

What Do Online Behavioral Advertising Privacy Disclosures Communicate to Users?

Pedro Giovanni Leon,[†] Justin Cranshaw,[†] Lorrie Faith Cranor,[†] Jim Graves,[†]
Manoj Hastak,^{*} Blase Ur,[†] and Guzi Xu[†]

[†]Carnegie Mellon University
{pgl,jcransh,lorrie,jtg,bur,guzix}@andrew.cmu.edu

^{*}American University
mhastak@american.edu

ABSTRACT

Online Behavioral Advertising (OBA), the practice of tailoring ads based on an individual's online activities, has led to privacy concerns. In an attempt to mitigate these privacy concerns, the online advertising industry has proposed the use of OBA disclosures: icons, accompanying taglines, and landing pages intended to inform users about OBA and provide opt-out options. We conducted a 1,505-participant online study to investigate Internet users' perceptions of OBA disclosures. The disclosures failed to clearly notify participants about OBA and inform them about their choices. Half of the participants remembered the ads they saw but only 12% correctly remembered the disclosure taglines attached to ads. When shown the disclosures again, the majority mistakenly believed that ads would pop up if they clicked on disclosures, and more participants incorrectly thought that clicking the disclosures would let them purchase advertisements than correctly understood that they could then opt out of OBA. "AdChoices," the most commonly used tagline, was particularly ineffective at communicating notice and choice. A majority of participants mistakenly believed that opting out would stop all online tracking, not just tailored ads. We discuss challenges in crafting disclosures and provide suggestions for improvement.

Categories and Subject Descriptors

H.5.2 [Information Interfaces and Presentation]: Miscellaneous;
K.4.1 [Computers and Society]: Public Policy Issues

General Terms

Human Factors, Experimentation, Security

Keywords

Usability, Privacy, Online Behavioral Advertising (OBA) Disclosures, Notice, Choice

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1. INTRODUCTION

Online advertising companies increasingly use a sophisticated mechanism called Online Behavioral Advertising (OBA) to gather data about users' online activities, build models inferring users' interests, and display advertisements accordingly. OBA can benefit advertisers by increasing click-through rates [3, 34]. While some users may enjoy receiving more relevant ads, many users are concerned about being tracked. In response to privacy concerns about OBA [10], the online advertising industry has established a self-regulatory program based on user education, transparency, and consumer control over OBA [8].

Advertisers primarily use OBA disclosures in the form of icons and accompanying taglines to provide consumers transparency and control. These icons and taglines are placed near behaviorally-tailored ads. Clicking on these disclosures directs users to *landing pages* that explain OBA in more detail and outline the choices users have for managing their opt-out preferences.

We present the results of a 1,505-participant online, between-subjects study investigating the messages that icons, taglines, and landing pages actually communicate to Internet users. We tested the "advertising option icon," three taglines that the online advertising industry currently uses, an alternative icon, three additional taglines, and five landing pages from major online advertisers.

We found that the OBA disclosures and landing pages fell short both in terms of effectively drawing participants' attention and communicating clearly about notice and choice. Only 28% of participants remembered seeing the icon, and fewer than 12% correctly recalled the tagline they had been shown. The "Why did I get this ad?"¹ tagline was most memorable. It was also most effective for communicating notice, followed by "Interest based ads" and "Learn about your ad choices." However, no tagline was effective at communicating choice. More than half of participants believed clicking the disclosure would trigger pop-up ads, and a similar fraction thought clicking would indicate interest in the advertised product. "AdChoices," currently in wide use, was ineffective at communicating notice and choice. While landing pages were effective at communicating notice, the majority of users mistakenly believed that opting out would stop online tracking.

We discuss background and related work in the next section. In Section 3, we explain our methodology. In Section 4, we present our results. Finally, we discuss the implications of our results and potential opportunities for improvement in Section 5.

¹In Fall 2011 Google used this tagline. As of March 2012, Google appears to be using a variety of taglines, including "AdChoices" and "Why these ads?"

2. BACKGROUND AND RELATED WORK

We first provide a brief background on online behavioral advertising and industry self-regulation. We then review related work evaluating OBA disclosures and tools, followed by work on the effectiveness of disclosure icons and taglines in a variety of domains. Finally, we discuss research on the design of privacy notices.

2.1 Online Behavioral Advertising

The U.S. Federal Trade Commission (FTC) defines *online behavioral advertising* as “the practice of tracking an individual’s online activities in order to deliver advertising tailored to the individual’s interests” [10]. Online advertisers track users as they navigate the Internet, constructing profiles for the purpose of delivering targeted advertisements. Third-party HTTP cookies are the main mechanism used for online tracking [19]. Unlike first-party cookies, which are placed by the domain a user is visiting, third-party cookies are placed by another domain, such as an advertising network. Studies have found that users are more likely to click on targeted ads. Yan et al. found that behavioral targeting led to improvements of up to 670% in the clickthrough rates of ads [34].

Although OBA is popular with advertisers, Internet users have concerns about the practice. In a 2009 telephone survey of 1,000 Americans by Turow et al. [29], 68% of respondents “definitely would not” and 19% “probably would not” allow advertisers to track them online if given a choice. McDonald and Cranor found that only 20% of respondents to their online study of 314 Americans preferred targeted ads to random ads, while 64% of respondents found the idea of targeted ads invasive [23]. Hastak and Culnan found in 2010 that only 24% of respondents were comfortable with OBA in the absence of transparency and choice [13]. In a 2012 Pew telephone survey of 2,253 participants, 68% of respondents said they were “not okay with targeted advertising because [they] don’t like having [their] online behavior tracked and analyzed” [27]. Ur et al. interviewed 48 users in 2011, finding that they perceived benefits in OBA, but that both privacy concerns and misunderstandings made them reluctant to embrace the practice [30].

2.2 Industry Self-Regulation

In February 2009, the Federal Trade Commission released a set of principles designed to guide industry groups’ efforts to self-regulate OBA practices [10]. The FTC’s principles focus on transparency, disclosure, and consumer consent. The Network Advertising Initiative (NAI) and Digital Advertising Alliance (DAA) industry organizations responded with self-regulatory principles. Both organizations maintain websites² where users can set opt-out cookies signaling a desire not to receive OBA.

One form of notice adopted by the industry is the use of uniform icons, links, and accompanying text—which we term “taglines”—disclosing that advertisements are behaviorally targeted. For instance, the DAA advises that participating entities “use the Advertising Option Icon and one of the approved wordings to represent adherence to the Self-Regulatory Principles for Online Behavioral Advertising and as a means for providing enhanced notice of online behavioral advertising practices” [9]. These disclosures are typically placed just above an ad. The icon and tagline serve as clickable links to a landing page, which describes the advertising company’s OBA practices and gives the user the option to opt out of OBA or change his or her OBA preferences with that company.

