Privacy Notice and Choice in Practice
Lorrie Faith Cranor
July 2013
CyLab Usable Privacy and Security Laboratory

HTTP://CUPS.CS.CMU.EDU
Patchwork quilt of privacy laws
US government privacy reports

- U.S. FTC and White House reports released in 2012
- U.S. Department of Commerce multi-stakeholder process to develop enforceable codes of conduct
Privacy self regulation

Notice and Choice
Notice and choice

Protect privacy by giving people control over their information

**Notice** about data collection and use

**Choices** about allowing their data to be collected and used in that way
“In theory there is no difference between theory and practice. In practice there is.”

—Yogi Berra
How effective is privacy notice and choice *in practice*?
Global Privacy Enforcement Network Internet Privacy Sweep Questions and Answers

May 6, 2013

What will happen during the Internet Privacy Sweep? What is the goal?

Privacy enforcement authorities participating in the Sweep will designate individuals within their organizations to search the Internet in a coordinated effort to assess privacy practices related to a predetermined theme – this year the theme is Privacy Practice Transparency.

The Sweep will provide flexibility for privacy enforcement authorities to tailor their search within this common theme to focus on issues that are relevant in the context of domestic legislation, market factors and strategic priorities.

The purpose of the Sweep is not to conduct an in-depth analysis of the privacy practice transparency of each website, but to replicate the consumer experience by spending a few minutes per site checking for performance against set common indicators.

The Sweep is not an investigation, nor is it intended to conclusively identify...
Nobody wants to read privacy policies

“the notice-and-choice model, as implemented, has led to long, incomprehensible privacy policies that consumers typically do not read, let alone understand”

Cost of reading privacy policies

• What would happen if everyone read the privacy policy for each site they visited once each month?

• Time = 244/hours year

• Cost = $3,534/year

• National opportunity cost for time to read policies: $781 billion

Privacy Icons

Your Data is Used Only for the Intended Use

Your Data May be Used for Purposes You Do Not Intend

Your data is never given to advertisers.

Site gives your data to advertisers.

Your data is never bartered or sold.

Your data may be bartered or sold.

Data is given to law enforcement only when legal process is followed.

Data may be given to law enforcement even when legal process is not followed.

Your data is kept for less than 1 month.

Your data may be kept indefinitely.

http://www.azarask.in/blog/post/privacy-icons/
Smartphone App Privacy Icon Study Conducted for LifeLock, Inc. by Cranor et al., 2013
Towards a privacy “nutrition label”

- **Standardized format**
  - People learn where to find answers
  - Facilitates policy comparisons

- **Standardized language**
  - People learn terminology

- **Brief**
  - People find info quickly

- **Linked to extended view**
  - Get more details if needed
Iterative design process

- Series of studies
  - Focus groups
  - Lab studies
  - Online studies

- Metrics
  - Reading-comprehension (accuracy)
  - Time to find information
  - Ease of policy comparison
  - Subjective opinions, ease, fun, trust


Privacy label for Android

**DESCRIPTION**
Like word games? Like weasels? This is the game for you. Word Weasel is a fast word game where you find as many words as you can from 9 letters in 50 seconds. Compete with everyone else playing at the same time, a new game starts every minute!

"The most fun you can have on your own with 9 random letters. Brilliantly simple, devilishly addictive." –Kim, Android Market comment
Role play studies

• Task for participants in lab or online
  – Select apps for friend with new Android phone
  – Choose from 2 similar apps w/ different permission requests in each of 6 categories
  – Click on app name to visit download screens

• Post-task questionnaire

• Participants who saw Privacy Facts more likely to select apps that requested fewer permissions
  – Other factors such as brand and rating reduce effect

P.G. Kelley, L.F. Cranor, and N. Sadeh. Privacy as part of the app decision-making process. CHI 2013.
Let your computer read for you

