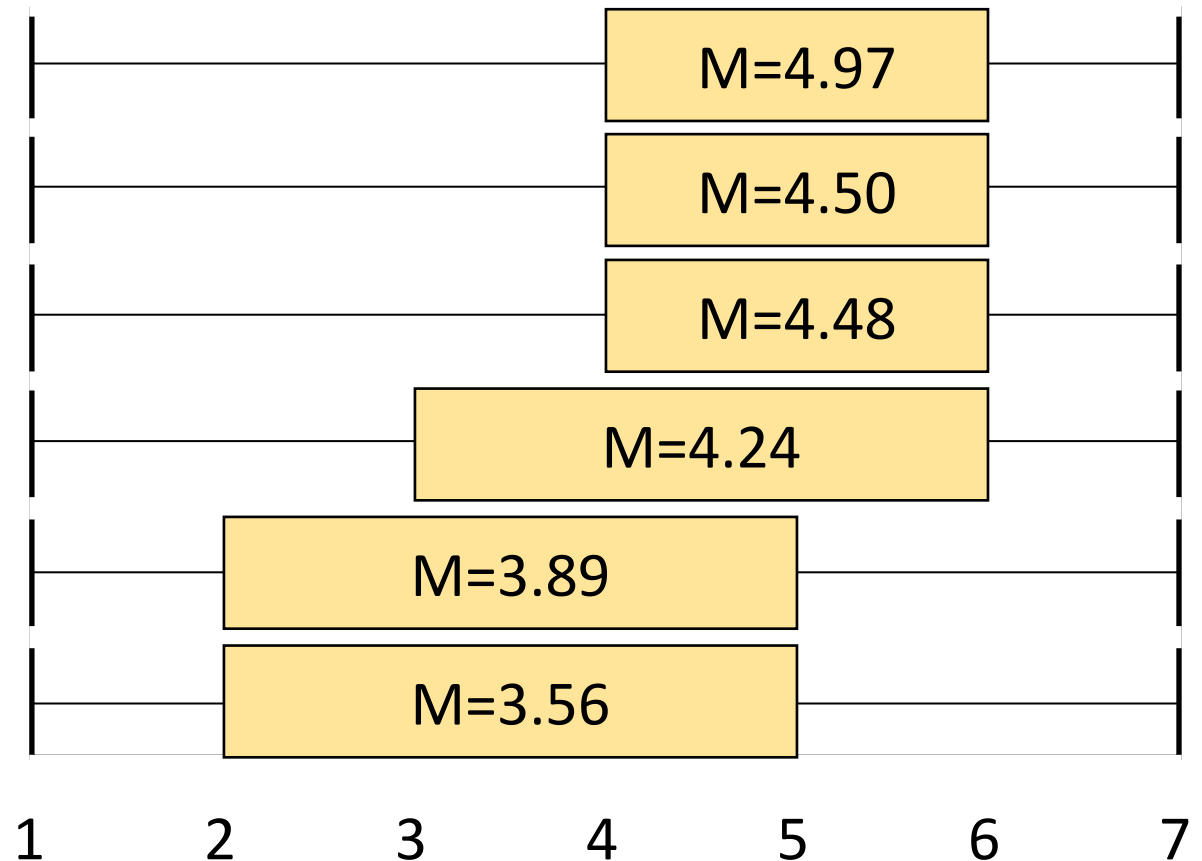
Motive Difference
across Different
Privacy Groups



