

**Smart, Useful,**

**Scary, Creepy**

**Perceptions of  
Online Behavioral Advertising**

Blase Ur, Pedro Giovanni Leon,  
Lorrie Faith Cranor, Richard Shay, Yang Wang

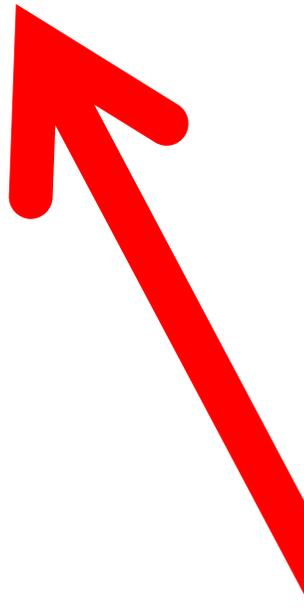
**Carnegie Mellon**

# Introduction

- Online Behavioral Advertising (OBA):  
Ads tailored based on websites you have visited

# How OBA works

F2g7zAdMr3v  
7%dw@vEbni



## Bicycle.com

Google™

### SPONSORS

AdChoices ▶

#### [Presentation interactive](#)

Interactive Projector, Interactive Classroom, One Simple Solution. [epson.com/BrightLink](http://epson.com/BrightLink)

#### [Stationary Bikes Sale](#)

The Top Rated Stationary Bike Site.

## Types

The bicycle has been around since the 1800s : popular form of recreation, and are the primary types, from children's toys to adult fitness; the services, and appears in competitive sporting e

The bicycle can be broken down into four distir visit later. The four main types of bicycles are r has distinct characteristics that make each ty much differently than a bmx bike, and a mount

# How OBA works

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**vital bmx**

**LXVI VANS** THE FUTURE. AVAILABLE NOW. LXVI.VANS.COM

Home Community

Not a Member? Join Today Sign in Search Site

Connect with Facebook Share your Vital activity on Facebook (More info) close

Newest Most Popular

Sean Morr and Nick Castillo Video

Gear Guide - Daily Grind, Osiris, Federal

It Is What It Is Jam

Home Turf: Scott Hamlin / Motion Skatepark

**Gear Guide - Daily Grind Hub Guard, Osiris Shoes, Federal Frame**

Check out [The Daily Grind](#)'s rear hub guard, Miles Rogoish's shoe from [Osiris](#), and Bruno Hoffmann's frame from [Federal](#)!

# How OBA works

F2g7zAdMr3v  
7%dw@vEbni



I think you  
like bicycles!

**Gear Guide - Daily Grind Hub Guard, Osiris Shoes, Federal Frame** 2

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**Sean Morr and Nick Castillo Video**

