

# How Short is Too Short?

## Implications of Length and Framing on the Effectiveness of Privacy Notices

**Joshua Gluck**, Florian Schaub, Amy Friedman, Hana Habib, Norman Sadeh, Lorrie Faith Cranor,  
Yuvraj Agarwal



**Carnegie Mellon University**  
**Societal  
Computing**





# Motivation

- More User Friendly
- Less Legalistic
- Shorter
- 1,300 Words
- 6,500 Characters
- Still Very Long

# Addressing this Problem

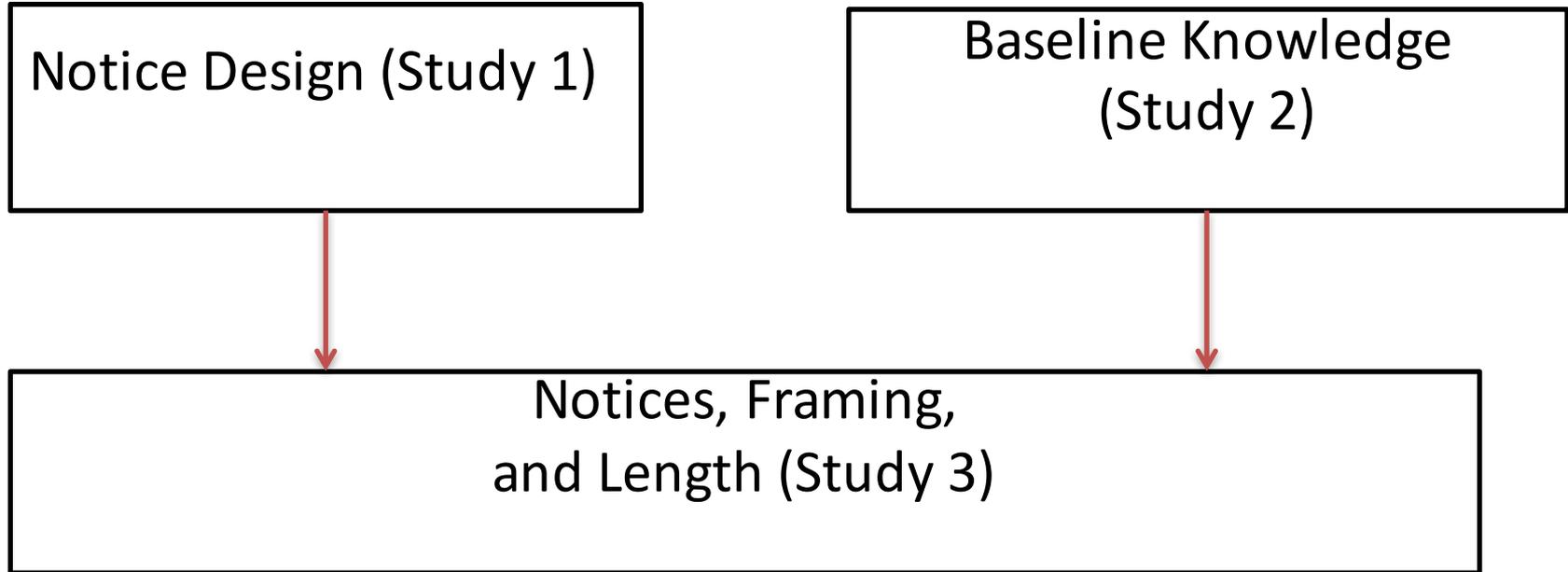
- Short form privacy notices
  - Layered notices (Ben-Shahar 2014)(McDonald 2008)
  - Timing of the notice (Balebako 2015)(Almuhimedi 2015)
  - Format of the notice (Levy 2008)(Earp 2004)
- Framing
  - Providing reasons and consequences can affect concern (Tan 2014)(Shih 2015)
- Proposals to focus on unexpected practices (FTC:IOT 2015)(Ayers 2014)
- Our goal is to test these proposals

# Research Questions

- Does removing unsurprising practices from privacy notices lead to higher overall awareness of privacy practices?
- Does framing practices in positive or negative ways lead to higher or lower overall awareness of privacy practices?
- Does showing a short-form privacy notice increase awareness of Fitness wearable privacy practices?

