

ALL DATA
STRAVA COLLECTS
ABOUT YOU

Poli-see:

An Interactive Tool for Visualizing Privacy Policies

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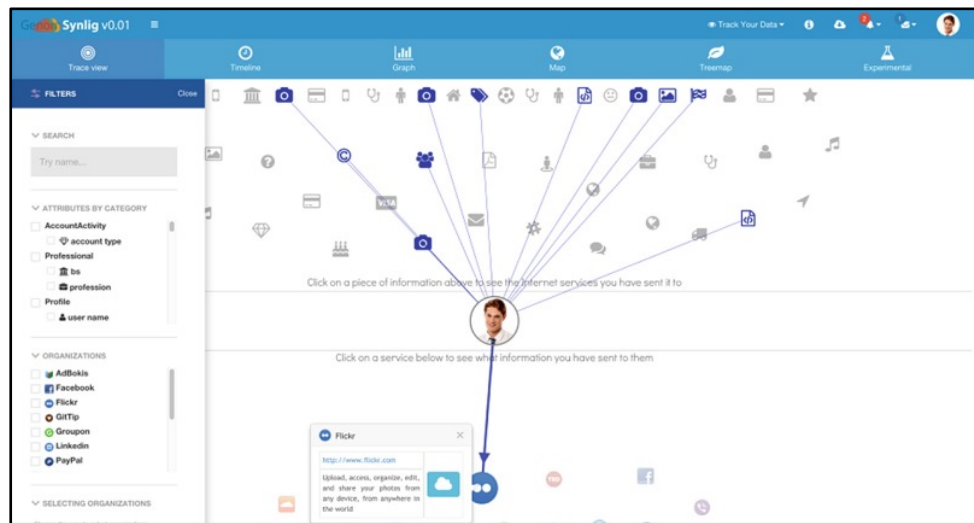


Motivation

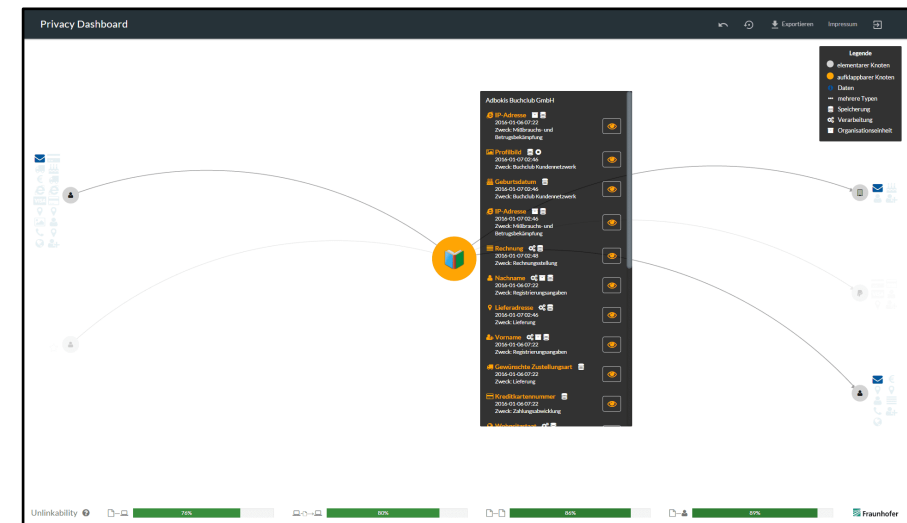
Current privacy policies fail to adequately implement informed consent