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# How OBA works

F2g7zAdMr3v  
7%dw@vEbni

- Later, on an unrelated site

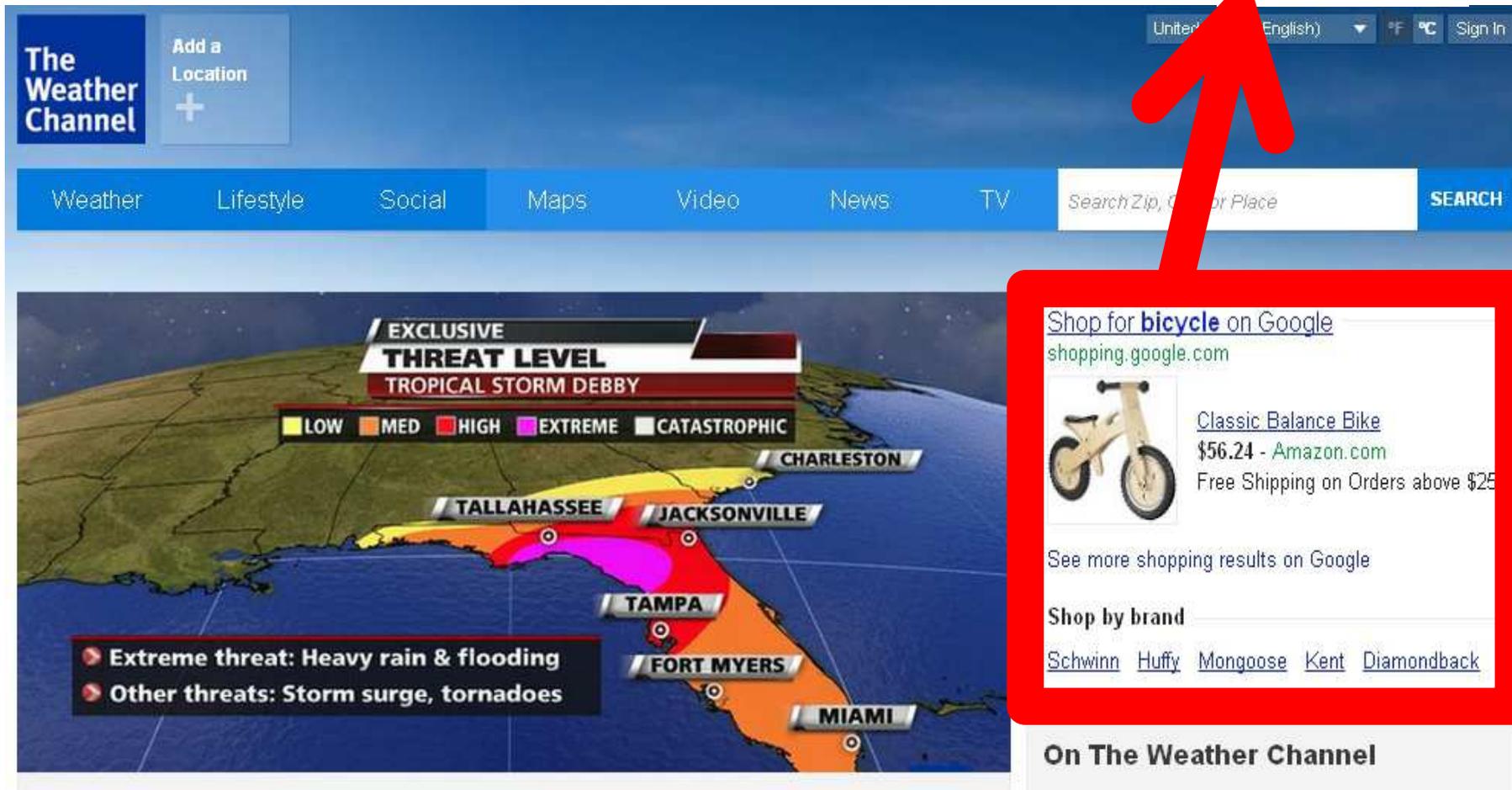


The screenshot shows the top navigation bar of 'The Weather Channel' website. It includes a search bar with the text 'Search Zip, City or Place' and a 'SEARCH' button. Below the navigation bar is a large map of Florida and the Gulf Coast region, titled 'EXCLUSIVE THREAT LEVEL TROPICAL STORM DEBBY'. The map is color-coded by threat level: LOW (yellow), MED (orange), HIGH (red), EXTREME (purple), and CATASTROPHIC (white). Major cities are labeled: CHARLESTON, TALLAHASSEE, JACKSONVILLE, TAMPA, FORT MYERS, and MIAMI. A legend at the bottom left of the map lists: 'Extreme threat: Heavy rain & flooding' and 'Other threats: Storm surge, tornadoes'. A large red arrow points from the cookie image above to the search bar. At the bottom of the page, there is a grey bar with the text 'On The Weather Channel'.