Privacy Sensitivity

Created by Gregor Greshner
from the Noun Project

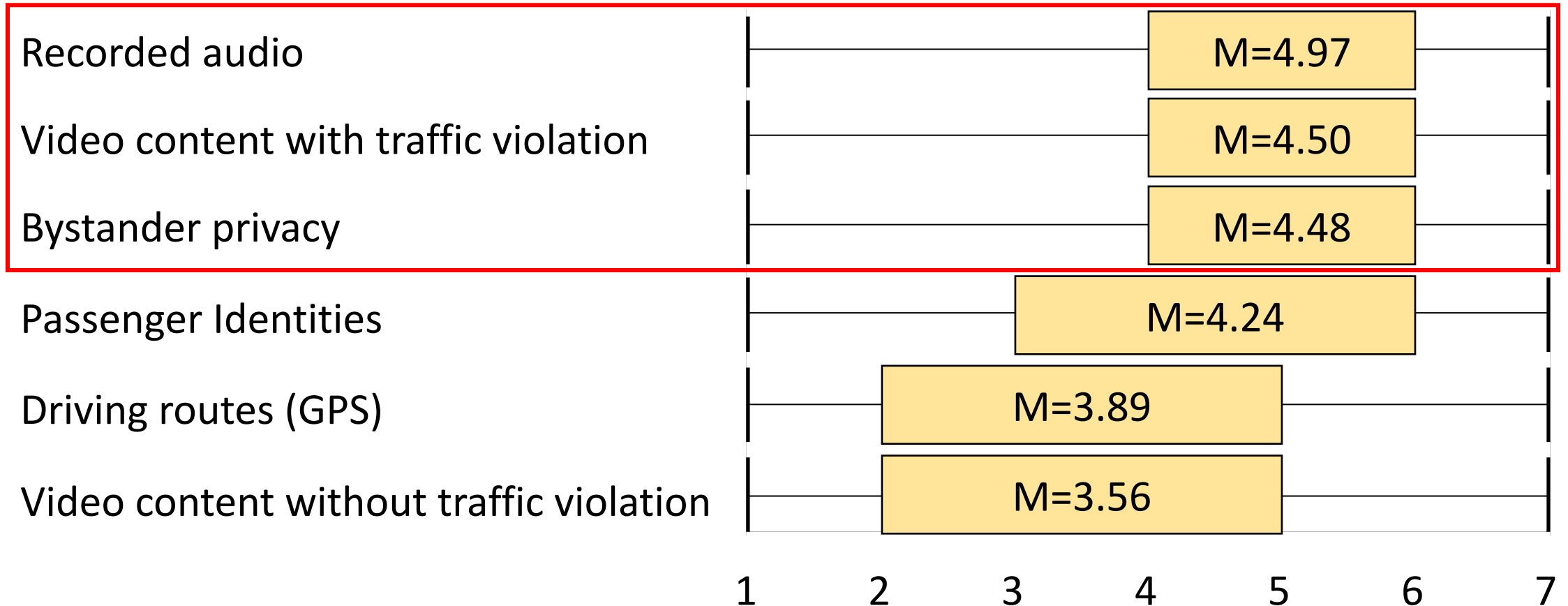
- Recorded audio
- Video content with traffic violation
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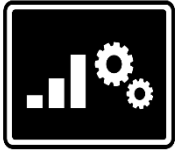