- Difficult to understand
- People don't read them

Recent works on visualization-based tools for managing personal data



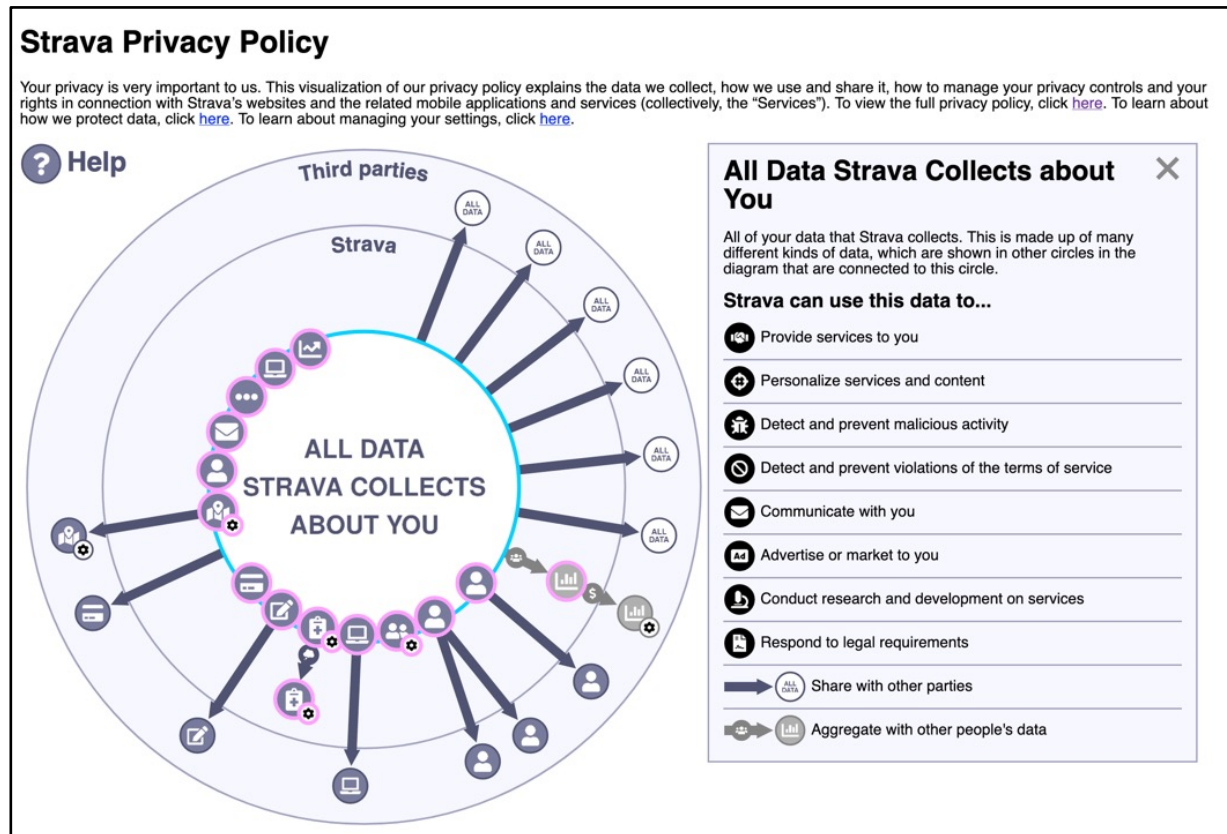
Fischer-Hübner et al. 2016



Bier et al. 2016

Poli-see

Generates interactive visualizations of privacy policies



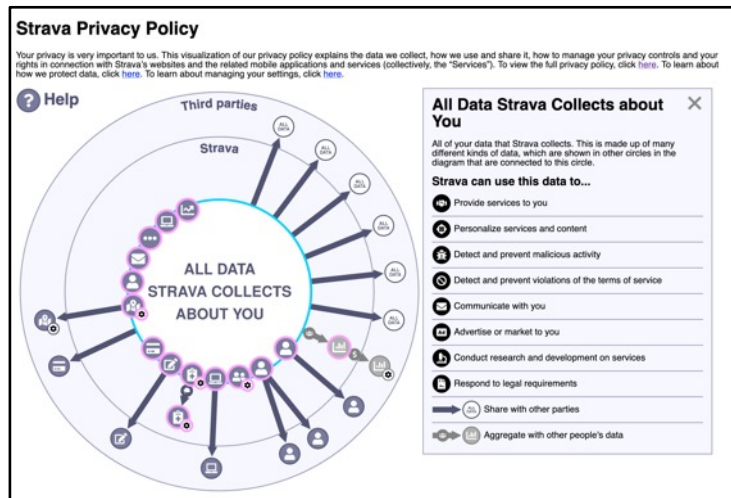
Design requirements:

- Collected data types
- Data sharing
- Data use
- Privacy controls
- Derived data

User Studies

In-person study – 24 undergraduate students recruited from the Claremont Colleges

Online study – 600 participants on Amazon Mechanical Turk



Poli-see

This screenshot shows the Strava Privacy Policy page with annotations from the POLI-SEE tool. A sidebar on the left lists categories: "First Party Collection/Use", "Third Party Sharing/Collection", "User Choice/Control", "User Access, Edit and Deletion", "Data Retention", "Data Security", "Policy Change", "Do Not Track", and "International and Specific Audiences". The main content area displays the policy text with a "Machine Annotated Policy 1" label and a "Feedback" button. A "Choice Links" section at the bottom indicates that the tool was unable to automatically locate choices.