# How OBA works

F2g7zAdMr3v  
7%dw@vEbni

- Later, on an unrelated site



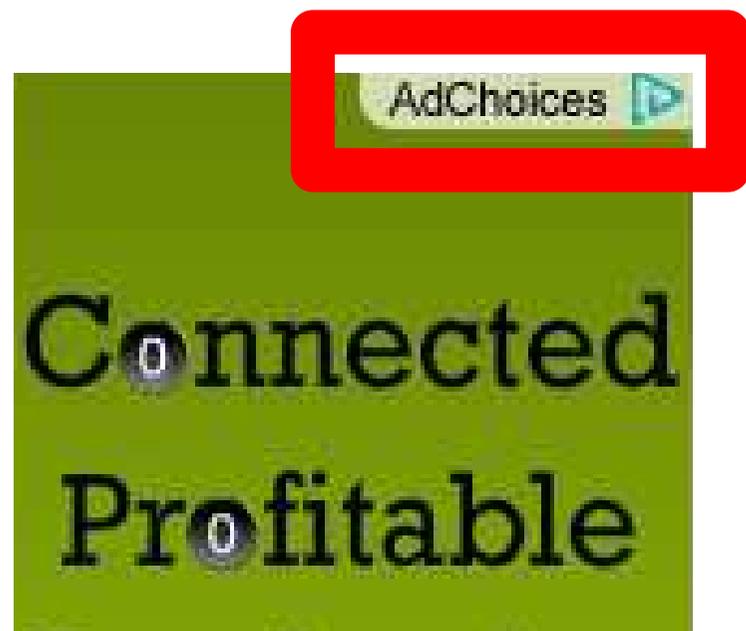
The screenshot shows the top of the Weather Channel website with navigation tabs for Weather, Lifestyle, Social, Maps, Video, News, and TV. A search bar is present. Below the navigation is a map of Florida showing threat levels for Tropical Storm Debby. The map is color-coded: yellow for Low, orange for Medium, red for High, pink for Extreme, and grey for Catastrophic. Major cities like Tallahassee, Jacksonville, Tampa, Fort Myers, and Miami are marked. A legend indicates the threat levels, and a text box notes 'Extreme threat: Heavy rain & flooding' and 'Other threats: Storm surge, tornadoes'. A red box highlights a shopping results box for a 'Classic Balance Bike' on Amazon.com, with a price of \$56.24. The shopping results box includes a search link, a product image, price, and shipping information. A red arrow points from a cookie image above to the shopping results box.

# How OBA works

- Hundreds of advertising networks perform OBA
  - From  to 
- Cookies commonly used for tracking