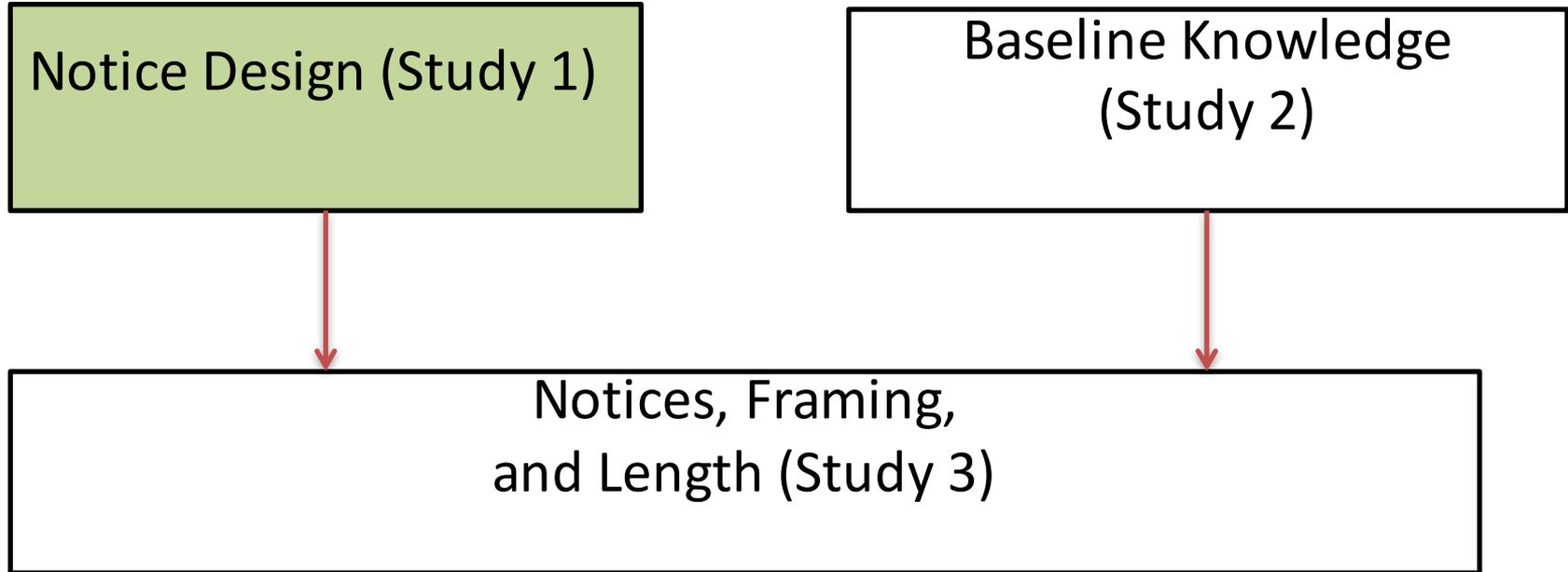
# Methodology

## Three Stage Mturk Study



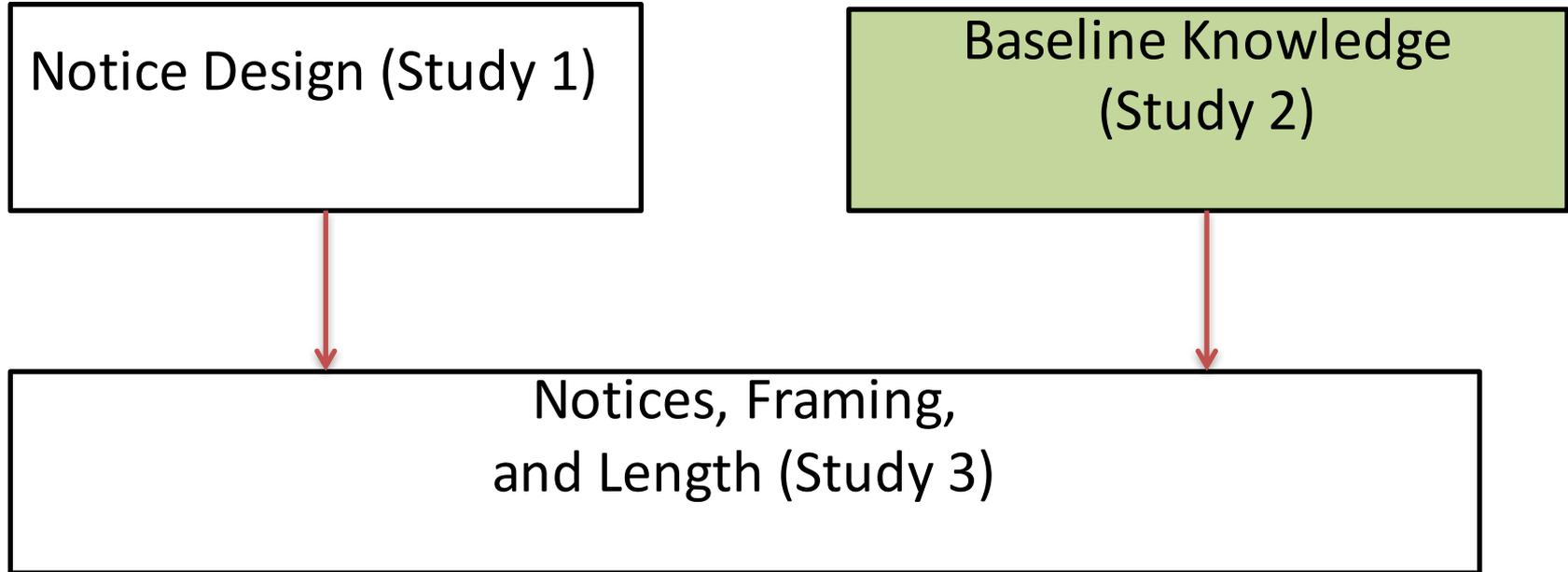
# Methodology

## Three Stage Mturk Study



# Methodology

## Three Stage Mturk Study



# Baseline Knowledge (Study 2)

- What are preconceptions of privacy practices

Question
Collection:
Steps
Distance
Info Posted to Profile
.
.
.
Height
Location Specific
Share With
Fitbit Friends
Companies Providing Services
Directed Organizations
Government
Misc.
Where to Find Privacy Policy
Use Fitbit Without an Account
Selling Data Conditions
Data Retention Policy