Annotated text policy
Wilson et al. 2018

This screenshot shows the standard Strava Privacy Policy page. It features a top navigation bar with "Mobile", "Features", "Support", "Blog", "Log In", and "Sign Up". A sidebar on the left contains links for "Terms of Service", "Privacy Policy", "Cookie Policy", "Legal Bases", and "API Agreement". The main content area includes the title "Strava Privacy Policy", the effective date "October 15, 2018", and the introductory text: "Your privacy is very important to us. Please read below to see how Strava handles information in connection with Strava's websites and the related mobile applications and services (collectively, the 'Services'). Before we get to the details, here are a few of our fundamental privacy principles:".

Conventional text policy
(online only)

Methods



1. Factual questions on privacy policies for fitness-tracking apps

	Definitely no	Probably no	Unsure	Probably yes	Definitely yes
Does the policy allow Strava to collect information about your location?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Likert-type questions about user experience

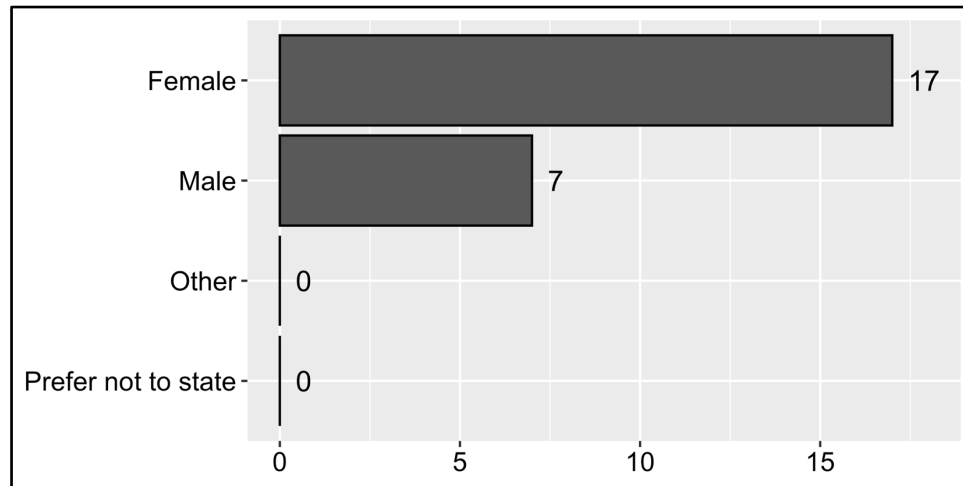
	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I feel that I understand how Strava uses my data.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Semi-structured interview (*in-person only*)

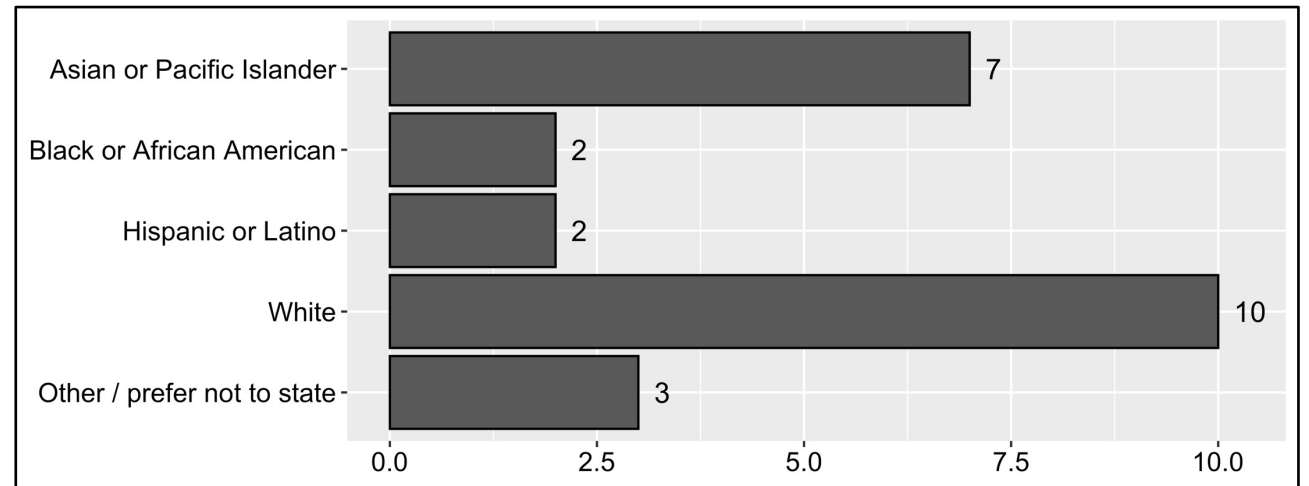
Demographics (In-Person Study)