- Platform for Privacy Preferences (P3P)
- W3C specification for XML privacy policies
  - Proposed 1996
  - Adopted 2002
- Optional P3P compact policy HTTP headers to accompany cookies
- Lacks incentives for adoption
P3P in Internet Explorer

• P3P implemented in IE 6, 7, 8, 9, 10 …

• Default privacy setting
  – Rejects third-party cookies without a CP
  – Rejects unsatisfactory third-party cookies
No P3P syntax checking in IE

• IE accepts P3P policies containing bogus tokens or missing required tokens

• Example of valid compact policy:

  CAO DSP COR CURa ADMa DEVa OUR IND PHY ONL UNI COM NAV INT DEM PRE

• Examples of invalid policies accepted by IE:

  AMZN

  Facebook does not have a P3P policy. Learn why here: http://fb.me/p3p

Microsoft uses a “self-declaration” protocol (known as “P3P”) dating from 2002 .... It is well known – including by Microsoft – that it is impractical to comply with Microsoft’s request while providing modern web functionality.
Do not track

• Proposed W3C standard
• User checks a box
• Browser sends “do not track” header to website
• Website stops “tracking”
• W3C working group trying to define what that means
Lots of tools to stop tracking

- Browser privacy settings
  - Cookie blocking
  - P3P
  - Tracking Protection Lists
  - Do Not Track
- Browser add-ons
- Opt-out cookies
- Digital Advertising Alliance (DAA) AdChoices icon and associated opt-out pages
Are any of these tools effective?

• Do the tools work?
  – Does technology do what it is supposed to do?
  – Do companies respect user choices?

• Can consumers use them?
  – Do users understand tracking?
  – Do users understand what tools do?
  – Can users make tools do what they want?
Smart, Useful, Scary, Creepy: Perceptions of Behavioral Advertising

Blase Ur, Pedro G. Leon, Lorrie Faith Cranor, Richard Shay, and Yang Wang

SOUPS 2012
Research goals

• Gain insight into what users think about online behavioral advertising (OBA)
• Identify how participants’ mental models correspond with notice and choice mechanisms
Methodology

• 48 participants
• Recruited from the Pittsburgh, PA region
  – Non-technologists
  – Interested in testing privacy tools
• Combination semi-structured interview and usability study
• Part way through interview showed WSJ video to inform participants about OBA
Participants unaware of OBA

- Participants believed ads were tailored, but only based on context or on a single site.
Participants unaware of OBA

• Participants believed ads were tailored, but only based on context or on a single site

• Thought it was only hypothetical
  – “I guess if they were monitoring what I did on the Internet…But I’d hope they weren’t…”
Didn’t recognize OBA icon

• Not sure what would happen if they clicked on icon
  – Express interest in product
  – Purchase your own ads
  – Go to product’s website
  – See related ads
Mixed opinion about OBA

• Recognized benefits
  – Advertisers can reach consumers interested in their products
  – Consumers find things they’re interested in and don’t get ads for things they’re not interested in
• Concerned about privacy
Beliefs about OBA

- Advertisers collect information including name, financial information, and address
- This information, along with browsing history, is stored in cookies
Participants’ impressions: available choice mechanisms

- Deleting cookies
- No options
- Antivirus software suites
- Web browser
Familiarity and trust are important

Familiar brands judged based on non-advertising activities

Unfamiliar brands not trusted
Takeaways

• Opinions about OBA mixed – both useful and creepy
• Participants did not understand OBA technologies
• Some of the worst fears based on misconceptions
• Participants did not know how to effectively exercise choice

Pedro G. Leon, Blase Ur, Rebecca Balebako, Lorrie Faith Cranor, Richard Shay, and Yang Wang

CHI 2012
Three types of tools tested

<table>
<thead>
<tr>
<th>Blocking Tools</th>
<th>Opt-out Tools</th>
<th>Privacy built in browser</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABINE</td>
<td>DAA</td>
<td>Mozilla Firefox</td>
</tr>
<tr>
<td>Ghostery</td>
<td></td>
<td>Google Chrome</td>
</tr>
<tr>
<td>AdBlock Plus</td>
<td>PrivacyMark</td>
<td>PrivacyMark</td>
</tr>
<tr>
<td>eTPLs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EVIDON</td>
<td></td>
</tr>
</tbody>
</table>
Methodology