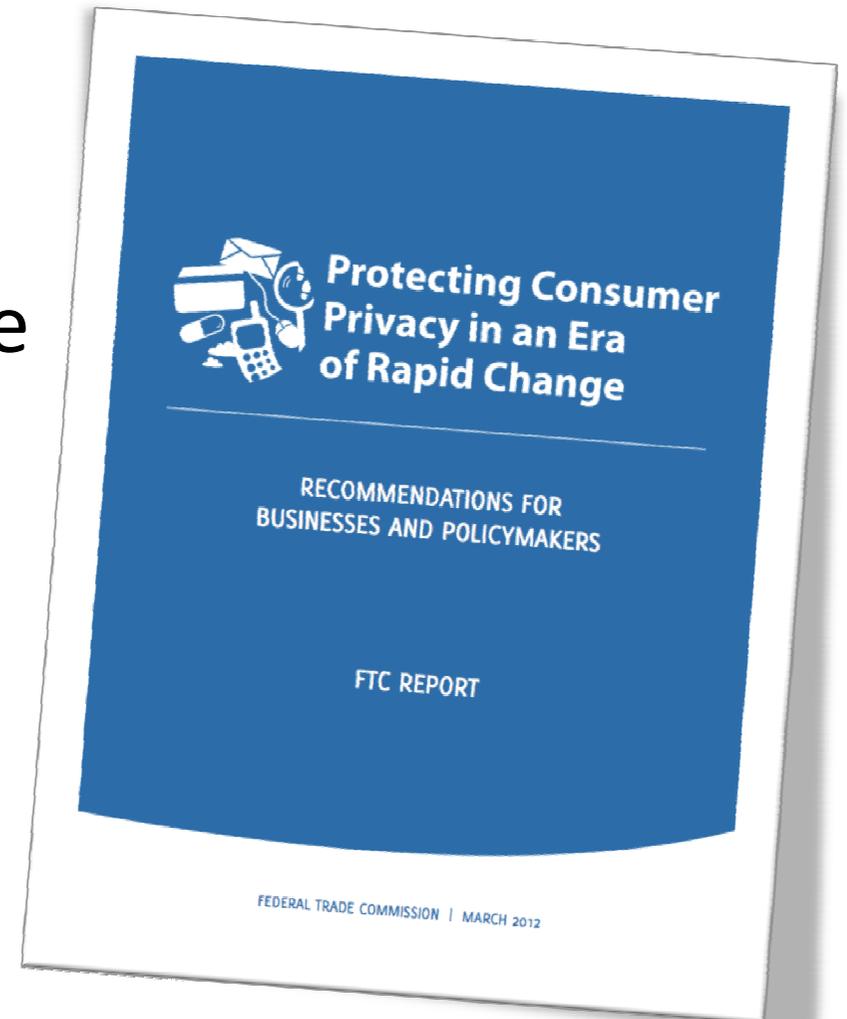
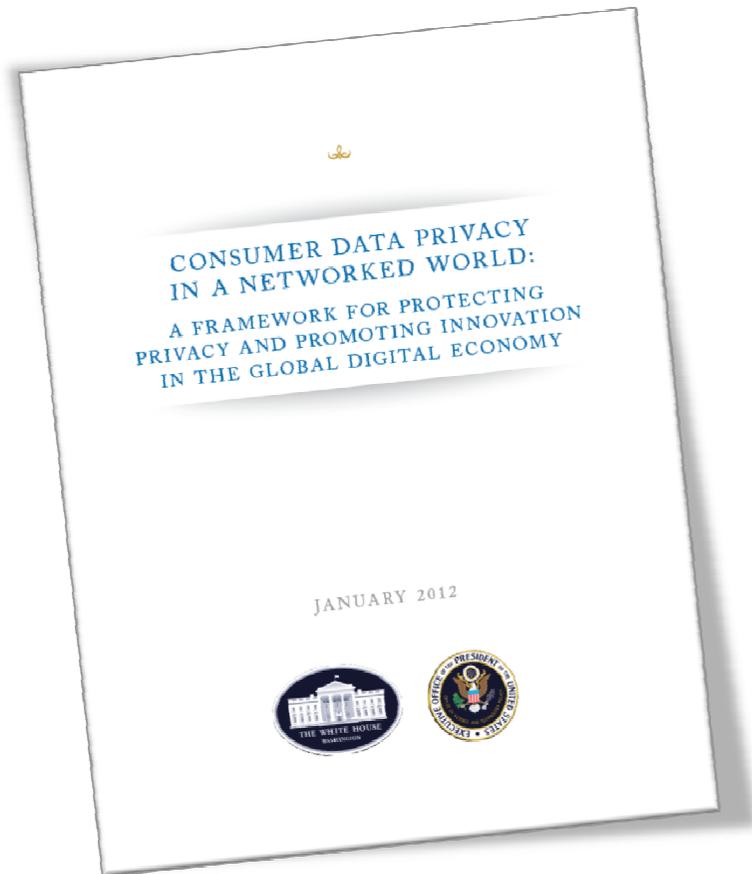
# Tension between utility and privacy

- Advertising networks like OBA
  - Target ads to interested users
  - Charge a higher price
- Users might have privacy concerns
- Advertising industry provides disclosures



# Media and government attention

- U.S. FTC and White House
- U.S. Department of Commerce multistakeholder meeting



# Related work

- Privacy surveys have found privacy concerns while marketing surveys have identified benefits
- 87% of Americans definitely or probably would not allow advertisers to track them [Turow et al., 2009]
- 62% of respondents would allow advertisers to track them “under the right circumstances” [KPMG, 2011]

# Research goals

- Gain insight into what users think about OBA
  - What factors influence these attitudes?
- Identify how participants' mental models correspond with notice and choice mechanisms
  - How can we best support users?

# Overview of methodology

- 48 participants for combination semi-structured interview and usability study
  - One-on-one, single moderator
  - Participants compensated \$30
  - Usability study separate [Leon et al., 2012]
- Recruited from the Pittsburgh, PA, USA region
  - Non-technologists
  - Willing to test privacy tools

# Interview structure

- Attitudes and knowledge about advertising
- Video from WSJ “What They Know” series



# Interview structure

- Attitudes and knowledge about advertising
- Video from WSJ “What They Know” series
- Opinions and beliefs about OBA

# Analysis

- Collaboratively developed codebook from researchers' notes
- Coded interviews from audio recordings
  - Codes could be added

# Overview of results

- Are people aware of OBA?
- What do privacy disclosures communicate?
- Opinion of OBA
- Beliefs about OBA that affect opinion
- Making choices about OBA

**Are people already  
aware of OBA?**

# Participants were unaware of OBA

- Participants believed ads were tailored, but only based on context or on a single site
  - Amazon, Gmail, Facebook



## Your Amazon.com

A carousel of recommended products from Amazon.com. The products are displayed in a row with navigation arrows on either side. Each product card includes an image, a "New Release" badge, the product name, a star rating with the number of reviews, and the current price with the original price crossed out. Below each product is a "Why recommended?" link.