All participants were current college students between the ages of 18 and 22

Gender

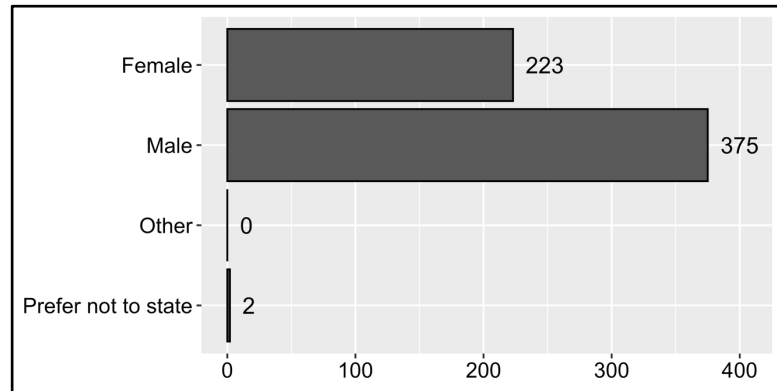


Race / ethnicity

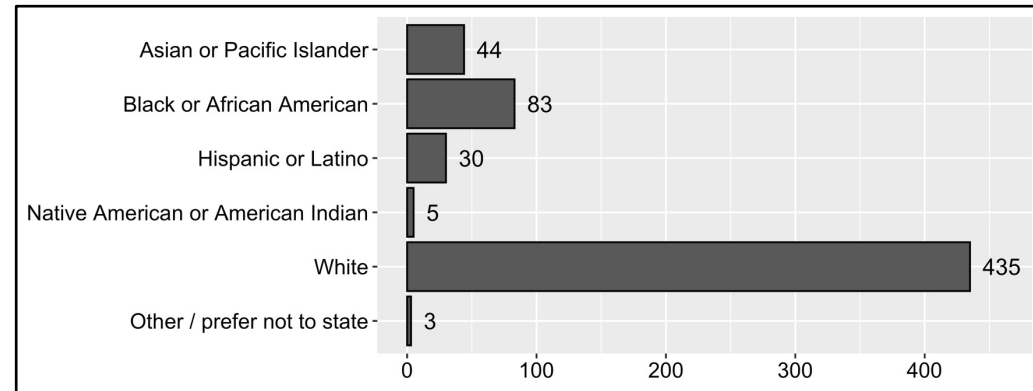


Demographics (Online Study)