Privacy Sensitivity

Created by Gregor Greshar
from the Noun Project





Data Management

Created by DesignNex
from Noun Project

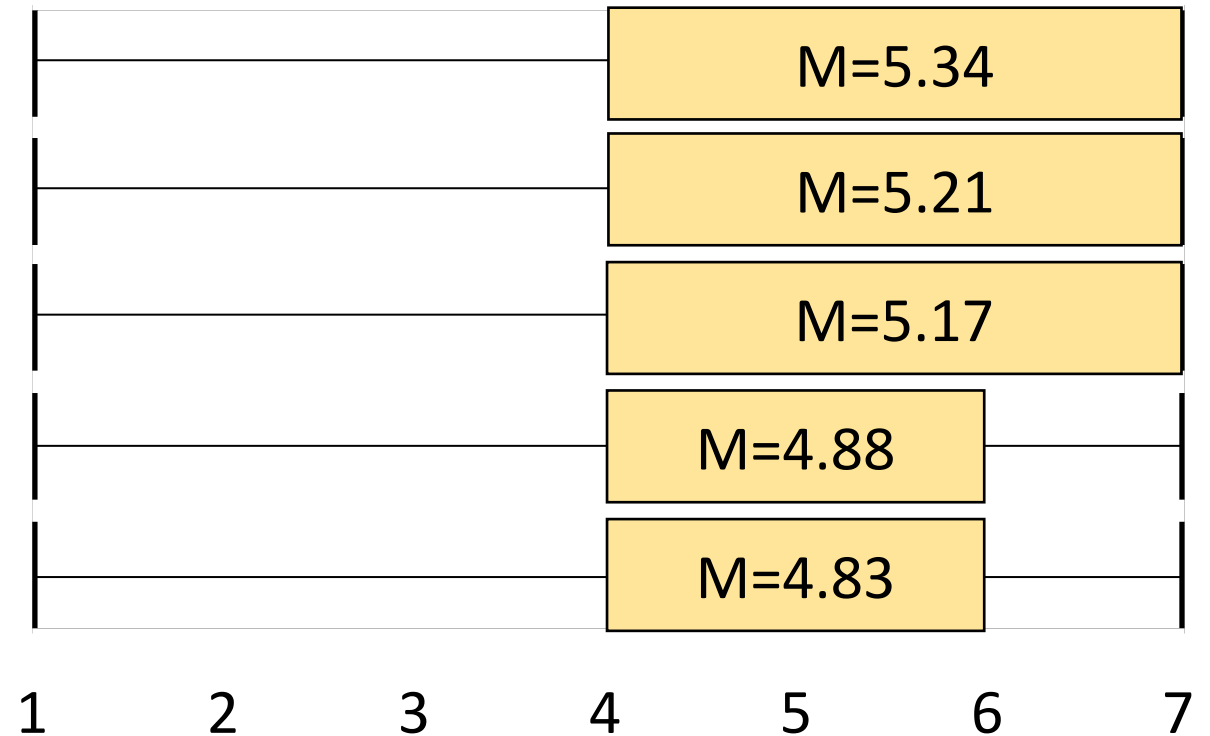
Non-disposal of shared data

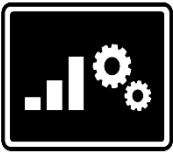
Misuse of shared videos

Identity exposure

Retaliation