Product	Rating	Price
Elixir Strings Acoust...	★★★★★ (153)	\$12.67 (was \$31.98)
Kyser 6 String Capo...	★★★★★ (39)	\$15.16 (was \$24.95)
Planet Waves Pro Wind...	★★★★★ (34)	\$6.99 (was \$13.99)
Elixir Strings Acoust...	★★★★★ (546)	\$12.12 (was \$30.00)
Elixir Strings Electr...	★★★★★ (34)	\$8.64 (was \$22.00)
Snark SN-2 All Instru...	★★★★★ (546)	\$11.20 (was \$39.00)

# Participants were unaware of OBA

- Participants believed ads were tailored, but only based on context or on a single site
  - Amazon, Gmail, Facebook
- Browsing could hypothetically be used
  - “I guess if they were monitoring what I did on the Internet...But I’d hope they weren’t...”

**What did privacy  
disclosures communicate?**

# Misconceptions about disclosures

- Express interest in product
- Purchase your own ads
  - “It looks like an icon advertising advertisements... a ‘place ad here’ kind of thing.”



# Misconceptions about disclosures

- Express interest in product
- Purchase your own ads
- Go to product's website
- See related ads
- Track user



# Opinions of OBA

# Participants mixed about OBA

- Recognized benefits for advertisers and users
  - Advertisers target the right person
  - Users find things they're interested in
- Privacy was the primary concern

**What factors may have  
influenced their opinions?**

# Beliefs about OBA

- Advertisers collect information including name, financial information, and address
- This information, along with browsing history, is stored in cookies
  - “I guess they can get into the cookies.”

# Making choices about OBA

# Existing methods for choice

- Deleting cookies



# Existing methods for choice

- Deleting cookies
- Websites that set opt-out cookies

All Participating Companies (106) SHOW Companies Customizing Ads For Your Browser (0) SHOW Existing Opt Outs (106)

**These 106 companies have set an opt-out preference to interest-based advertising in your browser.**  
[Need help?](#)

COMPANY NAME	
24/7 Media	-
33Across	-
Accuen Inc.	-
Acxiom	-
Adap.tv, Inc.	-
Adara Media, Inc.	-
Adblade Premium Ad Network	-
AdBrite, Inc.	-
Adchemy, Inc.	-
Adconion Media Group	-

# Existing methods for choice

- Deleting cookies
- Websites that set opt-out cookies
- Browsers' Do Not Track feature



## Tracking

Tell websites I do not want to be tracked

# Existing methods for choice

- Deleting cookies
- Websites that set opt-out cookies
- Browsers' Do Not Track feature
- Third-party browser plugins (Ghostery, DNT+)



# Participants' impressions of choice

- Deleting cookies
- Websites that set opt-out cookies
- Browsers' Do Not Track feature
- Third-party browser plugins (Ghostery, DNT+)

