# Privacy Policies Through the Lens of Contextual Integrity

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This research was funded by Princeton IoT Consortium grant and NSA and NSF grants

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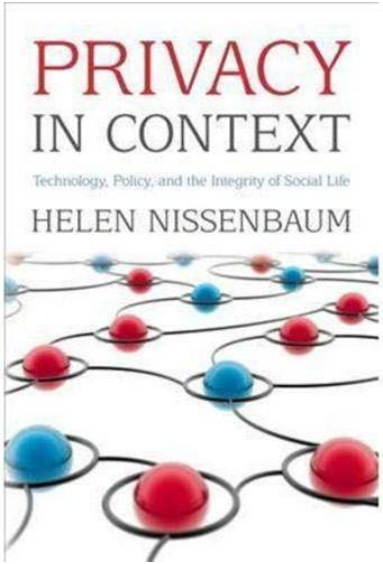
# Do these services respect our privacy?

# Let’s Check the Privacy Policy

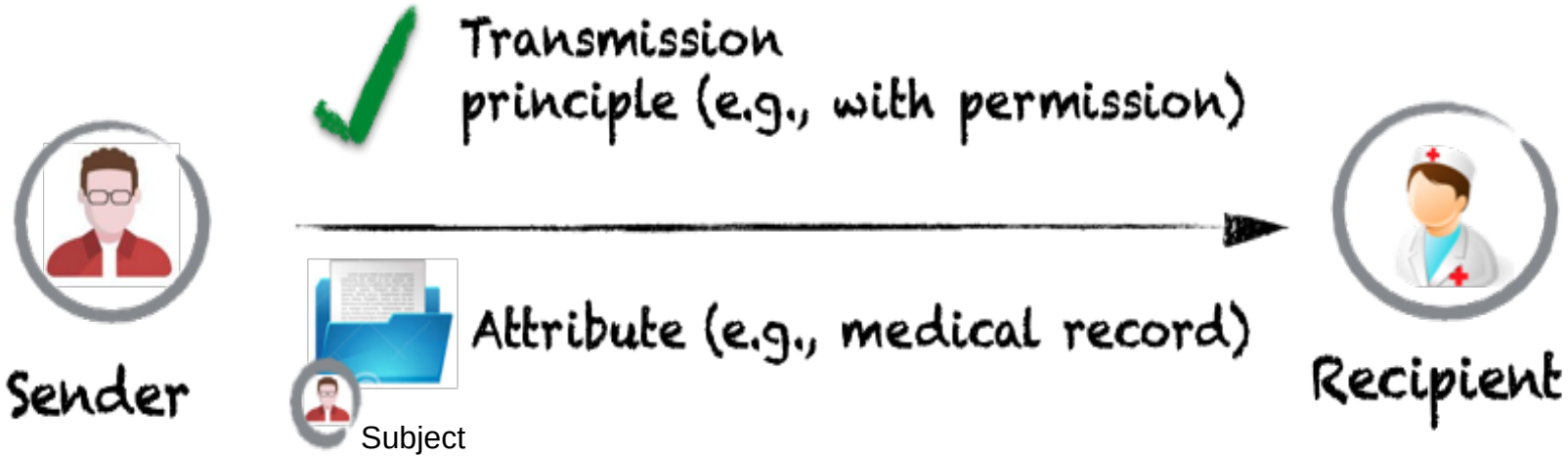
- We can infer that *claimed* practices respect our privacy if they conform to our expectations of the resulted information flows

# Privacy as Contextual Integrity

- Users come to services with privacy expectations in mind
- We can describe information flows using CI in terms of 5 key parameters

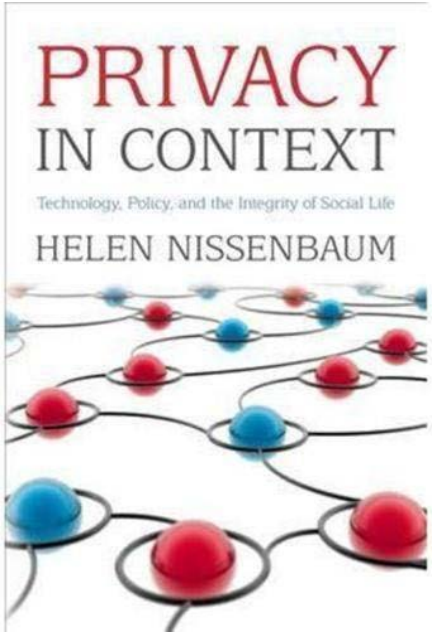


# All 5 CI Parameters Matter!



# Using CI to Capture Norms

- Actors
  - Who is the Sender?  Recipient?  Subject?
- Attribute
  - What type of information?
- Transmission Principle
  - Under what condition? For what purpose?