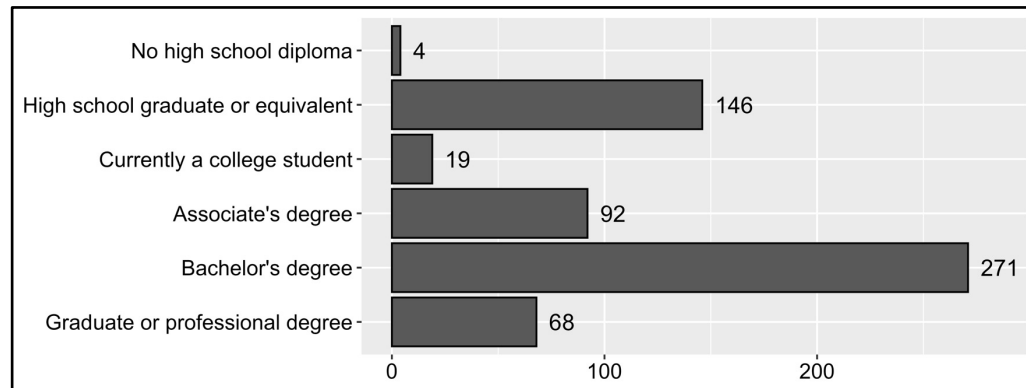
Gender



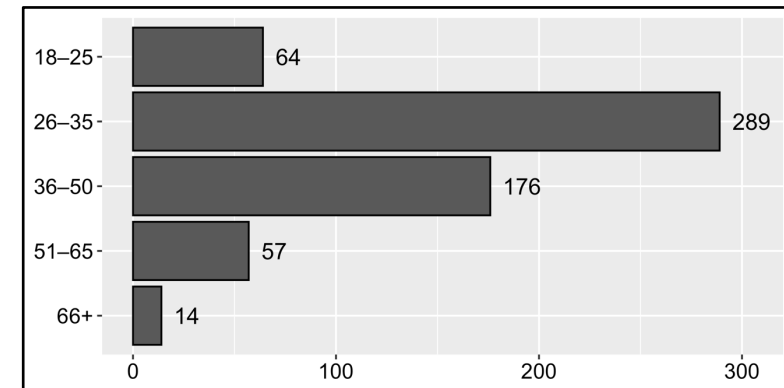
Race / ethnicity



Education

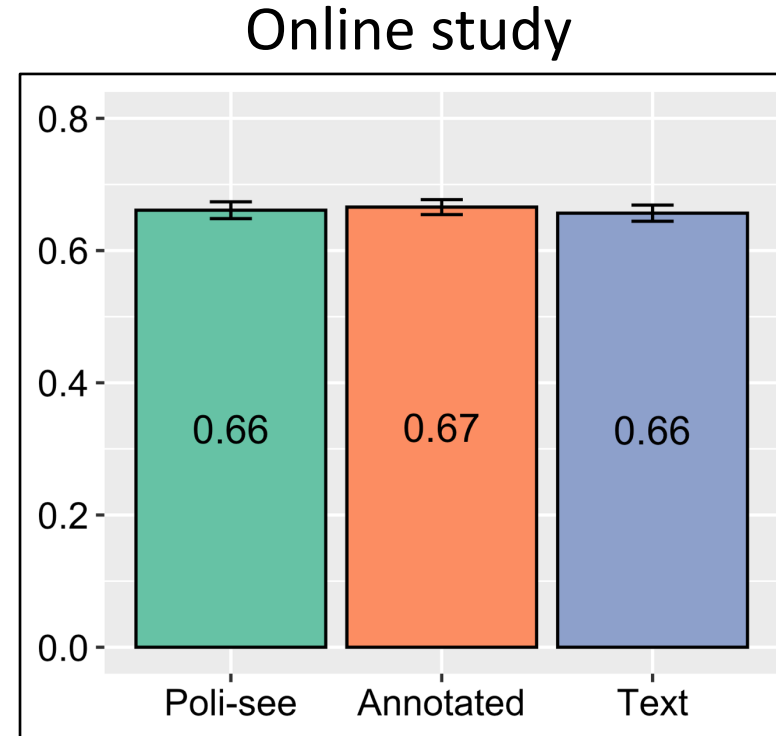
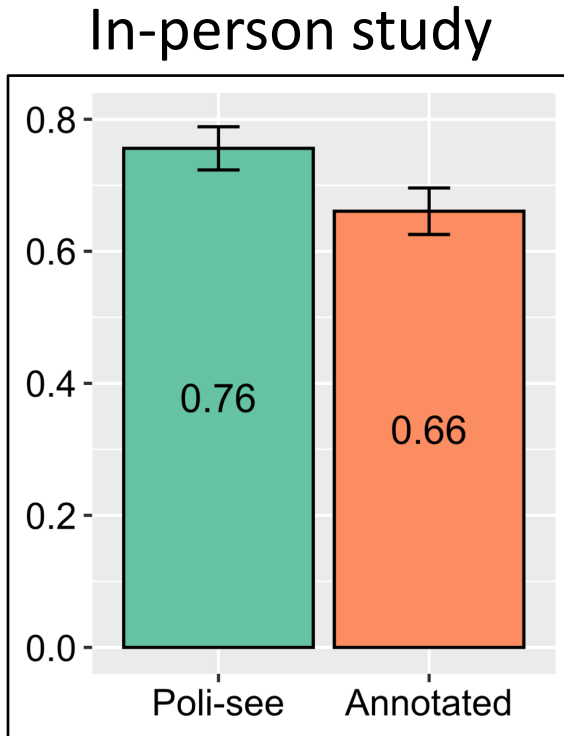