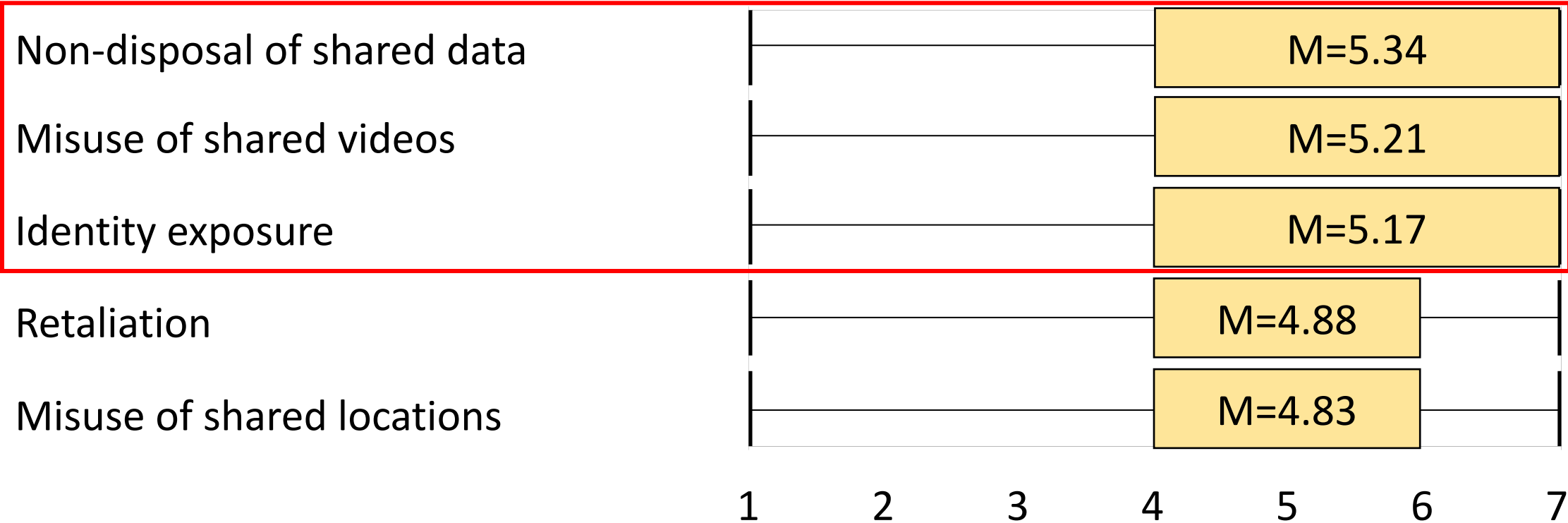
Misuse of shared locations





Data Management

Created by DesignHex from Noun Project





Requesters' trustworthiness

Police

M=3.01

Accident involved party

M=2.86

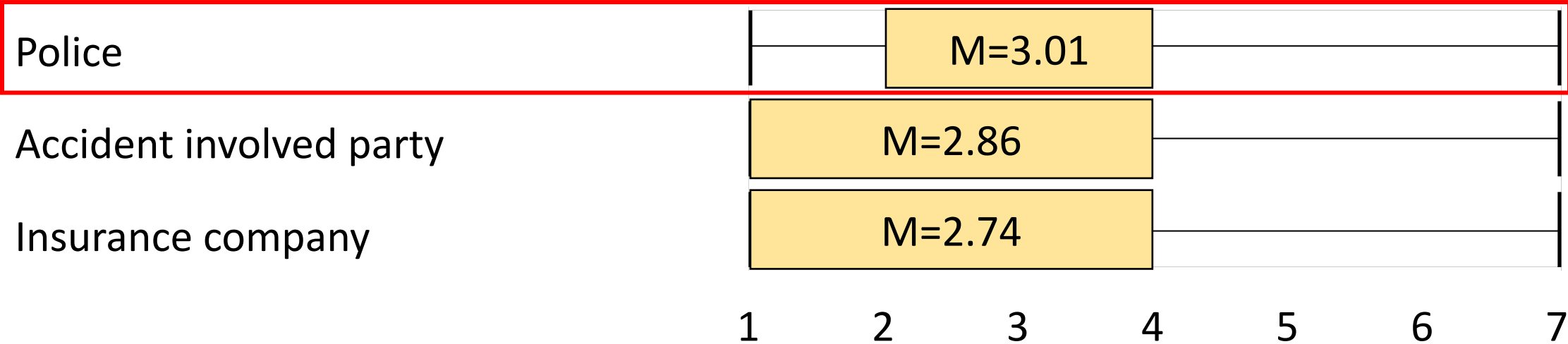
Insurance company

M=2.74





Requesters' trustworthiness