• Part of previous interview study
• 45 participants evaluated 9 tools
  – Between subjects study
  – Random assignment, controlled for preferred web browser and operating system
Testing protocol

• Semi-structured interview

• Usability testing
  – Task 1: Learn about and install the tool
  – Task 2: Change tool settings
  – Task 3: Browsing scenarios

• Exit questionnaire
DAA website

Welcome to the online home of the Self-Regulatory Program for Online Behavioral Advertising.

Building on the Self-Regulatory Principles for Online Behavioral Advertising (Principles) released in July 2005, the nation’s largest media and marketing associations have come together to launch this Program, which gives consumers a better understanding of and greater control over ads that are customized based on their online behavior (also called “interest-based” advertising).

Our participating companies share a commitment to delivering consumers a robust and credible Program of notice and choice for online behavioral advertising, and to enhancing consumer confidence in the online medium.

For Consumers

Learn about Online Behavioral Advertising: If you’re an online user, you can find out more about online behavioral advertising and how it helps you with more relevant advertising on the websites you visit. You’ll learn how online advertising supports the free content, products and services you use online, what choices you have; and how to use browser controls to enhance your privacy.

Exercise Your Choice: You can now opt out of behavioral advertising through the Program’s Consumer Opt Out Page, which allows users to...
Opting out can be challenging

If you have already targeted ads are delivered, all unsubscribe process may take your time. This process has not only stop targeting ads that reference the user information for ad serving, otherwise it does not stop in the process, please understand.
Ghostery configuration interface

Performance Options
- Scan and block images served off the matched tracker domain
- Scan and block iframes served off the matched tracker domain
- Scan and block embed and object tags served off the matched tracker domain
- Look for and prevent redirection from known trackers
- Scan for dynamically inserted page elements

Blocking Options
- Enable web bug blocking
- Enable cookie protection [experimental]

659 bugs & 396 cookies (click for more info)

- 24/7 Real Media
- 2eep
- 33Across
- 3DStats
- 5min Media
- [x+1]
- Accelerator Media
- Answer Media
IE-TPL configuration interface
Takeaways

• Problematic defaults
• Poorly designed interfaces and jargon
• Feedback
• Misconceptions about opt-out tools
• Users unable to make meaningful decisions on a per-company basis
What Do Online Behavioral Advertising Disclosures Communicate to Users?

Pedro Giovanni Leon, Justin Cranshaw, Lorrie Faith Cranor, Jim Graves, Manoj Hastak, Blase Ur, and Guzi Xu. WPES 2012
The industry claims total success

“The DAA has revolutionized consumer education and choice by delivering a real-time, in-ad notice more than 10 billion times every day through the increasingly ubiquitous DAA Advertising Option Icon (also known as the ‘Ad Choices’ Icon)”

Objectives

• Evaluate the effectiveness of different OBA disclosures at communicating notice and choice about OBA

• Find ways to improve effectiveness of OBA disclosures
Methodology

• Large scale between-subjects online study
  – 1,505 participants
  – Over 100 participants per treatment

• Participants recruited through Amazon Mechanical Turk

• Guided browsing scenario

• Online survey
First exposure to OBA disclosures
Second exposure to OBA disclosures

• Why did I get this ad?
• Interest based ads
• AdChoices
• Sponsor ads
• Learn about your ad choices
• Configure ad preferences
• ‘No tagline’
Exposure to landing pages

- AOL
- Yahoo!
- Microsoft
- Google
- Monster
Do icons and taglines suggest tailored ads?