2.3 Evaluation of OBA Disclosures

In 2009, the Future of Privacy Forum (FPF), a think tank, contracted with the WPP advertising company to develop icons to label OBA. The FPF commissioned Hastak and Culnan to conduct a study to test possible icons and taglines. Based on results from two focus groups, two icons and seven taglines were selected for study. The two icons tested were the “Power I” and “Asterisk Man.” Power I looks like a letter “i” with a circle around it, similar to a computer’s power button. Asterisk Man looks like a cross between an asterisk symbol and a stick figure.

In an online study of 2,604 participants, Hastak and Culnan measured the effectiveness of the icons and taglines at communicating OBA. Although they found that two of the tested taglines were statistically better at communicating than the others, taglines and icons were in general not effective at providing notice and choice about OBA. They found that Asterisk Man performed slightly better than Power I on several comprehension measures [13]. However, the circular Power I icon was modified to be triangular and became the industry-standard Advertising Option Icon. Our work differs from Hastak and Culnan’s since we evaluate disclosures in the context of a simulated browsing scenario, rather than on a single page. We also evaluate the landing pages to which users are taken when they click the icon.

In their summer 2011 study, Ur et al. found that most interviewees had difficulty interpreting OBA disclosure icons and both the “AdChoices” and “Interest Based Ads” taglines. Multiple participants misread “Interest Based Ads” as “Internet Based Ads” [30]. These results informed our selection of statements for evaluating OBA privacy disclosures.

2.4 Communicating with Icons

A number of studies have examined icons as a means to communicate information. Huang and Bias compared how visual representations and textual information were interpreted by 78 students; participants understood the semantics of an object or concept more quickly and more accurately when communicated with text [14]. Wiedenbeck studied the performance of 60 undergraduates using a computer interface that communicated information using only icons, using only text, or employing both icons and text. Although participants initially rated the text-only interface poor on perceived ease of use, participants performed poorly when using the icons-only interface for the first time, suggesting that text is important for initial communication in unfamiliar situations [32]. Haramundanis surveyed the use of icons in software, arguing that text performs an essential role in accompanying icons; she posits that icons cannot stand alone [12]. Taken together, this work suggests that text taglines should accompany unfamiliar icons.

Studies have also focused on the visual design of icons. For instance, Kunnath et al. compared the learning and performance of 53 graduate students when information was communicated using one of three types of icons: abstract, pictorial (photos), and line drawings. They found pictorial icons resulted in better learning and performance than abstract icons or line drawings [20]. This work suggests that the abstract icons used for OBA disclosures might not communicate semantic meaning or concepts effectively.

Icons have been evaluated in domains ranging from pharmaceuticals to foods, often in the context of communicating risk information. In a study of 406 students, Wang used a yellow “warning symbol” to draw attention to health disclosures on pharmaceutical advertisements, finding that this method of visual priming leads study participants to express greater trust towards the advertisements [31]. Employing a sample of 520 adults, Andrews et al. studied the “smart choices” nutrition icon, which is designed to

²<http://www.networkadvertising.org/choices/> and <http://www.aboutads.info/choices/>

condense a product’s nutritional information into a single front-of-package indicator. They found that participants more positively evaluate the nutritional content of products displaying this icon, even products with debatable nutritional content [1].

2.5 Evaluating Taglines

Taglines and other phrasal, textual communications have been studied in the context of advertising slogans, particularly as they relate to brand recognition. Lee found that including a tagline with a brand name can cue a person to recall the brand from memory [21]. In a study of 174 undergraduates, Boush found that slogans can either ease or undermine attempts to extend a brand to new products [4]. Dahlén and Rosengren found that slogans carry brand equity and are better liked when associated with stronger brands [7].

Taglines have been studied in both the healthcare and consumer marketing domains. Williams and Koepke evaluated 18 potential taglines for promoting Medicare information sources. They found “answers to your health care questions” and “helping you help yourself” were preferred by participants when the participants ranked a set of taglines. In contrast the less context-specific taglines, “so much more than you think,” “it’s all you need to know,” and “get the most out of it,” were rated lowest by participants [33].

2.6 Communicating Privacy

A growing body of work has examined how to make privacy disclosures more usable. Most privacy disclosures are presented as long plain-text documents. Studies have indicated that people do not read these policies, do not understand them, and do not like them [2, 16, 24]. McDonald and Cranor estimated that if Americans actually read privacy policies, it would take 244 hours per year per person, corresponding to a national opportunity cost of \$781 billion dollars [22].

Researchers have evaluated alternatives to text privacy policies. Kelley et al. proposed and tested a tabular “privacy nutrition label,” taking cues from the standardized presentation of the nutritional information of foods. They found that standardized privacy policy presentations allowed users to better understand privacy policies and do so more quickly [17]. Garrison et al. [11] found that a table format significantly improves comprehension of a privacy notice in comparison to other formats, including those currently popular.

Reducing privacy policies to icons has proved challenging in past work. Internet Explorer 6 introduced a status bar privacy icon that shows when cookies have been blocked [25]. The icon—a stylized eye with a red, do-not-enter road sign—can be difficult to notice and understand. Cranor et al. developed “Privacy Bird,” a browser helper object that uses bird-shaped icons with word balloons to indicate whether web sites comply with a user’s privacy preferences. However, in lab tests, users commonly misinterpreted these icons [6].

3. METHODOLOGY

Our goal was to evaluate the ability of OBA disclosures to empower users to make privacy choices. We conducted a between-subjects online study. We randomly assigned each participant to an experimental condition that consisted of an icon, tagline, and landing page. Half the participants were also assigned to a condition in which they were primed to believe that ads they were shown during the study were behaviorally targeted.

We recruited 1,548 users of Amazon’s Mechanical Turk (MTurk) crowdsourcing service to participate in what we described as an “Internet Usage Survey” in December 2011. We required that participants be at least 18 years old and live in the United States. Participants were compensated \$1 for the study, which took 24 minutes

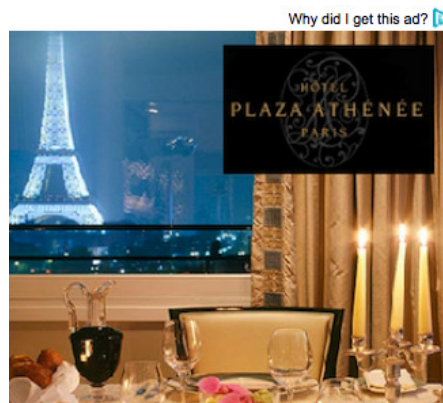


Figure 1: Advertisement shown to all participants for a Paris hotel. The icon and tagline on the top-right corner were assigned randomly from two and six options, respectively. The total area used to display both the ad and OBA disclosure was a square of 330px per side.

on average. 20 participants were excluded from the data set for using web blocking tools that prevented them from seeing part of the study. 23 other participants were excluded for providing answers unrelated to the study in response to the majority of open-ended questions. The remaining 1,505 respondents comprise our data set.