# Methodology

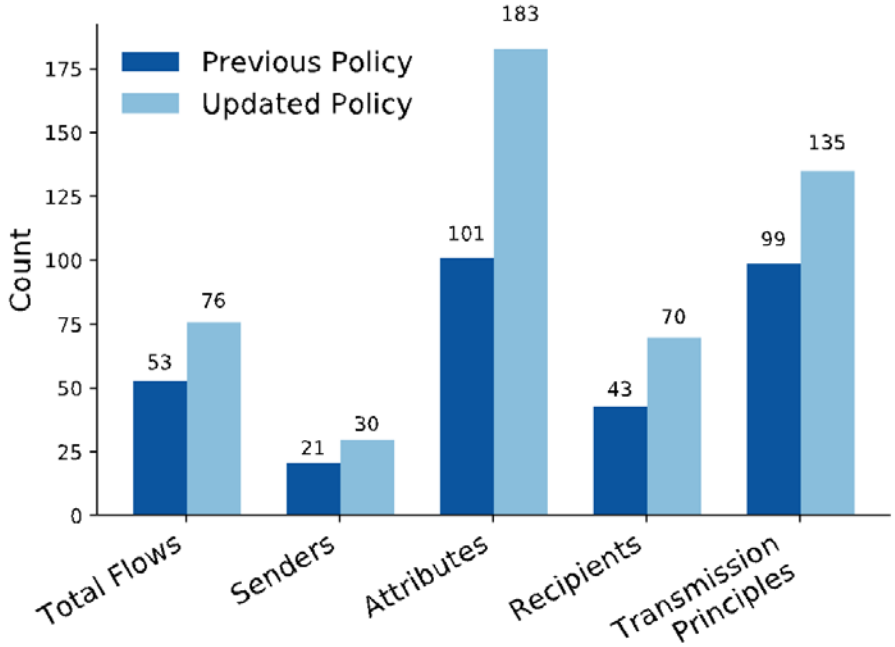
- Use the CI framework to annotate policy statements that describe contextual information exchanges

# Detecting Policy Ambiguities

- **Identifying statements that omit contextual information** (Incomplete flows)
- **Recognizing complex statements** (CI Parameter Bloating)
- Comparing privacy policy versions
- Diagnosing vague statements

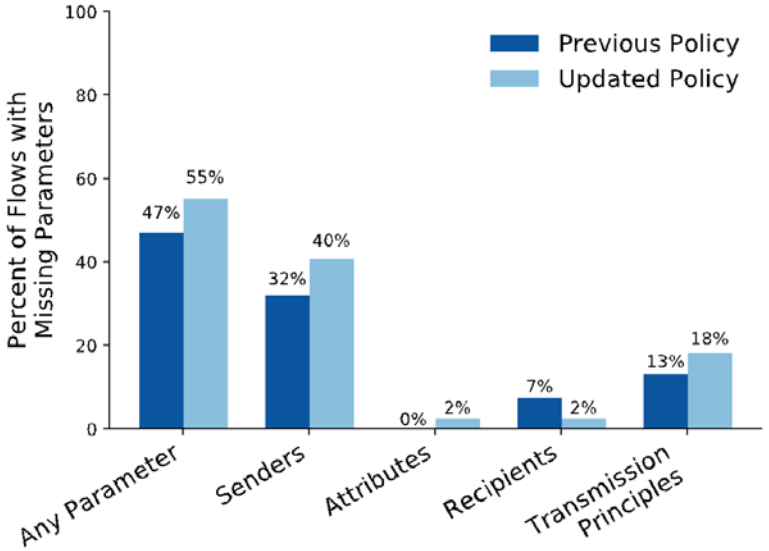
# Facebook Case Study

- Annotate previous and updated versions of Facebook's privacy policy
- Increase in the number of information flows and parameters
- **More information flows does not mean more clarity!**