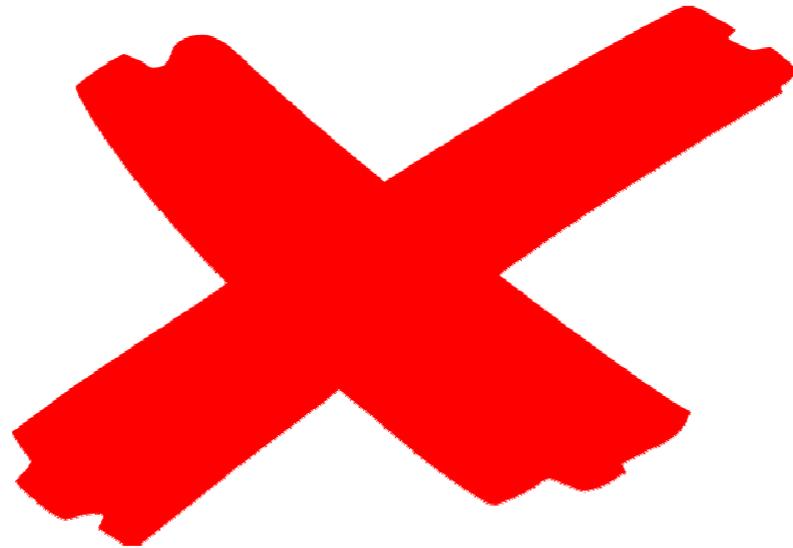
# Participants' impressions of choice

- Deleting cookies



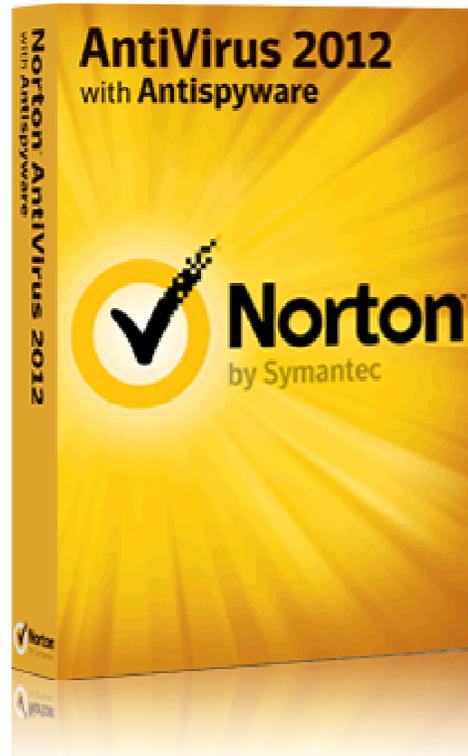
# Participants' impressions of choice

- Deleting cookies
- No options



# Participants' impressions of choice

- Deleting cookies
- No options
- Antivirus software suites



# Participants' impressions of choice

- Deleting cookies
- No options
- Antivirus software suites
- Web browser



# Decisions based on advertising company and context

# Choice based on companies

The screenshot shows a web browser interface with two main sections. The top section is a navigation bar with two tabs: 'Companies Customizing Ads For Your Browser (0)' and 'Existing Opt Outs (106)'. Below the tabs is a list of company names under the heading 'COMPANY NAME'. The bottom section is a 'Blocking Options' dialog box.

**COMPANY NAME**

- 24/7 Media
- 33Across
- Accuen Inc.
- Acxiom
- Adap.tv, Inc.
- Adara Media, Inc.
- Adblade Premium Ad Network
- AdBrite, Inc.
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- Adconion Media Group