3.1 Study Protocol

The study was conducted entirely online in a participant’s web browser. Each participant was first presented a consent form³ and told they would be asked about their Internet usage and opinions of webpages and online advertising. This broad description was intended to prevent users from initially realizing what was being studied.

Each participant was randomly assigned an experimental treatment that specified the form that OBA privacy disclosures presented in the study would take, as described in Section 3.2. Participants began by providing demographic information and rating their agreement or disagreement with general statements about Internet advertising. We then asked participants to conduct a Google search on one of two possible topics: “traveling to Paris” or “buying a Nissan car.” We asked them to visit two websites from the search results and report briefly on their impressions. Participants next answered several general questions about Internet usage. We then asked them to go to a simulated version of the *New York Times* front page and provide their impressions of the page, report the most interesting headline, and identify any privacy-protection mechanisms that they saw. The top of the news page contained two advertisements for Air France, each of which was 210px wide by 75px high and contained the privacy disclosure specified by the participant’s treatment. Consistent with current industry practice, disclosures in the study were located above the ad and justified to the right side. The area used to display a disclosure was 165px wide by 20px high. The page also contained a 330px wide by 310px high ad for a Parisian hotel, as depicted in Figure 1. This advertisement, located on the right side of the page below a list of op-ed article headlines, contained the same privacy disclosures as the AirFrance ads.

After viewing the simulated news page, participants clicked a button to continue, automatically closing the *New York Times* win-

³This study was reviewed and approved by the Institutional Review Board at Carnegie Mellon University.



Figure 2: The two OBA icons studied. Each participant was randomly assigned to see either the “Asterisk Man” icon (left) or the “Advertising Option” icon (right).

dow or tab so that they could not refer back to it. We then asked participants about the products advertised on the website, and whether they had seen a symbol or short phrase near the advertisements. These symbols and phrases were the OBA privacy disclosures. If they answered affirmatively, participants were asked to answer more detailed questions about the symbol or phrase. Taken together, this portion of the study investigated the extent to which participants noticed OBA privacy disclosures in context.

Next, we showed participants an ad with the OBA disclosure specified by their treatment, absent any website context. We asked participants to interpret these disclosures through multiple-choice questions, open-ended prompts, and a series of true/false statements to which participants responded on a 5-point scale (“Definitely not,” “Probably not,” “Not sure,” “Probably,” or “Definitely”).

In the final portion of the study, we asked participants to click on an OBA disclosure icon and visit a company’s landing page. On a landing page consumers are presented information about OBA and given the opportunity to opt out of receiving behavioral advertisements. A participant’s assigned treatment dictated which of five landing pages, described in Section 3.2, he or she would see. We again asked participants questions in a variety of formats about their interpretation of this landing page. We concluded the study with a final set of questions about participants’ privacy concerns and uses of privacy-protection mechanisms.

3.2 Treatments

We assigned participants randomly to experimental treatments across three major dimensions: the priming they received before the simulated browsing scenario, the privacy disclosures they saw during the scenario, and the landing page they were shown.

3.2.1 Priming

The first dimension of the experimental treatment was designed to give half the participants reason to believe the advertisements they saw in the simulated browsing scenario were behaviorally targeted. Before the simulated browsing scenario, participants were asked to search for, visit, and describe two websites on one of two randomly assigned topics: “traveling to Paris” or “buying a Nissan car.” Those who searched for Paris travel were considered to be primed for behavioral advertising. During the browsing scenario that followed, all participants were shown a simulated version of the *New York Times* website containing ads for travel to Paris, regardless of their priming. Participants primed toward a trip to Paris could have reason to believe that these ads had been tailored based on their search, while participants primed toward a car purchase would not believe that the ads were behaviorally targeted.

3.2.2 Icon

All study participants were randomly assigned to see one of two icons: the blue Asterisk Man icon previously tested by Hastak and Culnan [13], or the Advertising Option icon consisting of the letter “i” in a blue triangle. The Advertising Option icon is the current standard required by the Digital Advertising Alliance [9]. The icons we tested are shown in Figure 2.

3.2.3 Tagline

Independent of the icon shown, participants were randomly assigned one of seven conditions for the tagline, a phrase to the left of the icon. In one condition, no tagline was displayed. All other conditions were shown one of the following taglines: “Why did I get this ad?” “Interest based ads,” “AdChoices,” “Sponsor ads,” “Learn about your ad choices,” or “Configure ad preferences.”

We selected the first three taglines (“Why did I get this ad?” “Interest Based Ads,” and “AdChoices”) because they have been approved by the Digital Advertising Alliance [9]. Hastak et al. previously tested these three taglines and found that they were not effective at communicating notice [13]. “AdChoices” is the tagline that has been most widely used by advertising companies, and it is currently being used in multiple languages. “Sponsor ads” was used by Hastak et al. as a control and was not expected to communicate effectively about notice and choice [13]. We tested “Learn about your ad choices” as an alternative to “AdChoices” that includes an action. We tested “Configure ad preferences” to test the impact of “configure” and “preferences” as key words.

3.2.4 Landing page

The final dimension of our experimental treatment randomly assigned participants one of five landing webpages currently in use. These webpages are intended both to notify consumers about data collection and use as well as to provide consumers with the opportunity to opt out of receiving OBA. The five landing pages we used come from the advertising companies AOL, Yahoo!, Google, Microsoft, and Monster Career Network.

3.3 Statistical Analysis

Most of our data for this study was categorical. For instance, we provided participants with statements about online advertising to which they responded on a 5-point Likert scale (“Strongly Agree,” “Agree,” “Neutral,” “Disagree,” “Strongly Disagree”). We binned participants’ responses into *agreement* (“Strongly Agree,” “Agree”) and *non-agreement* (“Neutral,” “Disagree,” or “Strongly Disagree”). We also showed participants statements about the OBA disclosures tested, some of which were true and some of which were false. Participants again responded on a 5-point scale (“Definitely Not,” “Probably Not,” “Not Sure,” “Probably,” “Definitely”). We again binned responses into *yes* (“Definitely” or “Probably”) and *non-yes* (“Not Sure,” “Probably Not,” or “Definitely Not”).