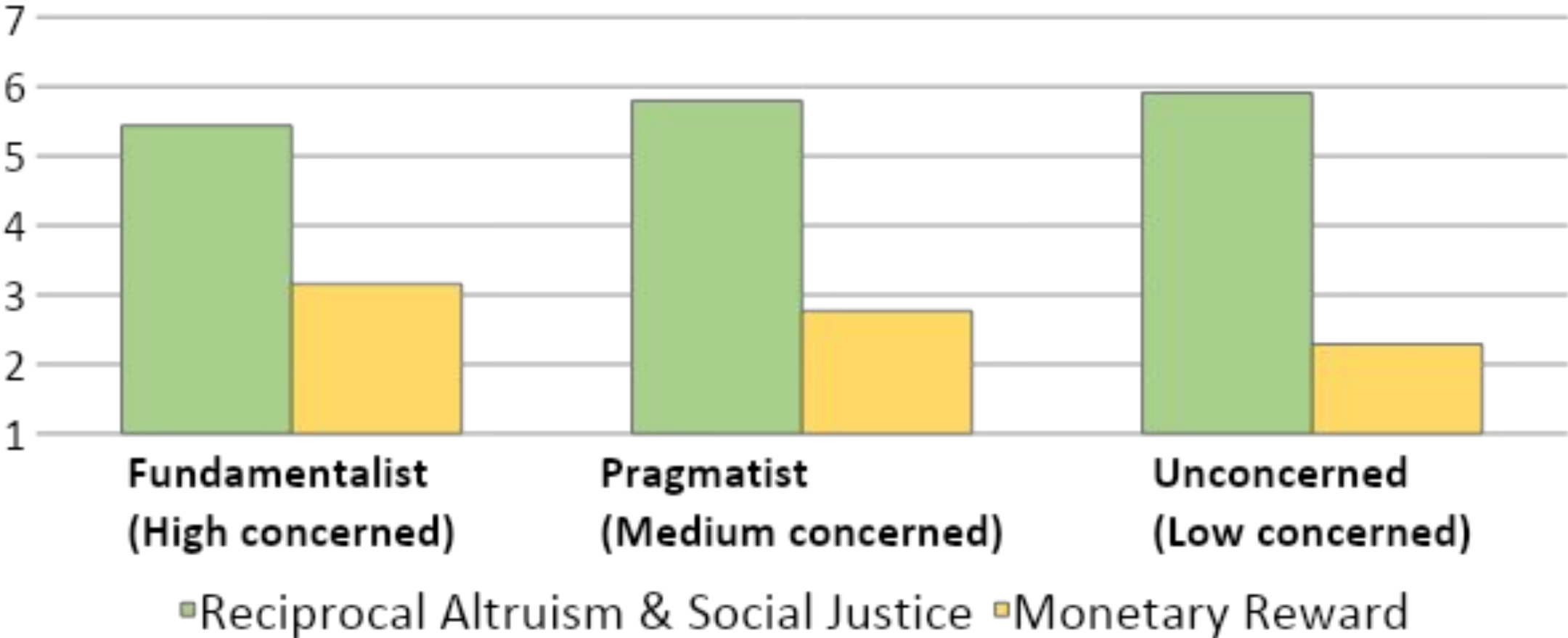
Motive difference across different privacy groups

Group	Level of privacy concerned (based on their privacy concern point)
Fundamentalist (28.4%)	High privacy concerned
Pragmatist (50.9%)	Medium privacy concerned
Unconcerned (20.6%)	Low privacy concerned