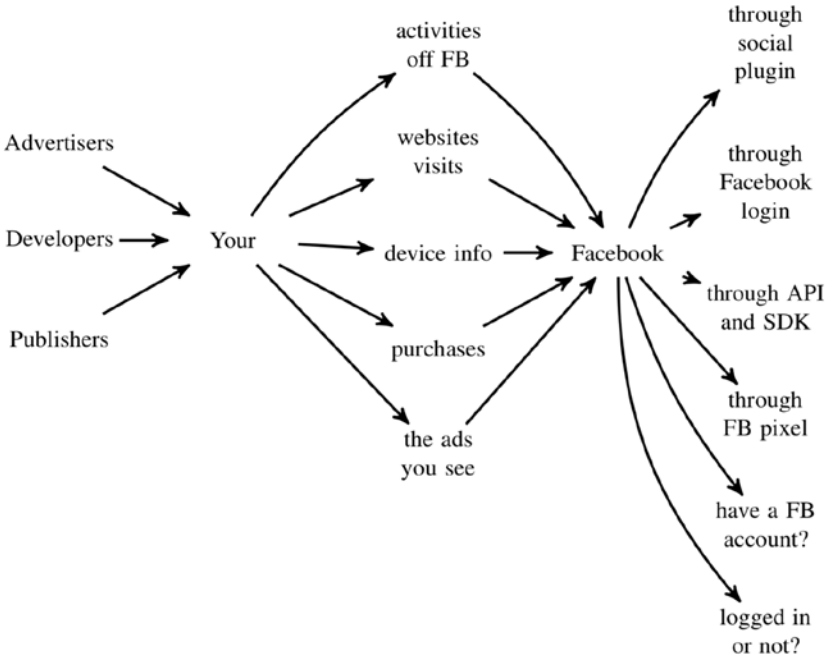
# Incomplete Information Flows

- Previous policy
  - **47%** (25/53) of flows are missing one or more parameters.
- Updated policy
  - **55%** (42/76) of flows are missing one or more parameters.
- **Failing to specify parameters introduces ambiguity, leaving consumers uninformed about company behavior.**

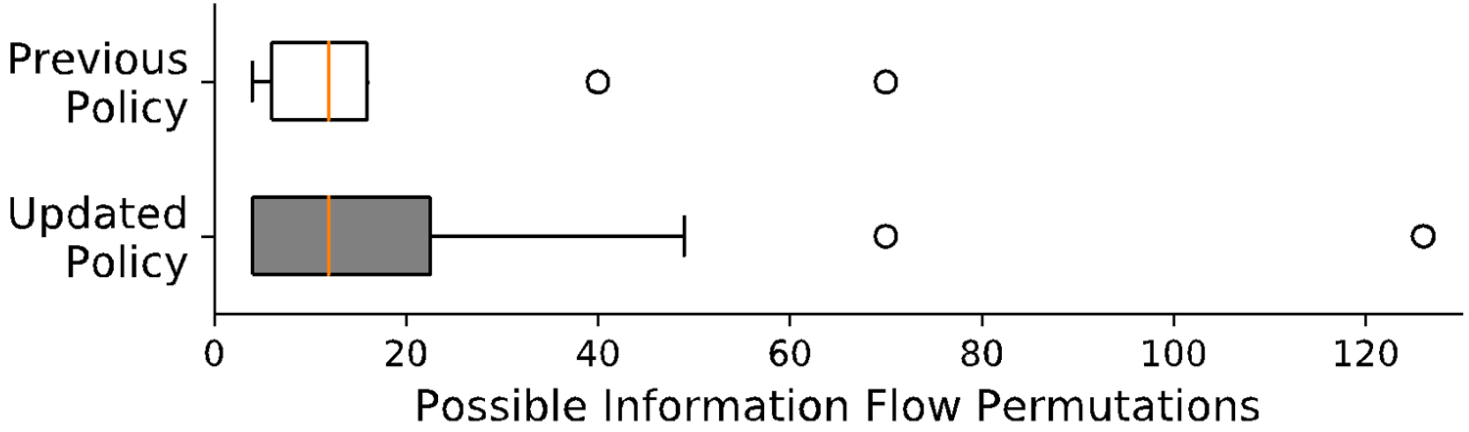


# CI Parameter Bloating

**Advertisers, app developers and publishers**[*senders*] can send **us**[*recipient*] information **through Facebook Business Tools that they use, including our social plug-ins (such as the Like button), Facebook Login, our APIs and SDKs or the Facebook pixel**[*TP*]. These partners provide information about **your**[*subject*] **activities off Facebook including information about your device, websites you visit, purchases you make, the ads you see and how you use their services**[*attributes*] **whether or not you have a Facebook account or are logged in to Facebook.**[*TP*]



# CI Parameter Bloating: 1 to N Flows



# Crowdsourcing Annotations

- Constructed CI annotation as an Amazon Mechanical Turk task
  - Promising results (high precision)
  - **Future goal**: produce a large corpus of privacy policies annotations to discover trends in within and across industries

# Takeaways

- Privacy practices should conform with privacy expectations
- Policies that omit contextual information are ambiguous and misleading
- CI Parameter Bloating generates complexity beyond human cognition and memory

# Thank You

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