For omnibus comparisons among conditions, we used Pearson’s chi-squared test (noted in our results as χ^2) on the binned responses. We also performed pairwise comparisons of all treatments. Since the frequency of responses in some categories could potentially be low, rendering χ^2 p-values unreliable, we used Fisher’s Exact Test (noted in results as FET) to perform these pairwise comparisons. Post-hoc comparisons, including the pairwise comparisons, were corrected for multiple testing using the Holm-Bonferroni method, indicated in our results as “HC.”

To test interaction effects between icons and taglines, we performed a logistic regression using the Asterisk man and “blank” (i.e. no tagline) as control categories for icon and tagline treatments, respectively. We did not find any significant interactions. Further, the results from the logistic regression analysis were consistent with the pairwise comparisons performed using chi-squared tests. Therefore, p-values reported in the remaining of this paper are those that resulted from our pairwise comparison analysis.

3.4 Limitations

Our study was conducted online, which enables a large number of participants to take part, yet introduces a number of lim-

itations. As with any online study, we were not able to prevent participants from answering randomly or disregarding instructions. However, we manually verified key responses to open-ended questions to verify that the participant’s answers related to the study and excluded participants for whom the majority of responses to open-ended questions were unrelated to the study (23 participants). Participants could view the study on any operating system and browser, with their preferred plugins installed. We could not perfectly control the context in which the participant took the study. Participants could have searched for information about OBA disclosures online or tried to keep the simulated browsing session open while answering questions about it. We used Javascript to close the simulated browsing session when the participant moved forward in the study, although it is possible that some participants found a workaround. In addition, regardless of their priming condition, participants might have perceived the ads shown as tailored had they been interested in vacation trips at the time the study took place.

As we conducted our study on MTurk, we are subject to its demographic biases. United States MTurk workers are not representative demographically of U.S. Internet users. MTurk workers in the U.S. trend younger, more female, and more educated than the general population [28]. They also tend to be lower income than overall U.S. Internet users [15]. Despite the known biases, previous studies have shown that MTurk participants behave similarly in studies to subjects recruited from other sources [26], and that MTurk can provide a sample that is at least as diverse as participants recruited from other online or laboratory channels [5].

Some of the icons and taglines we tested, and all of the landing pages, are deployed in the wild. It is possible that some participants had seen their experimental treatment previously, potentially influencing their responses. Furthermore, due to the time-limited nature of an online study, the context in which study participants viewed OBA disclosures is not a perfect proxy for viewing these icons over a long period of time. However, we think that if a user does not understand the purpose or message of a disclosure the first time it appears, repeated exposure to this disclosure will not necessarily clarify its meaning.

4. RESULTS

We analyzed responses from 1,505 participants, finding that the OBA disclosures we tested perform poorly. Participants ranged in age from 18 to 82 (mean = 32, SD = 11.5). We did not observe any statistical differences in education, technical background, gender, age, or Internet usage across treatments.

We first discuss the effects of our priming conditions. We then present results on the extent to which participants recognized the disclosures as privacy mechanisms, whether they noticed them, and whether they could recall them later. Next we discuss the messages conveyed by the disclosures, including the extent to which they conveyed notice and choice, as well as the expected results of clicking on them. Finally, we present participants’ perceptions and understanding of the landing pages to which OBA disclosures link.

4.1 Effect of Priming

In an attempt to simulate the experience of seeing tailored ads, half of the participants were assigned to perform a Google search about taking a vacation to Paris, while the other half were asked to perform a search about buying a Nissan car. When participants later saw ads from Air France and a Paris hotel, we expected (but could not validate) that participants who had searched for travel to Paris would perceive these ads as targeted, while participants who had searched for cars would not.

Responses from participants who were primed for traveling to

Paris did not differ significantly from those of participants who were primed for purchasing a Nissan car for any question in our study. We cannot conclude whether our priming task was ineffective or whether participants were oblivious to tailored advertising. Although we have anecdotal evidence suggesting that users do not correlate their Internet browsing with the ads they see, why our priming was ineffective remains an open question.

Since the priming did not seem to have any significant effect, the results presented in the following sections consider all participants together, regardless of their priming condition.

4.2 Identifying Privacy Mechanisms

While showing the news website, we asked participants to “Explain as completely as possible what privacy protection mechanisms (if any) do you see on this news webpage.” A handful of participants expressed uncertainty about how to identify privacy mechanisms, and a few dozen explicitly mentioned that there were not any privacy protection mechanisms on the news website.

Overall, participants did not perceive the icons and taglines as being associated with privacy protection mechanisms. However, a small number of participants (fewer than 10% of participants in any treatment) recognized that some of the taglines might be associated with privacy protection mechanisms. In particular, in the “Configure your ad preferences,” “Why did I get this ad,” “Learn about your ad choices,” and “Interest based ads” treatments, 16, 14, 8, and 6 participants, respectively, mentioned the icon or tagline. One participant in the “AdChoices” treatment expressed “...seems you may be able to filter or choose what ads you don’t mind viewing.” One “Interest based ads” participant misread the tagline, saying “there is a little icon to opt out of *internet* based ads” [emphasis added].

Regardless of the tagline treatment, many participants referred to the privacy policy link and TRUSTe seal at the bottom of the page. A few others mentioned the “Terms of Service,” “Your Ad Choices,” and “Contact Us” links at the bottom of the page. In addition, some participants mentioned that the opportunity to create an account or log into the news website could be seen as mechanisms to protect their privacy. Some said they believed that registered users would receive better privacy protection. On the other hand, a small number of participants noted that by logging in they would be identifying themselves to the website, which could reduce their privacy. Several participants mentioned that the sole fact that the news website was not asking for personal information could be seen as a privacy protection mechanism. Finally, a few participants conflated privacy with security and referred to the lack of security on the page (i.e. no https) as something that could affect their privacy.

4.3 Recall of Ads and OBA Disclosures

After participants closed the news page, we evaluated whether they remembered the OBA disclosure icon and tagline by asking, “Was there a symbol placed near, but not inside, at least one of the advertisements?” Only about a quarter of participants (27.6%) remembered having seen the disclosure icons, with no significant differences between the Asterisk Man and the advertising option icon. Participants were significantly more likely to remember the ads than icons ($p < 0.0005, \chi^2$). Only 11.9% of participants both said that they remembered a tagline and correctly selected the particular tagline they had seen from a list. In comparison, approximately half (49.3%) of the participants remembered the ads shown on the news webpage, with no significant differences between participants in different icon or tagline treatments. However, the memorability of taglines did differ significantly across conditions ($p < 0.0005, \chi^2$). When we performed pairwise comparisons, we found that participants who were shown the “Why did I

Tagline	Remembered	Not remembered
Why did I get this ad?	49 (22.3%)	171 (77.7%)
Interest based ads	27 (12.6%)	187 (87.4%)
Learn about your ad choices	24 (10.7%)	200 (89.3%)
Configure ad preferences	22 (10.8%)	181 (89.2%)
AdChoices	17 (7.9%)	199 (92.1%)
Sponsor ads	15 (7%)	200 (93%)
Overall	154 (11.9%)	1,292 (88.1%)

Table 1: Tagline recall across conditions. “Why did I get this ad?” was recalled at a significantly higher rate than all other taglines except “Interest based ads.”

get this ad?” tagline remembered it at a significantly high rate than participants in all other tagline conditions except “Interest based ads.” ($p < 0.05$, HC FET). Nevertheless, “Interest based ads” was not statistically significantly more memorable than any other tagline. Tagline recall rates are summarized in Table 1.