• To what extent, if any, does this combination of the symbol and phrase, placed on the top right corner of the above ad suggest the following?
  – This ad has been tailored based on websites you have visited in the past. [true]
This ad has been tailored based on websites you have visited in the past

Why did I get this ad?
- Definitely not: 0%
- Probably not: 20%
- Not sure: 40%
- Probably: 60%
- Definitely: 80%

Interest based ads
- Definitely not: 0%
- Probably not: 20%
- Not sure: 40%
- Probably: 60%
- Definitely: 80%

Learn about your ad choices
- Definitely not: 0%
- Probably not: 20%
- Not sure: 40%
- Probably: 60%
- Definitely: 80%

Configure ad preferences
- Definitely not: 0%
- Probably not: 20%
- Not sure: 40%
- Probably: 60%
- Definitely: 80%

AdChoices
- Definitely not: 0%
- Probably not: 20%
- Not sure: 40%
- Probably: 60%
- Definitely: 80%

Blank
- Definitely not: 0%
- Probably not: 20%
- Not sure: 40%
- Probably: 60%
- Definitely: 80%

Sponsor Ads
- Definitely not: 0%
- Probably not: 20%
- Not sure: 40%
- Probably: 60%
- Definitely: 80%

Definitely not
Probable not
Not sure
Probably
Definitely
Willingness to click

• What do you think would happen if you click on that symbol or that phrase?
  – It will take you to a page where you can tell the advertising company that you do not want to receive tailored ads. [true]
  – More ads will pop up. [false]
  – It will take you to a page where you can buy advertisements on this website. [false]
Will take you to a page where you can tell the advertising company that you do not want to receive tailored ads

Configure ad preferences: 50% Definitely or Probably
Learn about your ad choices: 34% Definitely or Probably
Why did I get this ad?: 28% Definitely or Probably
AdChoices: 27% Definitely or Probably
Blank: 20% Definitely or Probably
Interest based ads: 17% Definitely or Probably
Sponsor Ads: 16% Definitely or Probably

Legend:
- Brown: Definitely not
- Red: Probably not
- Gray: Not sure
- Blue: Probably
- Black: Definitely
Will take you to a page where you can buy advertisements on this website

% Definitely or Probably

AdChoices: 45%
Sponsor Ads: 45%
Learn about your ad choices: 32%
Interest based ads: 29%
Blank: 27%
Why did I get this ad?: 18%
Configure ad preferences: 15%

Definitely not  Probably not  Not sure  Probably  Definitely
Takeaways

• OBA icons and taglines are not noticed
• “AdChoices” was outperformed by other tagline treatments at communicating notice and choice about OBA
• Users are afraid to click on icon
How effective is privacy notice and choice in practice?
<table>
<thead>
<tr>
<th>Notice and Choice Mechanism</th>
<th>Effectiveness in Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privacy policies Nobody reads</td>
<td>Privacy nutrition labels Promising research, not used</td>
</tr>
<tr>
<td>Privacy Facts for Android Promising research, not used</td>
<td>P3P Used to circumvent browser privacy settings</td>
</tr>
<tr>
<td>Do Not Track No agreement on what it means</td>
<td>Tools to opt-out of tracking Difficult to use</td>
</tr>
<tr>
<td>AdChoices Icon Nobody knows what it means and people are afraid to click on it</td>
<td></td>
</tr>
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<td>Nobody knows what it means and people are afraid to click on it</td>
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Are They Actually Any Different? Comparing Thousands of Financial Institutions’ Privacy Practices

Lorrie Faith Cranor, Kelly Idouchi, Pedro Giovanni Leon, Manya Sleeper, Blase Ur, WEIS 2013
**FACTS**

### WHAT DOES PNC DO WITH YOUR PERSONAL INFORMATION?

**Why?**

Financial companies choose how they share your personal information. Federal law gives consumers the right to limit some but not all sharing. Federal law also requires us to tell you how we collect, share, and protect your personal information. Please read this notice carefully to understand what we do.