Age



Results: Accuracy

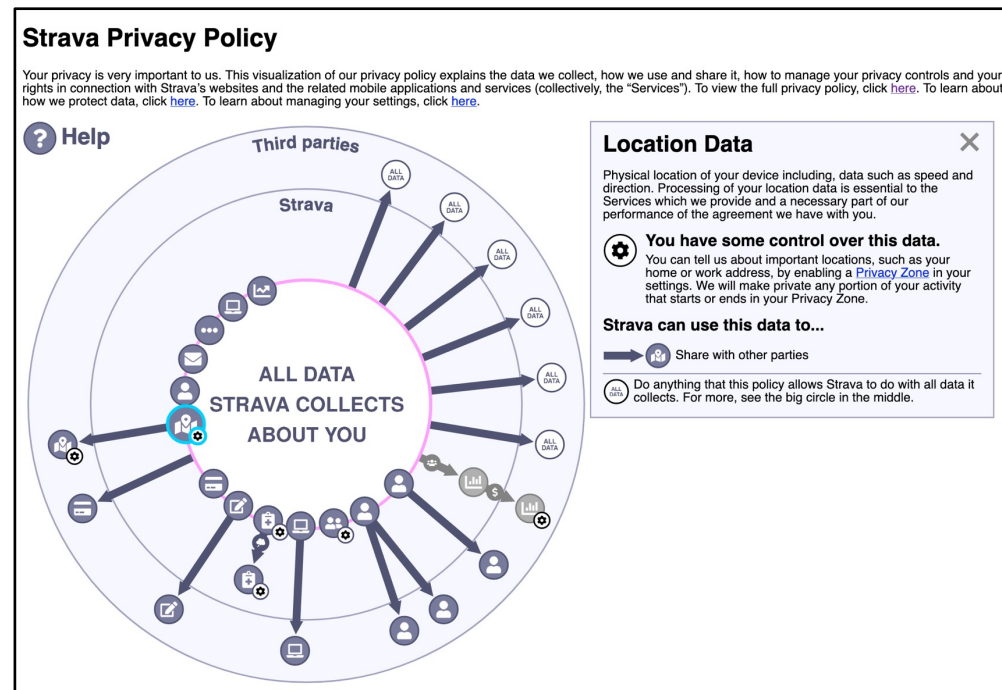
With Poli-see, higher rates of accuracy on the factual questions in the in-person study



Results: Simple vs. Complex Questions

Simple questions – single element of the Poli-see interface

- Does the policy allow Strava to collect information about your location?



Results: Simple vs. Complex Questions

Complex questions – multiple elements of the Poli-see interface

- Does the policy allow Strava to use your location data to conduct research?

Strava Privacy Policy

Your privacy is very important to us. This visualization of our privacy policy explains the data we collect, how we use and share it, how to manage your privacy controls and your rights in connection with Strava's websites and the related mobile applications and services (collectively, the "Services"). To view the full privacy policy, click [here](#). To learn about how we protect data, click [here](#). To learn about managing your settings, click [here](#).

Help

The diagram features a central circle labeled "ALL DATA STRAVA COLLECTS ABOUT YOU". This central circle is surrounded by an inner ring of icons representing various data types. The entire inner ring is enclosed within a larger circle labeled "Strava". Outside the "Strava" circle is another larger circle labeled "Third parties", with arrows pointing from the "Strava" circle to the "Third parties" circle, indicating data sharing. A callout box titled "Location Data" is overlaid on the diagram, containing text about physical location data and user controls.

Location Data

Physical location of your device including, data such as speed and direction. Processing of your location data is essential to the Services which we provide and a necessary part of our performance of the agreement we have with you.

You have some control over this data.
You can tell us about important locations, such as your home or work address, by enabling a [Privacy Zone](#) in your settings. We will make private any portion of your activity that starts or ends in your Privacy Zone.

Strava can use this data to...

Do anything that this policy allows Strava to do with all data it collects. For more, see the big circle in the middle.