*Clustred using K-mean algorithm based on respondents' privacy concern points

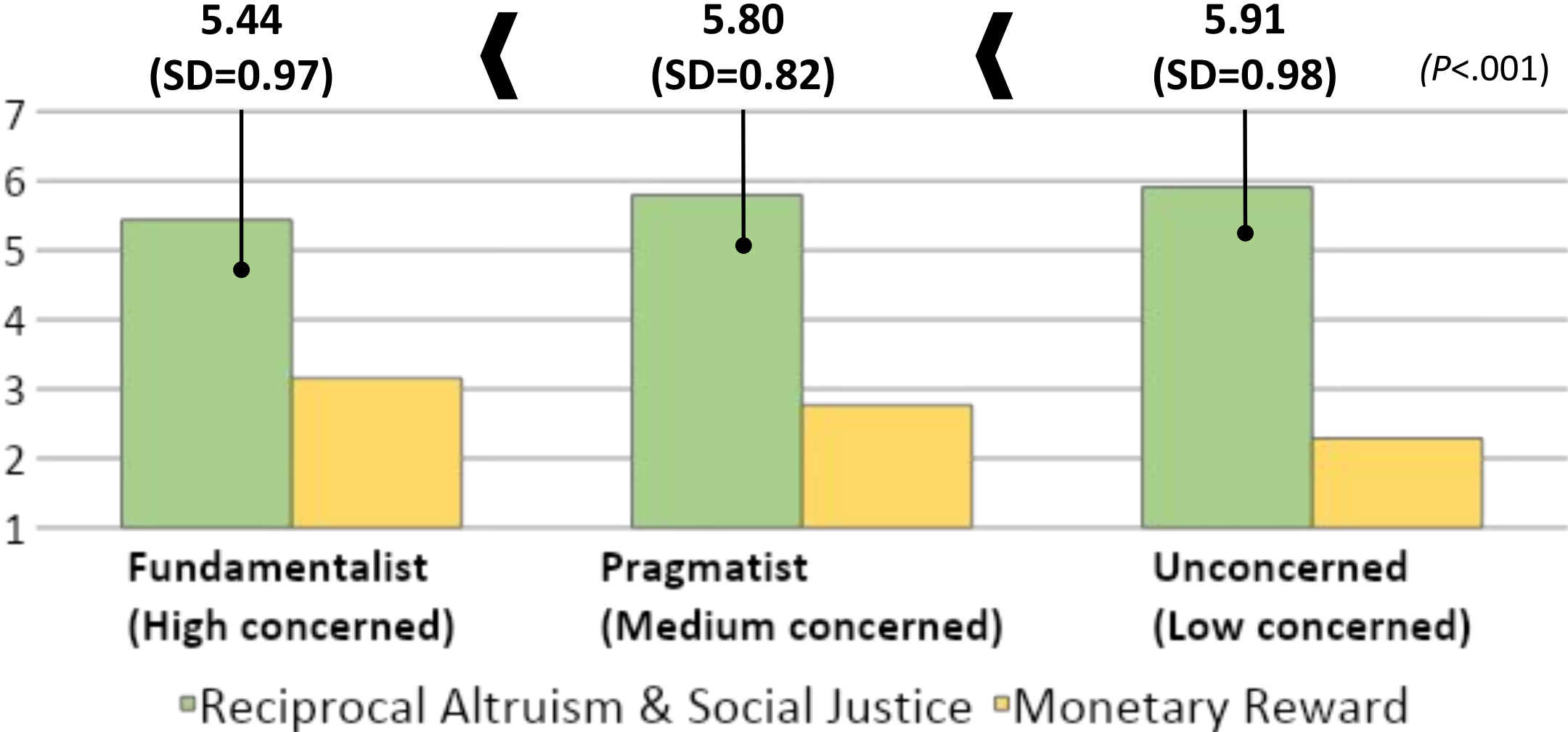


Motive difference across different privacy groups



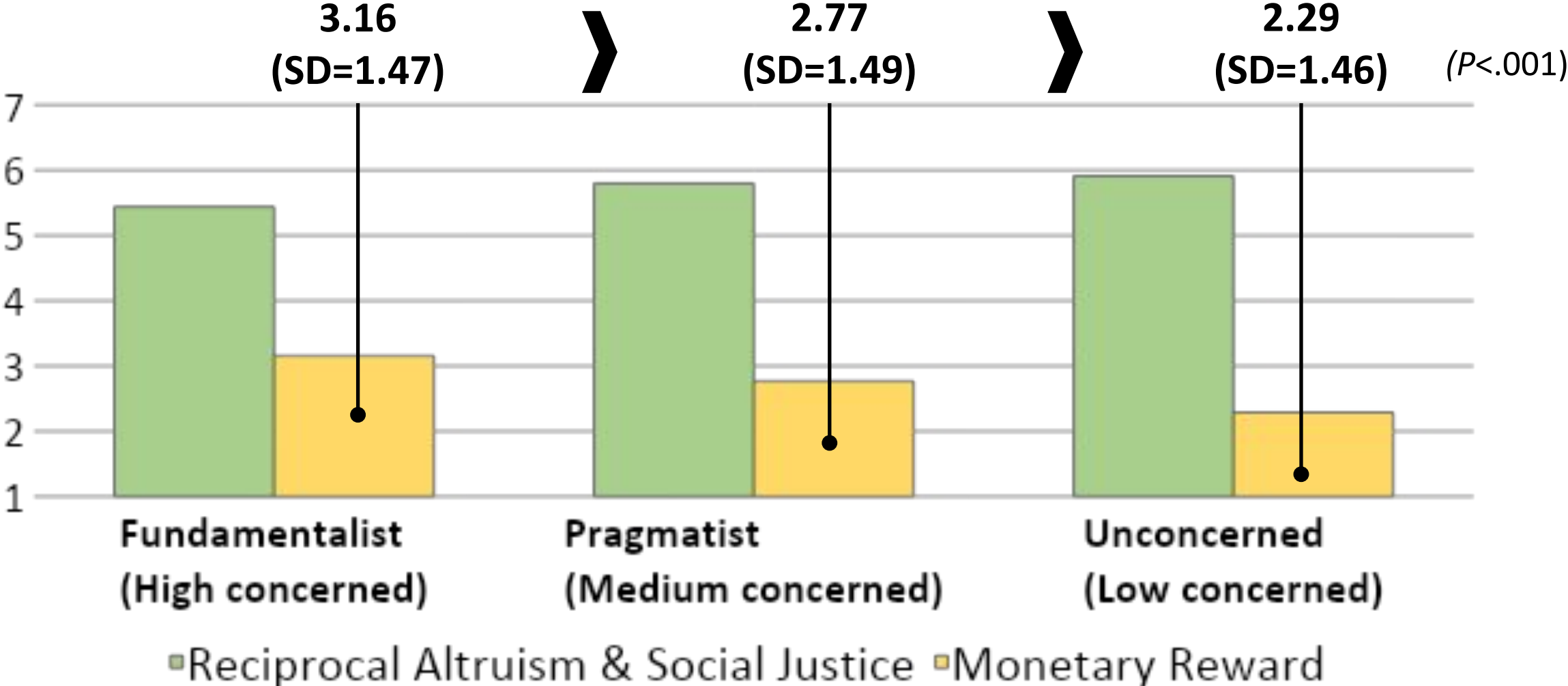
STUDY 2 – Result | Sharing Concerns

Groups with high privacy concerns had lower reciprocal altruism and social justice score



STUDY 2 – Result | Sharing Concerns

Groups with high privacy concerns had higher monetary score



Motivation difference

- Reciprocity, altruism, and social justice are much stronger
- Skill mastery, fun motives are not found

Privacy concerns types

- Audio and video content with traffic violation are highly concerned
- Requesters' identity (e.g., bystanders, passengers)

Motivation and concerns

- Motivational difference across difference privacy concern groups
- No significant differences between motivation/concern and demographic information (e.g., gender, age)



Encouraging Motivation for Sharing



- To highlight reciprocal altruism and social justice aspects