# Collection Practices Questions

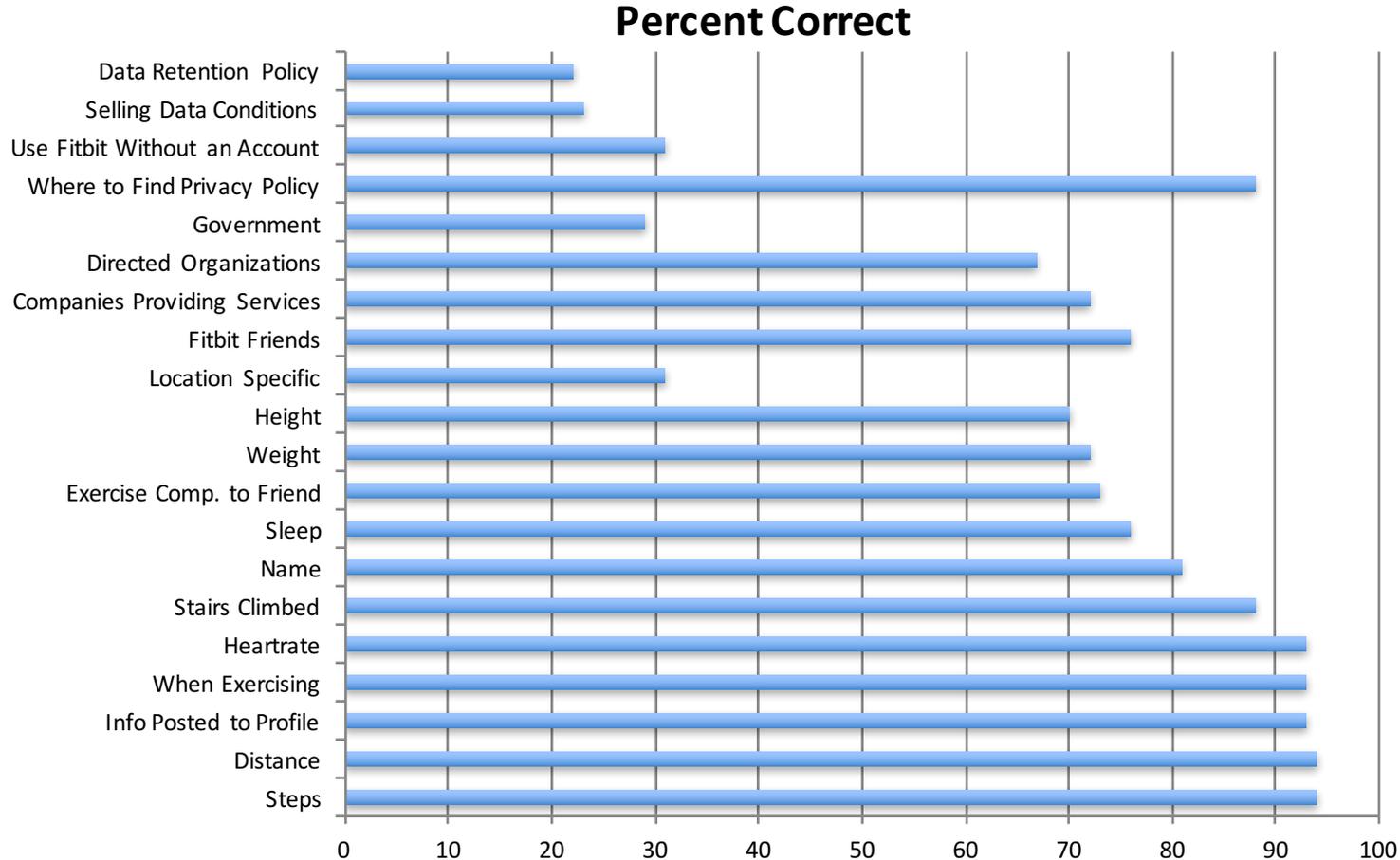
12. Imagine you are using a Fitbit Surge, which of the following types of information do you think Fitbit would collect about you? \*

	Definitely Collects	Probably Collects	Might Collect	Might not Collect	Probably Does not Collect	Definitely Does not Collect	I'm Unsure
Your perspiration rate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Your mood	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Your altitude	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Your shoe size	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
How many steps you've taken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
How far you've walked	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Information you've posted to your Fitbit profile	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Your name	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
A list of your Facebook friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