4.4 Messages Conveyed

We again showed participants the Paris hotel advertisement with a disclosure icon and tagline, as shown in Figure 1. We asked the free-response question: “What, if anything, does this symbol [and phrase] communicate to you?” Participants’ opinions varied considerably by treatment. Across most treatments, the icon and tagline did not communicate effectively the concepts of notice and choice about targeted advertising. The “Why did I get this ad?” tagline was most effective at communicating notice. While some of the taglines communicated that users had choices, they did not communicate that the choices were related to OBA.

“**Why did I get this ad?**” Many participants who received this tagline associated it with behavioral advertising. For example, one participant explained, “It communicates that there is a logical reasoning behind the ad, most likely tracking my cookies.” Similarly, another participant wrote, “This conveys that my web usage may be monitored so that the ads are tailored to my particular interests.” Another common response was that this tagline was intended to explain why ads were shown on the news page. For example, one participant wrote, “The New York Times understands that people may not like ads and may be wondering why they are there.”

“**Learn about your ad choices**” communicated three main messages: users can set preferences about what ads (if any) to see, the ads were selected based on previous browsing activity, and users can purchase advertising space.

“**Configure your ad preferences**” This tagline primarily suggested that a user could change the layout of the ad or set preferences regarding the types of ads he or she is interested in seeing. For example, one participant wrote, “It means you can make the ad smaller if you want,” while another mentioned the “ability to control the nature of ads (i.e. static vs. animated ads).”

“**Interest based ads**” Many participants correctly inferred that it communicates about tailored ads. Similarly, some participants also inferred that online tracking was involved. In addition, many participants wrote that the ads displayed were exclusively for the Internet, suggesting that participants might have misread the word “Interest” as “Internet,” which has been noted in prior work [30]. For example, one participant commented, “This advertisement is based only on the Internet. Not on a television or newspaper.”

“**AdChoices**” Opinions about this tagline were more varied. Although many participants wrote that they had no idea about the purpose of the disclosure, a few correctly mentioned that the tagline was providing notice about ads being tailored based on previous pages visited. Other common beliefs included: it indicates that

it is possible to select the types of ads you want to view, it provides a link to the ad supplier’s website, and it provides a way to differentiate between web page content and advertisements. Other participants inferred that “AdChoices” was the ad’s sponsor.

“**Sponsor ads**” Participants most commonly believed this tagline offered ad space for sale. For example, one participant expressed, “you as an individual (the symbols looks like a little person) can put your ad on this site” and another explained, “I can click on the emblem for the possibility to advertise there myself.” Another common thought was that the ads were from a third party.

“**Symbols alone**” did not communicate anything related to tailored ads. The Advertising option icon alone was mostly seen as a play button with a few participants suggesting it meant “click to play advertisement” or “click to see next picture.” Similarly, many of those who saw the asterisk man symbol thought it was intended to point the user to read more detailed information at the bottom or inform them about terms and conditions that might apply.

4.5 Communicating Notice and Choice

We evaluated the effectiveness of icons and taglines at communicating notice and choice by presenting participants with true and false statements describing the purpose of these disclosures. Participants evaluated these statements on a five-point scale (“Definitely not,” “Probably not,” “Not sure,” “Probably,” or “Definitely”), which we then binned into *agreement* (“Definitely” or “Probably”) and *non-agreement* (all other responses).

4.5.1 Communicating notice

We evaluated the degree to which different icons and taglines provided *notice* that OBA was occurring. We found that the “Why did I get this ad?” tagline performed significantly better than all other taglines, with no significant differences between icons.

Our evaluation focused on responses to the question, “To what extent, if any, does this combination of the symbol and phrase [icon+tagline shown], placed on the top right corner of the above ad suggest the following?” Participants rated their agreement with the true statement: “This ad has been tailored based on websites you have visited in the past.” Participants’ agreement with all other statements are summarized in Table 3 in the appendix.

Agreement with this statement did not differ significantly between icon treatments ($p = 0.4$, χ^2), whereas agreement differed significantly across tagline treatments ($p < 0.0005$, χ^2); responses are summarized in Figure 3. “Sponsor ads” and blank treatments were least effective at communicating notice. The five other taglines performed statistically better than both the “Sponsor ads” tagline and not having a tagline ($p < 0.005$, HC FET). “Why did I get this ad?” performed the best. In particular, 80% of participants who received this tagline agreed with the statement evaluated, compared with 68% in “Interest based ads” ($p = 0.03$, HC FET), 66% in “Learn about your ad choices” ($p = 0.01$, HC FET), and 58% in both “Configure ad preferences” and “AdChoices” ($p < 0.0005$, HC FET).

4.5.2 Communicating choice

We also investigated the degree to which different icons and taglines communicated that participants could make a *choice* about receiving OBA. Although we found “Configure ad preferences” to be significantly better than all others at communicating choice, none of our icons or taglines was particularly successful.

Our evaluation was based on the question, “What do you think would happen if you click on that symbol or that phrase?” We focused on the level of agreement with the true statement: “It will take you to a page where you can tell the advertising company that

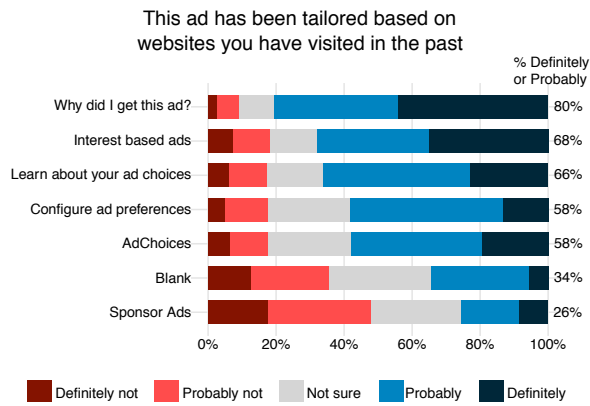


Figure 3: Agreement with the statement that the symbol and phrase suggest that “This ad has been tailored based on websites you have visited in the past.” As shown, “Why did I get this ad?” was significantly better than most other taglines at communicating notice about OBA.

you do not want to receive tailored ads.” Participants’ agreement with all other statements is summarized in Table 4 in the appendix.