Strava Privacy Policy

Your privacy is very important to us. This visualization of our privacy policy explains the data we collect, how we use and share it, how to manage your privacy controls and your rights in connection with Strava's websites and the related mobile applications and services (collectively, the "Services"). To view the full privacy policy, click [here](#). To learn about how we protect data, click [here](#). To learn about managing your settings, click [here](#).

Help

The diagram is identical to the one on the left, showing data collection from Strava and third parties. However, the callout box is titled "All Data Strava Collects about You" and lists various uses of the data.

All Data Strava Collects about You

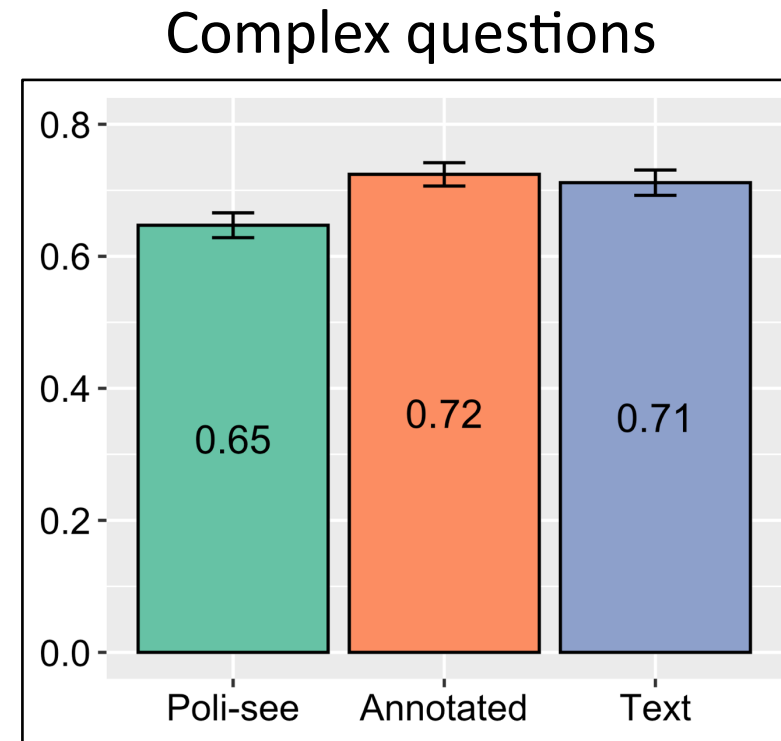
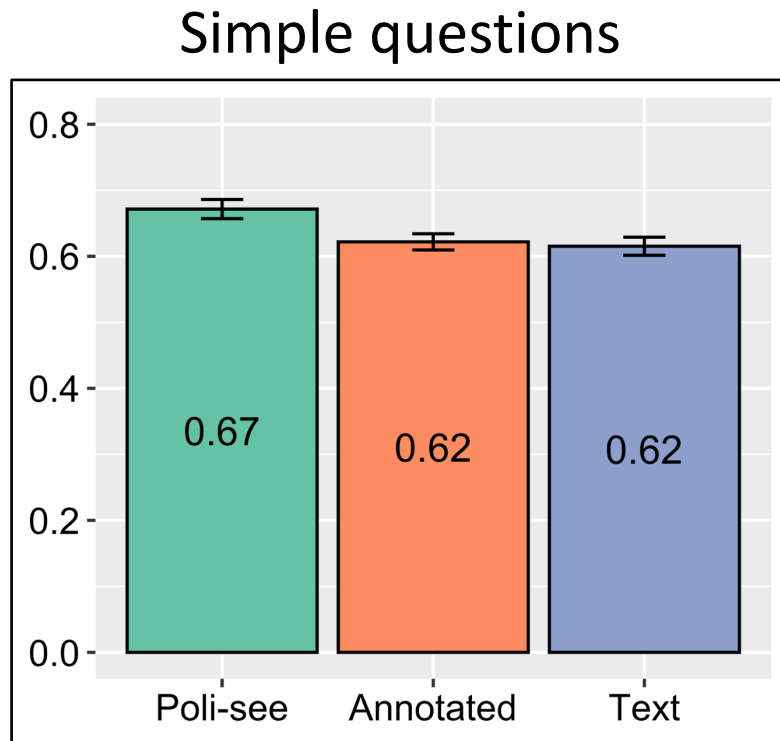
All of your data that Strava collects. This is made up of many different kinds of data, which are shown in other circles in the diagram that are connected to this circle.