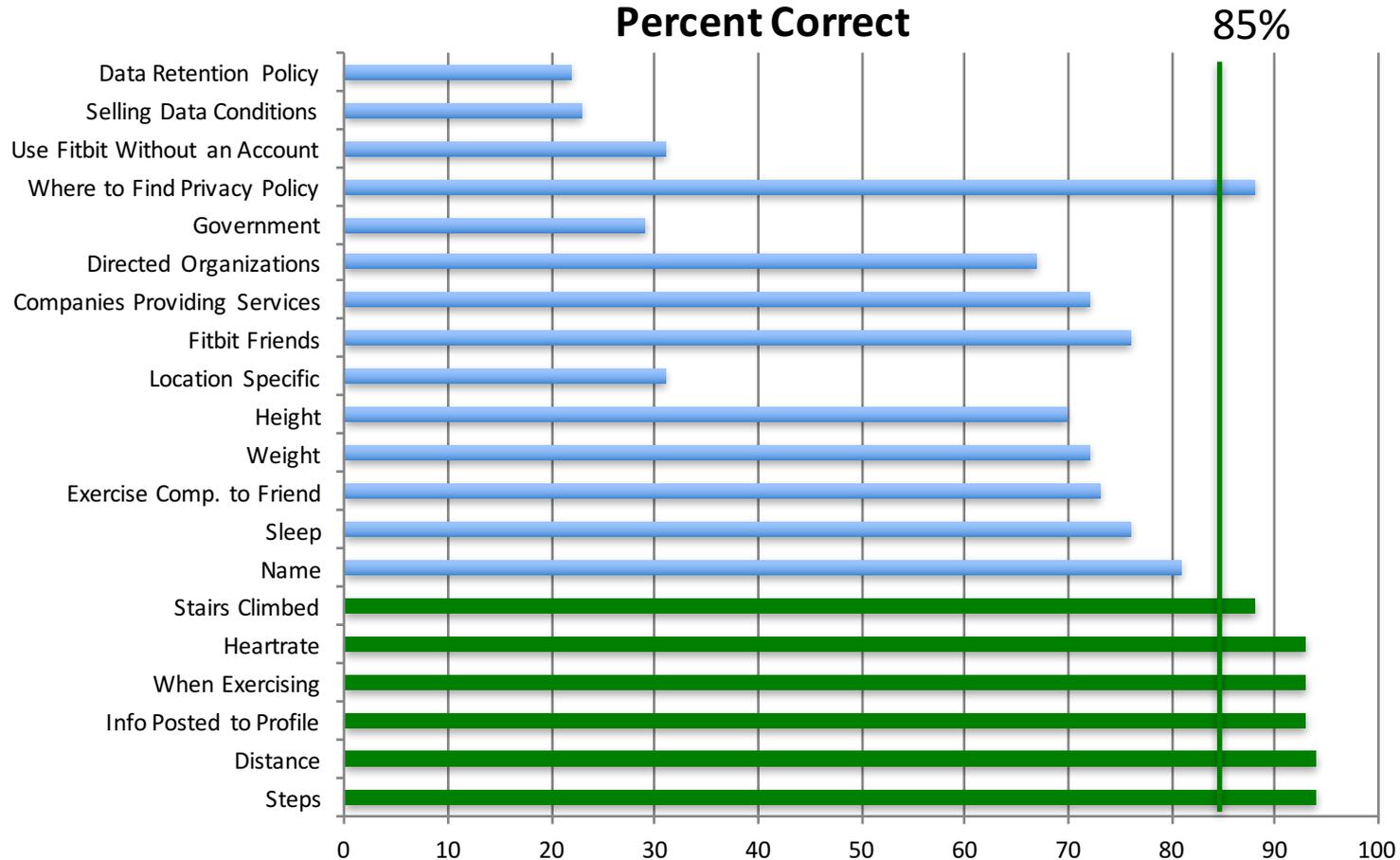
# Complex Practice Question

26. Do you think you can use a Fitbit device without having a Fitbit account? \*
- Yes and the device will function the same way as with an account
  - Yes, but only basic functions will work, such as distance, heartrate and step count.
  - Yes, but without an account to maintain calibration data, it won't count steps correctly
  - No. The Fitbit device won't function if it's not connected to an account
  - None of the above
  - I don't know