Supporting Privacy Preserving Tools

Created by icons.design
from Noun Project

A close-up photograph of a light blue keyboard key. The key features the word "Privacy" in a dark blue, sans-serif font. To the right of the text is a dark blue icon of an open padlock. The key is set against a background of other white keyboard keys on a wooden desk.

Privacy

- Clipping a relevant part from a recorded video
- Removing audio tracks (mute)
- Removing sensor data (e.g., GPS)

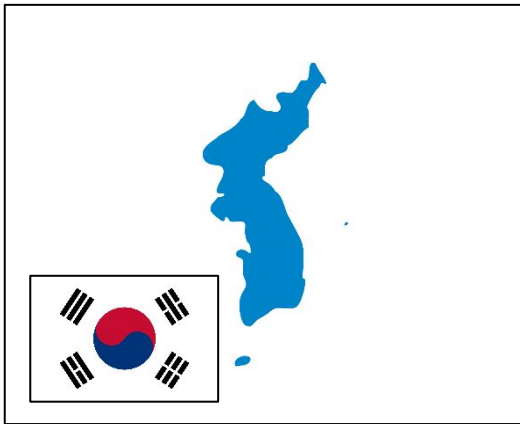


Dealing with Trust and Policy Issues



- Providing clear privacy management guideline

Limitation & Future Work



The online surveys were conducted in Korea. We are currently working on cultural difference in dashcam video sharing (e.g., in Russia, China, Japan)



As our work is based on only online surveys, a field study with real dashcam users is required to uncover various contextual factors affecting dashcam video sharing

Thank you



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