**What?**

The types of personal information we collect and share depend on the product or service you have with us. This information can include:

- Social Security number and income
- Account balances and account transactions
- Credit scores and payment history

**How?**

All financial companies need to share customers’ personal information to run their everyday business. In the section below, we list the reasons financial companies can share their customers’ personal information, the reasons PNC chooses to share, and whether you can limit this sharing.

<table>
<thead>
<tr>
<th>Reasons we can share your personal information</th>
<th>Does PNC share?</th>
<th>Can you limit this sharing?</th>
</tr>
</thead>
<tbody>
<tr>
<td>For our everyday business purposes — such as to process your transactions, maintain your account(s), respond to court orders and legal investigations, or report to credit bureaus</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>For our marketing purposes — to offer our products and services to you</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>For joint marketing with other financial companies</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>For our affiliates’ everyday business purposes — information about your transactions and experiences</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>For our affiliates’ everyday business purposes — information about your creditworthiness</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>For our affiliates to market to you</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>For nonaffiliates to market to you</td>
<td>No</td>
<td>We don’t share</td>
</tr>
</tbody>
</table>

**To limit our sharing**

- Call 1-800-762-2118 — our menu will prompt you through your choice(s)
- Visit us online: www.PNC.com/privacy (Online Banking customers only.)

**Questions?**

Call 1-800-762-2118
Gramm-Leach Bliley Act (1999)

- Mandated annual privacy disclosures
- Disclosures were full of fine print, difficult to read and compare
Standardized notice

• Eight federal agencies jointly released a model privacy form (2009)
  – Two pages
  – Optional, but widely adopted
  – Safe harbor
Data collection and extraction

- FDIC directory of 7,072 institutions
- Download top 10 results for Google query:
  
  WHAT DOES [NAME OF FINANCIAL INSTITUTION] DO WITH YOUR PERSONAL INFORMATION?

- Restrict to institution’s web domain
- Convert HTML or PDF to text
- Regular expressions (pattern matching)
  - Structure of document
- Manual verification: 90%+ accurate per section on a random sample of 50 policies
Reasons for sharing

- Our Everyday
- Our Marketing
- Joint Marketing
- Affiliates (Trans.)
- Affiliates (Credit.)
- Affiliates' Marketing*
- Nonaffiliates' Marketing

Legend:
- Green: Don't share
- Yellow: Share, opt-out
- Red: Share, no opt-out

% of institutions

0% 20% 40% 60% 80% 100%
100 largest banks

- Our Everyday
- Our Marketing
- Joint Marketing
- Affiliates (Trans.)
- Affiliates (Credit.)
- Affiliates' Marketing*
- Nonaffiliates' Marketing

- Don't share
- Share, opt-out
- Share, no opt-out
Comparing Credit Cards

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<th>Institution</th>
<th>Our everyday</th>
<th>Our marketing</th>
<th>Joint marketing</th>
<th>Affiliates-Trans.</th>
<th>Affiliates-Credit.</th>
<th>Affiliates' Marketing</th>
<th>Non-affiliates' marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital One, Chase, Discover, HSBC</td>
<td>Red</td>
<td>Red</td>
<td>Red</td>
<td>Red</td>
<td>Red</td>
<td>Red</td>
<td>Red</td>
</tr>
<tr>
<td>Bank of America, Citi</td>
<td>Red</td>
<td>Red</td>
<td>Red</td>
<td>Red</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
</tr>
<tr>
<td>Am. Ex.</td>
<td>Red</td>
<td>Orange</td>
<td>Red</td>
<td>Red</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Yellow</td>
</tr>
<tr>
<td>Barclays</td>
<td>Red</td>
<td>Orange</td>
<td>Red</td>
<td>Red</td>
<td>Red</td>
<td>Yellow</td>
<td>Red</td>
</tr>
<tr>
<td>GE Capital</td>
<td>Red</td>
<td>Orange</td>
<td>Red</td>
<td>Green</td>
<td>Green</td>
<td>Yellow</td>
<td>Green</td>
</tr>
<tr>
<td>U.S. Bank</td>
<td>Red</td>
<td>Orange</td>
<td>Red</td>
<td>Red</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Yellow</td>
</tr>
<tr>
<td>Wells Fargo</td>
<td>Red</td>
<td>Orange</td>
<td>Red</td>
<td>Red</td>
<td>Orange</td>
<td>Yellow</td>
<td>Orange</td>
</tr>
</tbody>
</table>

- Red: Share, no opt-out
- Orange: Share, opt-out
- Green: Don't share
Logistic Regressions

• Dependent variable: {Share, Do not share}
• Independent variables: assets, state, specialization, regulator, etc.