As with *notice*, the two icons did not differ significantly at communicating *choice* ($p = 0.26, \chi^2$). In contrast, tagline treatments did differ significantly ($p < 0.0005, \chi^2$). Figure 4 summarizes participants’ responses. “Sponsor ads,” “Interest based ads,” and blank were least effective at communicating choice, while “Configure ad preferences” was significantly better than all other taglines ($p < 0.01, \text{HC FET}$).

4.6 Communicating “Clickability”

A primary mechanism for visiting network advertisers’ landing pages is clicking on the icon or tagline located near ads. We evaluated the extent to which participants believe they can click on the icon and tagline, which we term “clickability.” We found that clickability was fairly high in most treatment conditions, but there were significant differences between tagline and icon treatments.

We asked participants, “To what extent, if any, does this combination of the symbol and phrase [icon+tagline shown], placed on the top right corner of the above ad suggest the following?” Our analysis focuses on participants’ agreement with the true statement: “You can click on that symbol [and phrase].”

Overall, participants believed the disclosures to be clickable, with 76% of participants agreeing. A larger fraction of participants given the advertising option icon (82%) agreed with the statement evaluated, compared with 69% of those given the asterisk man icon ($p < 0.0005, \chi^2$).

Taglines also differed in the clickability they conveyed. Figure 5 summarizes participants’ levels of agreement, for which we found significant differences across tagline conditions ($p < 0.0005, \chi^2$). “Why did I get this ad?” performed the best, significantly better than the “AdChoices,” “Interest based ads,” “Sponsor ads,” and blank treatments ($p < 0.0005, \text{HC FET}$). Differences between “Why did I get this ad?” “Learn about your ad choices,” and “Configure ad preferences” were not significant.

4.7 Attitudes About Clicking

What participants believe will happen when they click on a disclosure is important because it may influence their willingness to click. We found that most participants had misconceptions; more than half believed that clicking on the disclosure would lead to pop-up ads or signal interest in the advertised product.

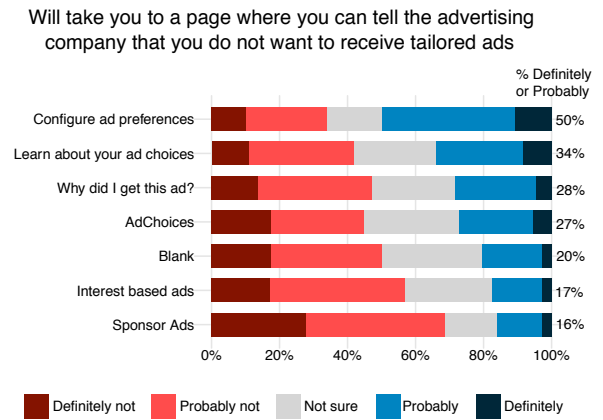


Figure 4: Agreement that clicking the OBA disclosures “will take you to a page where you can tell the advertising company that you do not want to receive tailored ads.”

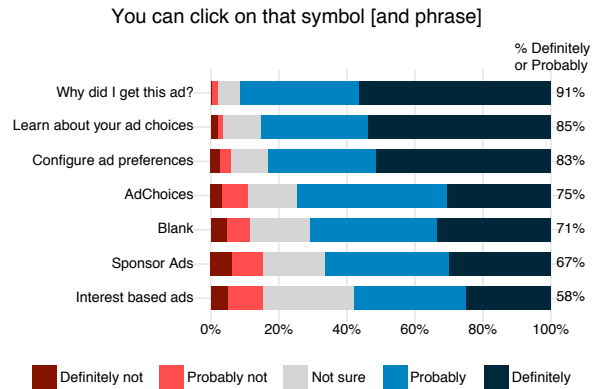


Figure 5: Agreement with “You can click on that symbol [and phrase].” “Why did I get this ad?” better conveyed clickability than all other taglines. Overall, those taglines containing actionable words communicated better clickability.

We evaluated participants’ agreement with the following statements, which were provided in response to the question, “What do you think would happen if you click on that symbol or that phrase?”

More ads will pop up. [false]

You will let the advertising company know that you are interested in those products. [false]

It will take you to a page where you can buy advertisements on this website. [false]

Overall, 53% of participants responded that clicking on the icon or tagline disclosure would probably or definitely trigger more ads to pop up. Figure 6 summarizes participants’ responses by condition. A lower percentage of participants shown the asterisk man icon thought incorrectly that additional ads would pop up if they clicked on the disclosure. 50% of participants shown the asterisk man icon believed more ads would pop up, compared with 57% of those who were shown the advertising option icon ($p = 0.003, \chi^2$). There were also differences across tagline conditions. The fraction of participants who saw “Sponsor ads” who responded “probably yes” or “definitely yes” (63%) was significantly greater than the fraction who saw “Configure ad preferences” (42%) or “Why did I get this ad?” (46%) ($p < 0.02, \text{HC FET}$).

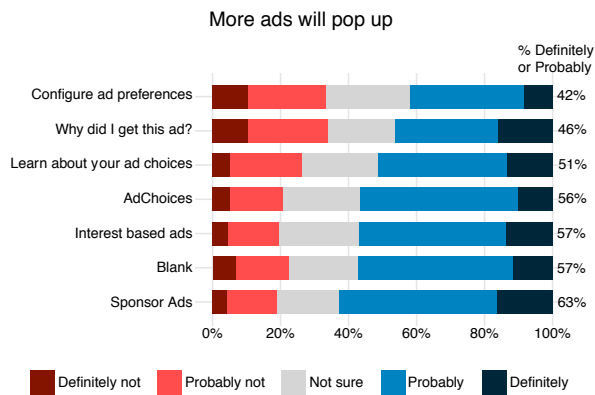


Figure 6: Agreement with the statement, “More ads will pop up,” if they click the OBA disclosures. Overall, participants believed that clicking the disclosures would cause additional ads to pop up.

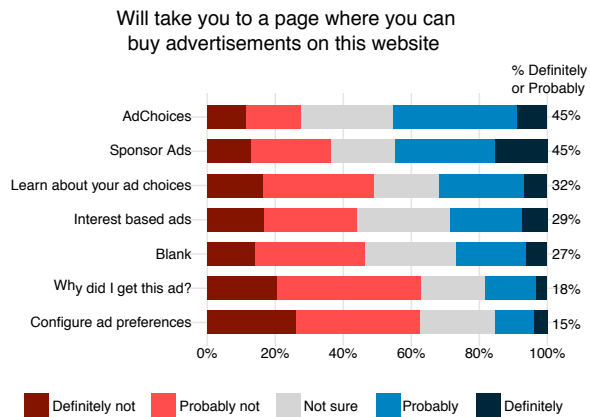


Figure 7: Agreement that clicking the OBA disclosures “will take you to a page where you can buy advertisements on this website.” Participants in the “Configure ad preferences” and “Why did I get this ad?” treatments were less likely to believe that the disclosures aimed to sell advertising space.