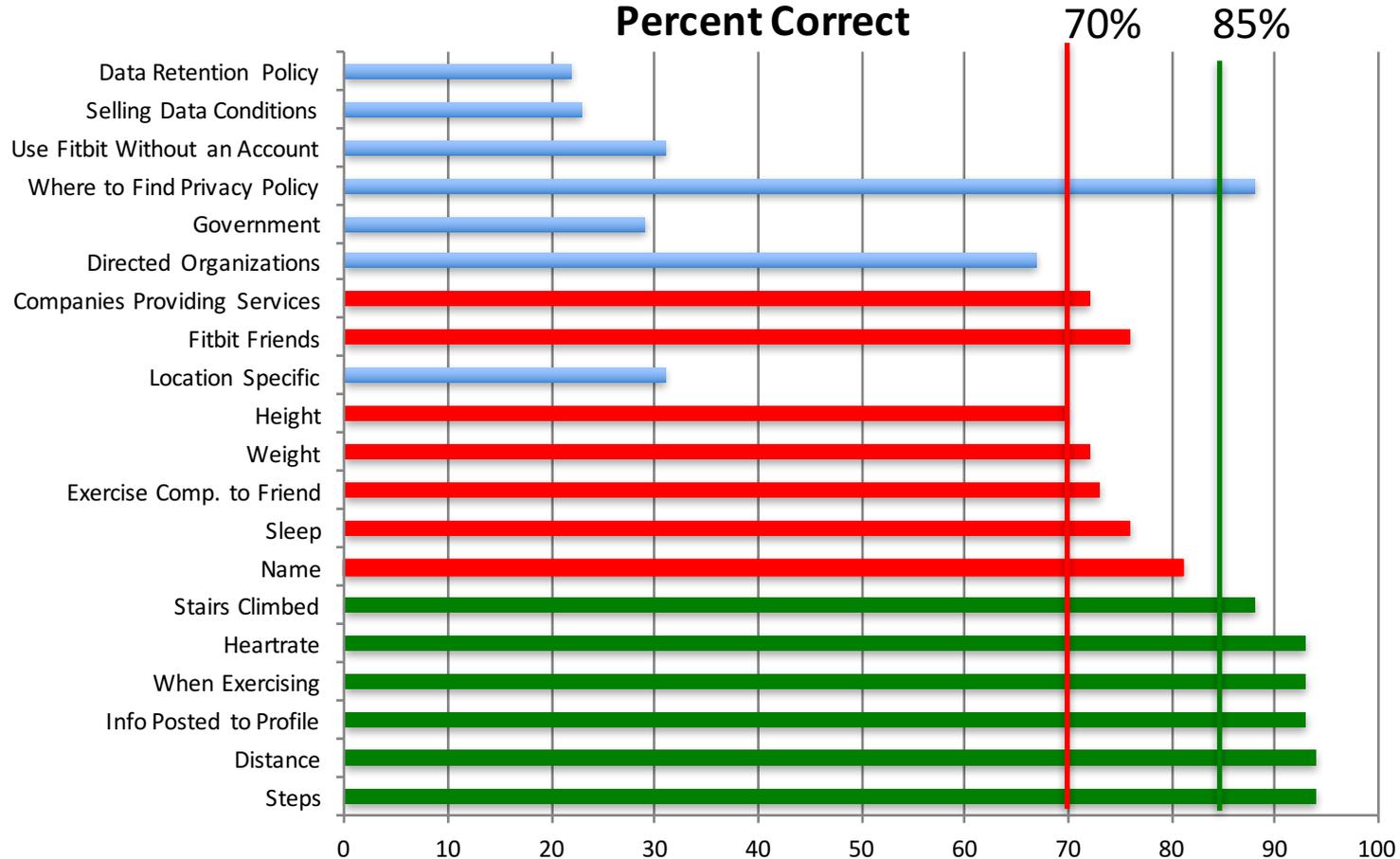
# Baseline Knowledge Results



# Practices Removed from Medium Notice



# Policies Removed from Shortest



# Long

## With an account, Fitbit will collect:

- \* Your **location**, when location features, such as maps, are active
- \* Your **name, height, and weight**
- \* Your **steps, distance and stairs climbed**
- \* When and how long you **exercise**
- \* When and how long you **sleep**
- \* Your **heart rate** throughout the day
- \* Exercise **compared with Friends**
- \* **Information posted** to your profile



You can track your heart rate, distance and step count with your Fitbit, without needing an account.

*Find further collection practices at [Fitbit.com/privacy](https://www.fitbit.com/privacy)*

## With whom do we share data?

- \* **Government Entities**
- \* **Companies** providing services to Fitbit
- \* **Organizations** you specifically direct Fitbit to share data with (e.g. Facebook)
- \* **Fitbit friends** you've listed (opt-out of sharing with friends in your profile settings)



Fitbit may share or sell aggregated information that does not identify you.

**It is sometimes possible to identify an individual from de-identified data.**

*Find further sharing practices at [Fitbit.com/privacy](https://www.fitbit.com/privacy)*

## How long do we keep your data?

- \* Personal Information, such as your address, is removed **when you delete your fitbit account.**
- \* Sensor Information that cannot identify you, such as fitness data, is **kept indefinitely**



**Until you delete your Fitbit account, anything you've ever posted will be kept by Fitbit, regardless of deleting your profile.**

Full Fitbit Privacy Policy:  
[www.fitbit.com/privacy](https://www.fitbit.com/privacy)

# Length Medium

## With an account, Fitbit will collect:

- \* Your **location**, when location features, such as maps, are active
- \* Your **name, height, and weight**
- \* When and how long you **sleep**
- \* Exercise compared with Friends



You can track your heart rate, distance and step count with your Fitbit, without needing an account.

*Find further collection practices at [Fitbit.com/privacy](https://www.fitbit.com/privacy)*

## With whom do we share data?

- \* **Government Entities**
- \* **Companies** providing services to Fitbit
- \* **Organizations** you specifically direct Fitbit to share data with (e.g. Facebook)
- \* **Fitbit friends** you've listed (opt-out of sharing with friends in your profile settings)



Fitbit may share or sell aggregated information that does not identify you.

**Selling your aggregated de-identified data allows Fitbit to provide Fitbit devices at lower cost, with no service charges.**

*Find further sharing practices at [Fitbit.com/privacy](https://www.fitbit.com/privacy)*

## How long do we keep your data?

- \* Personal Information, such as your address, is removed **when you delete your fitbit account.**
- \* Sensor Information that cannot identify you, such as fitness data, is **kept indefinitely**



**If you ever have a problem with Fitbit's data practices, simply delete your account and your personal data will no longer be stored.**

Full Fitbit Privacy Policy:  
[www.fitbit.com/privacy](https://www.fitbit.com/privacy)

# Short

## With an account, Fitbit will collect:

- \* Your **location**, when location features, such as maps, are active



You can track your heart rate, distance and step count with your Fitbit, without needing an account.

*Find further collection practices at [Fitbit.com/privacy](https://www.fitbit.com/privacy)*

## With whom do we share data?

- \* **Government Entities**
- \* **Organizations** you specifically direct Fitbit to share data with (e.g. Facebook)



Fitbit may share or sell aggregated information that does not identify you.

*Find further sharing practices at [Fitbit.com/privacy](https://www.fitbit.com/privacy)*

## How long do we keep your data?

- \* Personal Information, such as your address, is removed **when you delete your fitbit account.**
- \* Sensor Information that cannot identify you, such as fitness data, is **kept indefinitely**



Full Fitbit Privacy Policy:  
[www.fitbit.com/privacy](https://www.fitbit.com/privacy)

# More Information

## With an account, Fitbit will collect:

\* Your **location**, when location features, such as maps, are active



You can track your heartrate, distance and step count with your Fitbit, without needing an account.