Strava can use this data to...

- Provide services to you
- Personalize services and content
- Detect and prevent malicious activity
- Detect and prevent violations of the terms of service
- Communicate with you
- Advertise or market to you
- Conduct research and development on services
- Respond to legal requirements
- Share with other parties
- Aggregate with other people's data

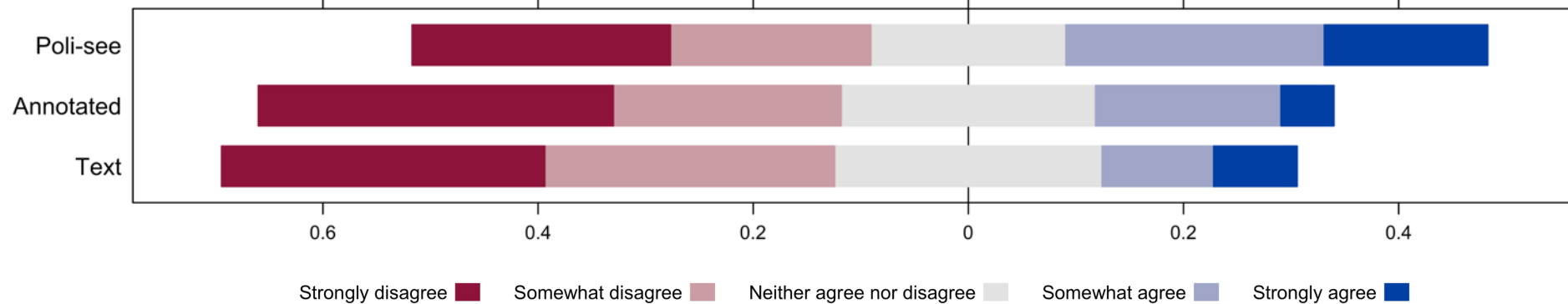
Results: Accuracy (Online Study)

With Poli-see, higher rates of accuracy on the simple questions, but lower rates of accuracy on the complex questions

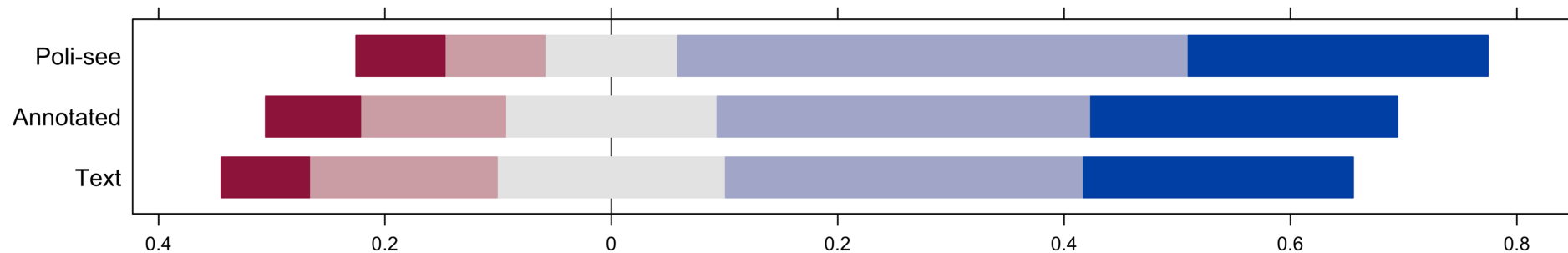


Results: User Experience (Online Study)

“Finding information in this policy was an enjoyable experience.”



“If this were how [company] presented its privacy policy, I would be likely to look at this policy before deciding whether to use this service.”



Recommendations

1. Further work is needed to understand how to graphically represent **non-specific data sharing and use policies** clearly but without increasing visual clutter
2. Future work on graphical representations of privacy policies should consider how to ease the **learning curve** of an unfamiliar format for users
3. Related work on parsing privacy policies using NLP could be leveraged to generate standardized inputs for tools like Poli-see **at scale**
4. Future work on graphical representations should design for **accessibility** broadly

Thank you!

- We designed Poli-see: the first interactive, graphical representation of privacy policies
- We evaluated Poli-see in two user studies, demonstrating the potential for graphical representations to accurately convey data use practices to users in a manner that encourages user engagement
- We provide insights into the advantages and challenges of graphical privacy policy representations

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