The majority of participants also mistakenly believed that clicking on the disclosure would signal to the advertising company interest in the product advertised. 51% of participants believed clicking would “let the advertising company know that you are interested in those products,” with no statistical differences across treatments.

Participants differed across tagline treatments in their level of agreement with the false statement that the OBA disclosures are intended to sell advertising space ($p < 0.0005$, χ^2). Figure 7 summarizes participants’ responses. Participants in “Configure ad preferences” and “Why did I get this ad?” were significantly less likely than those in other treatments to believe that the disclosure was intended to sell advertising space (all $p < 0.0005$, HC FET).

Overall, these clickability results suggest that users have significant misconceptions about the purpose of OBA disclosures. Although 27% of participants correctly believed that clicking on the disclosure would take them to a webpage on which they could stop receiving tailored ads, larger percentages of participants believed they would receive pop-up ads (53%), signal interest in a product (51%), or learn about placing advertisements themselves (30%). Of the taglines, “Configure ad preferences” and “Why did I get this

ad?” did the best job of conveying what happens when someone clicks on the disclosure.

4.8 Landing Pages

Landing pages, the pages that appear when a user clicks the icon or tagline disclosure, were the final element we tested. First, we report on what choices participants inferred from these pages and on user sentiment towards these pages. We then report on participants’ understanding of the opt-out process after visiting the landing page.

4.8.1 Opinions About Landing Pages

To evaluate participants’ sentiment toward the landing page they saw, we asked participants to rank the information it presented on three different dimensions: informativeness, understandability, and level of interest. Responses to these dimensions were significantly and positively correlated. The majority of participants felt the information on the landing pages was “very easy” or “easy” to understand (70%) and “very informative” or “informative” (75%), but only 41% felt it was “very interesting” or “interesting.”

The Monster opt-out page performed poorly. It was seen as less understandable than each of the others ($p < 0.0005$, HC FET). Only 54% of participants believed the page was very easy or easy to understand, compared with significantly higher percentages for AOL (74%), Microsoft (74%), Google (74%) and Yahoo! (72%). Similarly, the Monster opt-out page was perceived as less informative (all $p < 0.0005$, HC FET), with 52% of participants believing the page was very informative or informative, compared with Google (83%), Yahoo! (82%), Microsoft (80%), and AOL (77%).

4.8.2 Notice Provided by Landing Pages

To test the extent to which a landing page conveyed notice about OBA, participants rated completions to the phrase, “To what extent, if at all, does the information on the ‘landing page’ suggest to you that...” We focus on agreement with the true statement, “The ads you see in the news website are based on your visits to this news website and other websites.”

Overall, 77% of participants agreed or strongly agreed, “The ads you see in the news website are based on your visits to this news website and other websites.” This result suggests that opt-out pages are effective at communicating notice that OBA is occurring. In particular, 82% (Yahoo!), 79% (Google and Microsoft), 77% (AOL), and 67% (Monster) of participants agreed or strongly agreed with this statement. However, a significantly lower percentage of participants who saw the Monster landing page agreed with the statement than those who saw landing pages from Yahoo!, Google, or Microsoft ($p < 0.03$, HC FET).

4.8.3 The Meaning of “Opting Out”

All landing pages tested gave participants the opportunity to opt out of OBA. After visiting the landing pages, about half of participants misunderstood the meaning of opting out, either believing that it would stop online tracking or remove all advertisements. For example, one participant who visited the AOL landing page wrote, “It gives users the ability of opt out of having our data taken.” Another participant who visited the Yahoo! landing page wrote, “It gives you the option to tell websites to not monitor your browsing history.” Similarly, a participant who visited the Google landing page explained that the page offered “the ability to stop companies from monitoring your web activity.” One participant who visited the Microsoft landing page thought the page provides “ways to advertise or ways to opt out of seeing advertisements (for a fee).” Another participant thought the Microsoft landing page allowed him to decide “what ads you see or if you see any at all.”

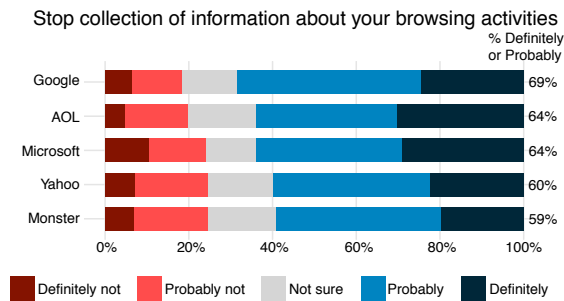


Figure 8: Agreement with the statement “Stop advertising companies from collecting information about your browsing activities.” Most participants (63%) believed that by opting out they could stop online tracking.

In addition, some participants expressed mistrust about the opt-out process. For example, a participant who visited the Microsoft landing page complained, “This is really hardly a choice at all since nothing stops them from continuing to gather the information.” A participant who visited the AOL landing page felt it contained “information to cover the company’s butt for taking my info.”

To further validate these anecdotal results, we asked participants to “indicate your agreement with the following statements defining what ‘opt out’ means in the context of internet advertising.”

Stop advertising companies from collecting information about your browsing activities. [false]

Stop seeing ads based on your browsing activities. [true]

Overall, 63% of participants agreed that opting out would stop advertising companies from collecting information about browsing activities, and 80% believed they would stop seeing advertisements based on their browsing activities. Figure 8 summarizes participants’ agreement with the first statement, showing that, independently of the landing pages seen, participants understood that by opting out they could stop online tracking.

Only 13.4% of participants chose the correct answers for both questions. In contrast, the majority of participants (57.9%) incorrectly believed that opting out would stop both tailored ads and online tracking.

5. DISCUSSION

Our investigation of OBA disclosures informed our understanding of what the different icons, taglines, and landing pages communicate to Internet users. While some disclosures stood out as being more effective at communicating notice and choice, we found that none of these disclosures are currently communicating clearly to consumers. In this section we discuss our main findings and suggest ways to make OBA disclosures more effective.

Notices are not noticed. One challenge of informing users about OBA through icons and taglines placed on ads is that most users do not notice them. After viewing the news webpage with ads that included our icon and tagline treatments, half of the participants correctly remembered the ads shown, but only a quarter of participants remembered the icons and fewer than 12% of participants recognized the correct taglines. While design improvements might lead to more people noticing OBA disclosures, it seems unlikely that small icons and taglines would be widely noticed on a page full of content and ads, especially when users are focusing on the content of the page. Salient links to user-friendly privacy policies with

explicit information about OBA practices on the site being visited should serve as an alternative means of providing notice and choice about OBA.