*Find further collection practices at [Fitbit.com/privacy](https://www.fitbit.com/privacy)*

# Positive and Negative Framing

Fitbit may share or sell aggregated information that does not identify you.

**Selling your aggregated de-identified data allows Fitbit to provide Fitbit devices at lower cost, with no service charges.**

*Find further sharing practices at [Fitbit.com/privacy](https://Fitbit.com/privacy)*

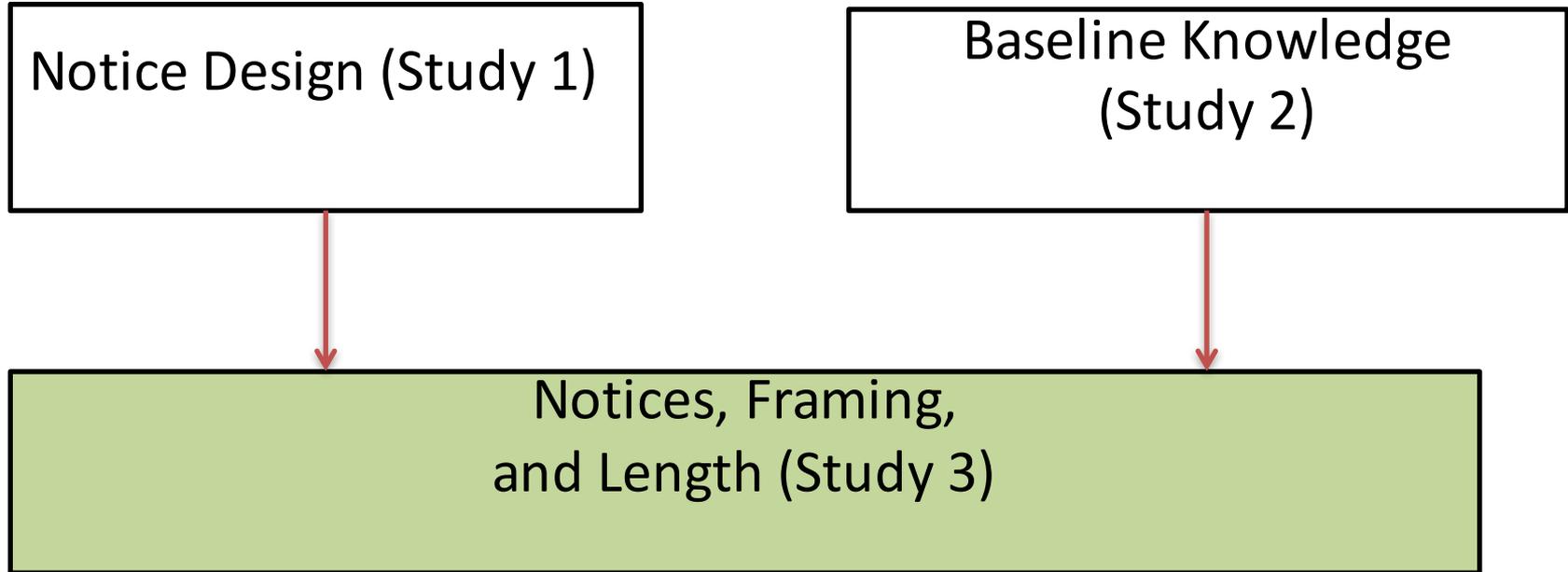
Fitbit may share or sell aggregated information that does not identify you.

**It is sometimes possible to identify an individual from de-identified data.**

*Find further sharing practices at [Fitbit.com/privacy](https://Fitbit.com/privacy)*

# Methodology

## Three Stage Mturk Study



# Study 3

## Framing, and Length

- 3x3 experimental design + control

	Short	Medium	Long
Positive	Short/Pos.	Med./Pos.	Long/Pos.
Negative	Short/Neg.	Med./Neg.	Long/Neg.
Neutral	Short/Neutral	Med./Neutral	Long/Neutral

**Control**

# Participant Factors Matter

- Diverse Group of Users
  - Median Age 29, Range 18-69
  - 50.1% Female
- Older participants, women more aware

# Notices outperform Control

- Short-Form Notices increase user awareness of privacy practices
  - Reconfirmation of prior work
- Fitness wearables companies have been improving communication of practices
  - Ready made way for these companies to increase user awareness of privacy practices

# No effect of framing

- No statistically significant effect of framing on awareness ( $p=.19$ )

Fitbit may share or sell aggregated information that does not identify you.

**Selling your aggregated de-identified data allows Fitbit to provide Fitbit devices at lower cost, with no service charges.**

*Find further sharing practices at [Fitbit.com/privacy](https://www.fitbit.com/privacy)*

**How long do we keep your data?**

- \* Personal Information, such as your address, is removed **when you delete your fitbit account.**
- \* Sensor Information that cannot identify you, such as fitness data, is **kept indefinitely**



**If you ever have a problem with Fitbit's data practices, simply delete your account and your personal data will no longer be stored.**

Positive

Fitbit may share or sell aggregated information that does not identify you.

**It is sometimes possible to identify an individual from de-identified data.**

*Find further sharing practices at [Fitbit.com/privacy](https://www.fitbit.com/privacy)*

**How long do we keep your data?**

- \* Personal Information, such as your address, is removed **when you delete your fitbit account.**
- \* Sensor Information that cannot identify you, such as fitness data, is **kept indefinitely**



**Until you delete your Fitbit account, anything you've ever posted will be kept by Fitbit, regardless of deleting your profile.**

Negative

Fitbit may share or sell aggregated information that does not identify you.