**Blocking Options**

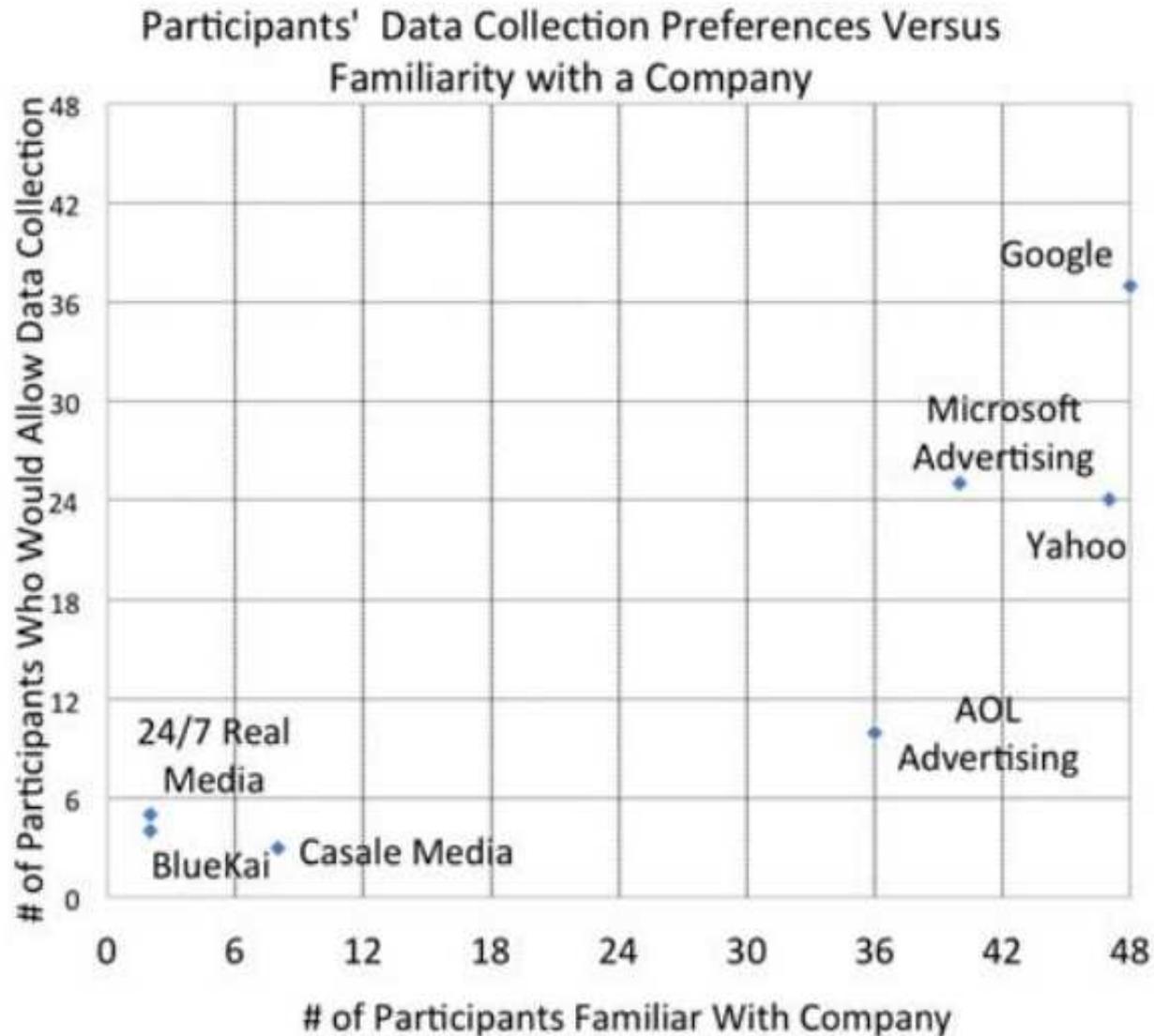
- Enable web bug blocking
- Enable cookie protection [experimental]

Blocking **no** bugs. Blocking **no** cookies.

Bugs	Cookies	Company Name	Logos	Actions
<input type="checkbox"/>	<input type="checkbox"/>	659 bugs & 396 cookies (check to block, click for more info)		
<input type="checkbox"/>	<input type="checkbox"/>	24/7 Real Media	iab. NAI	▶ 🛡️ 🔍
<input type="checkbox"/>	<input type="checkbox"/>	2leep		
<input type="checkbox"/>	<input type="checkbox"/>	33Across	iab. NAI	▶
<input type="checkbox"/>	<input type="checkbox"/>	3DStats		
<input type="checkbox"/>	<input type="checkbox"/>	5min Media	iab.	
<input type="checkbox"/>	<input type="checkbox"/>	[x+1]	NAI	▶
<input type="checkbox"/>	<input type="checkbox"/>	Accelerator Media		

# Companies: Familiarity and trust

- Asked about seven companies



# Opinions based on non-OBA activities

- Google is “not a company that I really associate with advertisements.”
- Microsoft “would collect information that would help them update your operating system.”

# Preferences depended on context

- Asked about six scenarios
  - Planning a vacation, shopping for a car and car loan, researching STD treatments for a friend, job-hunting, ordering food, reading the news
- 5 participants said 'no' to all six
- 0 participants said 'yes' to all six
- Preferences based on both **privacy** and **utility**
  - “I don't want to be bombarded with car ads for the rest of my life.”

# Conclusions

- Opinions about OBA mixed
  - OBA **Smart, Useful, Scary, Creepy**
  - Participants did not understand OBA technologies
  - Some of worst fears based on misconceptions
- Disconnect between mental models and existing notice and choice mechanisms
  - Privacy disclosures misunderstood
  - Meaningful choices?
  - Participants looked to familiar tools

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**Thank you!**

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