“AdChoices” is ineffective. “AdChoices” is one of the official DAA taglines, as well as the one that has been observed in use by the most advertising companies [18]. However, we found that other taglines provide more effective notice, including “Why did I get this ad?” and “Learn about your ad choices.” Although it contains the word “choices,” it was not particularly effective at communicating that users could make choices about receiving OBA. “AdChoices” performed similarly to our control tagline, “Sponsor ads,” with 45% of participants believing that the purpose of these two taglines was to communicate the availability of advertising space for sale. We suggest avoiding the use of meaningless phrases or contractions, which might be perceived by users more as a brand than as something informing them about OBA. “Configure ad preferences” and “Learn about your ad choices,” which contain action words, were most effective at communicating that users have a choice to make. Further, it may be worth investigating additional taglines that pose questions or contain words like “privacy.”

Users are afraid to click. The most effective taglines, “Why did I get this ad?” and “Learn about your ad choices,” performed reasonably well at providing notice and were perceived as clickable, yet were ineffective at communicating that participants could use them to exercise choices about OBA. In particular, more than half of participants believed clicking on the icon or phrase would trigger pop-up ads, and a similar fraction believed that clicking them would signal interest in the advertised product. These misconceptions may be due to beliefs that the icon was part of the ad. Furthermore, a third of participants believed the disclosure was intended for selling advertising space. If users do not understand the purpose of clicking on the icon, it is unlikely that many users will click on it. Consumer education campaigns might be helpful to educate users about the purpose of these disclosures. In addition, the use of tooltips and callouts might help convey information to users who otherwise would be afraid to click on the icon.

Users are confused about the meaning of opt out. After reading the landing page, participants were unable to understand the meaning of opting out. Two-thirds of participants believed that opting out would stop online tracking. Effective and transparent disclosures should clearly communicate users’ options for managing OBA. The distinction between opting out of tailored ads and opting out of online tracking should be clearly stated to avoid misleading users, or opt-outs should be made to match user expectations.

User education is needed. Arguably, the main challenge to the effectiveness of OBA disclosures is that users do not understand OBA and are unaware that disclosures link to choice mechanisms. Although user education is part of the self-regulatory principles for OBA, little user education has been done to date. The online advertising industry is currently providing consumer education about OBA through an industry website,⁴ but this website is mainly accessed through the OBA disclosures that are currently not being noticed. In January 2012, the DAA launched the “Your AdChoices” campaign.⁵ However, we have seen little evidence of this campaign beyond the campaign website and industry press releases.

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⁴<http://www.aboutads.info/>

⁵<http://www.youradchoices.com/>

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APPENDIX

Q1: As best as you can tell, what is the purpose of placing this symbol and phrase [icon+tagline shown] on the top right corner of the above ad?	Why did I get this ad?	Learn about your ad choices	Interest based ads	AdChoices	Configure ad preferences	Sponsor ads	Blank
To tell you that the ad is targeted to you	82%	67%	62%	55%	45%	22%	22%
To allow you to choose which types of products appear in ads that you see	45%	78%	33%	50%	72%	18%	24%
To tell you that this ads are from a legitimate company	39%	33%	33%	46%	22%	57%	21%
To give you information about placing advertisements on this website	33%	39%	31%	46%	29%	38%	23%
To attract your attention to the ad	45%	42%	55%	41%	34%	49%	42%
To advertise the company that is delivering this ad	37%	41%	41%	65%	35%	57%	34%
To give you more information about the advertised product	35%	35%	35%	30%	28%	40%	51%
To get your reactions to the ad	35%	33%	22%	19%	28%	13%	24%
To get you to click on the ad	54%	55%	58%	37%	41%	48%	47%

Table 2: Participants’ responses to the question, “As best as you can tell, what is the purpose of placing this symbol and phrase [icon+tagline shown] on the top right corner of the above ad?” The percentage of participants who answered “Probably” or “Definitely” is shown.

Q2: To what extent, if any, does this combination of the symbol and phrase [icon+tagline shown], placed on the top right corner of the above ad suggest the following?	Why did I get this ad?	Learn about your ad choices	Interest based ads	AdChoices	Configure ad preferences	Sponsor ads	Blank
This ad has been tailored based on websites you have visited on the past	80%	66%	68%	58%	58%	26%	34%
The ads you see on the news website are based on your visits to other websites	77%	62%	66%	56%	47%	28%	32%
This website shows ads that are chosen to match your needs	78%	70%	66%	65%	67%	26%	31%
These ads have been chosen to be relevant to you	83%	73%	72%	68%	62%	27%	35%
You can stop tailored advertising	18%	31%	15%	18%	41%	6%	13%
You can click on that symbol/phrase	91%	85%	58%	75%	83%	67%	71%
You can turn off advertisements on this website	12%	20%	6%	12%	41%	7%	13%
This ad is from one of the website’s premier partners	40%	34%	41%	44%	33%	66%	33%
You can choose to learn about the advertised product	50%	54%	58%	58%	43%	66%	55%
You can choose which ads you want to see on this website	37%	71%	26%	42%	72%	13%	19%

Table 3: Participants’ responses to the question, “To what extent, if any, does this combination of the symbol and phrase [icon+tagline shown], placed on the top right corner of the above ad suggest the following?” The percentage of participants who answered “Probably” or “Definitely” is shown.

Q3: What do you think would happen if you click on that symbol or that phrase?	Why did I get this ad?	Learn about your ad choices	Interest based ads	AdChoices	Configure ad preferences	Sponsor ads	Blank
It will take you to a page where you can tell the advertising company that you do not want to receive tailored ads	28%	34%	17%	27%	50%	16%	20%
It will take you to the advertised company site	45%	52%	64%	60%	39%	74%	71%
It will take you to a page where you can buy advertisements on this website	18%	32%	29%	45%	15%	45%	27%
It will take you to a page where you can tell the advertising company whether you are or not interested in the advertised product/service	46%	58%	36%	47%	60%	28%	33%
It will take you to a page where you can tell the advertising company what products/services you are interested in	51%	71%	50%	59%	73%	31%	40%
More ads will pop-up	46%	51%	57%	56%	42%	63%	57%
You will let the advertising company know that you are interested in those products	43%	53%	59%	51%	50%	53%	52%

Table 4: Participants’ responses to the question, “What do you think would happen if you click on that symbol or that phrase?” The percentage of participants who answered “Probably” or “Definitely” is shown.