*Find further sharing practices at [Fitbit.com/privacy](https://www.fitbit.com/privacy)*

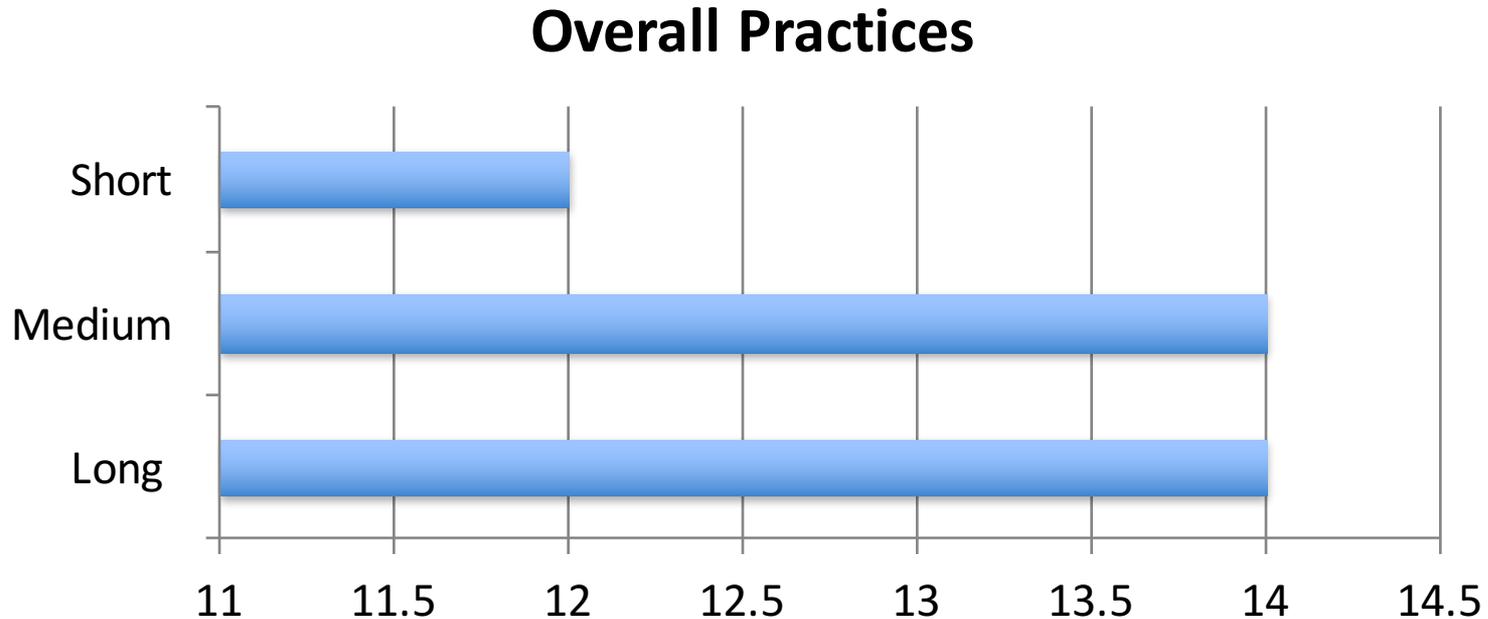
**How long do we keep your data?**

- \* Personal Information, such as your address, is removed **when you delete your fitbit account.**
- \* Sensor Information that cannot identify you, such as fitness data, is **kept indefinitely**