• Significant factors included:
  – OCC district (geographic location)
  – Number of offices
  – Member or not of a bank holding company
Banks are not all the same

- Banks have different privacy policies
- Many banks do little sharing of customer data
- No easy way for consumers to find banks with good privacy policies
Dress, Casual & Athletic Shoes | Zappos.com
Online shoe store selling a variety of brand name men's and women's footwear.
http://www.zappos.com/ - No Cache - Privacy Policy - Similar Pages

Nike.com - Shop the Official NikeStore
Designs, develops, and markets footwear, apparel, equipment, and accessory products. Explore Nike's site to shop online, customize products, and find a local store.
http://www.nike.com/ - No Cache - Privacy Policy - Similar Pages

Onlineshoes.com - official site
Shop online for name brand shoes at Onlineshoes.com. Choose from over 170 brands. Enjoy free shipping and exchanges, plus 110% price guarantee on all shoes.
http://www.onlineshoes.com/ - No Cache - Privacy Policy - Similar Pages

Shoes from Shoebuy.com - Free Shipping & Return Shipping
Sells mens' and womens' shoes, sandals, boots, and sneakers.
http://www.shoebuy.com/ - Cached - Privacy Policy - Similar Pages

Footwear Shopping in the Yahoo! Directory
Browse through footwear shops and official company sites in the Yahoo! Directory. Find retailers selling shoes, boots, and accessories from Nike, adidas, Puma, Timberland, Converse, Reebok, Skechers, and others.
http://dir.yahoo.com/Business_and_Economy/Shopping... - Cached - Privacy Policy - Similar Pages

Shoes.com - Womens, Mens, and Childrens Shoes
What Info is Collected, and How

- **What**: 24 options, SSN + choose exactly 5
  
  **What?**
  
  The types of personal information we collect and share depend on the product or service you have with us. This information can include:
  
  - Social Security number and [income]
  - [account balances] and [payment history]
  - [credit history] and [credit scores]

- **How**: 34 options, choose exactly 5
  
  **How does [name of financial institution] collect my personal information?**
  
  We collect your personal information, for example, when you
  
  - [open an account] or [deposit money]
  - [pay your bills] or [apply for a loan]
  - [use your credit or debit card]

- The most commonly used terms were the examples listed in the model
Curiosities Encountered

- Self-contradictory statements (15)

Does Geneva State Bank share?

- Yes
- Yes
- Yes
- Yes
Curiosities Encountered

• Self-contradictory statements (15)

<table>
<thead>
<tr>
<th>Does Geneva State Bank share?</th>
<th>Can you limit this sharing?</th>
</tr>
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<tbody>
<tr>
<td>Yes</td>
<td>We don't share</td>
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Curiosities Encountered

• Self-contradictory statements (15)

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• 24 institutions appear to be violating the Fair Credit Reporting Act (FCRA)
  – Not providing required opt-outs
Takeaways

• Adoption happens when there are incentives

• Institutions are actually different!
  – Largest institutions have the worst practices
  – Opportunity for consumer privacy choice

• But we need to help consumers find the banks with good privacy

• Model form needs some improvement
How effective is privacy notice and choice in practice?
How to make notice and choice more effective

• Incentives for adoption
• Enforcement (legal and technical)
• Baseline requirements
• Standardized notice formats
• Machine-readable notice formats
• Reduce ambiguity
• Link to full disclosure
• Comparison tools
• More research