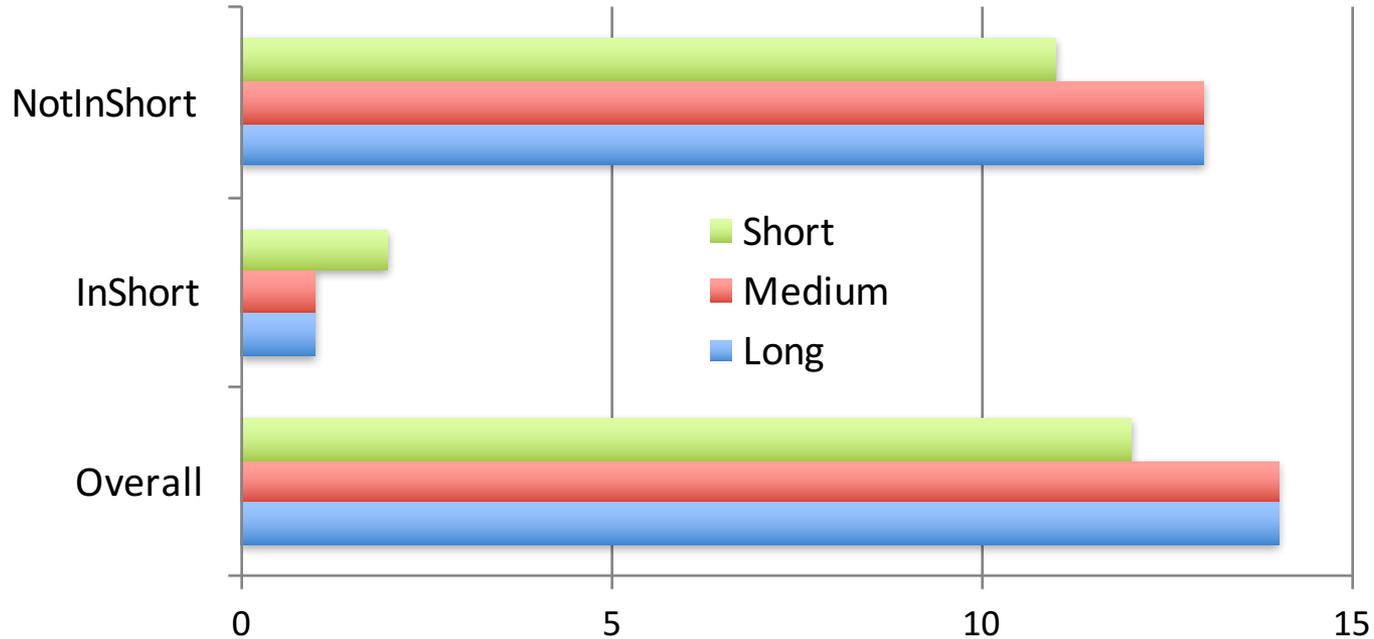


No Framing

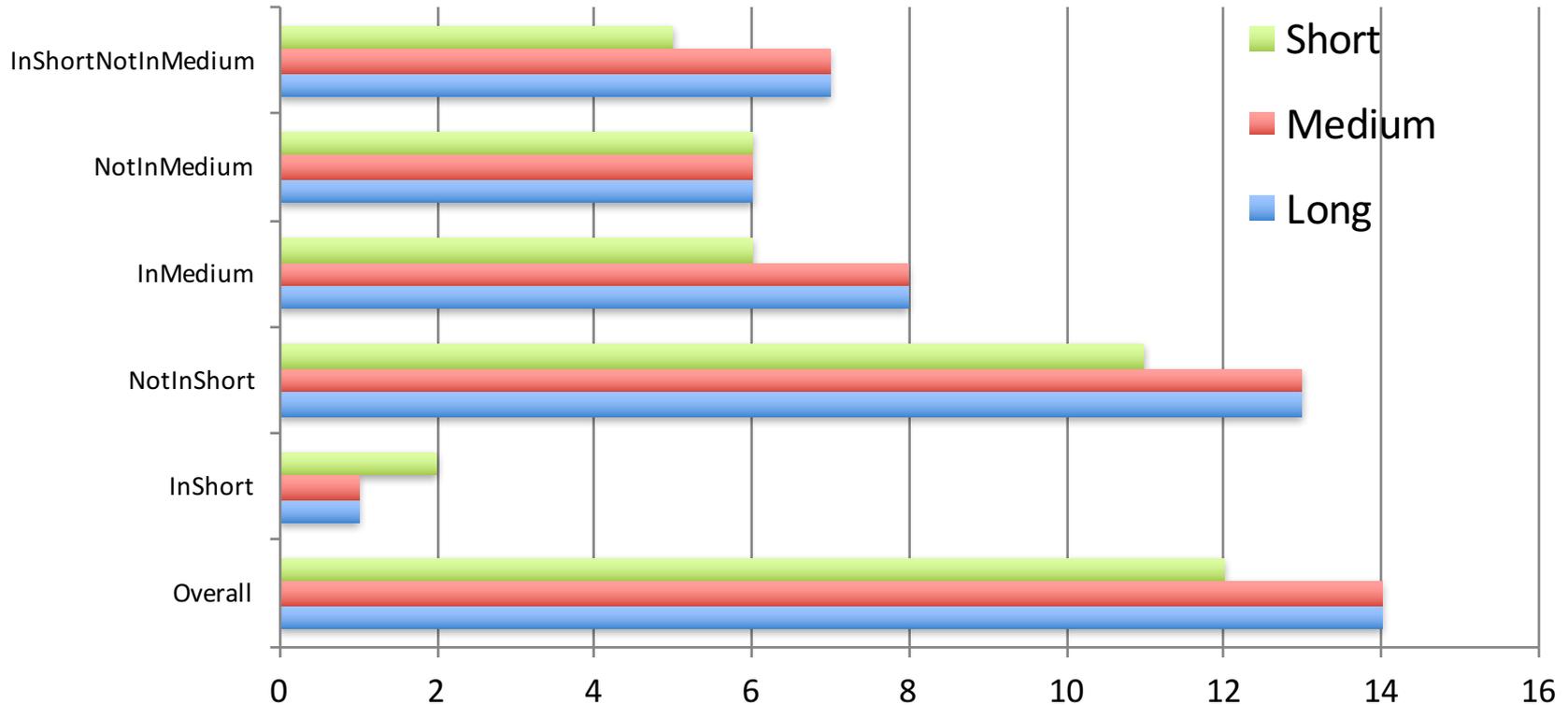
# Shortest Notices lead to less overall awareness



# Shortest does equally on remaining, worse on practices removed



# Medium Similar Performance as Long



# Results (Overview)

- Short-Form notices were beneficial
- No effect of framing on awareness
- Shortest notices led to reduced awareness
- Medium notices led to equal awareness

# Limitations

- Generalizability
- Wording of notice
- Mturk survey

# Take Aways

- Focusing on unexpected practices
  - Some practices can be removed with no negative effects
    - A method for determining these practices
  - There is a lower bound to notice length (policies must be included)
- Short-form notices are effective

**Joshua Gluck**  
PhD Student at CMU  
Email: [jgluck@cmu.edu](mailto:jgluck@cmu.edu)